This is a Cover Sheet to the State's Owner and Contractor Standard Construction Contract, known as the *MICHSPEC™* Division 0 Specifications. The *MICHSPEC™* Division 0 Specifications have been developed from the FORMSPEC™ Michigan Model, 1997 Edition. Although the State's 2008 Version of the Division 0 Specifications are written as simply as practical, it is nonetheless advisable to consult with companion Guide to Specifiers when preparing specifications for a specific project. These Division 0 Specifications were developed by incorporating provisions and requirements furnished by the State into the FORMSPEC™ Michigan Model. These Division 0 Specifications have undergone detailed technical reviews by Department of Technology, Management and Budget, **State Facilities Administration** representatives and detailed legal reviews by the Department of the Attorney General for the State of Michigan. Specifiers are encouraged to consult with a Division 0 specifications specialist or an attorney knowledgeable in public contracts when preparing specifications for a specific project.

STATE OF MICHIGAN

DEPARTMENT OF TECHNOLOGY, MANAGEMENT AND BUDGET

STATE FACILITIES ADMINISTRATION

MICHSPEC™ 2008 VERSION, OWNER AND CONTRACTOR

STANDARD CONTRACT FORMS AND CONDITIONS OF THE CONTRACT

MICHSPEC™ No. 97.0820 – 00020 THROUGH 97.0820 – 00440

RELEASED ON NOVEMBER 1, 1997.

Developed from
Contract Forms and Conditions of the Contract
FORMSPEC™ Michigan Model
and suggested for use with
Bidding Requirements

File No. 761/25250.SAR
Department/Agency EGLE
Project Name Bishop Airport Landfill (Site ID # 25000453)
Location Flint Bishop Airport, Flint, MI

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SECTION 00020 GLOSSARY

1.1 Defined Terms:

1.1.1. The following terms or relative pronouns used in Division 0 of the Specifications have these intent and meanings:

Activity– An element in the Progress Schedule establishing a requisite step, or the time and resources required, for completing the part of the Work associated with that Activity.

Addenda– Written instruments that are used by the **Owner** and/or **Professional** to incorporate interpretations or clarifications, modifications, and other information into the Bidding Documents. An Addendum issued after Bid opening to those Bidders who submitted a Bid, for the purpose of rebidding the Work without readvertising, is referred to as a post-Bid Addendum.

Agreement– The written agreement between the **Owner** and **Contractor** covering the Work to be furnished and performed.

Alternate– Refers to Work specified in the Bidding Documents for which the Bidder shall bid a Bid Price in the space provided in the Schedule of Alternates in Section 00300 Bid Form.

Apparent Low Bidder:- Those Bidders whose Base Bid, when added to those specific Alternates the Owner intends to accept, yields the three lowest sums of Base Bid and Alternates. Additional Bidders may be considered Apparent Low Bidders if their Base Bid, when added to those specific Alternates the Owner intends to accept, yields a sum within 10% of the lowest of the Apparent Low Bidder's sum. If a qualified disabled veteran meets the requirements of the contract solicitation and with the veteran's preference is the lowest Bidder is considered the Apparent Low Bidder.

Archaeological Feature– Any prehistoric or historic deposit of archaeological value, as determined by a representative of a State agency that is duly authorized to evaluate such findings and render such judgments. An Archaeological Feature deposit may include, but is not limited to Indian habitations, ceremonial sites, abandoned settlements, treasure trove, artifacts, or other objects with intrinsic archaeological value and that relate to the history and culture of the State of Michigan.

As-Planned Schedule– The **Contractor's** Revision 0 Progress Schedule returned to the **Contractor** as "Resubmittal Not Required," with or without comments or objections noted.

Authorized Technical Data– Information and data contained in a report of exploration and tests of subsurface conditions that are expressly designated in paragraph 2.0 of Section 00210 Information for Bidders. Also, any physical data (dimension, location, conditions, etc.) contained in those drawings of physical conditions of existing surface and subsurface facilities identified in paragraph 3.0 of Section 00210 Information for Bidders.

Bar Chart Schedule– Activity schedule, in a bar chart format, that accounts for the entire Work at a level of detail commensurate with the Progress Schedule requirements of the Contract Documents.

STATE OF MICHIGAN MODEL
Developed from FORMSPEC™ Michigan Model.

Bid– Written offer by a Bidder for the Work, as specified, which designates the Bidder's Base Bid and Bid Prices for all Alternates. The term *Bid* includes a *Rebid*.

Bidder– The Person acting directly, or through an authorized representative, who submits a Bid directly to the **Owner**.

Bidding Documents– The proposed Contract Documents as advertised, and all Addenda issued before Bid opening, and after Bid opening, if the Work is rebid without readvertising.

Bid Price– The Bidder's price for a lump sum item of Work, or the product of the Bidder's unit price for an item of Unit Price Work times the quantity given on the Bid Form for that item.

Bid Security– A security serving as a guarantee that the Bidder will conform to all conditions requisite for its return or as liquidated damages in the event of failure or refusal to conform.

Bidding Requirements– The Advertisement, Instructions to Bidders (including Attachment A), Supplementary Instructions, Information for Bidders, Bid Form, Bid Form Attachments and Qualification Submittals, as advertised and as modified by Addenda, and any other Section included within Division 0 of the Bidding Documents for the purpose of governing bidding and award of the Contract.

AD Board– The Administrative Board of the State of Michigan.

Bonds– *Section 00310 Bid Bond, Section 00610 Performance Bond* and *Section 00620 Payment Bond* are security furnished by the **Contractor**, as required by the Contract Documents.

Business Day– Any Day except Saturdays, Sundays and holidays observed by the **Owner.**

Bulletin– A standard **DTMB or other PSC** form used by the **PSC & Owner** to describe a change in the Work under consideration by the **Owner** and to request the **Contractor** to submit a proposal for the corresponding adjustment in Contract Price and/or Contract Time, if any.

Calendar Day– Every day shown on the calendar, Saturdays, Sundays, and holidays included.

Cash Allowance– An **Owner**-specified sum included within the Contract Price to reimburse the **Contractor** for the actual purchase/furnished cost of materials and/or equipment or other designated items, as specifically provided in the Contract Documents. Although the scope (e.g., the required quantity) of any Work covered by a Cash Allowance is sufficiently detailed in the Contract Documents for the purposes of bidding the required labor costs, Subcontract costs, construction equipment costs and general conditions costs and Fee, it is understood that the required materials, equipment or other designated items are of uncertain purchase cost at the time of Bid or are yet to be specified in more detail by the **Professional** as to quality, appearance, durability, finish and such other necessary features affecting purchase price.

Change Authorization– A written order issued and signed by the **Professional,** which directs changes in the Work that require no adjustment in Contract Price or Contract Time, or which allows for variations in the quantities of Unit Price Work.

Change Order– A written order issued and signed by the **Owner**, which amends the Contract Documents for changes in the Work or an adjustment in Contract Price and/or Contract Time, or both.

Construction Mechanic– A skilled or unskilled mechanic, laborer, worker, helper, assistant, or apprentice working on a state project but shall not include executive, administrative, professional, office, or custodial employees

Contact Person– Individual in the employ of the **Professional** or the **Owner** who is designated as the sole point of contact for prospective Bidders for requests or inquiries concerning the Work and/or the Bidding Documents.

Contract– Refer to the definition in paragraph 1.1 of Section 00500 Agreement. The term “Contract” encompasses the legal obligations of the **Owner** and **Contractor**, as defined by the Contract Documents.

Contract Award– The official action of the **Board**, the **Director-SFA** or the **Director-DCD** awarding the Contract to the **Contractor**.

Contract Documents– Those documents itemized or designated in paragraphs 2.2 through 2.4 of Section 00500 Agreement.

Contract Float– Calendar Days between the **Contractor's** anticipated date for early completion of the Work, or of a specified portion of the Work, if any, and the corresponding Contract Time.

Contract Price– The Contract price for the Work, or a designated portion of the Work, as designated in Section 00500 Agreement or elsewhere in the Contract Documents, is the total compensation, including authorized adjustments, payable by the **Owner** to the **Contractor** (subject to provisions for Unit Price Work).

Contract Times– The Contract Times for the entire Work are the periods allowed, including authorized adjustments, for Substantial Completion and final completion of the Work. The Contract Times for a designated portion of the Work are the periods allowed for Substantial Completion and final completion of any such portion of the Work, as specified in the Contract Documents.

Contractor– Person named "the **Contractor**" in Section 00500 Agreement with whom the **Owner** has entered into the Contract.

Correction Period– The period during which the **Contractor** shall, in accordance with the Contract Documents, (a) correct or, if rejected, remove, and replace Defective Work, and (b) maintain warranties for materials and equipment in full force and effect.

Cost of the Work Involved– The sum of all costs that would be, or were, necessarily incurred by the **Contractor** in providing any Work Involved with the related change, less the costs that would be, or would have been, incurred by the **Contractor** to provide such Work without the related **change**.

CPM Schedule– Computerized, Activity-based Progress Schedule, using Critical Path Method (CPM) techniques, and accounting for the entire Work at a level of detail commensurate with the Progress Schedule requirements of the Contract Documents.

Critical Path Method (CPM)– The Critical Path Method of planning and scheduling. The term "Critical Path" denotes a sequence of Activities controlling achievement of a specified Contract Time.

Date of Commencement of the Contract Time– The date when the Contract Time starts to run.

Defective– An adjective which when referring to or when applied to the term "Work" refers to (a) Work not conforming to the Contract Documents or not meeting the requirements of any inspection, test, or approval, or (b) Work itemized in a Punch List which the **Contractor** fails to complete or correct within a reasonable time after issuance of the Punch List by the **Professional**.

Defective Work/Non-Compliance Notice – A DTMB-0499 form or equivalent issued to identify defective or non-compliant conditions requiring response and remedy by the **Contractor.**

Delay– Any act or omission or other event that in any manner adversely affects or alters the schedule, progress or completion of all or any part of the Work. Delay is a generic term intended to include deferral, stoppage, slow down, interruption and extended performance, and all related hindrance, rescheduling, disruption, interference, inefficiency and productivity and production losses. Tariffs, trade restrictions, or governmental pricing measures do not constitute a Delay and shall not excuse performance or entitle the **Contractor** to additional compensation or time.

Department (DTMB)– Department of Technology, Management and Budget of the State of Michigan. ***Director*** is the Director of the **Department.**

Director-SFA- The Director of **DTMB** State Facilities Administration.

Director-DCD- The Director of **DTMB** State Facilities Administration, **Design and Construction Division**

Division– Each of the numbered, distinct parts (starting with Division 0) into which the Specifications are divided.

Drawings– Part of the Contract Documents showing the Work. Drawings shall neither serve nor be used as Shop Drawings.

Early (Late) Dates– Early (late) times of performance for the Activities.

Emergency– A condition affecting the safety or protection of persons, or the Work, or property at or adjacent to the site.

Fee for the Work Involved (Fee)– A negotiated, percentage mark-up on the Cost of the Work Involved which is allowed to the **Contractor** for (a) reasonable administrative costs, and (b) negotiated, reasonable profit on the Cost of the Work Involved.

General Requirements– Division 1 of the Specifications.

Hazardous Material– Asbestos, ACBMs, PCBs, petroleum products, such construction materials as paint thinners, solvents, gasoline, oil, etc., and any other like material the manufacture, use, treatment, storage, transportation, or disposal of which is regulated by federal, State, or local Laws governing the protection of public health, natural resources, or the environment.

State Facilities Administration- Entity in the **Department** of Technology, Management and Budget responsible for design, construction, and operations and maintenance of facilities and capital renewal.

***State Facilities Administration** Representative*- Designated DTMB-SFA **Design and Construction Division Project Director** (a) Responsible for directing and supervising the **Professional's** services during the period allowed for completion of the Work; and/or (b) Acting as representative for the **Owner** and for the enforcement of the Contract Documents, approving payment to the **Contractor** and coordinating the activities of the State, **Owner, Professional** and **Contractor.**

Law(s)– Means federal, state, and local statutes, ordinances, orders, rules and/or regulations.

MCL– The Michigan Compiled Laws of the State of Michigan.

Means and Methods– Includes means, methods, techniques, sequences and/or procedures applicable to the Work.

Notice of Award– Written notice accepting the Bid to the lowest responsive, responsible Bidder and designating the Contract Price (and establishing the Alternates accepted by the **Owner**).

Notice to Proceed– Written notice authorizing the **Contractor** to proceed with the Work, or a designated portion of the Work, and establishing the Date of Commencement of the Contract Time.

On-Site Inspection– The **Professional's** on-site examination of the **Contractor's** completed or in progress Work to determine and verify to the **State Facilities Administration** Representative that the quantity and quality of all Work is in accordance with the requirements of the Contract Documents.

Owner– The State of Michigan, named "the **Owner"** in Section 00500 Agreement, with whom the **Contractor** has entered into the Contract and for whom the Work is to be provided. The State of Michigan includes its departments, agencies, boards, commissions, officers, employees, and agents.

Partial Use– The use, by the **Owner,** of a designated portion of the Work before accomplishing Substantial Completion of the entire Work. Partial Use does not implicate or refer to Substantial Completion of the portion of the Work placed in use by the **Owner**.

Person– Individuals, partnerships, corporations, receivers, trustees, joint ventures, and any combinations of any of them.

Political Subdivision– Any county, city, village, or other local unit of the State, including any agency, department, or instrumentality of any such county, city, village, or other local unit.

Pre–Award Schedule– A Qualification Submittal required of the Apparent Low Bidder before Contract Award, and which is used by the **Owner** in the evaluation of the Apparent Low Bidder's Bid.

Professional Services Contractor (Professional)– The Person or its authorized representative licensed to practice architecture and/or engineering, named as **"Professional"** in Section 00500 Agreement, who has the right and authority assigned in the Contract Documents. The term **Professional** includes the **Professional's** consultants practicing the disciplines required by the Contract Documents. If the **Owner** will function as the **Professional**, such information will be noted in Section 00800 Supplementary Conditions or at the pre-construction conference.

Progress Schedule– Work Schedule that shows the **Contractor's** approach to planning, scheduling, and execution of the Work and that accurately portrays completed Work as to sequencing and timing, as provided in the Contract Documents.

Project– The total construction, which includes the Work and possibly other work, as indicated in the Contract Documents.

Project Field Representative– A **DTMB-SFA** Design and Construction employee or consultant, acting in collaboration and with direction from the **DTMB-SFA-DCD Project Director**, providing on-site, periodic observation and documentation of the Work for compliance with the Contract Documents.

Project Manual– The Book of Specifications, containing Division 0 of the Specifications and the technical Specifications.

Provisionary or Contingency Allowance– An amount included within the Contract Price to reimburse the **Contractor** for the cost to furnish and perform Work that is uncertain, i.e., may not be required, or is of indeterminate scope, i.e., design information and quantities, complexity, etc. are neither shown nor detailed in the Contract Documents. Work authorized under any Provisionary Allowance may consist of (a) changes required by actual conditions, as determined by the **Professional**, that are incorporated into the Work in accordance with Section 00700 General Conditions, and (b) any other Work authorized and completed under the pertinent provisions of the Contract Documents. Unlike a Cash Allowance, payments under a Provisionary Allowance shall include not only the purchase/furnished cost of the materials and equipment involved, but also all related labor costs, Subcontract costs, construction equipment costs, general conditions costs and Fee, provided they are calculated in accordance with the requirements of Articles 10 and 11 of Section 00700 General Conditions.

Public Utility– Any utility company, utility department or agency of a Political Subdivision, natural gas pipeline company, cable TV company, or any other owner/operator of utilities that are operated or maintained in, on, under, over or across public right-of-way or public or private easements and which is defined as "Public Utility" under the provisions of 2013 PA 174, as amended, MCL 460.721.

Punch List– A list of minor items to be completed or corrected by the **Contractor,** any one of which do not materially impair the use of the Work, or the portion of the Work inspected, for its intended purpose. A Punch List shall be prepared by the **Professional** upon having decided that the Work, or portion of the Work inspected, is substantially complete and shall be attached to the respective certificate of Substantial Completion.

Qualification Submittals– Data concerning a Bidder's qualifications and eligibility, as specified in the Bidding Requirements.

Rebid– A revised or new Bid submitted by a Bidder on the Section 00300 Bid Summary and Bid Form and the Bid Form Attachments made available through post-Bid Addenda, in the event the Work is rebid without readvertising, as allowed by post-Bid Addenda.

Record Documents– Drawings, Specifications, Addenda, Change Orders, Change Authorizations, Bulletins, inspection, test and approval documentation, photographs, written clarifications and interpretations and all other documents recording, or annotated to show, all revisions and deviations between the as-built installation and the Contract Documents, all approved Submittals and all clarifications and interpretations.

Records– Books, reports, documents, and other evidence relating to the bidding, award and furnishing and performance of the Work.

Record Schedule– A Progress Schedule Revision Submittal returned to the **Contractor** as "Resubmittal Not Required," with or without comments or objections noted.

**Recycled Material*– Recycled paper products, structural materials made from recycled plastics, refined lubricating oils, reclaimed solvents, recycled asphalt and concrete, recycled glass products, retreaded tires, ferrous metals containing recycled scrap metals and all other materials that contain (a) waste materials generated by a business or consumer, (b) materials that have served their intended purpose, and/or (c) materials that have been separated from solid waste for collection, recycling and disposition in the percentage determined by the State as provided by Law.

Request for Payment– The form provided by the **Owner** (Payment Request DMB-440) to be used by the **Contractor** in requesting payment for Work completed, which shall enclose all supporting information required by the Contract Documents.

Resident Project Representative– The authorized representative of the **Professional** who is assigned to the site.

Schedule of Values– A schedule of pay items, which subdivides the Work into its various parts and which details, for each itemized part, cost and pricing information required for making payments for Work performed. The sum of all pay item costs in the Schedule of Values shall equal the Contract Price for the Work.

Shop Drawings– Includes drawings, diagrams, illustrations, standard schedules, performance charts, instructions and other data prepared by or for the **Contractor** to illustrate some part of the Work, or by a Supplier and submitted by the **Contractor** to illustrate items of material or equipment.

Soil Erosion and Sedimentation Control– The planning, design and installation of appropriate Best Management Practices designed and engineered specifically to reduce or eliminate the off-site migration of soils via water runoff, wind, vehicle tracking, etc. Soil erosion and sedimentation control in the State of Michigan is regulated under The Natural Resources Environmental Protection Act; Soil Erosion and Sedimentation Control, 1994 PA 451, Part 91, as amended, MCL 324.9101 et seq. Soil erosion and sedimentation control associated with this Contract is monitored and enforced by the **Department** of Technology, Management and Budget, State Facilities Administration.

Specifications– Parts of the Contract Documents organized into Divisions. "Technical Specifications" means Divisions of the Specifications consisting of technical descriptions of materials, equipment, construction systems, standards, and workmanship.

State– The State of Michigan in its governmental capacity, including its departments, agencies, boards, commissions, officers, employees, and agents. Non-capitalized references to a state refer to a state other than the State of Michigan.

**State Construction Code*– The Michigan State Construction Code Act, 1972 PA 230, as amended, MCL 125.1501 et seq.

Sub agreement– A subcontract or purchase order awarding a part of the Work to a Subcontractor or Supplier.

Subcontractor– A Person having a Sub agreement for providing labor at the site, or for providing labor at the site and furnishing materials and/or equipment for incorporation into the Work.

Submittals– Includes technical Submittals, Progress Schedules and those other documents required for submission by the Contract Documents. The term "technical Submittal" includes Shop Drawings, brochures, samples, Operation and Maintenance (O&M) Manuals, test procedures and any other Submittal the Contract Documents require the **Contractor** to submit to demonstrate how the items covered, after installation or incorporation into the Work, will conform to the information given in the Contract Documents and be compatible with the design of the completed Work as a functioning whole as indicated in the Contract Documents.

Substantial Completion– The Work, or a portion of the Work designated in the Contract Documents as eligible for separate Substantial Completion, has been completed in accordance with the Contract Documents, to the extent that the **Owner** can use or occupy the

entire Work, or the designated portion of the Work, for the use intended without any outstanding, concurrent Work at the site, except as may be required to complete or correct Punch List items. Prerequisites for Substantial Completion, over and above the extent of Work completion required, include (a) receipt by the **Owner** of operating and maintenance documentation, (b) all systems have been successfully tested and demonstrated by the **Contractor** for their intended use, and (c) the **Owner** having received all required certifications and/or occupancy approvals from the State and those Political Subdivisions having jurisdiction over the Work. Receipt of all certifications and/or occupancy approvals from those Political Subdivisions with jurisdiction in and of itself does not necessarily connote Substantial Completion.

Supplementary Conditions– Section 00800 within Division 0 of the Specifications that amends and/or supplements Section 00700 General Conditions and other designated Contract Documents.

Supplementary Instructions– Section 00120 within Division 0 of the Specifications that amends and/or supplements Section 00100 Instructions to Bidders and any other designated Bidding Requirement.

Supplier– A manufacturer or fabricator, or a distributor, material man or vendor representing a manufacturer or fabricator, who has a Sub agreement for furnishing materials and/or equipment.

Target– A point of progress for a key part of the Work, which is identified for monitoring progress of the Work. Target Times are not Contract Times.

Tariffs– means any duties, taxes, fees, charges, or other assessments of any kind imposed by any federal authority on the importation of goods, products or materials, including but not limited to customs duties; Section 201, 232, and 301 tariffs; antidumping and countervailing duties; import surcharges; merchandise processing fees; harbor maintenance fees; and any comparable or successor governmental assessments applicable to imported goods, products or materials.

Total Float– Number of Calendar Days by which the Work or any part of the Work may be delayed from its Early Dates without necessarily causing an overrun in a pertinent Contract Time. Total Float is by definition at least equal to Contract Float.

Underground Utilities– Pipelines, piping, conduit, duct, cables, wells, tanks, tunnels and appurtenances, or other similar facilities, installed underground to convey or support conveyance of potable water, sprinkler or irrigation water, fire protection systems, electricity, gases, steam, petroleum products, sewerage and drainage removal, telephone, communications, cable TV, traffic, or control systems.

Unit Price Work, Contingent– Work involving specified but undefined quantities (i.e., related Work quantities are not detailed in the Contract Documents) which when performed is measured by the **Professional** and paid using the measured quantities and unit prices contained in the Contract Documents. Performance of such Unit Price Work is contingent upon conditions encountered at the site, as determined, and authorized by the **Professional**.

Unit Price Work, Specified– Work of specified and defined quantities (i.e., quantities are detailed in, and can be taken-off from, the Contract Documents) that when performed is measured by the **Professional** and paid based on the measured quantities and unit prices contained in the Contract Documents.

Work (as in *"the Work,"* "*the entire Work*)– The entire *completed Construction* required by the Contract Documents. The Work results from furnishing and performing all services, obligations, responsibilities, management, supervision, labor, materials, equipment, construction equipment, general conditions, permits, taxes, Tariffs, patent fees and royalties, testing, inspection and approval responsibilities, warranties, temporary facilities, small tools, field supplies, Bonds, insurance, mobilization, close-out, overhead and all connections, devices and incidental items of any kind or nature required and/or made necessary by the Contract Documents.

Work Involved, any Work Involved– Existing or prospective Work (a) reflected in any notice, proposal, or claim, or (b) reflected in changes ordered or in process, or (c) affected by Delay.

1.1.2. Other defined terms used in Division 0 but not assigned intent and meanings in this Section 00020 Glossary have the intent and meanings set forth in MCL or Section 00800 Supplementary Conditions.

1.1.3. Terms defined in this Section 00020 Glossary and used in other Specifications and/or in the Drawings in lower cases, or as capitalized terms, have the intent and meanings assigned to them in this Section 00020 Glossary if the context will permit.

1.2 Division 0 Rules of Construction:

1.2.1. Each Article in a Section in Division 0 contains “sub-articles,” numbered as this sub-article 1.2 is numbered; “parts,” numbered as this part 1.2.1 is numbered, and “sub-parts,” all of which are considered "paragraphs." A reference to a paragraph means a reference to the sub-article, part or sub-part, or any combination of any of them, if the context will permit.

1.2.2. Any reference to an Article or a paragraph in a Section within Division 0 means a reference to an Article or a paragraph in the very Section in which the reference is made, unless that reference specifically names another Section.

1.2.3. Whenever the context of any provision requires, the singular number includes the plural number and vice versa, and the use of any gender includes all genders.

END OF SECTION 00020

SECTION 00030 ADVERTISEMENT

1. Invitation to Bid (ITB) – Your firm is invited to submit a Bid. The State of Michigan as the Owner will receive **bids electronically through the SIGMA VSS website at SIGMA VSS** until 2:00 p.m., ET, on 7/15/2026. The State reserves the right to cancel this Invitation to Bid (ITB) or change the date and time for submitting Bids by announcing same at any time before the established date and time for Bid opening. Bids must remain open for acceptance by the Owner for no less than the Bid hold period. Contractor may agree to extend the Bid hold period. However, any such extension must be based upon no increase in the Bid Price and/or Contract Time. As a public record, all portions of the proposal response and resulting Contract are subject to disclosure as required under Michigan's Freedom of Information Act (FOIA), MCL 15.231, *et seq*.**,** including but not limited to any required project documentation utilized throughout the entirety of the contract. However, the State may exempt some information from disclosure as permitted by law. The State reserves the right to determine whether materials submitted by a bidder fall under applicable FOIA exemptions.

2. Work Description – The Work, Flint Bishop Airport Landfill Cap, File No. 761/25250.SAR includes, but is not necessarily limited to construction of landfill cap. The site is located at a former landfill site located immediately west of the Flint Bishop Airport, as shown on the Drawings.

3. Bidding Documents – Sets of Bidding Documents may be obtained at:
SIGMA VSS

4. Bid Security – Each Bid shall enclose Bid Security, as specified in Section 00100 Instructions to Bidders (and as specified in Section 00310 Bid Bond, if a Bid Bond is enclosed), in the amount of five percent (5%) of the Bidder's Base Bid. *If Bid Security is by check or money order, such certified or cashier's check or money order must be delivered in original copy before the Bid Due Time to:*

State Facilities Administration
Design & Construction Division
3111 W. St. Joseph Street
Lansing, Michigan 48917

All other Bid information must be submitted via SIGMA as per standard bidding procedure.

5. Pre-Bid Conference – A mandatory ☒ voluntary ☐ pre-bid conference will be held at The Flint Bishop Airport Sharp Conference Room, 3425 West Bristol Road, Flint, MI on 6/9/2026 at 10:00 AM ET. A tour of the project site will ☒ will not ☐ be held on the same day, immediately following the pre-bid conference. All prospective Bidders and other parties interested in the Work are required ☒ encouraged ☐ to attend the tour, if held. Addenda may be issued, in response to issues raised at the pre-bid conference and tour, or as the **Owner** and/or **Professional** may otherwise consider necessary. An individual is only permitted to represent one bidder at a mandatory Pre-Bid Conference.

FOR CORRECTIONAL FACILITIES ONLY: All contractor/vendor representatives attending a Pre-Bid Walk Through Meeting must submit a Vender/Contractor LEIN Request five business days prior to the meeting date, (Lien Request For CAJ-1037 attached to Bid posting). Send the LEIN Request form, filled out and signed, by email to SmithD76@michigan.gov & FrostS1@michigan.gov. The email "Subject" must include Facility Name, Project Name, Date & Time of Pre-Bid Walk Through Meeting).

6. SIGMA VENDOR NUMBER: If you are bidding a State job for the first time, visit the State of Michigan SIGMA website, SIGMA VSS, and follow the "SOM VSS User Guide for New Vendors" instructions, located under Forms and Reference Documents. Registration is required for bid submission. **Do not wait until the last minute to submit a proposal**, as the SIGMA system requires the creation of an account and entry of certain information, in addition to uploading and submitting the materials. The SIGMA system **will not** allow a proposal to be submitted after the proposal deadline, even if a portion of the proposal has been updated.

Questions on how to submit information or how to navigate in the SIGMA VSS system can be answered by calling **(517) 373-4111 or (888) 734-9749**.

7. Equal Employment Opportunity – Covenants not to discriminate in employment by contractors, subcontractors and suppliers required by Law are contained in paragraph 14.12 of Section 00100 Instructions to Bidders and paragraph 7.12 of Section 00700 General Conditions and are applicable to the Work and any Sub agreement under the Contract.

8. Contract Times – The Contract Times and the associated liquidated damages are specified in Article 4 of Section 00500 Agreement.

9. Contact Person – All requests or inquiries concerning the Bidding Documents, or the Work shall be addressed to Rob Butler at rbutler@dlz.com.

10. Award – Subject to any agreed extension of the period for holding Bids, Bids shall remain valid for acceptance by the **Owner** for 60 Calendar Days after the date of Bid opening. In addition, the **Owner** expressly reserves the right, within the **Owner's** sole discretion, to reject any or all Bids, to waive any irregularities, to issue post-Bid Addenda and rebid the Work without re-advertising, to re-advertise for Bids, to withhold the award for any reason the **Owner** determines and/or to take any other appropriate action.

END OF SECTION 00030

SECTION 00100 INSTRUCTIONS TO BIDDERS

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STATE OF MICHIGAN MODEL

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ARTICLE 1 BIDDING DOCUMENT INTERPRETATIONS

1.1. Section 00020 Glossary assigns specific intent and meanings to capitalized terms and to other defined terms used in Section 00030 Advertisement, this Section 00100 Instructions to Bidders and Section 00210 Information for Bidders. The Glossary also provides specific rules for construing any reference to any Article or paragraph that is made in this Section 00100.

1.2. The deadlines and submission requirements imposed on the Bidders by the provisions of Articles 3 and 4 also shall apply to any prospective subcontractor or supplier seeking access to the site or needing to submit written questions or inquiries.

1.3. Except as otherwise noted, the deadlines and other requirements imposed upon the "Apparent Low Bidder" by the provisions of Articles 2, 5, 8 and 13 also shall apply to any other Bidder remaining or wishing to remain in contention for the award.

1.4. Neither the **Owner** nor **Professional** assumes any responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents in preparing Bids. The **Owner** and **Professional** make Bidding Documents available only for obtaining Bids, and neither the **Owner** nor **Professional** grants a license for any other use of the Bidding Documents.

ARTICLE 2 QUALIFICATIONS OF BIDDERS

2.1. The Apparent Low Bidder shall submit to the **Professional**, within two (2) Business Days after receipt of the **Professional's** request, Section 00430 List of Subcontractors. The Apparent Low Bidder also shall submit to the **Professional,** within five (5) Calendar Days after the **Professional's** request, a Pre–Award Schedule and those other Qualification Submittals noted in Sections 00410, 00420 and 00440. The Apparent Low Bidder(s) may be required to attend a pre-award conference(s).

2.2. The Pre–Award Schedule shall consist of a time-scaled CPM Schedule or a Bar Chart Schedule, as designated by the **Professional**. The Pre–Award Schedule shall (a) identify start and completion dates for the Work in summary form, (b) show the sequencing in which the Bidder plans to perform the Work to conform to the Contract Times and sequences of Work indicated in or required by the Bidding Documents, and (c) include a plot with percentages of completion for the Work correlating to the start and completion dates.

2.3. Unless otherwise determined by the **Owner**, in its sole discretion, failure, neglect or refusal by the Apparent Low Bidder to submit Qualification Submittals when and as requested justifies the **Owner's** refusal to consider the Apparent Low Bidder's Bid and the Apparent Low Bidder's Bid Security will be forfeited to the **Owner** as liquidated damages. However, in the case of any other Bidder remaining or wishing to remain in contention for the award, such failure, neglect, or refusal will not constitute grounds for forfeiting that other Bidder's Bid Security

ARTICLE 3 BIDDING DOCUMENTS; SITE CONDITIONS. SAFETY REQUIREMENTS; LAWS

3.1. It is the responsibility of each Bidder, before submitting a Bid, to: (a) examine the Bidding Documents thoroughly; (b) visit the site and, if necessary, record conditions at the site (through logs/notes, photographs, video or any other means); (c) study and correlate the Bidder's observations with the Bidding Documents; and (d) submit written questions or inquiries about the Bidding Documents or the Work, as provided in Article 4, immediately after discovering any conflicts, ambiguities, errors or omissions in the Bidding Documents.

3.2. It is also the responsibility of each Bidder, in the preparation of its Bid, to take those steps that are reasonably necessary to (a) ascertain and satisfy itself of the physical conditions under which the Work will be performed and the condition of existing facilities, including those which may not be a part of the Work, but could be affected by the performance of the Work, and (b) account for all general, local and prevailing conditions at or near the site that may in any manner affect the cost, schedule, progress, performance or furnishing of the Work. Examples of such conditions include, but are not limited to: (a) the nature and location of the Work; (b) conditions related to the transportation, disposal, handling and storage of materials; (c) the availability and suitability of labor, materials, water, electric power, telephone, sanitary services and roads; (d) daily and monthly weather variations, including any related subsurface conditions, river stages, or similar conditions; (e) the character, quality and quantity of surface and subsurface conditions at the site, including but not limited to ground water table variations, and the location, configuration and condition of existing facilities and Underground Utilities; (f) the character of equipment and facilities needed preliminary to and during Work performance; (g) conditions related to maintaining the uninterrupted operation/occupancy of existing services or facilities; and (h) the extent to which the nature, characteristics and use of any adjacent or nearby lands, rights-of-way and easements, and facilities (in all cases, inclusive of real and personal property) may affect the Bidder's activities.

3.3. It is the responsibility of each Bidder to inform itself of, and the Bidder awarded the Contract shall comply with, all applicable Laws, including, but not limited to Laws affecting cost, schedule, progress, performance or furnishing of the Work. Examples of those Laws include, but are not limited to, those relating to nondiscrimination in employment, prevailing wages, protection of public and employee health and safety, environmental protection, building codes, fire protection, grading and drainage, use of explosives,

vehicular traffic, restoration of lands and property under the control of the State or a Political Subdivision, taxes, Tariffs, permits and licensing.

3.4. Section 00210 Information for Bidders identifies (a) reports of explorations and tests of subsurface conditions, and (b) drawings of physical conditions of existing surface and subsurface facilities that have been used by the **Professional** in the preparation of the Bidding Documents. Bidders may rely upon such expressly stated technical information and data contained in those reports which are expressly designated as Authorized Technical Data in Section 00210 Information for Bidders, but those reports and drawings are not part of the Bidding Documents.

3.4.1. Any conclusions or interpretations made by any Bidder based on such Authorized Technical Data shall be at the Bidder's own risk. Reliance by any Bidder on any Non-technical Information or Data, interpretations or opinions contained in those reports or drawings also shall be at the Bidder's own risk. The **Owner**, **Professional** and their respective consultants assume no responsibility for any understanding reached or representation made about subsurface conditions and physical conditions of existing facilities, except as otherwise expressly shown in or represented by the Authorized Technical Data made available.

3.4.2. Section 00210 Information for Bidders also identifies additional reports of explorations and tests of subsurface conditions and reference documents reflecting physical conditions of existing surface and subsurface facilities that have not been used by the **Professional** in the preparation of the Bidding Documents. Any such reports and documents are not part of the Bidding Documents and are made available solely to allow Bidders to have access to the same information available to the **Owner** and **Professional**. Neither the **Owner** nor **Professional** warrants the accuracy or completeness of any such information nor do they warrant that Section 00210 Information for Bidders identifies all such existing relevant reports and/or documents.

3.5. Section 00210 Information for Bidders also identifies information and data shown or indicated in the Bidding Documents or Underground Utility drawings about Underground Utilities. Such information and data about existing Underground Utilities is based on information and data obtained from record documents of previous construction or furnished to the **Owner** by the owners of those Underground Utilities or by others.

3.6. Section 00700 General Conditions contain provisions concerning (a) responsibilities for Underground Utilities, (b) changes that may be ordered because of incidents with differing site conditions, and (c) the adequacy and completeness of the Authorized Technical Data of subsurface conditions and existing subsurface and surface facilities made available to Bidders.

3.7. To the extent that any Bidder considers that additional Authorized Technical Data is necessary for determining its Bid, it is the responsibility of that Bidder to request from the **Owner** the necessary additional Authorized Technical Data. In the event the **Owner** does not have the requested additional Authorized Technical Data, it shall be the responsibility of the Bidder, at the Bidder's sole cost, to undertake reasonable examinations of the site and any other pertinent available information and data that the Bidder considers necessary for determining its Bid.

3.8. If requested by a Bidder at least seven (7) Calendar Days before the date of Bid opening (or as otherwise agreed to by the **Owner**), the **Owner** will provide access to the site, when and as designated by the **Owner**, to allow that Bidder to conduct those reasonable explorations and tests that Bidder considers necessary for preparation and submission of the Bidder's Bid. Any such explorations and/or tests conducted by that Bidder shall comply with the requirements of the **Owner**, any Public Utilities involved and any Political Subdivisions with jurisdiction. If access to the site is granted, that Bidder shall fill all holes and clean up and restore the site to its former condition, to the **Owner's** satisfaction, upon completion of those explorations and/or tests.

3.9. The Bidder awarded the Contract shall be responsible for obtaining any lands, areas, properties, facilities, rights-of-way, and easements, in addition to those furnished by the **Owner**, that the Bidder considers necessary for temporary facilities, storage, disposal of spoil or waste material or any other similar purpose. Neither the **Owner** nor **Professional** assumes any responsibility for site conditions at any lands, areas, properties, facilities, rights-of-way, and easements obtained by any Bidder.

*3.10. With respect to any earth disturbance associated with this Contract, the Bidder awarded the Contract shall comply with The Natural Resources and Environmental Protection Act; Soil Erosion and Sedimentation Control, 1994 PA 451 Part 91, as amended, MCL 324.9101 et seq. **State Facilities Administration** is the designated "Authorized Public Agency" under the provisions of Section 9110 of 1994 PA 451, Part 91 as amended.

3.11. Each Bid shall include and be deemed to have included all (a) sales and use taxes and other similar taxes, including Tariffs, applicable to the Work that are required by Law as of the date of Bid opening, and (b) the cost of all permits, approvals, licenses, and fees necessary for the commencement, prosecution, and completion of the Work. Section 00700 General Conditions contain provisions concerning responsibilities of the Bidder for sales and use taxes and other similar taxes, including Tariffs; and for obtaining permits, approvals, licenses, and fees applicable to the Work.

3.12. To the extent the **Owner** or **Professional** has knowledge of other work at the site, which may be ongoing during the period allowed for the Work, the Bidding Documents shall identify such other work. Before submitting a Bid, each Bidder shall evaluate: (a) the effect that any such other work operations (e.g., dewatering, blasting, etc.) may have on the Work, (b) related conditions and

sequences of Work contained in the Bidding Documents, (c) the requirements for coordination and cooperation between the Work and other work, and (d) related Contract Times.

3.13. The submission of a Bid constitutes a binding representation by the Bidder that: (a) the Bidder has complied with every requirement of this Article and the Bidding Documents; (b) the Bidder has examined and agrees with the Progress Schedule requirements contained in the Specifications, including, but not limited to, requirements concerning the administration of early completion schedules; (c) without exception, the Bid is premised upon performing and furnishing the Work required by the Bidding Documents and in accordance with those Means and Methods indicated in or required by the Bidding Documents; and (d) the Bidder considers the Bidding Documents to be sufficient in scope and detail to indicate a clear understanding of all terms and reasonably foreseeable conditions applicable to the Work, and how such terms and conditions may affect the cost, schedule, progress, performance and furnishing of the Work.

3.14. Any failure of a Bidder to take the actions described and acknowledged in this Article will not relieve that Bidder of the responsibility for (a) properly estimating the difficulty, cost of and schedule for successfully performing and furnishing the Work, or (b) upon award, performing and furnishing the Work successfully at no increase in Contract Price or Contract Time.

3.15. Neither the **Owner** nor **Professional** assumes any responsibility for any conclusions or interpretations made by any Bidder based on the information made available by the Bidding Documents. Nor does the **Owner** or **Professional** assume any responsibility for any understanding reached or representation made about conditions that may in any way affect cost, schedule, progress, furnishing or performance of the Work, unless that understanding, or representation is expressly stated or indicated in the Bidding Documents (including written Addenda).

ARTICLE 4 INTERPRETATIONS; ADDENDA

4.1. All requests for clarification or interpretation of the Bidding Documents, all proposals for any modifications to the Bidding Documents, all requests for information and all other questions or inquiries about the Bidding Documents and/or the Work shall be submitted in writing to the Contact Person identified in Section 00030 Advertisement, Article 8. Requests or inquiries received less than seven (7) Calendar Days before the date of Bid opening will be answered only if (a) the response can be given through Addenda made available at least seventy-two (72) hours before Bid opening (counting Business Days only), (b) the Bid opening is postponed by Addendum, or (c) the Work is rebid without readvertising following the issuance of post-Bid Addenda.

4.2. Any interpretation or clarification, modification to the Bidding Documents (whether by correction, addition, deletion, or other revision) and/or information given will be binding only if given by Addenda. Interpretations, clarifications, corrections, additions, deletions or other revisions or information given orally or in any other manner are not binding on the **Owner** and if relied upon by any Bidder, shall be relied upon at the Bidder's own risk. Addenda will be provided by posting to and may be obtained by bidders at: SIGMA VSS

4.3. In the **Owner's** sole discretion, subsequent to the opening of Bids, post-Bid Addenda may be issued setting a new date for the receipt and opening of sealed Rebids.

4.4. Any quantities of Unit Price Work given on the Bid Form, whether detailed in the Drawings or Specifications or contingent upon actual conditions, are approximate only, and are to be used solely for comparing Bids and establishing the Contract Price. Neither the **Owner** nor **Professional** represents that the actual quantity for any item of Unit Price Work performed will equal the quantity given. Payments will be made only for actual quantities of Unit Price Work completed in accordance with the Contract Documents. Actual quantities of Unit Price Work may overrun or underrun those in the Bid Form without necessarily invalidating the unit prices bid (except as provided in paragraph 10.6 of Section 00700 General Conditions).

ARTICLE 5 BID SECURITY

5.1. Bid Security shall be made payable to the "State of Michigan" in the form of a certified or cashier's check or money order drawn upon a bank insured by an agency of the Federal Government or consist of a duly executed Bid Bond. A Bid Bond shall be duly executed by the Bidder and by a surety authorized to do business in the State by the Department of Energy, Labor and Economic Growth and listed on the current U.S. Department of the Treasury Circular 570. Bidders shall attach a certified copy of Power of Attorney to sign Bid Bonds as the Attorney-in-Fact. Copies of the current Circular listing of approved bonding/insurance companies and interim changes may be obtained through the Internet web site https://www.fiscal.treasury.gov/fsreports/ref/suretyBnd/c570.htm.

5.2. Failure by a Bidder to enclose with its Bid a certified or cashier's check or money order or a duly executed Bid Bond signed by Bidder and Surety shall disqualify that Bidder from any consideration for the award. *If Bid Security is by check or money order, such certified or cashier's check or money order must be delivered in original copy before the Bid Due Time to:*

State Facilities Administration
Design & Construction Division

3111 W. St. Joseph Street
Lansing, Michigan 48917

All other Bid information must be submitted via SIGMA as per standard bidding procedure.

5.3. The Bid Security of the Bidder recommended for award will be retained until that Bidder has fulfilled all the following: (a) submitted Qualification Submittals and required information, (b) executed and delivered Section 00500 Agreement, (c) delivered evidence of insurance, and (d) furnished the required Section 00610 Performance Bond and Section 00620 Payment Bond (including separate certifications). If that Bidder fails to do so when and as specified, the **Director-DCD or his/her designee,** may annul the Notice of Award recommendation, and the Bid Security of that Bidder will be forfeited to the **Owner** as liquidated damages. If the **Owner** incurs any collection costs in the enforcement of the Bid Security requirement, that Bidder and its surety, if any, agree jointly and severally to reimburse the **Owner's** costs of collection, which shall include reasonable fees and charges of attorneys and others, court or hearing costs incurred with or without suit and interest.

5.4. If the Apparent Low Bidder gives a certified or cashier's check or money order as Bid Security, and the **Owner** requests a certification by an acceptable surety stating that the Bidder will furnish the Section 00610 Performance Bond and Section 00620 Payment Bond if awarded the Contract, that Bidder shall furnish such certification within seven (7) Calendar Days after the **Owner's** request.

5.5. The Bid Securities of the Apparent Low Bidder and of any other Bidder remaining in contention for the award will be retained by the **Owner** until the end of the period during which Bids shall remain open, or seven (7) Calendar Days after the **Owner** executes Section 00500 Agreement, whichever last occurs.

ARTICLE 6 CONTRACT TIME; LIQUIDATED DAMAGES

6.1. The Contract Times, i.e., the number of Calendar Days within, or dates by, which the Work or any part of the Work shall be completed, are specified in Section 00500 Agreement, and may be supplemented, as provided in Section 00500 Agreement. As stated in Section 00500 Agreement, the Contract Times are of the essence of the Contract. If any Bidder believes that any of the Contract Times are insufficient or excessive, that Bidder shall advise the **Owner** in accordance with the requirements of Article 4.

6.2. Liquidated damages are specified in Section 00500 Agreement and may be supplemented, as provided in Section 00500 Agreement.

ARTICLE 7 MATERIALS AND EQUIPMENT

7.1. Named or Specified Materials and Equipment – Materials and equipment described in the Specifications by naming a brand, make, supplier or manufacturer or by using a specification shall establish a standard and shall be intended to convey function, necessary design features, general style, type, materials of construction, character and quality, serviceability, and other essential characteristics. A number of Specifications, if any, using named or specified materials and equipment are *listed* in Schedule 1.6 of Section 00440 Schedule of Materials and Equipment.

7.2. Proposal for Adding Products by Addenda – For those Specifications *listed* in paragraph 1.6 in Section 00440 Schedule of Materials and Equipment, the **Professional** will, up to ten (10) Calendar Days before the date of Bid opening stated in Section 00030 Advertisement, accept written proposals from non-named manufacturers and suppliers seeking to have the **Professional** add their products to Schedule 1.6. The **Professional** will consent to any such proposal by Addendum if, in the **Professional's** judgment, the proposed material or equipment also may be used as a named or specified product. Lack of adequate time or information needed to evaluate a proposal, as determined in the sole discretion of the **Professional**, may justify its rejection.

7.2.1. Any such proposal shall clearly identify differences between the proposed and named or specified material or equipment and demonstrate objectively that the proposed material or equipment: (a) has the same essential characteristics of the item named or specified, (b) will equally perform the functions and achieve the results called for by the general design concept, (c) is suited to the same use as the item named or specified, (d) is at least of equal materials of construction, quality and necessary essential design features to the material or equipment named or specified, (e) conforms substantially to the desired detailed requirements, including, but not limited to durability, strength, appearance and aesthetics (if aesthetics are significant), safety, service, life, reliability, economy of operation and ease of maintenance, and (f) offers a proven record of performance and service for at least three (3) years before the date of Bid opening.

7.2.2. Any such proposal shall further include (a) a list of installations that have been in service for at least three (3) years before the date of Bid opening (including the name, address, and telephone number of a person familiar with and at the installation), and (b) sufficient drawings, diagrams, brochures, schedules, performance charts, instructions, samples, and other data as may be necessary to allow the **Professional** to make a determination.

7.3. Each Bidder is responsible for notifying the **Professional** in writing if the Bidder knows or has reason to know that any material or equipment *listed* in Section 00440 Schedule of Materials and Equipment, which the Bidder intends to bid requires changes in the Work. Any such notice shall be provided no later than seven (7) Calendar Days before Bid opening. This requirement applies but is not limited to changes in any testing requirements or Means and Methods indicated in or required by the Bidding Documents. However, this requirement is not intended to make the Bidder responsible for correcting design errors or omissions.

7.3.1. If any Bidder fails to provide such notice, and is awarded the Contract, that Bidder assumes responsibility for its proportionate share of any *excess* costs and Delay. *Excess* costs and Delay are those resulting from changes in the Work that would not have been incurred had that Bidder not failed to provide written notice to the **Professional.**

7.4. Bidding Requirement – For those Specifications *listed* in paragraph 1.6 of Section 00440 Schedule of Materials and Equipment, each Bidder shall bid one of the *listed* materials and equipment only. This requirement to not bid "or equal" or substitute materials and/or equipment for the *listed* Specifications applies even if the Bidding Documents state that an "or equal" or substitute may be furnished or used for any *listed* Specification.

7.5. Contract Condition – For those Specifications *listed* in paragraph 1.6 of Section 00440 Schedule of Materials and Equipment, the Contract will be awarded on the basis that only *listed* named or specified materials and equipment will be furnished. If an "or equal" or a substitute may be furnished for any *listed* Specification, if acceptable to the **Professional**, application for acceptance will not be considered until after Contract Award.

7.6. Section 00700 General Conditions contains provisions requiring each Supplier (a) to be bound to the requirements of the Contract Documents, (b) to assume toward the **Contractor** all obligations that the **Contractor** assumes toward the **Owner** and **Professional,** and (c) to furnish Work under a Sub-agreement containing waiver of rights of subrogation provisions.

ARTICLE 8 SUBCONTRACTORS

8.1. For each Division, Section of the Specifications and/or trade itemized in Section 00430 List of Subcontractors, the Apparent Low Bidder shall, when requested by the **Professional**, nominate the Subcontractor(s) to be awarded a Sub-agreement(s). When completing Section 00430, the Apparent Low Bidder shall provide licensing data for trades for which contractors' licensing is required and, if applicable, indicate minority, woman, or handicapped status. One Subcontractor shall be nominated for each Specification or trade, unless the Apparent Low Bidder, directly or through a Subcontractor, intends to award more than one Sub-agreement for the listed Specification or trade.

8.1.1. For any asbestos abatement projects, Contractor must comply with MCL 338.3375(4) and complete the Bid Form Attachment Section 00330 Asbestos Abatement Attestation. Notwithstanding anything to the contrary, the Owner has the right to object, regardless of cause, to any asbestos abatement Subcontractor nominated by the Contractor to be awarded a Sub-agreement that has 5 or more notices of violation of environmental regulations or has been subject to an administrative consent order or a consent judgment involving environmental regulations, within the immediately preceding 5 years.

8.2. If the **Owner** objects, for good cause, to any nominated Subcontractor, the **Owner**, before issuing the Notice of Award, may request replacement of that Subcontractor. In that event, the Apparent Low Bidder shall nominate a substitute Subcontractor or the Bidder itself, if qualified for the Work involved. In such case, there will be no extension in the Bid hold period nor any increase in the Bidder's Bid or Alternates. If the Bidder declines, that Bidder shall not be recommended for the award; however, such declining will not constitute grounds for forfeiting the Bidder's Bid Security.

8.3. Except as provided in paragraph 8.2, no removal or replacement of a nominated Subcontractor will be considered by the **Owner**, except for good cause. Before Contract Award, any removal, replacement, or addition of a nominated Subcontractor shall be responsive to the requirements of the Bidding Documents only to the extent it permits the timely evaluation of the newly nominated Subcontractor. After Contract Award, if the Apparent Low Bidder, as the **Contractor**, nominates *for the first time* a Subcontractor for any Division, Specification and/or trade listed in Section 00430 List of Subcontractors, and the **Owner** objects for good cause to any such newly nominated Subcontractor, the **Contractor** shall provide a replacement Subcontractor at no increase in Contract Price and/or Contract Time.

8.4. Section 00700 General Conditions contains provisions requiring each Subcontractor (a) to be bound to the requirements of the Contract Documents, (b) to assume toward the **Contractor** all obligations that the **Contractor** assumes toward the **Owner** and **Professional,** and (c) to provide Work under a Sub-agreement containing waiver of rights of subrogation provisions.

8.5. These provisions shall not be construed to create any third-party beneficiary or joint employer status with respect to the **Owner** and/or **Professional** and any Subcontractor. Furthermore, these provisions shall not be construed to create or impose any duty or liability on the **Owner** to exercise this authority for the benefit of any Bidder, nominated or newly nominated Subcontractor or any other third party.

ARTICLE 9 BID FORM AND BID FORM ATTACHMENTS

9.1. All bid forms should be uploaded as attachments to SIGMA, including the Section 00300 Bid Summary, Section 00300 Bid Form and Bid Form Attachments (Section 00310 Bid Bond Form, Section 00320 Non-collusion Affidavit, and if applicable, Section 00330 Asbestos Abatement Attestation). If any forms are revised by Addendum, the latest revision of the appropriate Bid Summary, Bid Form and/or Bid Form Attachment shall be used. All blank spaces shall be legibly and properly printed in ink or typed as required in these Instructions to Bidders and each form. All Bid prices shall be printed or typed in both words and figures.

9.2. Bids by individuals shall be signed by the person making that Bid, or the Bid shall enclose a Power of Attorney evidencing authority to sign the Bid in the individual's name.

9.3. Bids by partnerships shall be signed in the name of the partnership. The partner authorized to sign shall be named and sign where indicated. A certified copy of power of attorney authorizing that partner to bind all partners shall be attached to Section 00300 Bid Form. If a certified copy of the partnership's certificate attached to Section 00300 Bid Form indicates that all partners have signed, no separate authorization is required.

9.4. Bids by corporations shall be signed in the legal corporate name. The signature of the president or authorized officer shall be entered below the corporate name, followed by the attesting signature of the corporation secretary or of an authorized officer other than the officer signing the Bid. A certified copy of a pertinent Board Resolution authorizing that individual to bind the corporation shall be attached to Section 00300 Bid Form.

9.5. Bids by joint ventures shall be signed by all or one of the joint venturers. If not all joint venturers sign, a certified copy of Power of Attorney authorizing the individual(s) signing to bind all joint venturers shall be attached to Section 00300 Bid Form. If a certified copy of the joint venturer's certificate attached to Section 00300 Bid Form indicates that all joint venturers have signed, no separate authorization is required.

9.6. The Bidder shall acknowledge receipt of all Addenda by completing the blank spaces in the table provided for that purpose in paragraph 2.1 of Section 00300 Bid Form.

ARTICLE 10 PREPARATION AND SUBMISSION OF BIDS

10.1. **Prevailing Wage and Asbestos Abatement Project Requirements:**

10.1.1. The Bidding Documents include either the attached Schedule of prevailing rates of wages and fringe benefits for all classes of Construction Mechanics called for in the Bid and resulting Contract, if any, or the attached current prevailing wage determination issued by the U.S. Department of Labor, as applicable depending on the funding source(s).

10.1.2. To the extent MCL 401.1101 et seq. is applicable, Contractor shall include in a bid for a state project a copy of the state project registration for the Contractor and for each Subcontractor of the Contractor that has been selected at the time the Contractor submits the Bid.

10.1.3 For any project with asbestos abatement, Contractor must complete the Bid Form Attachment, Section 00330 Asbestos Abatement Attestation, to be considered a responsive Bidder.

10.2. **Bids must be submitted electronically through the SIGMA VSS website at SIGMA VSS**

10.3. Each bid requesting the Qualified Disabled Veterans (QDV) preference, in accordance with Public Act 22 of 2010, MCL 18.1241(3), shall include a DD 214 Proof of Service and Discharge, a Veterans Administration rating decision letter, proof of disability (if the disability is not indicated on the DD 214), and appropriate legal documents setting forth the 51% natural persons QDV ownership.

10.4. If Unit Price Work is specified, the Bidder shall, for each Unit Price Work item listed separately on Article 6 of Section 00300 Bid Form, bid a unit price, and enter, in the appropriate column, the computation of the respective quantity multiplied by the respective Bidder's bid unit price. Bid prices for each lump sum or "One Each" item listed on the Bid Form shall be printed or typed only in the appropriate "Bid Price" column. The Bidder shall show the sum representing the Bidder's Base Bid and, if Alternates are listed, the Bid prices for all Alternates, in the spaces provided for those purposes.

10.5. For each Cash Allowance, the Bidder shall include, within the Bid, all labor costs, construction equipment costs, insurance and Bond premiums and other general conditions costs and Fee (Bidder's and Subcontractors') to complete Work associated with the material, equipment, or other designated item to be furnished under the Cash Allowance. For each Provisionary/Contingency Allowance, the Bidder shall include, within the Bid, insurance premiums (not recoverable as labor burden) and Bond premiums required to complete Work that may be ordered under the Provisionary/Contingency Allowance. Cash Allowances and

Provisionary/Contingency Allowances are defined in Section 00020 Glossary and are further described in paragraph 10.7 of Section 00700 General Conditions.

10.6. The Bidder's Base Bid and Alternate Bid prices shall include, and payment for completed Work shall be compensation in full for, all services, obligations, responsibilities, management, supervision, labor, materials, commodities (including all fuel, gas, or other consumables necessary to operate any equipment), devices, equipment, construction equipment, general conditions, permits, patent fees and royalties, testing, inspection and approval responsibilities, warranties, temporary facilities, small tools, supplies, Bonds, insurance, taxes, Tariffs, mobilization, close-out, overhead and profit and all connections, appurtenances and any other incidental items of any kind or nature, as are necessary to complete the Work, in a neat, first quality, workmanlike and satisfactory manner in accordance with the Drawings and Specifications and as otherwise required to fulfill the requirements of the Bidding Documents. Except as otherwise provided in the Contract, the Bidder assumes all risk of increases in prices for all services, obligations, responsibilities, management, supervision, labor, materials, commodities (including all fuel, gas, or other consumables necessary to operate any equipment), devices, equipment, construction equipment, general conditions, permits, patent fees and royalties, testing, inspection and approval responsibilities, warranties, temporary facilities, small tools, supplies, Bonds, insurance**,** taxes, Tariffs, mobilization, close-out, overhead and profit and all connections, appurtenances and any other incidental items of any kind or nature, as are necessary to complete the Work. Unless otherwise provided for under the Contract, no adjustment to the Contract Price, and no claim for additional compensation, reimbursement, or relief of any kind, shall be allowed on account of any such price increases, market fluctuations, supply chain impacts, or other cost escalations occurring before or during performance of the Work.

10.7. Neither the Section 00300 Bid Form nor any Bid Form Attachment made available to the Bidders and submitted with the Bid shall be altered in any way. Bids shall not contain any qualifications or conditions or any recapitulations of the Work whatsoever. No Alternate will be considered, unless any such Alternate is itemized in paragraph 6.2 Schedule of Alternates in Section 00300 Bid Form and specified in the Bidding Documents.

10.8. Before and after Bid submission, and before the time for receiving Bids has expired, any Bidder may alter or revise any price or information the Bidder has entered on its Bid Form or any Bid Form Attachments by: (a) crossing out the entry, (b) legibly printing in ink or typing the new price or information, and (c) placing the initials of the person who signs the Bid adjacent to each change. After Bid opening, the **Owner** may require a Bidder to verify any such alteration or revision. Ambiguities arising from any alterations or revisions made by any Bidder may be resolved against that Bidder, in the **Owner's** sole discretion.

10.9. Neither the **Owner** nor **Professional** assumes any responsibility for any costs any Bidder incurs, however caused, in preparing and submitting its Bid, in withdrawing its Bid, or in objecting to the award or to being disqualified for the award.

10.10. In the event of any conflict between Attachment A to Section 00100–Bidder's Checklist and any requirements specified in any other parts of the Bidding Documents; the requirements of the Bidding Documents taken as a whole shall be binding on the Bidders.

10.11. All bonds, insurance, and other required documents shall be issued in the name of the bidder.

ARTICLE 11 BID WITHDRAWAL

11.1. Any Bidder may withdraw its Bid before Bid opening by submitting to the **Owner** a document requesting the withdrawal in the manner in which a Bid shall be signed and submitted to the **Owner**. Withdrawal of a Bid before Bid opening will not prejudice the right of that Bidder to submit a new, modified Bid. After the time for receiving Bids has expired, the following will apply: (a) no Bid may be modified, altered, or reformed, except to resolve irregularities on the Bid Form or Bid Form Attachments, as provided in paragraph 14.6, and (b) no Bid withdrawal will be accepted by the **Owner**, except as provided in paragraphs 11.2 through 11.6.

11.2. After the time for receiving Bids has expired, no Bid may be withdrawn, unless that Bidder lodges a written claim of a mathematical or clerical error in the Bidder's Bid with the **Owner** within two (2) Business Days after the date of Bid opening. The claim shall describe in detail the mathematical or clerical error, include a signed affidavit stating the facts of the alleged error and request that the Bidder be released from the Bidder's Bid.

11.3. If any Bidder's claim to withdraw its Bid due to an alleged mathematical or clerical error is timely filed, the **Director-DCD**, or his/her designee, will determine the validity of the claim and, as he/she deems necessary within his/her sole discretion, will provide an opportunity to the Bidder making the withdrawal to present its verification claim at a hearing/review session within ten (10) Calendar Days after the **Owner** received the claim.

11.4. At the Bid withdrawal claim review, the **Director-DCD**, or his/her designee shall, within his/her discretion, informally hear testimony and receive evidence as to whether (a) the Bid contains an obvious mathematical or clerical error not involving lack of good faith or fair dealing, (b) the error is subject to objective certification and is of such grave consequences that to enforce the Contract would be unconscionable, (c) the error relates to a material feature of the Contract, and (d) the error was not caused in any way by the Bidder's violation of positive legal duty or culpable negligence.

11.5. Upon completion of the claim review process and before any award recommendation, the **Director-DCD**, or his/her designee, will enter findings and render a determination on the Bidder's withdrawal claim. The **Owner** will notify the Bidder within a reasonable time after such determination.

11.6. If the **Director-DCD**, or his/her designee, concurs with the Bid withdrawal claim and the **Owner** suffers no serious prejudice, except loss of bargain, the **Owner** will allow the Bidder to withdraw its Bid will return the Bidder's Bid Security within a reasonable time. However, that Bidder will not be allowed to submit another Bid for the Work. The decision of the **Director-DCD**, or his/her designee, shall be final and binding on any such Bidder.

ARTICLE 12 BID OPENING; OBJECTION TO THE AWARD

12.1. Each Bidder bears sole responsibility **to submit their bid electronically through the SIGMA VSS website at SIGMA VSS**

12.2. Within reasonable time after the date of Bid opening, the **Owner** will make available a "Bid tabulation" listing the Bids opened and the Apparent Low Bidder. If any Bidder listed in the Bid tabulation has any objection to the Apparent Low Bidder, the objecting Bidder shall file a written protest with the **Owner** within seven (7) Calendar Days after the date of Bid opening. The protest shall describe in detail the basis for the protest and request a determination under this Article.

12.3. If a written protest is timely filed, the **Director-DCD**, or his/her designee, will review the protest and if he/she determines in his/her sole discretion that a claim review process is necessary, such proceeding shall be conducted within ten (10) Calendar Days after receipt of the written protest.

12.4. The **Owner** will notify the Bidders involved within a reasonable time of the **Director-DCD's**, or his/her designee's, recommendation to dismiss or uphold the protest. If the protest has been denied, the **Owner** will notify those Bidders of the time and date on which the **Board's** Building Committee will meet to consider the **Director-DCD's**, or his/her designee's recommendation of award. The objecting Bidder and the Apparent Low Bidder will be given an opportunity to be heard at the Building Committee meeting and, at the discretion of the **Board**, at any subsequent **Board** meetings. The Building Committee and **Board**, at its discretion, will review or hear the protest under such terms and conditions as either deems proper.

12.5. Upon reviewing the protest, the Building Committee and/or the **Board** will either (a) dismiss the protest, or (b) uphold the protest and send the Bid back to the **Director-DCD**, or his/her designee, for a new Bid evaluation or rebid, consistent with the determination of the Building Committee or **Board's** findings. The decision of **Board** as to the protest shall be final and binding.

ARTICLE 13 BIDS TO REMAIN OPEN

13.1. Bids shall remain open for acceptance by the **Owner** for no less than the period during which Bids shall remain valid (i.e., the Bid hold period) stated in Section 00030 Advertisement.

13.2. The **Owner**, by written notice, may elect to request the Apparent Low Bidder and any other Bidder remaining or wishing to remain in contention for the award to hold their Bids beyond the Bid hold period. Any such Bidder who fails or refuses to agree to the **Owner**-requested extension may be disqualified for further consideration for the award. However, no such Bidder shall forfeit the Bidder's Bid Security due to its failure or refusal to hold its Bid.

13.3. Any such Bid hold extension request by the **Owner** and consent by any Bidder shall be based upon no increase in (a) the Bidder's Base Bid, (b) any of the Bidder's Alternate Bid Prices, and (c) any Contract Times stated in Calendar Days. However, in the event none of the Bidders involved consent to extending their Bids, as conditioned in this paragraph, the **Owner** will issue a post-Bid Addendum specifying an additional Alternate for the sought extension in the Bid hold period.

ARTICLE 14 AWARD OF THE CONTRACT

14.1 If the Owner elects to award the Contract, the Owner will make the award to the responsive and responsible best value bidder except as provided below relative to veteran's preference.

14.1.1 The Apparent Low Bidders will be evaluated for responsiveness and responsibility based on the following:

- Compliance with the bid specifications and requirements.
- The Bidder's financial resources.
- The Bidder's technical capabilities.
- The Bidder's technical experience.
- The Bidder's past performance.

- The Bidder's insurance and bonding capacity.
- The Bidder's business integrity.

If a qualified disabled veteran meets the requirements of the contract solicitation, provides acceptable responses to both Part One and Part Two of the Best Value Construction Bidder Evaluation to achieve a Best Value recommendation and with the veteran's preference is the lowest responsive, responsible, best value Bidder the Owner will award the contract to the qualified disabled veteran bidder.

A determination as to whether the requirements of the bid solicitation have been met will be based solely on the Owner's and Professional's evaluation of the Section 00300 Bid Form, Bid Form Attachments, Bidder-provided documents, Best Value Evaluation by the PSC, interview, and Bidder Qualification Submittals received in a timely basis. Each bid requesting the Qualified Disabled Veterans (QDV) preference, in accordance with Public Act 22 of 2010, MCL 18.1241.3 shall include a DD 214 Proof of Service and Discharge, a Veterans Administration rating decision letter, proof of disability (if the disability is not indicated on the DD 214), and appropriate legal documents setting forth the 51% natural persons QDV ownership.

The bids will be evaluated for best value based on price and qualitative components by comparing the qualitative components of the three lowest responsive and responsible Bidders. The comparison may also include other Bidders whose bids are within 10% of the lowest responsive and responsible Bidder. Determination of the lowest three Bidders shall be based on the sum of the Base Bid and any additive and deductive Alternates the Owner accepts. Alternates shall be accepted in the order listed in paragraph 6.2 Schedule of Alternates in Section 00300 Bid Form only. The Owner will accept an Alternate only if all other previously listed Alternates are also accepted unless acceptance by the Owner of Alternates in a different order does not affect determination of the lowest three bidders in any way.

Some qualitative components that may be evaluated are:

- Technical approach.
- Quality of proposed personnel.
- Management plans.
- Past performance of any nominated asbestos abatement subcontractor(s).
- ADD ANY OTHER PROJECT SPECIFIC

For contracts under $250,000, best value will primarily be based on the lowest responsive and responsible bid.

14.1.2. For determining the lowest, responsive, and responsible bid, when a Qualified Disabled Veterans (QDV) preference is requested, 10% of the lowest responsive and responsible bid (the bid that would otherwise receive the contract award if the preference were not being considered) will be deducted from all QDV bids. If the low responsive and responsible QDV bid, less the 10% preference, is less than the lowest responsive and responsible bid, then the QDV bid will be declared the official lowest responsive and responsible bid. The original QDV bid amount will be the basis of the contract award.

14.1.3. Bid irregularities with respect to the Bidding Documents, for which corrective action is not already provided in paragraph 14.6 or elsewhere in the Bidding Documents, may be waived at the sole discretion of the **Owner**, unless the irregularity was due to the Bidder's lack of good faith or fair dealing, or where the waiver would lead to a determination obviously in error or inconsistent with the Bidding Documents.

14.1.4. For Bids over $100,000.00, Bidders that self-certify to be a Michigan business shall be given a preference over an out of state Bidder in the same manner in which an out-of-state Bidder would be preferred in its home state. Bidders that neither self-certify as a Michigan business in their Bid nor authorize the Michigan Department of Treasury to release information necessary to verify entitlement will be deemed to have waived their right to claim entitlement to any preference.

14.2. No Bidder shall be considered responsible under the requirements of the Bidding Documents, unless that Bidder delivers the information required in paragraph 2.1 that the **Owner** considers necessary to the evaluation of the Bid.

14.3. The following may be considered examples of sufficient grounds for determining that a Bidder is not responsible, or for objecting to any of the Bidder's Subcontractors (even if holding a valid license) or Suppliers: *(a) being listed on the Michigan Department of Labor's register of employers who have been found in contempt of court by a Federal Court of Appeals for failure to correct an unfair labor practice as prohibited by Section 8 of Chapter 372 of the National Labor Relations Act, 29 U.S.C. 158 (1980 PA No. 278, as amended, MCL 423.321 et seq.); *(b) being debarred from participation in the bid process pursuant to Section 264 of 1984 PA 431, as amended, MCL 18.1264, or debarred or suspended from consideration for award of contracts by any other State or any federal Agency; (c) a felony conviction in any state (including this State) within the last three (3) years before the date of Bid opening; (d) lack of adequate experience or demonstrated qualifications or capability to perform the trades or classifications of the Work specified in the Bidding Documents; (e) reasonable doubt concerning the ability to maintain adequate construction equipment, quality control, schedule control or financing to meet contractual obligations under the Bidding Documents; (f) a previous termination

for cause by the **Owner** within the last five (5) years before Bid opening; (g) failure to comply with all requirements for foreign corporations; (h) concealment, misrepresentation or misstatement of any material facts; or (i) failure to pay any federal, State or local taxes.

14.4 If the Owner, either through the Director-DCD or his/her designee, or the Board, intends to disqualify any Bidder under consideration for award, written notice of the impending disqualification will be provided by the Owner (including reasons for the disqualification) to that Bidder and those Bidders remaining under consideration to the award. If the disqualified Bidder has any objection to the disqualification that Bidder shall, within two (2) Business Days, file a written protest, as provided in paragraph 12.2, and follow the protest procedures in paragraphs 12.3 through 12.5. The decision of the Board shall be final and binding on the disqualified Bidder.

14.5. Except in circumstances leading to a determination obviously in error or inconsistent with the Bidding Documents, irregularities on any Bid shall be resolved using the rules provided in paragraph 14.6. Except as stated in paragraph 14.6(e), any Bid Form and Bid Form Attachment having any such irregularity shall be modified, altered, or revised to reflect the resolution of the irregularity, however, no Bidder-provided sum or extension shall be modified, altered, or revised and the Bidder's Bid shall be binding on the Bidder and the Bidder's surety, subject to the provisions governing Bid withdrawals stipulated in Article 11.

14.6. The following irregularities on any Bid Form or Bid Form Attachment shall be resolved as follows: (a) between SIGMA entry and signed Bid Summary attachment, the signed Bid Summary attachment will be used; (b) between words and figures, the words shall be used; (c) between any sum, computed by the Bidder, and the correct sum, the sum computed by the Bidder shall be used; (d) between the product, computed by the Bidder, of any quantity and bid unit price and the correct product of the unit price and the quantity of Unit Price Work, the product extended by the Bidder shall be used; (e) between a stipulated Allowance and the amount entered, the Allowance shall be used; (f) any mobilization pay item exceeding the maximum specified shall be ignored and the Bid shall remain unchanged; (g) if any Bidder fails or neglects to bid a unit price for an item of Unit Price Work but shows a "Bid Price" for that item, the missing unit price shall be computed from the respective quantity and the Bid Price shown; (h) if any Bidder fails or neglects to show a "Bid Price" for an item of Unit Price Work but bids a unit price, the missing Bid Price shall remain as “zero”; and (i) if any Bidder fails or neglects to enter a Bid price in both words and figures, the Bid price printed or typed, whether in words or figures, shall be used.

14.7. If there are reasonable grounds for believing that collusion or unlawful agreements exist between any Bidders, that a Bidder is interested in more than one Bid, or that any Bids are not genuine, those Bidders will be disqualified, and their Bids will be rejected without consideration.

14.8. All costs of the Bidder awarded the Contract and that are incurred in responding to requests from the **Owner** or **Professional**, whether or not sufficient, shall neither justify any increase in Contract Price or Contract Time nor provide any basis for subsequent consideration by the **Owner** of a proposal or claim for any increase in Contract Price or Contract Time.

*14.9. Michigan and Recycled Products – The Bidder awarded the Contract and all Subcontractors and Suppliers shall use (a) Michigan-made products whenever possible where price, quality and performance are equal to or better than non-Michigan products, and (b) supplies, materials and equipment made from Recycled Materials if there is a readily identifiable source or market as determined by the **Director-DCD, or his/her designee,** and the cost does not exceed one hundred ten percent (110%) of supplies, materials or equipment not containing Recycled Materials (Sections 261 and 261a of the Management and Budget Act, 1984 PA 431, as amended, MCL 18.1261 and MCL 18.1261a).

*14.10. Subcontractor and Supplier Businesses Owned by Minorities, Women and Persons with Physical or Mental Disabilities – Bidders are urged to utilize as Subcontractors and Suppliers, businesses owned by minorities, women, and persons with physical or mental disabilities. For assistance in locating and identifying certified businesses, contact the Michigan Department of Civil Rights, Business and Community Affairs, Cadillac Place, 3054 W. Grand Boulevard, Suite 3-600, Detroit, MI 48202, 1-800-482-3604.

*14.11. Unfair Labor Practice - Bidders who have been found in contempt of court by a Federal Court of Appeals on not less than three occasions involving different violations during the preceding seven (7) years for failure to correct an unfair labor practice prohibited by Section 8 of Chapter 372 of the National Labor Relations Act, 29 U.S.C. 158 are not eligible to be awarded the Contract. A register of employers in violation of this requirement is compiled by the Michigan Department of Energy, Labor and Economic Growth pursuant to 1980 PA 278, MCL 423.321 et seq. Further, the Bidder awarded the Contract shall not use any Subcontractors or Suppliers on the Work whose name appears on the register. According to Section 4 of 1980 PA 278, any contract entered into by the State may be declared void and rescinded to the extent the Bidder awarded the Contract or any Subcontractor, manufacturer, or Supplier awarded Work under the Contract subsequently appears in the register compiled by the Department of Consumer and Industry Services.

*14.12. Nondiscrimination – The Bidder awarded the Contract, and each Subcontractor and Supplier awarded a Sub agreement covenants that it will comply with the nondiscrimination requirements described in paragraphs 7.12.1 through 7.12.3 of Section 00700 General Conditions.

*14.12.1. A breach of the covenants set forth in paragraph 7.12 of Section 00700 General Conditions shall be regarded as a material breach of the Contract.

*14.12.2. The Bidder awarded the Contract shall include or incorporate by reference paragraph 14.12.1 (above) and the provisions of paragraphs 7.12.1 through 7.12.3 of Section 00700 General Conditions in every Sub agreement, unless exempted by rules, regulations, or orders of the Michigan Civil Rights Commission. Each Sub agreement shall provide that those provisions shall be binding upon the Subcontractor or Supplier.

*14.13. Bidders are further directed to Article 7 of Section 00700 General Conditions for terms and conditions concerning the specific legal requirements applicable to this Contract.

ARTICLE 15 EXECUTION OF THE AGREEMENT

15.1. Upon acceptance of a Bid for the Work by the **Board** or by the **Director** of the **Department** of Technology, Management and Budget, the **Director-DCD** or his/her designate will send the Notice of Award to the Bidder awarded the Contract. The Notice of Award will (a) designate the Contract Price and itemize the Alternates that the **Owner**, in its sole discretion, has accepted, (b) enclose completed, unsigned Section 00500 Agreement forms and blank Section 00610 Performance and Section 00620 Payment Bond forms, and (c) outline the procedures to be followed and information to be provided by the **Contractor** for execution of Section 00500 Agreement.

15.2. Unless otherwise designated in the Notice of Award, within fifteen (15) Calendar Days after receipt of the Notice of Award, the Bidder recommended for award shall (a) sign Section 00500 Agreement; (b) execute Section 00610 Performance Bond and Section 00620 Payment Bond (and attach to each Bond separate, certified copy of Power of Attorney); and (c) return to the Owner the executed Section 00500 Agreement, Section 00610 Performance Bond and Section 00620 Payment Bond forms, evidence of original certificates of insurance and any other documents required for submission by the Notice of Award.

15.3. Evidence of insurance shall consist of certificates of insurance confirming that the policies of insurance that the **Contractor** has obtained, including the limits of coverage and endorsements provided, are in compliance with the insurance requirements specified in paragraphs 7.4 through 7.7 of Section 00700 General Conditions. Certificates of insurance shall contain a statement confirming that coverage will not be canceled, adversely changed or renewal refused until at least thirty (30) Calendar Days' prior written notice has been delivered or mailed to the **Owner** and **Contractor**.

15.4. The **Owner** will execute the Section 00500 Agreement retain one hard copy and compile a complete electronic copy of the Contract Documents upon two conditions: (a) receipt of the executed Section 00500 Agreement, Section 00610 Performance Bond and Section 00620 Payment Bond (with each Bond enclosing a separate certified copy of Power of Attorney and a separate certificate of principal) and evidence of insurance; and (b) a determination by the **Owner** that the Section 00610 Performance Bond and Section 00620 Payment Bond, required certifications and evidence of insurance received conform to the requirements of the Contract Documents and are acceptable to the **Owner**.

15.5. Each full set of the executed Contract Documents shall consist of: (a) two (2) or more volumes containing the executed Agreement (conformed Section 00500); executed Performance and Payment Bond and certifications (conformed Section 00610 and Section 00620); the **Contractor's** Bid Form and Non-Collusion Affidavit (conformed Sections 00300 and 00320); and the remainder of the Bidding Documents, including Addenda; and (b) a separate volume with Qualification Submittals submitted by the **Contractor** that the **Owner**, in its sole discretion, chooses to include as part of the Contract Documents. The **Contractor** will receive one full set of the executed Contract Documents.

15.6. Bid prices in the "Schedule of Change Order Prices" on the **Contractor's** Bid Form accepted by the **Owner** upon evaluation of the **Contractor's** Bid will be incorporated into the Contract as provided in paragraph 3.2 of Section 00500 Agreement.

15.7. The Notice to Proceed shall be authorized by the **Director-DCD** or his/her designee. Subject to the provisions of Article 13 and compliance with paragraphs 15.2 through 15.4, the Notice to Proceed shall designate a Date of Commencement of the Contract Time no later than sixty (60) Calendar Days after the date ending the Bid hold period, or thirty (30) Calendar Days after receipt by the **Owner** of the executed Section 00500 Agreement and acceptable, executed Section 00610 Performance Bond and Section 00620 Payment Bond, whichever last occurs, unless otherwise directed in writing by the **Owner**.

15.8. Within fifteen (15) Calendar Days after receiving the Notice to Proceed, the **Contractor** shall submit to the **Owner** any additional Change Order cost and pricing data requested with the Notice to Proceed. The **Contractor's** submittal shall be itemized in a breakdown acceptable to the **Owner**, and shall be certified as accurate, current, and complete by a duly authorized financial representative of the **Contractor**. The **Contractor** shall meet with the **Owner** to review the cost and pricing data submittal. The **Owner** shall incorporate into the Contract Documents any acceptable cost and pricing data by Change Authorization issued within a reasonable time after the Notice to Proceed.

ARTICLE 16 MOBILIZATION PAY ITEM

16.1. The mobilization pay item, if designated in the Specifications and/or the Bid Schedule in Section 00300 Bid Form, shall be intended to cover, at least in part, up-front costs incurred by the **Contractor** from Contract Award until sixty (60) Calendar Days after the **Contractor** starts the Work. Allowable mobilization items shall be as itemized in the Schedule of Values approved by the **Professional**, and may include costs incurred by the **Contractor** (a) in establishing temporary site offices and other facilities specified in the Specifications, (b) in obtaining permits required to commence the Work, (c) for premiums for the required Section 00610 Performance Bond and Section 00620 Payment Bond, (d) for insurance obtained by the **Contractor** to comply with the requirements of the Contract Documents, and (e) in complying with the Revision 0 Schedule and Cost Submittal requirements.

16.2. Total payments to the **Contractor** under the mobilization pay item shall not exceed four percent (4%) of the Base Bid, unless otherwise expressly provided in the Bidding Documents. If the **Contractor** incurs costs, which the **Contractor** considers within the scope of the mobilization pay item, more than the four percent (4%) limitation, those excess costs will not be reimbursed under the mobilization pay item and will be deemed to have been included in other parts of the **Contractor's** Bid.

16.3. To the extent practicable, the basis of measurement for payment shall be proof of actual payment by the **Contractor**. Where actual payment by the **Contractor** does not apply, as in the case of premiums for the Section 00610 Performance Bond, the Section 00620 Payment Bond and the insurance policies the **Contractor** is required to furnish under the provisions of Article 15, or in connection with the **Contractor** costs to comply with the Revision 0 Progress Schedule and Cost Submittal requirements of the Contract Documents, the basis of measurement for payment shall be as stipulated in the Schedule of Values approved by the **Professional**. Payments to the **Contractor** shall be based on the requirements of the Bidding Documents, subject to the following:

16.3.1. Approval by the **Professional** of the Schedule of Values (required by paragraph 12.1 of Section 00700 General Conditions) shall be a condition precedent to making any payment under the mobilization pay item. Partial payments shall be based on the breakdown itemized in the Schedule of Values and the extent of completion, as determined by the **Professional**.

16.3.2. Full payment of the amount corresponding to the Revision 0 Schedule and Cost Submittals shall be paid by with the Request for Payment following return to the **Contractor** of the Revision 0 Submittal, or Revision 0A Submittal (i.e., first resubmission), Revision 0B Submittal (i.e., second resubmission), etc. of the Progress Schedule marked "Resubmittal Not Required."

ARTICLE 17 SOIL EROSION AND SEDIMENTATION CONTROL –-FINE FOR NON-COMPLIANCE

17.1. All Work within this Contract must comply with the applicable soil erosion and sedimentation control rules and regulations (Soil Erosion and Sedimentation Control – 1994 PA 451, Part 91, as amended, MCL 324.9101 et seq.) and specific provisions for same within the Contract Documents. Soil erosion and sedimentation control will be monitored and enforced by the Department of Technology, Management and Budget, **State Facilities Administration**.

17.2. Soil erosion and sedimentation control on **Department** Projects will be monitored and enforced by **State Facilities Administration** through the review of **Contractor** implementation plans and site inspections by Soil Erosion and Sedimentation Control Unit personnel and/or **State Facilities Administration** Representative.

17.2.1. In the event, the **Owner** determines through site inspections by the **State Facilities Administration** Representative or by notification by regulatory authorities that the **Contractor** has not met the soil erosion requirements of the Project and/or is in violation of the applicable soil erosion and sedimentation control statutes, the **Contractor** shall be notified in writing and stop work orders may be issued by **State Facilities Administration** in conjunction with paragraph 2.3 of Section 00700 General Conditions.

17.3. In the event, the **Owner** determines through site inspections by the **State Facilities Administration** Representative or by notification by regulatory authorities that the **Contractor** has not met the soil erosion requirements of the Project and/or is in violation of the applicable soil erosion and sedimentation control statutes, the **Contractor** shall be notified in writing and corrective actions undertaken by **State Facilities Administration** in conjunction with paragraph 9.4 of Section 00700 General Conditions.

17.4. In the event, the **Contractor** fails to respond to written notice from **State Facilities Administration** regarding noncompliance with the provisions of the Contract Documents and/or soil erosion and sedimentation control regulations applicable to this Work, **State Facilities Administration** has the right to assess a fine to the **Contractor**. Fines shall be in addition to any other remediation costs or liquidated damages applicable to the Project and may exceed the value of the Contract.

END OF SECTION 00100

ATTACHMENT A TO SECTION 00100 – BIDDER'S CHECK LIST

PROFESSIONAL – DLZ Michigan, Inc.

WORK – Flint Bishop Airport Landfill Cap Construction

FILE No. – 761/25250.SAR

BEFORE BID OPENING:

Date. – Due date for delivery to the **Professional** of written proposals seeking to have the **Professional** consent to naming additional materials or equipment by Addenda. (Reference: Section 00100, Paragraph 7.2).

Date. – Bidder inquiries received after this date will not be answered, unless answered through Addenda issued at least seventy-two (72) hours before Bid opening (Business Days only), the Bid opening is postponed by Addendum, or the Work is rebid following post-Bid Addenda. (Reference: Section 00100, paragraph 4.1).

CONTENTS SHALL BE UPLOADED AS A PDF DOCUMENT TO/THROUGH SIGMA VSS (ITEMS 1 THROUGH 7 BELOW):

NOTE 1: THE BIDDER SHALL USE THE BID SUMMARY, BID FORM AND BID FORM ATTACHMENTS INCLUDED WITH THE BIDDING DOCUMENTS, UNLESS REVISED BY ADDENDUM, IN WHICH CASE THE LATEST REVISION OF THE BID SUMMARY, BID FORM AND/OR BID FORM ATTACHMENTS ISSUED BY ADDENDUM SHALL BE USED.

NOTE 2: THE BIDDER IS NOT REQUIRED TO INCLUDE THE PROJECT MANUAL OR DRAWINGS IN THE PDF BID DOCUMENT PACKAGE UPLOADED TO SIGMA VSS, ONLY THE COMPLETED BID SUMMARY, BID FORM AND BID FORM ATTACHMENTS!

☐ 1. Completed Bid Summary provided with Section 00300 Bid Form.

☐ 2. Completed Section 00300 Bid Form, which requires (a) completing the acknowledgment of Addenda in paragraph 2.1, (b) filling out Article 6 Bid Schedule and, if any prices are designated, completing Article 7 Change Order Prices, and (c) completing Article 8, that is, entering the date the Bid is submitted, completing paragraphs 8.1 through 8.4, and, if the Bidder is a joint venture, paragraph 8.5, and signing, as appropriate, in the spaces provided.

☐ 2.1 Completed Certificate of Principal or other equivalent acceptable certificate or authorization document, which certificate shall be attached to the completed Section 00300 Bid Form.

☐ 3. If the Bid includes a Bid Bond, ensure that the surety is authorized to do business in the State by the Department of Licensing and Regulatory Affairs – Insurance Bureau and is listed on the current U.S. Department of the Treasury Circular 570. Also, ensure that the completed Section 00310 Bid Bond is dated, is signed by both the Bidder and surety, and attaches Power of Attorney. If the Bid includes a certified or cashier's check or money order, that check, or money order shall be delivered in original copy before the Bid Due Time to:

State Facilities Administration
Design & Construction Division
3111 W. St. Joseph Street
Lansing, Michigan 48917

All other Bid information must be submitted via SIGMA as per standard bidding procedure.

☐ 4. Completed Section 00320 Non-collusion Affidavit and if applicable, completed Section 00330 Asbestos Abatement Attestation.

☐ 5. Qualified Disabled Veterans Preference Documentation (if preference requested).

☐ 5.1 DD 214 – Proof of Service/Discharge.

☐ 5.2 Veterans Administration Rating Decision Letter – Proof of Disability, if not indicated in the DD 214.

☐ 5.3 Legal Proof of 51% QDV Ownership

☐ 6 Byrd Anti-Lobbying Certification (Only when Federal Provisions Addendum is included)

☐ 7 State Project Registration (SPR) for the Contractor and subcontractors (if applicable pursuant to 2023 PA 10, as amended, MCL 408.1101 et seq.)

This Bidder's Check List is provided solely to aid the Bidder in submitting a Bid. It shall not be relied on to include all items necessary to insure a complete Bid. The Bidder is solely responsible for including all items as required by the Bidding Documents, including any items required by Addenda, which may not be listed in this Bidder's Check List.

END OF ATTACHMENT A TO SECTION 00100

SECTION 00120 – SUPPLEMENTARY INSTRUCTIONS

PROFESSIONAL – DLZ Michigan, Inc.

WORK – Flint Bishop Airport Landfill Cap Construction

FILE No. – 761/25250.SAR

The provisions of this Section 00120 Supplementary Instructions amend or supplement Section 00100 Instructions to Bidders and those other provisions of the Bidding Requirements that are indicated below. All other Bidding Requirements that are not so amended or supplemented remain in full force and effect.

Click or tap here to enter text.

END OF SECTION 00120

SECTION 00210 INFORMATION FOR BIDDERS

PROFESSIONAL – DLZ Michigan, Inc.

WORK – Flint Bishop Airport Landfill Cap Construction

FILE No. – 761/25250.SAR

1.0 RELATED PROVISIONS

1.1. Paragraphs 3.4 through 3.7 of Section 00100 Instructions to Bidders, which contain terms and conditions governing the information made available to Bidders in this Section, are made part of this Section 00210 Information for Bidders by this reference.

2.0 SUBSURFACE CONDITIONS

2.1. The reports of explorations and tests of subsurface conditions itemized immediately below have been used by the **Professional** in the preparation of the Bidding Documents.

- Environmental Assessment by NTH Consultants, Ltd., dated April 26, 2013

2.1.1. Information or data contained in those reports that may be properly considered Authorized Technical Data concerning subsurface conditions include (NOTE: All other information or data excluded from the list below represent Non-Technical Information or Data, interpretations, or opinions):

- Sample analytical results and tables
- Soil boring logs

2.2. The reports of explorations and tests of subsurface conditions itemized immediately below have not been used by the **Professional** in the preparation of the Bidding Documents. Those reports are available at the office of the **Professional** for review or purchase. Neither the **Owner** nor **Professional** warrants that this list identifies all existing relevant documents.

3.0 OTHER PHYSICAL CONDITIONS

3.1. The Drawings and technical Specifications and those drawings itemized immediately below contain information or data that have been used by the **Professional** in the preparation of the Bidding Documents, and that may be properly considered Authorized Technical Data concerning physical conditions of existing surface and subsurface facilities.

Not Applicable

3.2. The reference documents itemized immediately below have not been used by the **Professional** in the preparation of the Bidding Documents and are available at the office of the **Professional** for review or purchase. Information and data contained in those reference documents, including, but not limited to dimensions, locations and conditions of existing surface and subsurface structures, roadways, piping, raceways, equipment, etc. may not accurately or reliably reflect actual conditions. Neither the **Owner** nor **Professional** warrants that this list identifies all existing relevant documents.

Not Applicable

4.0 UNDERGROUND UTILITIES

4.1. Information or data about physical conditions of existing Underground Utilities, that have been used by the **Professional** in the preparation of the Bidding Documents, is shown or indicated in the Drawings and technical Specifications and those Underground Utility drawings itemized immediately below.

Not Applicable

5.0 PERMITS, APPROVALS, LICENSES AND FEES

5.1. To the extent that the **Owner** has secured or will secure any permits, approvals and licenses and has paid or will pay any associated charges and fees, any such permits, approvals and licenses are itemized in this paragraph.

- Construction Safety Phasing Plan – CSPP (FAA Form7460-1)
- EGLE and Genesee County Drain Permits

5.2. In the event any permits, approvals and licenses itemized in paragraph 5.1 have been obtained by the **Owner** and the fees have been paid, copies of those permits, approvals, licenses, and corresponding fee receipts, will be attached by the **Professional** as a PDF copy with the SIGMA posting or will otherwise be made available for contractor to download.

5.3. Except for any permits, approvals, licenses, and fees identified in paragraph 5.1, the **Contractor** shall be responsible for all permits, approvals, licenses, and fees applicable to Work.

6.0 SEQUENCING REQUIREMENTS

6.1. Refer to the technical Specifications, including, but not limited to the General Requirements, for information, data, and criteria on sequences of Work restraints, constructability, and maintenance of service to existing facilities, which, if provided, shall govern the selection of Work sequences.

6.2. Each Bidder shall be responsible for any conclusions or interpretations the Bidder makes related to the selection of sequences and Means and Methods, based on the technical data made available, and/or those additional investigations or studies made or obtained by that Bidder.

END OF SECTION 00210

BID SUMMARY

DEPARTMENT OF TECHNOLOGY, MANAGEMENT AND BUDGET

STATE FACILITIES ADMINISTRATION
DESIGN AND CONSTRUCTION DIVISION
3111 W. St. Joseph Street
Lansing, Michigan 48917

Bids must be submitted electronically through the SIGMA VSS website at SIGMA VSS

FILE NUMBER	DEPARTMENT/AGENCY	
761/25250	Michigan Department of Environment, Great Lakes, and Energy	
CONTRACT TIME(S)	PROJECT NAME	LOCATION
365 days	Bishop Airport Landfill (Site ID# 25000453)	Flint Bishop Airport Landfill 4122 – 4188 S. Linden Rd Flint, MI
BID OPENING DATE	FOR AN EXAMINATION OF THE SITE CONTACT:	
July 15, 2026 at 2:00 pm ET	Rob Butler at rbutler@dlz.com	

SEE SECTION 00100 INSTRUCTIONS TO BIDDERS AND SECTION 00700 GENERAL CONDITIONS PROVIDED WITH THE BIDDING DOCUMENTS.
BID: WE PROPOSE TO FURNISH, PERFORM AND COMPLETE THE ENTIRE WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS IN CONSIDERATION OF THE BID PRICE (S) STATED BELOW.

FIRM NAME AND COMPLETE ADDRESS	TELEPHONE NUMBER and E-MAIL ADDRESS
	SIGMA VENDOR NUMBER (protected information required for processing payments)
☐ Qualified Disabled Veteran	
BIDDER'S SIGNATURE AND TITLE DATE	WITNESS' SIGNATURE DATE

By signing this bid above, bidder certifies their enclosed Qualified Disabled Veteran and Michigan-Based Business Certifications.

BASE BID FROM BID SCHEDULE (Include specified Allowances):

_____ Dollars $_____
(use words) (in figures)

Alternate1: (Add/Subtract) _____ Dollars $ _____
(use words) (in figures)

Alternate 2: (Add/Subtract) _____ Dollars $ _____
(use words) (in figures)

Alternate 3: (Add/Subtract) _____ Dollars $ _____
(use words) (in figures)

A PERFORMANCE BOND AND A PAYMENT BOND ARE REQUIRED FOR ALL BIDS OVER $50,000.00. EACH BID MUST BE ACCOMPANIED BY A FIVE (5) PERCENT BID GUARANTEE. BUILDERS RISK INSURANCE IS REQUIRED TO BE PROVIDED BY THE CONTRACTOR UNLESS OTHERWISE INDICATED IN THE BID DOCUMENTS.

BIDDERS ARE ALSO CAUTIONED TO FAMILIARIZE THEMSELVES WITH ALL OF THE OTHER CONDITIONS OF THE CONTRACT.

Project Scope of Work:

General information covering the "Scope of Work" is specified in the Advertisement. Additional information is as follows:

The work is to be performed according to all local, state and federal regulations. The enclosed Drawings and Specifications detail the applicable requirements for completing this work. In general, the work will include:

a. Clearing and grubbing of trees and brush. Removal of existing monitor wells.
b. Removal/incorporation of debris. Cutting, filling and grading of area to receive cap.

c. Constructing a cap which will consist of 1.0 ft of sand (gas collection) layer, Geosynthetic Clay Liner (GCL), 1.0 ft of drainage layer, 1.0 ft of general fill, and 6 inches of topsoil with seeding.

d. Installation of gas vents.

e. Installation of pipes and structures for leachate/groundwater collection under the cap.

f. Construction of new perimeter roads and temporary roads around the landfill.

g. The construction of temporary and final fencing.

h. Construction of temporary drain crossing. Removal of temporary drain crossing.

i. All associated activities presented in the Specifications and Drawings.

The Bidder must figure its Base Bid on the specified, or Addendum-approved, materials and equipment **only**. No "or equal" or substitution proposals will be permitted after Bid opening, except as provided in the General Conditions.

Addenda: Bidder acknowledges receipt of Addenda: No. ___ dated: _____, No. ___ dated: _____ No. ___ dated: _____

SECTION 00300 BID FORM

PROFESSIONAL – DLZ Michigan, Inc.

WORK – Flint Bishop Airport Landfill Cap Construction

FILE No. – 761/25250.SAR

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ARTICLE 1 THIS BID IS SUBMITTED TO THE STATE OF MICHIGAN ("the **Owner**").

1.1. The undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into an agreement with the **Owner** on the form in Section 00500 Agreement and to furnish and perform the Work as specified or indicated in the Bidding Documents for the Bid prices in the "Bid Schedule" on this Section 00300 Bid Form, within the Contract Times specified in Section 00500 Agreement, and in accordance with all other provisions and terms and conditions of the Bidding Documents, including, without limitation, those dealing with the disposition of the Bid Security.

1.2. The undersigned Bidder agrees to hold this Bid open for acceptance by the **Owner** for the period specified in Article 9 of Section 00030 Advertisement.

1.3. The Bidder will provide a signed original of Section 00500 Agreement, the executed Section 00610 Performance Bond, the executed Section 00620 Payment Bond, and appropriate evidence of insurance within the times and in the manner specified in the Bidding Documents.

ARTICLE 2 THE BIDDER'S REPRESENTATIONS

2.1. The Bidder has examined the Bidding Documents, including the Addenda acknowledged in the table below. The Bidder has verified that the Addenda acknowledged below include all issued Addenda. Except for Addenda, which solely revise the date of Bid, opening, failure by the Bidder to acknowledge receipt of all Addenda correctly, by either failing to complete or incorrectly

completing the table below, shall justify the Owner's refusal to read the Bid and automatically disqualify the Bidder from any consideration for award of the Contract.

No. ___ Dated _____ No. ___ Dated _____ No. ___ Dated _____

No. ___ Dated _____ No. ___ Dated _____ No. ___ Dated _____

No. ___ Dated _____ No. ___ Dated _____ No. ___ Dated _____

2.2. The Bidder has taken those steps that are reasonably necessary to (a) ascertain and become familiar with the Work, site, and locality; (b) account for all applicable federal, state, and other local Laws and all general, local, and prevailing conditions that may in any manner affect cost, schedule, progress, performance or furnishing of the Work; and (c) study and account for the terms and conditions of the Bidding Documents. The Bidder has carefully correlated the Bidder's observations with the Bidding Documents.

2.3. The Bidder has studied carefully all reports concerning subsurface conditions and drawings of physical conditions of existing surface and subsurface facilities that have been used by the **Professional** and all documents of physical conditions of existing Underground Utilities facilities that have been used by the **Professional** – in both cases as identified in Section 00210 Information for bidders. The Bidder assumes responsibility for carefully and accurately locating existing Underground Utilities in a manner consistent with paragraph 10.3 of Section 00700 General Conditions and as required by 2013 PA 174, as amended, MCL 460.721 et seq. The Bidder accepts the determinations set forth in the Bidding Documents as to the extent of such Authorized Technical Data and Underground Utilities information and data contained in those reports, drawings, documents, or the Bidding Documents, as applicable, upon which the Bidder may rely.

2.4. To the extent Additional Technical Data has been considered by the Bidder as necessary for determining the Bid in Article 6 Bid Schedule, and the **Owner**, upon request, did not have the necessary Additional Technical Data, the Bidder assumes responsibility for having undertaken or undertaking reasonable examinations of the site and any other pertinent available information and data. The Bidder agrees to perform and furnish the Work affected by the conditions involved, at no increase in Contract Price and Contract Time, to the extent the information and data necessary for determining the Bid could have been discovered through reasonable examinations of the site and any other pertinent information and data available (including, but not limited to the information and data designated in Section 00210 Information for Bidders).

2.5. The Bidder has carefully correlated the results of its observations, examinations, and studies of those reports of explorations and all that information and data in studies, drawings, and specifications, referred to in paragraphs 2.3 and 2.4, with the terms and conditions of the Bidding Documents.

2.6. The Bidder has examined all information and data shown or indicated in the Bidding Documents concerning other work, including, but not limited to provisions in Section 00700 General Conditions. The Bidder assumes responsibility for all reasonably foreseeable terms, conditions and consequences resulting from other work that may in any manner affect cost, schedule, progress, performance or furnishing of the Work.

2.7. The Bidder has carefully examined the terms and conditions of the Bidding Documents concerning Delay, Activity Float times and early completion. The Bidder agrees that increases in Contract Price and/or Contract Time for Delay shall be as provided in Section 00700 General Conditions. The Bidder has correlated those terms and conditions with the Bidder's schedule for the Work and its Base Bid and Alternates.

2.8. The Bidder represents that each unit price covering Specified or Contingent Unit Price Work, whether bid on Article 6 – Bid Schedule or on Article 7 – Schedule of Change Order Prices, includes sufficient amounts to cover (a) all labor costs, Subcontractor costs, material and equipment costs, construction equipment costs and general conditions costs, and (b) all administrative costs and home office overhead), and (c) profit. The **Owner** reserves the right to reject any unit prices bid on paragraph 6.2 Schedule of Alternates or in Article 7 Schedule of Change Order Prices, which, in the **Owner's** sole discretion, are not in the **Owner's** best interest.

2.9. The Bidder has given the **Professional** written notice of all conflicts, ambiguities, errors, or omissions the Bidder has discovered in the Bidding Documents, and the written resolution given by the **Professional** is acceptable to the Bidder.

2.10. This Bid is genuine, is not made in the interest of or on behalf of any undisclosed person and is not submitted in conformity with any agreement or rules of any group, association, organization, or corporation. To induce the **Owner** into consideration of this Bid, the Bidder reiterates and makes each of the representations made by the Bidder in Section 00320 Non-collusion Affidavit attached to this Section 00300 Bid Form.

2.11. The Bidder is aware of the **Owner's** requirements for business owned by minorities, women, and persons with physical or mental disabilities, and assumes responsibility for all conditions and consequences that may result from meeting those requirements and that may in any manner affect cost, schedule, progress, performance and furnishing of the Work.

2.12. The Bidder has read and studied each provision of the Bidding Documents. The Bidder has no expectations different from the terms and conditions of the Bidding Documents.

2.13. The Bidder is aware of the **Owner's** requirements for asbestos abatement projects pursuant to PA 59 of 2024, MCL 338.3371 et seq. and the APPENDIX II – ASBESTOS ABATEMENT PROJECT PROCEDURES as part of and in conjunction with all other contract requirements and assumes responsibility for all conditions and consequences that may result from meeting those requirements and that may in any manner affect cost, schedule, progress, performance and furnishing of the Work.

ARTICLE 3 TIME OF COMPLETION

3.1. The Contract Times are specified in paragraph 4.1 of Section 00500 Agreement. The Bidder has carefully correlated the provisions in paragraph 4.1 of Section 00500 Agreement with the other terms and conditions of the Bidding Documents and unequivocally accepts the Contract Times for the Work, and any other designated parts of the Work, as specified.

3.2. The Bidder unequivocally accepts the liquidated damage provisions specified in paragraph 4.2 of Section 00500 Agreement in the event of any failure, neglect, or refusal to complete the Work, or designated part of the Work, within the corresponding Contract Times specified in paragraph 4.1 of Section 00500 Agreement.

ARTICLE 4 ATTACHMENTS INCLUDED WITH THIS BID

4.1. Attachments to this Section 00300 Bid Form and made a condition of this Bid are:

4.1.1. Evidence of Authority to Sign the Bid.

4.1.2. Section 00310 Bid Bond, with the attached certified copy of Power of Attorney, or

Alternate Bid Security.

4.1.3. Section 00320 Non-collusion Affidavit, and if applicable, Section 00330 Asbestos Abatement Attestation.

TO BE PROVIDED POST BID WITH SECTION 00400 SUBMITTALS:

4.1.5 Current EMR Rating

4.1.6 Identification of the proposed project superintendent with a resume or list of similar projects handled by that individual.

4.1.7 A list of at least three (3) projects completed within the last three (3) years of similar size and complexity, with contact information for references for each.

4.2. Bidder-provided documents, made a condition of this Bid, are as required in the following Section(s) of the Bidding Documents: _____

ARTICLE 5 DEFINED TERMS

5.1. Section 00020 Glossary assigns specific intent and meanings to capitalized terms and to other defined terms used in (a) this Section 00300 Bid Form, (b) Section 00310 Bid Bond and Section 00320 Non-collusion Affidavit), and (c) Section 00410 Bid Breakdown, Section 00420 Questionnaire, Section 00430 List of Subcontractors and Section 00440 Schedule of Materials and Equipment.

ARTICLE 6 BID SCHEDULE

6.1 Base Bid Schedule - The Bidder will complete the Work and accept in full payment, for the Work items listed, the following unit prices and/or Bid Prices, as applicable:

Base Bid Item No.	Estimated Quantity	Unit	Description	Unit Price	Item Bid Price
1	1	Lump Sum	Mobilization	NA	
2	1	Lump Sum	Site Services	NA	
3	1	Lump Sum	Clearing and Grubbing	NA	
4	1	Lump Sum	Soil Erosion, Sedimentation, and Stormwater Control	NA	
5	1	Lump Sum	Grading		
6	88,000	Ton	General Fill		
7a	3,000	Ton	Structural Fill		
7b	174,000	Ton	Granular Material		
8	6,000	Ton	MDOT 22A Aggregate		
9	2,000	Ton	MDOT 6A Aggregate		
10	52,000	Ton	Topsoil		
11	11,000	Square Yard	MDOT Plain Rip Rap		
11a	5,500	Square Yard	1”x3” Crushed Stone		
12	3,100	Ton	Asphalt		
13	1,530,000	Square Feet	Geosynthetic Clay Liner		
14	195,000	Square Feet	Geotextile-Woven		
15a	11	Each	Gas Vent		
15b	46	Each	Monitoring Well Installation		
16	2,340	Lineal Feet	Temporary Fence		
17	3,440	Lineal Feet	Permanent Fence		
18	43	Acre	Turf Establishment		
19	6,000	Lineal Feet	Cap Drain – 4” Dia. Perforated Pipe		
20	1	Lump Sum	Leachate Collection System	NA	
21	12	Month	Operation and Maintenance of Leachate Collection System		
22	100,000	Gallon	Removal and Disposal of Leachate		
23	1	Lump Sum	Drain Crossing	NA	
24	1	Lump Sum	Demobilization	NA	
25	1	Provisionary Allowance	Provisionary Allowance	NA	$150,000
			TOTAL (This amount should equal the Base Bid amount on the Bid Summary Form)		**$**

Base Bid (Sum of Bid Prices for all Base Bid Items):

_____ Dollars and No/Cents $_____

(use words) (in figures)

Name of the Bidder _____ File No. 761/25250.SAR

Date _____

SIGMA VENDOR NUMBER _____

Telephone No. _____

6.2 Schedule of Alternates - The Bidder will complete (or deduct from the Contract) the parts of the Work designated by the Alternates that follow and accept in full payment (or allow in full credit) for those parts of the Work the following Bid Prices:

Alternate Item No.	Bid Quantity	Description	Unit Price	Item Bid Price

The Bidder further acknowledges and agrees that the separate prices bid on this "Schedule of Alternates," where they are applicable and deemed acceptable by the **Owner**, will be used if incorporated into the Contract when the **Owner** issues the Notice of Award.

Name of the Bidder _____ File No. 761/25250.SAR

Date _____

SIGMA VENDOR NUMBER _____

Telephone No. _____

ARTICLE 7 SCHEDULE OF CHANGE ORDER PRICES

7.1 The Bidder shall use this "Schedule of Change Order Prices" to propose contingent prices. The proposed contingent Change Order prices set forth in this schedule, at the sole discretion of the **Owner,** may, or may not be incorporated into the Contract Documents. The **Owner** reserves the right to negotiate contingent Change Order prices set forth herein prior to their possible incorporation into the Contract Documents. Proposed Change Order prices will not affect determination of the lowest Bid.

7.2 Subject to their incorporation into the Contract Documents, as provided in the Agreement, the Bidder will add to, or deduct from, the Contract Work covered by the contingent prices that follow and accept in full payment, or allow in full credit, for that Work (a) those prices bid by the Bidder, or (b) if a particular price is not bid, the price proposed by the **Owner** (and shown in the appropriate column):

Item No.	Bid Quantity	Description	Unit Price	Item Bid Price

Name of the Bidder _____

File No. 761/25250.SAR

Date _____

SIGMA VENDOR NUMBER _____

Telephone No. _____

ARTICLE 8 BID SUBMITTED ON the _____ day of _____, 20____.

8.1. Bid Security is in the form of a Bid Bond _____ Bid Bond form provided in Section 00310 has been duly executed _____; or

A Certified or Cashier's check ___ or Money Order ___ *if a check or money order is provided as Bid Security, the original check/money order must be delivered before Bid Due Time to the issuing office as per Section 00100 paragraph 5.2 and Section 00110 item 3.*

8.2. If the Bidder is an Individual:

Name of Individual: _____

Name & Title of Person Authorized to sign: _____

Signature: _____
(If not the Individual, Attach Power of Attorney) Date

Doing Business as: _____

Business Address: _____

SIGMA VENDOR NUMBER_____

County of registration _____

Telephone: _____ FAX: _____

8.3. If the Bidder is a Partnership:

By: _____
(True Name of the Partnership)

_____
Partner Authorized to Sign Date

Signature: _____
(Attach evidence of Authority to sign) Date

Business Address: _____

SIGMA VENDOR NUMBER_____

County of registration _____

Telephone: _____ FAX _____

8.4. If the Bidder is a Corporation:

By: _____
(Legal Corporation Name)

Name & Title of Authorized Officer: _____

Signature: _____
(Attach evidence of Authority to sign) Date

Name & Title of Officer Attesting: _____

Signature: _____
Date

Business Address: _____

SIGMA VENDOR NUMBER_____

Telephone: _____ FAX _____

(State of Incorporation): _____

8.5. If The Bidder is A Joint Venture: JOINT VENTURE SIGNATURES SHALL BE AS PROVIDED IN PARAGRAPH 9.5 OF SECTION 00100 INSTRUCTIONS TO BIDDERS. EACH JOINT VENTURER SIGNING THE BID SHALL SIGN IN THE MANNER INDICATED FOR AN INDIVIDUAL, A PARTNERSHIP OR A CORPORATION. IF MORE THAN TWO JOINT VENTURERS OF THE SAME TYPE ARE INCLUDED, USE ADDITIONAL PAGES. JOINT VENTURE STATE OF INCORPORATION _____ OR COUNTY OF REGISTRATION _____

CERTIFICATE OF PRINCIPAL

(BIDDER)

I, _____, certify that I am the Secretary of the Corporation ____, or a General Partner ____ or Managing Partner ____ or Partner ____ of the partnership, named as the Bidder in the attached Section 00300 Bid Form; that _____ _____ who signed Section 00300 Bid Form on behalf of the Bidder, was then _____ of that corporation ____ or partnership ____; that I know the undersigned's signature, and the signature is genuine; and that Section 00300 Bid Form was duly signed, sealed and attested for and on behalf of that corporation ___ partnership ___ by authority of its governing body ___ or partners ___

_____ _____
Signed by the Secretary or Other Authorized Officer of the Corporation Date
or By General Partner or Managing Partner or Authorized Partner Certifying

_____
Name of the Corporation or True Name of the Partnership

Federal Identification (I.D.) No. or Social Security No. (**LAST 4 ONLY**) _____

Telephone No. _____

(Corporate Seal)

VERIFICATION
(BIDDER)

STATE OF MICHIGAN)
)
COUNTY OF _____)

Before me, a Notary duly commissioned, qualified and acting, personally appeared (enter name of person who signed the Bid Form on behalf of the Bidder), _____ to me well known to be the person described in and who signed Section 00300 Bid Form, who being by me first duly sworn upon oath, says that he/she is the Attorney-in-Fact for (enter the Bidder's name) _____ and that he/she has been authorized by (enter name of individual, partnership name, or that governing body of the Bidder named in the attached corporate resolution) _____ _____ to execute the attached Section 00300 Bid Form on behalf of the named Bidder in favor of the STATE OF MICHIGAN.

Subscribed and sworn before me this _____ day of _____, 20_____.

_____

Notary Public, State of: _____

My Commission Expires: _____

END OF SECTION 00300

SECTION 00310 BID BOND

FILE No. 761/25250.SAR SURETY COMPANY REFERENCE No. _____

KNOW ALL PERSONS BY THESE PRESENTS: That we, "the Bidder," _____, a corporation ____, individual ____, partnership ____, joint venture ____, of the State of _____, qualified to do business in the State of Michigan, as Principal, and "the Surety," _____, of the State of _____, as surety, are hereby held and firmly bound unto the State of Michigan, "the **Owner**," as Obligee, in the amount of _____ Dollars ($_____), and if no amount is entered, in the amount of five percent (5%) of the Bidder's Base Bid designated in paragraph 6.1 Base Bid Schedule in Section 00300 Bid Form, for the payment of which the Bidder and the Surety hereby bind ourselves, our respective heirs, successors, legal representatives and assigns, jointly and severally, firmly by these presents in accordance with Michigan Law.

WHEREAS, the Bidder has submitted to the **Owner** a Bid, to which this Bond is attached, to enter into the Contract with the **Owner** for _____ covered by Bidding Documents prepared by the **Professional**, which Bidding Documents are incorporated into this Bid Bond by this reference:

NOW, THEREFORE: THE CONDITION OF THIS OBLIGATION IS THAT, if the Bidder faithfully performs and fulfills all the understandings, covenants, terms and conditions of the Bidding Documents governing the bidding and award of the Contract (including Addenda issued before Bid opening and any post–Bid Addenda) within the time specified or any extension thereof, with or without notice to the Surety or fails to do so but pays to the **Owner** the full amount of the sum set forth in this Section 00310 Bid Bond as liquidated damages - then THIS OBLIGATION SHALL BE NULL AND VOID, OTHERWISE THIS OBLIGATION SHALL REMAIN IN FULL FORCE AND EFFECT.

A. If the **Owner** makes demand on the Surety to perform in accordance with the Surety's obligations under this Section 00310 Bid Bond, the full amount of the sum set forth in this Section 00310 Bid Bond shall be immediately due and payable to the **Owner**, and the Surety shall pay that sum without delay. Additionally, the Surety shall reimburse the **Owner** all costs of collection, which shall include, but not be limited to reasonable fees and charges of architects, engineers, attorneys and others, court or hearing costs incurred with or without suit, and interest.

B. The Surety, for value received, stipulates, and agrees that the obligations of the Surety and this Section 00310 Bid Bond shall be in no way impaired or affected by any extension of the time within which the **Owner** may accept the Bid, and the Surety does, by this agreement, waive notice of any such extension.

C. It is the intention of the Bidder, Surety and **Owner** that the Surety shall be bound by all terms and conditions of the Bidding Documents and this Section 00310 Bid Bond. However, if any provision(s) of this Section 00310 Bid Bond is/are illegal, invalid, or unenforceable, all other provisions of this Section 00310 Bid Bond shall nevertheless remain in full force and effect, and the **Owner** shall be protected to the full extent provided by Michigan Law.

IMPORTANT: The Surety shall be authorized to do business in the State by the Department of Consumer and Industry Services – Insurance Bureau and listed on the current U.S. Department of the Treasury Circular 570 and shall be otherwise acceptable to the **Owner**.

Address and Telephone of Surety

Address and Telephone of Agent

Signed and sealed this _____ day of _____, 20____ (NOTE: Use the date entered on Article 8 of Section 00300 Bid Form).

THE BIDDER: (Print Full Name and Sign)

By: _____

Name & Title: _____

Signature: _____

WITNESS: _____

Telephone No. _____

THE SURETY: (Print Full Name and Sign)

By Agent: _____

By Attorney-in-Fact: _____
(Attach Certified Copy of Power of Attorney)

Signature: _____

WITNESS: _____

Telephone No. _____

Email: _____ _____

END OF SECTION 00310

SECTION 00320 NONCOLLUSION AFFIDAVIT

PROFESSIONAL – DLZ Michigan, Inc.

WORK – Flint Bishop Airport Landfill Cap Construction

FILE No. – 761/25250.SAR

Affiant, _____, being first duly sworn, deposes and says that:

(1) Affiant is (enter title) _____ of _____ _____, "the Bidder." Affiant has personal knowledge of the matters set forth in this Affidavit and is competent to testify about them.

(2) The Bidder has submitted to the **Owner** a "Bid" to enter into the above referenced Contract, also referred to in this Affidavit as "the Work."

(3) This Section 00320 Non-collusion Affidavit is executed by Affiant for inclusion with the submission to the **Owner** of the Bid and may be relied upon by the **Owner** in considering the Bid.

(4) Affiant is fully informed about the preparation and contents of the Bid and of all pertinent circumstances surrounding the Bid, has not entered into any contract, combination, conspiracy, or other act prohibited by federal, State or any other local Law. The Bid is genuine and is not a collusive or sham Bid.

(5) Neither the Bidder nor any of the Bidder's owners, officers, partners, directors, agents, representatives, employees or parties in interest, including this Affiant, have in any way entered or proposed to enter into any combination to prevent the making of any Bid, or to fix any prices (including overhead, profit or other costs) for the Bid; or have made any agreement, or given or promised any consideration to induce any other person not to Bid for the Work, or to Bid at a specified price; or have secured, proposed or intended to secure through any agreement an unlawful advantage against the **Owner** or any other person interested in the Work.

(6) No officer or employee of the State of Michigan is personally or financially interested, directly or indirectly, in the Bid, or any Contract which may be under it, or in the purchase or sale of any materials, equipment or supplies for the Work to which it relates, or any portion of any expected profits thereto.

(7) The Bid is not intended to secure an unfair advantage or benefit from the **Owner** or in favor of any person interested in the proposed Contract.

(8) The prices bid are fair and proper and are not tainted by any collusion, conspiracy, connivance, or unlawful agreement on the part of the Bidder or any other of the Bidder's owners, officers, partners, directors, agents, representatives, employees or parties in interest, including this Affiant; and neither the Bidder nor any of its owners, officers, partners, directors, agents, representatives, employees or parties in interest, including this Affiant, have divulged any information regarding the Bid or any data about the Bid to any other person.

By: _____ Title: _____

SIGMA VENDOR NUMBER_____ Telephone No. _____

VERIFICATION

STATE OF _____)
)
COUNTY OF _____)

Before me, a Notary Public commissioned, qualified and acting, personally appeared (enter name of the person signing this Affidavit) _____ to me well known to be the person described in and who signed this Section 00320 Non-collusion Affidavit, who being by me first duly sworn upon oath, says that he/she is the Attorney-in-Fact for (enter Bidder's name) _____-_____, that he/she has been authorized by (enter name of individual, partnership name, or the authorized governing body of the Bidder) _____ to execute this Section 00320 Non-collusion Affidavit on behalf of the named Bidder in favor of the STATE OF MICHIGAN, for the uses and purposes mentioned.

Subscribed and sworn to before me this _____ day of _____, 20_____.

_____

Notary Public, State of _____

My Commission expires: _____, 20 ___

END OF SECTION 00320

SECTION 00330 ASBESTOS ABATEMENT ATTESTATION

PROFESSIONAL – DLZ Michigan, Inc.

WORK – Flint Bishop Airport Landfill Cap Construction

FILE No. – 761/25250.SAR

ASBESTOS ABATEMENT ATTESTATION

SUBMISSION REQUIRED WITH ALL BIDS

Pursuant to the Public Entity Asbestos Removal Verification Act, PA 59 of 2024, MCL 338.3371 et seq. ("the Act"), the Owner will conduct the background investigation as required of any asbestos abatement contractor, or a general contractor that contracts with an asbestos abatement contractor, for the abatement of asbestos. Under the Act, an "Asbestos abatement contractor" means a business entity that is licensed under the asbestos abatement contractors licensing act, 1986 PA 135, MCL 338.3101 to 338.3319, and that carries on the business of asbestos abatement on the premises of another business entity and not on the asbestos abatement contractor's premises. Asbestos abatement contractor includes an individual or person with an ownership interest in a business entity described in MCL 338.3373(b).

■ **THE SCOPE OF WORK TO BE COVERED UNDER THIS CONTRACT DOES NOT CONTAINS ASBESTOS ABATEMENT AND THIS ATTESTATION IS TO BE LEFT BANK.**

Contractor attests that: *(check one:)*

1. ☐ The Contractor will self-perform all asbestos abatement project work and attests that Contractor has not been issued 5 or more notices of violation of environmental regulations (State and/or Federal), nor has been subject to an administrative consent order or a consent judgment involving environmental regulations.

2. ☐ The Contractor will self-perform all asbestos abatement project work; however, Contractor has been issued 5 or more notices of violation of environmental regulations (State and/or Federal), or has been subject to an administrative consent order or a consent judgment involving environmental regulations, requiring Owner to conduct a background investigation and a public hearing pursuant to PA 59 of 2024, MCL 338.3371 et seq.

3. ☐ The Contractor nominates the following Sub-contractor for all asbestos abatement project work and attests that the nominated Sub-contractor has not been issued 5 or more notices of violation of environmental regulations (State and/or Federal), nor has been subject to an administrative consent order or a consent judgment involving environmental regulations:

   Nominated Sub-contractor: _____

4. ☐ The Contractor nominates the following Sub-contractor for all asbestos abatement project work; however, the nominated Sub-contractor has been issued 5 or more notices of violation of environmental regulations (State and/or Federal), or has been subject to an administrative consent order or a consent judgment involving environmental regulations, requiring Owner to conduct a background investigation and a public hearing pursuant to PA 59 of 2024, MCL 338.3371 et seq.

   Nominated Sub-contractor: _____

END OF SECTION 00330

SECTION 00410 BID BREAKDOWN

PROFESSIONAL – DLZ Michigan, Inc.

WORK – Flint Bishop Airport Landfill Cap Construction

FILE No. – 761/25250.SAR

1.0 BID BREAKDOWN: The Apparent Low Bidder shall itemize below a cost breakdown of the Apparent Low Bidder's Bid. The Bid Breakdown shall be organized into separable parts of the Work so that one hundred percent (100%) of the Base Bid plus all Alternates is accounted for. Portions of the Work for which costs are itemized shall include Work to be furnished and performed directly by the Apparent Low Bidder and its Subcontractors and Suppliers, as applicable. Each separable part of the Work identified in this Bid Breakdown shall have a value not exceeding _____ percent (____%) of the Apparent Low Bidder's Base Bid, except parts of the Work designating furnished materials or equipment, which may be itemized as quoted.

2.0 DISCREPANCIES: Discrepancies in this Section 00410 Bid Breakdown shall be resolved in accordance with Article 14 of the Instructions to Bidders. Any discrepancies between the Apparent Low Bidder's Bid Breakdown and Article 6 "Bid Schedule" on the Apparent Low Bidder's Section 00300 Bid Form with respect to a given lump sum item, unit price item or "One Each" item, or any sum of any of them, will be resolved so that the corresponding amount(s) on the Apparent Low Bidder's Section 00300 Bid Form will be binding on the Apparent Low Bidder.

END OF SECTION 00410

SECTION 00420 QUESTIONNAIRE

PROFESSIONAL – DLZ Michigan, Inc.

WORK – Flint Bishop Airport Landfill Cap Construction

FILE No. – 761/25250.SAR

ARTICLE 1 ORGANIZATION

1.1. Date of organization (or incorporation) _____ State of incorporation _____ (IRS) EIN _____

1.2. Title and name of Principals (President, Vice-Presidents, Secretary and Treasurer, if a corporation; partners, if a partnership)

_____

_____

1.3. Is your organization's principal place of business maintained in the State of Michigan? ___ If your organization maintains its principal place of business outside the State, attach a copy of the Certificate of Authority which your organization procured in accordance with MCL 450.2011.

1.4. If your organization, any business entity related to or affiliated with your organization, or any present or former executive employee, officer, director, shareholder (owning twenty percent (20%) or more of the outstanding shares), partner, or owner of your organization or of any such related or affiliated entity has ever been convicted of a felony, or has felony charges pending, in any state within the last three (3) years from the date of Bid opening, furnish with this Bidder's Questionnaire all material facts relating to any such felony conviction or such pending felony charges.

ARTICLE 2 SPECIALTY CONTRACTOR LICENSES

2.1. Does your organization hold valid licenses covering specialty classifications of Work that your organization itself intends to perform and for which a specific specialty license is required by any Political Subdivision with jurisdiction over the Work _____? If so, attach a list with all licenses by number and classification; state the name of the organization holding the license, the renewal date of each license, whether each license is active, and attach a copy of each license.

ARTICLE 3 EXPERIENCE

3.1. What is the general character of the work performed by your organization? _____ How many years of experience in construction work similar in character and scope to the Work under the Bidding Documents has your organization had: (a) as a General Contractor? _____; (b) as a Subcontractor? _____.

3.2. Attach a list of all public contracts or subcontracts under public contracts that your organization has performed within the last five (5) years which are similar in character and scope to the Work under the Bidding Documents (using the forms in the "References Attachment" provided with this Questionnaire). If the contract or subcontract referenced is not substantially completed, furnish the percent complete for that contract or subcontract.

3.3. Within the last five (5) years, has your organization been in litigation with The State of Michigan or failed to complete a contract or subcontract awarded to it? _____ If so, attach a list for each contract or subcontract, state when, where and why.

3.4. Within the last five (5) years, has any officer, partner or executive employee of your organization been an officer, partner or employee of another organization that was involved in a litigation with The State of Michigan? or failed to complete a contract or subcontract? _____. If so, for each contract or subcontract, state the name of each officer, partner or employee and the name of the organization and owner(s), and the explanation of litigation or reasons why the contract or subcontract was not completed.

3.5 Identify your organizations Experience Modification Rating (EMR) _____. Attach a letter of explanation if your organization does not have an EMR.

3.6 Provide the name and attach a brief resume and list of similar success projects for your proposed Project Superintendent.

ARTICLE 4 ADDITIONAL QUALIFICATIONS

4.1. (**Nominated Subcontractor only**) Will you subcontract any part of the Work covered by the intended Sub agreement? ___. If so, which parts of the Work covered by the intended Sub agreement do you intend to subcontract to a lower tier Subcontractor? _____

4.2. State the name, address, and telephone number of a representative of your organization who personally visited and inspected the site: _____.

Also, describe, in an attachment to this Section 00420 Questionnaire, subsurface and physical conditions at or contiguous to the site that your representative investigated and how they were accounted for in the preparation of your organization's Bid.

4.3. Attach a list of construction equipment and machinery your organization intends to use in the execution of the Work, as estimated in the preparation of your organization's Bid.

4.4. Does your organization rent or lease equipment or facilities from other affiliate organizations? _____. If so, state the name of the affiliate organization(s) _____

4.5. (**Apparent Low Bidder only**) Bank line of credit available? $_____.

4.6. (**Apparent Low Bidder only**) Will your organization, i.e., the Bidder named in the Authorized Signature Article on Section 00300 Bid Form, be the only named Principal in Section 00610 Performance Bond and Section 00620 Payment Bond? _____ If not, please identify the organization who will be named as Principal or Co-Principal on Section 00610 Performance Bond and Section 00620 Payment Bond _____. Also, state how such organization relates to the Bidder _____ (NOTE: If another organization is identified, the Apparent Low Bidder shall submit to the **Owner** a separate Section 00420 Questionnaire filled out by that organization as part of the Qualification Submittals required under Article 2 of Section 00100 Instructions to Bidders).

ARTICLE 5 REFERENCES

5.1. Trade references (Minimum of three (3)):

5.2. Bank references:

5.3. Insurance:

The undersigned Apparent Low Bidder ____ or nominated Subcontractor _____ _____ certifies that all statements and answers made to the interrogatories in this Section 00420 Questionnaire are current, accurate and complete as of the date stated below. (Note: Attachments shall be fastened at the end of this Section).

Signed by: _____ Name _____ Title _____

on this _____ day of _____, 20_____.

END OF SECTION 00420

REFERENCES ATTACHMENT

PROFESSIONAL – DLZ Michigan, Inc.

WORK – Flint Bishop Airport Landfill Cap Construction

FILE No. – 761/25250.SAR

REFERENCE #___

Public Owner: _____

Project/Contract Name: _____

Location of Project/Contract: _____

Contract Price: _____ Project/Contract Started: _____ Completed: _____

Owner's Representative (Name and Telephone): _____

_____

Apparent Low Bidder's ___ or Nominated Subcontractor's ____

Representative Name and Telephone _____

Scope of Project/Contract: _____

_____

REFERENCE #___

Public Owner: _____

Project/Contract Name: _____

Location of Project/Contract: _____

Contract Price: _____ Project/Contract Started: _____ Completed: _____

Owner's Representative (Name and Telephone): _____

_____

Apparent Low Bidder's ___ or Nominated Subcontractor's ____

Representative Name and Telephone _____

Scope of Project/Contract: _____

_____

REFERENCES ATTACHMENT

PROFESSIONAL – DLZ Michigan, Inc.

WORK – Flint Bishop Airport Landfill Cap Construction

FILE No. – 761/25250.SAR

REFERENCE #___

Public Owner: _____

Project/Contract Name: _____

Location of Project/Contract: _____

Contract Price: _____ Project/Contract Started: _____ Completed: _____

Owner's Representative (Name and Telephone): _____

_____

Apparent Low Bidder's ___ or Nominated Subcontractor's ____

Representative Name and Telephone _____

Scope of Project/Contract: _____

_____

REFERENCE #___

Public Owner: _____

Project/Contract Name: _____

Location of Project/Contract: _____

Contract Price: _____ Project/Contract Started: _____ Completed: _____

Owner's Representative (Name and Telephone): _____

_____

Apparent Low Bidder's ___ or Nominated Subcontractor's ____

Representative Name and Telephone _____

Scope of Project/Contract: _____

_____

SECTION 00430 LIST OF SUBCONTRACTORS

PROFESSIONAL – DLZ Michigan, Inc.

WORK – Flint Bishop Airport Landfill Cap Construction

FILE No. – 761/25250.SAR

1. To enable the **Owner** and **Professional** to evaluate the Apparent Low Bidder's qualifications to perform the Work, for each Division of the Specifications, Section of the Specifications and/or trade itemized in this Section 00430 List of Subcontractors, the Apparent Low Bidder shall nominate the Subcontractor(s) to be awarded a Sub agreement(s). The Apparent Low Bidder will ensure that all Subcontractors have a current State Project Registration in compliance with PA10 of 2023, as amended in PA110 of 2024. To the extent a contractors' licensing is required for any such classification of Work, the Apparent Low Bidder shall provide the nominated Subcontractor's license number(s). If the Apparent Low Bidder intends to self-perform any of the listed classifications of Work, the Apparent Low Bidder shall nominate itself in the spaces provided for that purpose and shall furnish the corresponding Apparent Low Bidder's license number(s). For each nominated Subcontractor, the Apparent Low Bidder shall enter, if applicable, whether the Subcontractor is a minority, woman or handicapped owned business in the spaces provided for that purpose. The Apparent Low Bidder also shall furnish the amount of the Sub agreement that the Apparent Low Bidder, directly or through another higher tier Subcontractor, anticipates awarding to each nominated Subcontractor.

2. Should the Apparent Low Bidder fail to nominate Subcontractors, as required, or provide duplicate nominees for any Division, Specification, or trade, or fail to enter the required licensing information, the Apparent Low Bidder shall clarify the omission or ambiguity within two (2) Business Days of the **Owner** or **Professional's** request. Failure by the Apparent Low Bidder to comply with this Subcontractor nominating requirement may render the Bid as not conforming in all material respects with the requirements of the Bidding Documents.

3. Pursuant to the Bidding Documents, the Apparent Low Bidder shall not remove, replace, or add a nominated Subcontractor except as provided in paragraph 8.3 of Section 00100 Instructions to Bidders and/or in paragraph 5.1 of Section 00700 General Conditions. Since the requirement to nominate Subcontractors for the *listed* Divisions, Specification Sections and/or trades survives the award of the Contract, any Subcontractor nominated for any *listed* Division, Specification Section and/or trade *for the first time* after Contract Award and who is objected to by the **Owner**, for good cause, shall be replaced at no increase in Contract Price and/or Contract Time.

4. The requirement to make a definite nomination of Subcontractors or to state that the Apparent Low Bidder intends to self-perform that classification, and to clarify any omissions or ambiguities in this Section 00430 List of Subcontractors, applies to the Apparent Low Bidder and any other Bidder remaining or wishing to remain in contention for the award.

5. This listing requirement is not intended to create any express or implied duty or obligation to the Apparent Low Bidder or the nominated Subcontractors by the **Owner** or **Professional**.

(THE REMAINDER OF THIS PAGE LEFT BLANK INTENTIONALLY)

Division, Specification Section and/or Trade	Nominated Subcontractor(s)	License Number(s) Classification	Amount of Subcontract
1._____	_____	_____	_____
2._____	_____	_____	_____
3._____	_____	_____	_____
4._____	_____	_____	_____
5._____	_____	_____	_____
6._____	_____	_____	_____
7._____	_____	_____	_____
8._____	_____	_____	_____
9._____	_____	_____	_____
10._____	_____	_____	_____
11._____	_____	_____	_____
12._____	_____	_____	_____
13._____	_____	_____	_____
14._____	_____	_____	_____

The undersigned Apparent Low Bidder _____ certifies that all the information and data furnished in this Section 00430 List of Subcontractors are current, accurate and complete as of the date stated below.

Signed by: _____ Name _____ Title _____

on this _____ day of _____, 20_____.

END OF SECTION 00430

PROFESSIONAL – DLZ Michigan, Inc.

WORK – Flint Bishop Airport Landfill Cap Construction

FILE No. – 761/25250.SAR

ARTICLE 1 BID MATERIALS AND EQUIPMENT – *LISTED (NAMED OR SPECIFIED) ITEMS*

1.1. The Apparent Low Bidder has examined the requirements of paragraphs 7.4 and 7.5 of Section 00100 Instructions to Bidders, and by submitting a Bid, commits to bid only a *listed* named or specified materials and equipment for those Specifications *listed* in Schedule 1.6. To the extent that any such *listed* Specification states that an "or equal" or a substitute may be furnished, if acceptable to the **Professional,** application for any such acceptance will not be considered by the **Professional** until after Contract Award. Any such application shall comply with the terms and conditions of Article 2 in this Section and paragraph 5.2 of Section 00700 General Conditions.

1.2. For those Sections of the Specifications *listed* in paragraph 1.6, the Contract will be awarded on the basis that only one of the *listed* materials or equipment will be furnished. Therefore, to be considered responsible, the Apparent Low Bidder shall nominate, by circling the letters "A," "B," "C," etc. corresponding to each *listed* manufacturer/Supplier, the Bidder's chosen manufacturers/Suppliers for the corresponding products named or specified in the Specifications and Drawings (including all Addenda).

1.3. If the Apparent Low Bidder fails to circle a manufacturer/Supplier for a *listed* material or equipment, or circles more than one letter for a *listed* material or equipment, the Apparent Low Bidder hereby agrees to correct the omission or ambiguity within two (2) Business Days after submittal of this Section 00440 Schedule of Materials and Equipment. The requirement to make a definite selection and to correct any omissions or ambiguities in Schedule 1.6 applies to the Apparent Low Bidder and any other Bidder remaining or wishing to remain under consideration for the award.

1.4. The Apparent Low Bidder's attention is directed to paragraph 7.3 of Section 00100 Instruction to Bidders, which holds the Apparent Low Bidder responsible, if awarded the Contract, for certain costs and time impacts, provided the Apparent Low Bidder, in the preparation of its Bid, knew or had reason to know, that any *listed* material or equipment bid by the Bidder requires changes in the Work and failed to provide advanced written notice to that effect to the **Professional**.

1.5. The Apparent Low Bidder shall insert the provisions of this Section in all Sub agreements with Subcontractors and Suppliers furnishing the materials or equipment *listed* in Schedule 1.6, altering the respective paragraphs only as appropriate to properly identify the contracting parties. Each such Sub agreement shall expressly bind the respective Subcontractor or Supplier to the conditions of paragraph 1.4, the other provisions of Section 00440 Schedule of Materials And Equipment and paragraph 5.2 of Section 00700 General Conditions.

1.6. Schedule of Bid Materials and Equipment

ITEMS NAMED OR SPECIFIED (ENTERED BY THE **PROFESSIONAL**)		
ITEM OF MATERIAL OR EQUIPMENT	SPECIFICATION SECTION	**CONTRACTOR** TO NOMINATE (CIRCLE) ITS CHOSEN NAMED OR SPECIFIED MANUFACTURERS AND SUPPLIERS
ITEM 1 -		A. B. C. D.
ITEM 2 -		A. B. C. D.
ITEM 3 –		
ITEM 4 -		

1.7 Use of "Or Equal" or Substitute Materials or Equipment After Contract Award

1.7.1. Paragraph 5.2 of Section 00700 General Conditions provides for the consideration (after the date of Contract Award) and possible acceptance by the **Professional** of "or equal" or substitute materials or equipment (unless any material or equipment named is followed by words establishing that no "or equal" or substitution is permitted). If sufficient information is submitted to allow the **Professional** to determine in a timely manner that the material or equipment proposed is equivalent or equal to that named or described in the Drawings or specified in the Specifications, then the **Professional** will consider the proposed "or equal" or substitute material or equipment.

1.7.2. The Apparent Low Bidder assumes responsibility for the cost and time required to make any proposed "or equal" or substitute material or equipment approved by the **Professional** conform to the requirements of the Contract Documents. In addition, if any such "or equal" or substitute material or equipment requires any changes in the drawings, or in any testing requirements, or in any Means and Methods indicated in or required by the Contract Documents, or in work performed by the **Owner** or others, or requires any other changes in the Work whatsoever, the Apparent Low Bidder shall assume full responsibility for the cost and the time required to carry out such changes in the Work or the work of others. Pursuant to this provision, the Apparent Low Bidder shall bear an appropriate portion of the Delay and costs resulting from the events contemplated in this paragraph.

1.7.3. Paragraph 5.2 of Section 00700 General Conditions provides for reimbursement by the **Contractor** to the **Owner** for any additional expenses incurred by the **Professional** directly attributable to the evaluation of any proposed substitute material or equipment and any proposed “or equal” material or equipment for materials and equipment *listed* in Schedule 1.6.

1.7.4. The Apparent Low Bidder shall insert the provisions of this Article 1 of Section 00440 Schedule of Materials and Equipment in all Sub agreements with Subcontractors and Suppliers furnishing any materials or equipment, altering the respective paragraphs only as appropriate to properly identify the contracting parties. Each such Sub agreement shall expressly bind the respective Subcontractor or Supplier to the conditions of paragraph 1.7.2, the other provisions of this Section 00440 Schedule of Materials And Equipment and paragraph 5.2 of Section 00700 General Conditions.

ARTICLE 2 BID MATERIALS AND EQUIPMENT – *OPEN* SPECIFICATIONS

2.1. For those Specifications *not listed* in Schedule 1.6, the Apparent Low Bidder, if and when awarded the Contract, shall disclose to the **Owner** and **Professional** (when submitting the Schedule of Values required by paragraph 12.1.1 of Section 00700 General Conditions) the Bidder's chosen manufacturers/Suppliers for the corresponding materials and equipment specified in the Specifications and Drawings (including all Addenda).

2.2. The Apparent Low Bidder has examined the requirements of paragraphs 7.2 and 7.3 of the Instructions to Bidders and commits to furnish materials and equipment meeting the requirements of the Specifications. If any such Bidder-selected material or equipment represents an "or equal" or a substitute material or equipment, no such material or equipment shall be used or furnished in the execution of the Work unless previously approved by the **Professional** as an acceptable “or equal” or substitute material or equipment. Application for any such acceptance will not be considered until after Contract Award. Any such application shall comply with the terms and conditions of this Article 2 and paragraph 5.2 of Section 00700 General Conditions.

2.3. The Apparent Low Bidder shall insert the provisions of this Section in all Sub agreements with Subcontractors and Suppliers furnishing the materials or equipment listed in Schedule 2.4, altering the respective paragraphs only as appropriate to properly identify the contracting parties. Each such Sub agreement shall expressly bind the respective Subcontractor or Supplier to the conditions of paragraph 2.2, the other provisions of this Section 00440 Schedule of Materials and Equipment and paragraph 5.2 of Section 00700 General Conditions.

2.4. Schedule of Bid Materials and Equipment

MATERIAL OR EQUIPMENT	SPECIFICATION SECTION	**CONTRACTOR** TO NAME ITS CHOSEN MANUFACTURERS AND SUPPLIERS
ITEM 1 -		
ITEM 2 -		
ITEM 3 -		
ITEM 4 -		

ITEM 5 -

ITEM 6 -

ITEM 7 -

ITEM 8 -

ITEM 9-

ITEM 10 -

ITEM 11-

ITEM 12 -

MATERIAL OR EQUIPMENT	SPECIFICATION SECTION	**CONTRACTOR** TO NAME ITS CHOSEN MANUFACTURERS AND SUPPLIERS

IMPORTANT: The provisions of this Section 00440 Schedule of Materials and Equipment shall not create or impose any express or implied duty or obligation on the **Owner** or **Professional** to exercise this authority for the benefit of the Apparent Low Bidder or any *listed* manufacturer/Supplier.

The undersigned Apparent Low Bidder _____ certifies that all the information and data furnished in this Section 00440 Schedule of Materials and Equipment are current, accurate and complete as of the date stated below.

Signed by: _____ Name _____ Title _____

on this _____ day of _____, 20_____.

END OF SECTION 00440

SECTION 00500 AGREEMENT

FILE No. 761/25250.SAR _ CONTRACT ORDER No. Y_____

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* To be Completed With the Bidding Documents
** To Be Completed Upon Award of the Contract **

THIS AGREEMENT TO CONTRACT is made this _____ day of _____ in the year Two-Thousand And _____ (_____) by and between **THE STATE OF MICHIGAN, "Owner," represented by the **Director, Department** of Technology, Management and Budget, duly authorized, and _____, _____ the "**Contractor**," a corporation ____, partnership ____, individual ____, or joint venture ____ (between _____ and _____), of the State of _____, whose address is _____ _____, represented by _____, its _____, duly authorized.

The **Owner** and **Contractor**, in consideration of the mutual covenants and obligations stated in this Section 00500 Agreement and the other parts of the Contract Documents, agree as follows:

ARTICLE 1 THE CONTRACT; THE PROJECT; THE WORK

1.1. THE CONTRACT – The contract entered between the **Owner** and **Contractor** for the furnishing and performance of the Work by the **Contractor**, which consists of the Contract Documents listed or designated in paragraphs 2.2 through 2.4.

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1.2. PROJECT NAME – Flint Bishop Airport Landfill

1.3. THE WORK – Flint Bishop Airport Landfill Cap Construction

ARTICLE 2 CONTRACT DOCUMENTS

2.1. The Contract Documents form the contract between the **Owner** and **Contractor** and represent the entire and final integrated agreement between the **Owner** and **Contractor** with respect to the Work. The Contract Documents are incorporated into this Agreement by this reference, and supersede all prior oral or written agreements, if any, between the **Owner** and **Contractor**. Any statement, representation, promise or inducement not set forth in the Contract Documents is null and void, and not binding on either the **Owner** or **Contractor**.

The Contract Documents shall not in any way create a relationship of any kind between the **Professional** and **Contractor**, or between the **Owner** and a Subcontractor, or Supplier or any other third party. The **Professional** shall, however, be entitled to performance and enforcement of obligations under the Contract that are consistent with the **Professional's** authority and responsibilities under the Contract Documents.

2.2. The Contract Documents on the date when the **Owner** executes this Section 00500 Agreement, which are attached to this Section 00500 Agreement, consist of the following:

2.2.1. This ***Section 00500 Agreement***, fully executed by the **Owner** and **Contractor**, including the following attachments: _____ and ***Addenda*** ____ through ____.

2.2.2. ***Section 00800 Supplementary Conditions***, including _____; and ***Section 00120 Supplementary Instructions***, including ____ _____

2.2.3. ***Section 00020 Glossary***, and ***Section 00700 General Conditions***.

2.2.4. ***General Requirements***, Division 1 of the Specifications.

2.2.5. ***Divisions 2 through _____ of the Specifications***, and ***Drawings***, bearing the title: _____ _____, dated _____.

2.2.6. ***Section 00030 Advertisement; Section 00100 Instructions to Bidders***, including ***Attachment A–Bidder's Check List***, and ***Section 00210 Information for Bidders***.

2.2.7. ***Section 00610 Performance Bond*** and ***Section 00620 Payment Bond***, fully executed by the **Contractor** and the sureties for the contract award amount, each enclosing separate evidence of Power of Attorney.

2.2.8. The **Contractor's** ***Section 00300 Bid Summary and Bid Form*** (with attachments), Section ***00320 Non-collusion Affidavit*** (including any revisions delivered after Bid opening) and ***Section 00330 Asbestos Abatement Attestation***.

2.2.9. The following **Contractor's** ***Qualification Submittals*** (post-Bid opening:) _____

2.3. Contract Documents that will be issued after the date the **Owner** executes this Section 00500 Agreement consist of:

2.3.1. ***Change Orders*** and ***Change Authorizations*** signed as provided in the Contract Documents.

2.3.2. ***Notice of Award*** and ***Notice to Proceed.***

2.4. There are no Contract Documents other than those listed or designated in this Article or added through Section 00520 Attachment A to the Agreement. The Contract Documents may be modified, as provided in Section 00700 General Conditions.

ARTICLE 3 CONTRACT PRICE

3.1. The **Contractor** will furnish and perform the Work and accept in full payment the Contract Price of _____ _____ Dollars ($_____). The Contract Price includes only those Alternates accepted by the **Owner**, as itemized in the Notice of Award.

3.2. The Contract will include those Change Order prices (bid on Section 00300 Bid Form) accepted by the **Owner** when the **Owner** issues the Notice to Proceed or by Change Authorization.

3.3. Payments to the **Contractor** will be made based on the prices stated on the **Contractor's** Section 00300 Bid Form, subject to the terms and conditions of the Contract Documents.

ARTICLE 4 CONTRACT TIME; LIQUIDATED DAMAGES

4.1. The periods allowed for completion of the Work, or a designated part of the Work, will be as follows:

4.1.1. The entire Work will be substantially complete in accordance with the requirements of the Contract Documents: 365 calendar days from the notice to proceed date.

4.1.2. If separable parts of the Work shall be completed before the period allowed for Substantial Completion of the entire Work, the Contract Times for those parts of the Work will be as specified in Section 00520 Attachment A to Agreement, and as may be supplemented in the Specifications.

4.1.3. The entire Work will be complete and ready for final payment as specified in the Contract Documents: 365 calendar days from the substantial completion date.

4.2. The **Owner** and **Contractor** recognize that the Contract Times are of the essence of the Contract and that the **Owner** will suffer costs and damages if the Work is not completed within the Contract Times, including any extensions in Contract Time authorized by Change Orders. Therefore, liquidated damages (in the amounts specified in paragraphs 4.2.3 through 4.2.5) will apply if the Work is not completed within the limits of the Contract Times. Liquidated damages are not a penalty, are cumulative and represent a reasonable estimate of the **Owner's** extra costs and damages, which are difficult to estimate with accuracy in advance.

4.2.1. Accordingly, if the **Contractor** fails, neglects, or refuses to complete all or any designated part of the Work within the specified Contract Time, the **Contractor** agrees to pay to the **Owner** liquidated damages and to allow, at the appropriate time, a corresponding adjustment in Contract Price.

4.2.2. If under the procedures of paragraph 4.3, the **Owner** is justified in withholding liquidated damages due to or in anticipation of late completion, the **Contractor** agrees to allow the **Owner** to deduct liquidated damages from Requests for Payment.

4.2.3. Liquidated damages for each Calendar Day that expires after the Contract Time specified in paragraph 4.1.1 for Substantial Completion of the entire Work – until the Work is substantially complete – shall be in the amount of two thousand Dollars and No/Cents ($2,000.00)

4.2.4. Liquidated damages for each Calendar Day that expires after each of the Contract Times designated in Section 00520 Attachment A to the Agreement – until each such part of the Work is sufficiently complete – shall be in the amounts stated in Section 00520 Attachment A to the Agreement.

4.2.5. Liquidated damages for each Calendar Day after Substantial Completion of the entire Work that expires after the Contract Time specified in paragraph 4.1.3 for completion and readiness for final payment – until the entire Work is complete and ready for final payment – shall be in the amount of two thousand Dollars and No/Cents ($2,000.00)

Assessment and/or Withholding of Liquidated Damages

4.3. If the **Contractor** fails to complete the Work, or a specified part of the Work, within the corresponding Contract Time, or if at any time after the Work is eighty percent (80%) in place, the **Contractor** does not prosecute the balance of the Work with the diligence required to comply with the Contract Times, the **Contractor** shall be requested to submit a schedule recovery plan acceptable to the **Owner**. The **Contractor's** schedule recovery plan shall describe the cause of schedule slippage or delayed progress and the actions proposed and taken to recover schedule. In addition, to the extent that the **Contractor** believes that an extension in Contract Time is justified, the recovery plan shall include a request for an appropriate extension in Contract Time.

4.3.1. Within fifteen (15) Calendar Days after the **Contractor** receives any such request, the **Contractor** shall meet with the **Owner** and present the **Contractor's** written schedule recovery plan. If, upon evaluation of the **Contractors'** schedule recovery plan, and after consultation with the **Professional**, the **Owner**, in its sole discretion, determines that there is sufficient cause to withhold liquidated damages, the **Owner** may deduct from Requests for Payment the liquidated damages then due or that would become due using the **Owner's** estimate of late completion of the Work.

4.3.2. For the purposes of returning liquidated damages, schedule recovery implementation shall not be complete until such slippage or delayed progress has been corrected and the Progress Schedule once again supports compliance with the Contract Times. Once late completion has been corrected, the **Contractor** shall be entitled to reimbursement of all liquidated damage sums previously withheld. Any such reimbursement of liquidated damages previously withheld shall not constitute a waiver of any claims that the **Owner** may otherwise have.

ARTICLE 5 PAYMENTS TO CONTRACTOR

*5.1. The **Owner** will pay one hundred percent (100%) of the amount due upon completion of any Schedule of Value *pay item*. The **Professional** may require, for each Request for Payment, sworn statements, consent of surety, waivers of lien (from the **Contractor**, Subcontractors and Suppliers), Record Documents, guarantees, operating and maintenance manuals and such other documents required by the Contract Documents. Payment to the **Contractor** will be made within thirty (30) Calendar Days from receipt by the **Owner** of the **Professional's** certification representing to the **Owner** the amount of payment to be due to the **Contractor**.

*5.2. Processing of Requests for Payment by the **Owner** may be deferred until Work having a prior sequence, as provided in the Contract Documents, is in place and is approved.

5.3. Payments shall be subject to the terms and conditions of Section 00700 General Conditions and the other parts of the Contract Documents and shall be made less such deductions as the **Owner** and/or **Professional** determines are appropriate, as specified in paragraph 12.4 of Section 00700 General Conditions.

5.4. If any portion of the Work is funded by a federal or State agency, the **Owner** will have fifteen (15) Calendar Days after receiving those funds in which to make payment. This provision shall take effect only after the thirty (30) Calendar Day period following certification by the **Professional** has expired.

ARTICLE 6 THE PROFESSIONAL SERVICES CONTRACTOR

6.1. The **Owner** has retained DLZ Michigan, Inc. to assume all duties and responsibilities of, and have the rights and authority assigned to, the **Professional Services Contractor** in the Contract Documents with respect to completion of the Work in accordance with the Contract Documents.

ARTICLE 7 CONTRACTOR'S REPRESENTATIONS

7.1. The **Contractor** reiterates and makes each of the representations itemized in Article 2 of the **Contractor's** Section 00300 Bid Form. Article 2 in the **Contractor's** Section 00300 Bid Form is by this reference repeated verbatim in this Section 00500 Agreement as paragraphs 7.2 through 7.13 just as though those paragraphs had been written in this Article 7, except that the term "**Contractor**" shall replace the term "Bidder" in every instance.

ARTICLE 8 MISCELLANEOUS

8.1. If any provision of the Contract Documents is invalid, illegal, or unenforceable, all other provisions of the Contract Documents shall remain in full force and effect. If any provision of the Contract Documents is inapplicable to any Person or circumstance, that provision shall remain applicable to all other Persons and circumstances.

8.2. It is the intent of the **Owner** and **Contractor** that all provisions of Law required to be inserted or referenced in the Contract Documents are in fact so inserted or referenced. If any provision of Law is not so inserted or referenced, or is inserted or referenced improperly, then each such provision shall be considered inserted or referenced in the Contract Documents in proper form at no increase in Contract Price and/or Contract Time.

8.3. The duties, obligations, criteria or procedure imposed by, and the rights and remedies made available in, the Contract Documents are in addition to, and not in any way a limitation of, any rights and remedies that are otherwise allowed or imposed by Law, except that in the event a specific part or detailed requirement of a provision, criterion or procedure in the Contract Documents and a specific part or detailed requirement of a provision, criterion or procedure imposed by Law conflict, the specific part or detailed requirement of such provision, criterion or procedure imposed by Law shall govern. All other specific parts or detailed requirements in the provisions, criteria or procedures imposed by Law and the Contract Documents shall remain in full force and effect and be read with the controlling specific part or detailed requirement. These provisions will be as effective as if repeated specifically in the Contract Documents in connection with each duty, obligation, right and remedy to which they apply.

8.4. The **Contractor** shall not sell, assign, transfer or otherwise convey any of the **Contractor's** rights and shall not delegate any of the **Contractor's** duties under this Agreement without the prior written consent of the **Owner** and the sureties for the **Contractor**. In its sole discretion, the **Owner** may refuse to consent to any proposed assignment or delegation. Any attempted sale, assignment, transfer, or other conveyance in violation of this paragraph shall be void and shall relieve the **Owner** of any further liability under the Contract Documents but shall not relieve the **Contractor's** sureties of any liability. If the **Owner** consents in writing to an assignment, unless specifically stated to the contrary in the consent, that assignment shall not release or discharge the **Contractor** from any duty or responsibility set forth in the Contract Documents and shall not release or discharge the **Contractor's** sureties under the Bonds required by the Contract Documents.

8.5. The **Owner** reserves the right to correct any error in any Request for Payment that may have been paid. The **Owner** reserves the right, should proof of Defective Work be discovered after final payment, to claim and recover from the **Contractor** and/or the **Contractor's** surety, sufficient sums to correct or remove and replace the Defective Work.

8.6. Any waiver by the **Owner** of any provision of the Contract Documents shall be specific and in writing and apply only to the specific matter and not to other similar or dissimilar matters. Any waiver of any breach of this Contract shall not be held to be a waiver of any other or subsequent breach.

8.7. Nothing contained in this Agreement shall in any manner authorize, empower, or constitute the **Contractor**, Subcontractors or Suppliers (a) to act as agents of the **Owner,** (b) to assume or create any obligation or responsibility whatsoever, express, or implied, on behalf of or in the name of the **Owner**; (c) to bind the **Owner** in any manner, or (d) to make any representation, warranty, covenant, agreement, or commitment on behalf of the **Owner**. It is the intent and understanding of the parties that the **Contractor** shall perform the Work as an independent contractor. This Agreement does not create, and shall not be construed as creating, any rights enforceable by any third party.

8.8. If the **Owner** or **Contractor** suffers injury or damage to person or property because of error, omission, or act of the other, any of the other's employees or agents or others for whose acts the other party is legally liable, claim will be made in writing to the other party within a reasonable time of the first observation of that injury or damage. This provision is not and shall not be construed as a substitute for or a waiver of the provisions of any applicable statute of limitations or time requirements set forth in Section 00700 General Conditions.

8.9. All computer programs which are not the subject of copyrights by third parties, and which are delivered, developed, produced, or paid for under a specific requirement of the Contract Documents and all plans, drawings, designs, specifications, technical reports, operating manuals, and other data which are delivered, developed, produced, or paid for under the Contract Documents shall be the property of the **Owner**. The **Owner** maintains all rights to such programs and deliverables, including the right to use, duplicate, and disclose the programs and deliverables, in whole or in part, in any manner and for any purpose. If any program or deliverable is copyrightable, the **Contractor** may copyright it subject to the **Owner's** rights. The **Owner** reserves a royalty-free, nonexclusive, and irrevocable license to use, duplicate, publish, and disclose such programs and deliverables, in whole or in part, and to authorize others to do so.

8.10. The **Contractor** warrants that all costs in proposals and claims for adjustments in Contract Price shall not exceed those allowed under the Contract Documents, and that proposals and claims for adjustments in Contract Price shall grant prices, terms, and warranties comparable to or better than prices, terms and warranties offered to others for similar work.

8.11. This Agreement shall be binding on the **Contractor, Owner** and their respective successors and legal representatives and, if the **Owner** has consented to an assignment or other conveyance, on all their respective assigns and delegates.

*8.12. The Contract Documents shall be governed by and construed in accordance with the Laws of the State of Michigan in effect on the date of Bid opening. Any change in Michigan Law after that date shall be binding only to the extent the **Owner** and **Contractor** agree or to the extent such change is beyond the capacity of the parties to avoid.

ARTICLE 9 NOTICE AND SERVICE

9.1. Unless otherwise provided in the Contract Documents or consented to by the **Owner** in writing, any notice, demand, or communication shall be in writing and shall be deemed to have been given when received by the individual required to be given notice at the address designated in this Agreement. A copy of any notice, demand or notification shall be sent to the address below.

9.2. Any written notice or other written communication to the sureties shall be sufficiently given if delivered to the individual required to be given notice at the address designated in the Bond.

IN WITNESS WHEREOF, the **Owner** and **Contractor** have signed this Section 00500 Agreement in triplicate and initialed three (3) full sets of the Contract Documents. One (1) full set of the executed Contract Documents will be delivered to the **Contractor**.

THE **STATE OF MICHIGAN**
BY:

_____
Director, DTMB, SFA, Design and Construction
NAME:

_____
Witness:

_____
Date:

_____
Address for giving notices:

Department of Technology, Management and Budget
State Facilities Administration
Design and Construction
3111 W. St. Joseph Street
Lansing, MI 48917

THE **CONTRACTOR**
BY:

_____
Title: Date

NAME:

_____
Federal ID No. or SS No.(LAST 4 Only)

Telephone No.

_____
Witness:

_____
Date:

_____
Address for giving notices

CERTIFICATE OF PRINCIPAL

(If **Contractor** is Other Than a Sole Proprietor)

I, _____, certify that I am the Secretary of the Corporation ____, or a General Partner ____ or Managing Partner ____ or Partner ____ of the partnership, named as the **Contractor** in the attached Section 00500 Agreement, that _____ _____ who signed Section 00500 Agreement on behalf of the **Contractor**, was then _____ of that corporation ___ or partnership ___; that I know the undersigned's signature, and the signature is genuine; and that Section 00500 Agreement was duly signed, sealed and attested for and on behalf of that corporation ___ partnership ___ by authority of its governing body ___ or partners ___

_____

Signed by the Secretary or Other Authorized Officer of the Corporation Date
or By General Partner or Managing Partner or Authorized Partner Certifying

_____

Name of the Corporation or True Name of the Partnership

Telephone No. _____

(Corporate Seal)

VERIFICATION

(by **Contractor**)

STATE OF _____)
)
COUNTY OF _____)

Before me, a Notary Public duly commissioned, qualified and acting, personally appeared (enter name of person who signed Section 00500 Agreement on behalf of the Bidder), _____ to me well known, who being by me first duly sworn upon oath, says that he/she is the Attorney-In-Fact for (enter the **Contractor's** name) _____ _____ and that he/she has been authorized by (enter name of individual, partnership name, or that governing body of the Bidder named in the attached corporate resolution) _____ to execute Section 00500 Agreement on behalf of the named **Contractor** in favor of the STATE OF MICHIGAN.

Subscribed and sworn before me this _____ day of _____, A.D., 20_____.

_____

Notary Public, State of _____

My Commission Expires: _____

RESOLUTION OF CORPORATE AUTHORITY
(If **Contractor** is a Corporation)

I, _____, Corporate Officer of _____, a _____
(Print or type) Corporation (the "Company") (Indicate State)

DO HEREBY CERTIFY that the following is a true and correct excerpt from the minutes of the meeting of the Board of Directors, wherein a quorum was present, duly called and held on _____ and that the same is now in full force and effect:

"RESOLVED, that the Chairman, the President, each Vice President, the Treasurer, and the Secretary and each of them, hereby is authorized to execute and deliver, in the name and on behalf of the Company and under its corporate seal or otherwise, any agreement or other instrument or document in connection with any matter or transaction that shall have been duly approved; the execution and delivery of any agreement, document, or other instrument, or document in connection with any matter or transaction that shall have been duly approved; the execution and delivery of any agreement, document, or other instrument by any of such officers to be conclusive evidence of such approval."

I FURTHER CERTIFY that _____ is Chairman of the Board, _____ is President, _____ is Treasurer, and _____ is Secretary.

I FURTHER CERTIFY that any of the officers of the Company named in this Resolution of Corporate Authority are authorized to execute or guarantee and commit the Company to the conditions, obligations, stipulations, and undertakings contained in the Contract Documents for File No. 761/25250.SAR Work _____, _____ and that all necessary corporate approvals have been obtained in relationship thereto.

IN WITNESS THEREOF, I have set my hand this _____ day of _____, 20___.

CORPORATE SEAL

_____
Corporate Officer's Signature

_____
Title

Telephone No. _____

CERTIFICATE OF PARTNERSHIP AUTHORITY
(If **Contractor** is a Partnership)

I, _____, General Partner in _____, a _____
(Print or Type) Partnership (the "Partnership") (Indicate State)

DO HEREBY CERTIFY that I am a General Partner in the Partnership formulated pursuant to a Partnership Agreement dated _____, 20___, and that the following is a true and correct excerpt from the minutes of the meeting of the General Partnership held on _____ and that the same is now in full force and effect:

"That each General Partner is authorized to execute and deliver, in the name and on behalf of the Partnership, any agreement or other instrument or document in connection with any matter or transaction that shall have been duly approved; the execution and delivery of any agreement, document, or other instrument, or document in connection with any matter or transaction that shall have been duly approved; the execution and delivery of any agreement, document, or other instrument by a General Partner to be conclusive evidence of such approval."

I FURTHER CERTIFY that any of the aforementioned General Partners of the Partnership are authorized to execute or guarantee and commit the assets of the Partnership to the conditions, obligations, stipulations, and undertakings contained in the Contract Documents for File No. 761/25250.SAR Work _____, _____ and that all necessary partnership approvals have been obtained in relationship thereto.

IN WITNESS THEREOF, I have set my hand this _____ day of _____, 20___.

_____
General Partner's Signature

_____
Title

Telephone No. _____

END OF SECTION 00500

SECTION 00520 ATTACHMENT "A" TO AGREEMENT

PROFESSIONAL – DLZ Michigan, Inc.
WORK – Flint Bishop Airport Landfill Cap Construction
FILE No. – 761/25250.SAR CONTRACT ORDER No. Y_____

This Section 00520 Attachment A to Agreement supplements those specific provisions in Section 00500 Agreement designated below. All other provisions in Section 00500 Agreement that are not so supplemented remain in full force and effect. The terms "Agreement", "Contract Documents" and "Contract" have specific intents and meanings assigned as stated in Section 00500 Agreement and Section 00020 Glossary.

SUPPLEMENTARY TERMS AND CONDITIONS TO
ARTICLE 4 CONTRACT TIME; LIQUIDATED DAMAGES

The following separable parts of the Work will be completed, as specified in the Contract Documents:
(a)
within _____ (___) Days from the date when the Contract Time commences to run, or on or before _____, 20____.
(b)
within _____ (___) Days from the date when the Contract Time commences to run, or on or before _____, 20____.
(c)
within _____ (___) Days from the date when the Contract Time commences to run, or on or before _____, 20____.

These interim Contract Times are of the essence so as to: (a) not Delay work by others as provided in Article 13 of the General Conditions; (b) conform to the sequences of Work indicated in or required by the Contract documents; and (c) comply with the coordination requirements of the Contract Documents.

The **Owner** and **Contractor** recognize that the Contract Time(s) specified in this Attachment A is(are) of the essence to this Agreement in that the **Owner** will suffer costs and damages if the Work is not completed within the Contract Time(s) plus any extensions authorized in accordance with Section 00700 General Conditions. Accordingly, liquidated damages will apply based on the following schedule: (a) ____ _____ Dollars and No/Cents ($_____); (b) _____ Dollars and No/Cents ($ _____); and (c) _____ Dollars and No/Cents ($_____) for each Calendar Day that expires after each of the respective Contract Times specified in this Section 00520 Attachment A to the Agreement for the completion of each of those designated parts of the Work, respectively, until each of those parts of the Work is complete. Any deduction by the **Owner** of liquidated damages from Requests for Payment shall be undertaken only after consultation with the **Professional** and shall be subject to the procedures outlined in paragraph 4.3, Section 00500 Agreement.

END OF SECTION 00520

SECTION 00610 PERFORMANCE BOND

FILE No. 761/25250.SAR SURETY COMPANY REFERENCE No. _____

"The **Contractor**," _____, a corporation ___, individual ___, partnership ___, joint venture ___ of the State of _____, qualified to do business in the State of Michigan, as Principal, and "the Surety," _____, of the State of _____, as surety, are held and bound unto the State of Michigan, "the **Owner**," as Obligee, in the amount of _____ Dollars ($_____), for the payment of which the **Contractor** and Surety hereby bind themselves, their respective heirs, successors, legal representatives and assigns, jointly and severally, in compliance with 1963 PA 213, as amended, MCL 129.201 et seq.

The **Contractor** has entered into "the Contract" with the **Owner** for _____ _____, "the Work," covered by the Contract Documents, which are incorporated into this Performance Bond by this reference.

If the **Contractor** faithfully performs and fulfills all the undertakings, covenants, terms, conditions, warranties, indemnifications and agreements of the Contract Documents within the Contract Time (including any authorized changes, with or without notice to the Surety) and during the Correction Period, and if the **Contractor** also performs and fulfills all the undertakings, covenants, terms, conditions, warranties, indemnifications and agreements of any and all duly authorized modifications of the Contract Documents, then THIS OBLIGATION IS VOID, OTHERWISE TO REMAIN IN FULL FORCE AND EFFECT.

A. No change in Contract Price or Contract Time, "or equal" or substitution or modification of the Contract Documents (including addition, deletion, or other revision) releases the Surety of its obligations under this Section 00610 Performance Bond. The Surety expressly waives notice of any such change in Contract Price or Contract Time, "or equal" or substitution or modification of the Contract Documents (including addition, deletion, or other revision).

B. This Section 00610 Performance Bond shall be solely for the protection of the **Owner** and its successors, legal representatives or assigns. The prevailing party in a suit on this Bond is entitled to recover as part of that party's judgment reasonable attorneys' fees.

C. It is the intention of the **Contractor** and Surety that they shall be bound by all terms and conditions of the Contract Documents (including, but not limited to Article 14 of Section 00700 General Conditions and this Section 00610 Performance Bond). However, this Section 00610 Performance Bond is executed pursuant to 1963 PA 213, as amended, MCL 129.201 et seq., and if any provision(s) of this Section 00610 Performance Bond is/are illegal, invalid, or unenforceable, all other provisions of this Section 00610 Performance Bond must nevertheless remain in full force and effect, and the **Owner** shall be protected to the full extent provided by 1963 PA 213, as amended, MCL 129.201 et seq.

IMPORTANT: The Surety shall be authorized to do business in the State of Michigan by the Department of Licensing and Regulatory Affairs, must be listed on the current U.S. Department of the Treasury Circular 570, and, unless otherwise authorized by the **Owner** in writing, must have at least an A– Best's rating and a Class VII or better financial size category per current A. M. Best Company ratings.

Name, Address and Telephone of the Surety:

Address and Telephone of Agent, who is either a resident of, or whose principal office is maintained in, the State of Michigan

Signed and sealed this _____ day of _____, 20_____.

THE **CONTRACTOR**: (Print Full Name and Sign)
WITNESS _____

By: _____
Name & Title: _____
Telephone No. _____

THE SURETY: (Print Full Name and Sign)
Agent: _____

WITNESS _____

Attorney-in-Fact: _____
Telephone No. _____

Email: _____

END OF SECTION 00610

SECTION 00620 PAYMENT BOND

FILE No. 761/25250.SAR _ SURETY COMPANY REFERENCE No._____

"The **Contractor**," _____, a corporation ___, individual ___, partnership ___, joint venture ___ of the State of _____, qualified to do business in the State of Michigan, as Principal, and "the Surety," _____, of the State of _____, as surety, are held and bound unto the State of Michigan, "the **Owner**," as Obligee, in the amount of _____ Dollars ($_____), for the payment of which the **Contractor** and Surety bind themselves, their respective heirs, successors, legal representatives and assigns, jointly and severally, in compliance with 1963 PA 213, as amended, MCL 129.201 et seq.

The **Contractor** has entered into "the Contract" with the **Owner** for _____ _____, "the Work," covered by the Contract Documents, which are incorporated into this Payment Bond by this reference.

If the **Contractor** promptly pays all claimants supplying labor or materials to the **Contractor** or to the **Contractor's** Subcontractors in the prosecution of the Work, then THIS OBLIGATION IS VOID, OTHERWISE TO REMAIN IN FULL FORCE AND EFFECT.

A. All rights and remedies on this Section 00620 Payment Bond shall be solely for the protection of all claimants supplying labor and materials to the **Contractor** or the **Contractor's** Subcontractors in the prosecution of the Work and must be determined in accordance with Michigan Law.

B. No change in Contract Price or Contract Time, "or equal" or substitution or modification of the Contract Documents (including addition, deletion, or other revision) must release the Surety of its obligations under this Section 00620 Payment Bond. The Surety hereby expressly waives notice of any such change in Contract Price or Contract Time, "or equal" or substitution or modification of the Contract Documents (including addition, deletion, or other revision).

C. It is the intention of the **Contractor** and Surety that they must be bound by all terms and conditions of the Contract Documents (including, but not limited to this Section 00620 Payment Bond). However, this Section 00620 Payment Bond is executed pursuant to 1963 PA 213, as amended, MCL 129.201 et seq., and if any provision(s) of this Section 00620 Payment Bond is/are illegal, invalid, or unenforceable, all other provisions of this Section 00620 Payment Bond must nevertheless remain in full force and effect, and the **Owner** must be protected to the full extent provided by 1963 PA 213, as amended, MCL 129.201 et seq.

IMPORTANT: The Surety shall be authorized to do business in the State of Michigan by the Department of Licensing and Regulatory Affairs, must be listed on the current U.S. Department of the Treasury Circular 570, and, unless otherwise authorized by the **Owner** in writing, must have at least an A– Best's rating and a Class VII or better financial size category per current A. M. Best Company ratings.

Name, Address and Telephone of the Surety:

Address and Telephone of Agent, who is either a resident of, or whose principal office is maintained in, the State of Michigan

Signed and sealed this _____ day of _____, 20_____.

THE **CONTRACTOR**: (Print Full Name and Sign) By: _____
WITNESS _____ Name & Title: _____
Telephone No. _____

THE SURETY: (Print Full Name and Sign) Agent: _____

WITNESS _____ Attorney-in-Fact: _____
Telephone No. _____

Email: _____

END OF SECTION 00620

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STATE OF MICHIGAN MODEL

Developed from FORMSPEC™ Michigan Model

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ARTICLE 1 INTERPRETATIONS

1.1 Section 00020 Glossary:

1.1.1. Section 00020 Glossary assigns specific intent and meanings to capitalized terms and to other defined terms used in this Section 00700 General Conditions, Section 00500 Agreement, Section 00520 Attachment A to the Agreement, Section 00610 Performance Bond, Section 00620 Payment Bond, and Section 00800 Supplementary Conditions.

1.1.2. Section 00020 Glossary also provides specific rules for construing any reference to any Article or paragraph that is made in this Section 00700 General Conditions.

1.2 Intent of the Contract Documents:

1.2.1. The intent of the Contract Documents is to describe the *entire* Work, including its various parts, to the extent necessary for the **Contractor** to discharge its obligation to execute and complete the Work in accordance with the Contract Documents. The Contract Documents are complementary; what is required by one shall be as binding as if required by all Contract Documents.

1.2.2. The *entire* Work required by the Contract Documents includes Work, which is reasonably inferable from the Contract Documents or from prevailing custom and trade usage.

The **Contractor** shall provide any Work reasonably inferable to the extent such Work is required to properly complete the installation of other Work expressly shown or specified in the Contract Documents. If the **Contractor** disagrees that Work that is not expressly shown or detailed in the Contract Documents is Work reasonably inferable, the **Contractor** shall proceed in accordance with the provisions of paragraph 10.1.3.

1.2.3. The breakdown of the Work by Divisions and Sections, or the identification of any Drawing, shall not delineate or be construed to delineate Work to be performed by any trade. The breakdown shall not control the manner in which the Work may be divided by the **Contractor** among Subcontractors and Suppliers.

*1.2.4. Reference to the State Construction Code Act of 1972, 1972 PA 230, as amended, MCL 125.1501 et seq., or to standard specifications, manuals or codes of any technical society, organization, or association, whether specifically or by implication, means the issue in effect on the date of Bid opening, unless otherwise expressly stated. Work indicated in or required by the Contract Documents that is above standards set in the State Construction Code shall be provided to the higher standard.

1.2.5. The provisions of the Contract Documents shall govern over any standard specification, manual or code of any technical society, organization, or association. Unless otherwise provided in the Contract Documents, words with an accepted technical or trade meaning used to describe any Work shall be interpreted in accordance with that meaning.

1.2.6. If any Work indicated in, or required by, the Contract Documents is above the standards set by any Law applicable to the Work and the Project, the higher standard shall govern.

1.2.7. The terms "the Contract Documents," "as specified in the Contract Documents," "in accordance with the Contract Documents" or such other similar terms shall be construed as including all valid Change Orders and Change Authorizations.

1.2.8. "Execution of the Work" and “shall provide” includes the furnishing and/or performance of the Work. "*Work*" as in "Unit Price Work," or “any Work” or "acceptable Work," etc. refers to a specific part(s) of the Work.

1.2.9. Subject to the **Contractor's** continuing responsibilities for the acts of Subcontractors and Suppliers, whenever in the Contract Documents the term "the **Contractor**" is used concerning any action, obligation, cost, or event, it shall cover, even if not expressly stated, actions or obligations or costs of, or events involving, any Subcontractor, Supplier, or anyone for whom any of them may be liable, unless the context requires otherwise.

1.2.10. Use of the terms "as ordered," "as directed," "as required," "as allowed," "as approved" or similar terms, or the adjectives "reasonable," "suitable," "acceptable," "proper" or "satisfactory" or similar adjectives, to describe a requirement, direction, review, or judgment of the **Professional** or **Owner** as to the Work will be solely to evaluate the Work for compliance with the Contract Documents. No use of any such term or adjective, or provision of any standard specification, manual or code (whether expressly incorporated by reference in the Contract Documents or not), or Suppliers' instructions, shall be effective to (a) change the duties and responsibilities of the **Owner** or **Professional** from those assigned in the Contract Documents, (b) assign to the **Owner** or **Professional** any duty or authority to supervise or direct the furnishing or performance of the Work or assume responsibility contrary to the provisions of the Contract Documents.

1.2.11. A provision stating "the **Contractor** shall bear its proportionate share of the Delay and costs" shall be construed as entitling the **Owner** to an appropriate decrease in Contract Price and Contract Time for all the **Owner’s** direct, indirect, and consequential costs and damages that are attributable to the **Contractor**.

1.2.12. Contract Time computations shall be made in Calendar Days. The Progress Schedule shall be in the form of a Critical Path Method schedule, Total Float and Contract Float values stated in Business Days shall be converted to Calendar Days when used for the purpose of calculating changes in Contract Time.

1.2.13. Any computation of a Contract Time which adds Calendar Days to a date shall include both the first and last Day. Any computation of a notice period shall exclude the first Day and include the last Day. In any case, if the computed Day falls on a non-Business Day, it shall be omitted from the computation.

1.2.14. In the Contract Documents, the terms "substantially completed" and "substantially complete" have in context the same meaning as Substantial Completion.

1.3 Priority of the Contract Documents:

1.3.1. Whenever an issue of priority involves two Sections within the Contract Documents, the following will apply: Unless the **Owner** and **Contractor** mutually agree otherwise, a Section of the Contract Documents will *supersede* another *conflicting* Section if the *superseding* Section is listed in paragraph 2.2 of Section 00500 Agreement ahead of the *conflicting* Section.

1.3.2. Whenever an issue of priority involves Work called for in the technical Specifications or Drawings – figured dimensions shall govern scaled dimensions, detail Drawings shall govern general Drawings and Drawings shall govern Submittals.

Whenever specifications, dimensions, notes, schedules, or details conflict (whether within the Specifications or Drawings, or between the Specifications and Drawings, or between Change Order Drawings and the Drawings), the **Contractor** shall be required to provide the higher performance requirement only to the extent such outcome results in Work reasonably inferable.

1.4 Interpretation of Indemnification Provisions:

1.4.1. Paragraphs 1.4.2 and 1.4.3 will be as effective as if repeated in paragraphs 4.5.2, 4.6.1, 4.9.1, 10.4.4, 13.3.1 and in any other paragraph requiring the **Contractor** to defend, indemnify and hold harmless the **Owner** and **Professional**.

1.4.2. Any indemnification provision requiring the **Contractor** to defend, indemnify and hold harmless the **Owner** and **Professional** against all claims, or covering liability of the **Owner** or **Professional**, shall include claims caused in part by the negligence or other liability-creating conduct or omission of the **Contractor**.

1.4.3. The terms "against all claims" in any such obligation shall be construed as covering all claims, of whatever type and nature, and all judgments, costs, losses, and damages, whether direct, indirect, or consequential (including, but not limited to, charges of architects, engineers, attorneys and others and all court, hearing, and any other dispute resolution costs).

1.5 Additional Interpretations:

1.5.1. The term "the **Professional**" shall be construed as covering, even if not expressly stated, the **Professional's** consultants, agents, and employees. This interpretation shall not be construed as relieving the **Professional** of its sole responsibility for the performance of the **Professional's** obligations and responsibilities, whether performed by the **Professional** directly or through any consultant, agent, or employee.

1.5.2. The expression "any act or omission within the control of" shall include, but is not limited to, the fault or negligence of the party involved and any other act, cause, and event for which that party is responsible. The expression "any cause beyond the control of" shall include any act or omission not within the reasonable control of the party involved and any other act, cause, and event for which that party is not responsible.

1.5.3. Whenever in the Contract Documents, the term "first tier" is used concerning a Subcontractor or Supplier, it means a Subcontractor or Supplier having a direct Sub agreement with the **Contractor**. Relatedly, the term "lower tier" refers to a Subcontractor or Supplier having a direct Sub agreement with another Subcontractor.

1.5.4. The expression "materials and/or equipment" shall not be construed to equate materials with equipment, but rather shall be interpreted as a general reference to materials or equipment, whichever actually applies. The term "stored materials" shall include materials and equipment. Where a differentiation between materials or equipment is necessary, such as for payments for approved equipment Shop Drawings, use of the term “equipment” shall exclude materials. In any such case, examples of equipment shall be conveying equipment, tanks, pumps, vessels, fans, boilers, air handling units, heat exchangers, compressors, incineration equipment, motor control centers, switchgears, transformers, control panels and so forth; and such components as pipe fittings and specialties, valves, ductwork, plumbing fixtures, cable tray, conduit and cable, electrical fixtures, panel boards and so forth shall be materials and not equipment.

1.5.5. The term "registered mail" includes registered U.S. mail and certified U.S. mail with return receipt requested. The term "hand delivered" includes delivery by private carriers.

1.5.6. The term "self-performed Work” means Work performed by the **Contractor**, as opposed to Work performed by a Subcontractor, which is referred to as “Subcontractor Work.”

1.5.7. An "early completion" Progress Schedule is a **Contractor**-prepared Revision Progress Schedule Submittal that anticipates completion of the entire Work, or of any portion of the Work having a separate, specified Contract Time, ahead of the correspondingly specified Contract Time.

1.6 Ownership and Use of the Contract Documents:

1.6.1. Neither the **Contractor** nor any Subcontractor or Supplier shall have or acquire title to or ownership rights in any of the Drawings, Specifications or documents identified in Section 00210 Information for Bidders, and they shall not reuse any of them on extensions of the Project or any other project without prior written consent of the **Owner** and **Professional**.

1.6.2. The **Contractor**, Subcontractors and Suppliers are granted a limited license to use and reproduce parts of the Contract Documents and those documents identified in Section 00210 Information for Bidders as appropriate for their use in the furnishing and performance of their Work. All copies of the Drawings and Project Manual and other documents made under this license shall retain all copyright and trademark notices, if any.

1.7 Copies of the Contract Documents:

1.7.1. The **Owner** will furnish, at no cost to the **Contractor**, one (1) electronic copy of the Drawings and Project Manual. If the **Contractor**, or the Contractor's Subcontractors or Suppliers request hard copy sets, reproduction of these documents will be the responsibility of the **Contractor**.

ARTICLE 2 THE OWNER – GENERAL PROVISIONS

2.1 Availability of Lands, Areas, Properties and Facilities:

2.1.1. The Contract Documents indicate the lands, areas, properties, and facilities upon which the Work is to be performed and those rights-of-way and easements for access to the site furnished by the **Owner**. Easements for permanent structures or for permanent changes in any existing lands, areas, properties, and facilities will be obtained by the **Owner**, unless otherwise expressly stated elsewhere in the Contract Documents.

2.1.2. The **Contractor** shall obtain, at no increase in Contract Price or Contract Time, any other lands, areas, properties, facilities, rights-of-way, and easements the **Contractor** requires for temporary facilities, storage, disposal of spoil or waste material or any other such purpose. If public property, the **Contractor** shall obtain all required permits from the federal agency, State agency, Political Subdivision or Public Utility with jurisdiction. If private property, the **Contractor** shall obtain prior permission by written agreement. The **Contractor** shall submit copies of the permits and written agreements to the **Owner**.

2.2 Reference Points; Base Lines and Benchmarks:

2.2.1. Unless noted otherwise, the **Owner or Professional** will provide engineering surveys to establish reference points for construction that the **Professional** considers necessary for the **Contractor** to proceed with the Work. The **Contractor** shall be responsible for surveying and laying out the Work from those reference points. The **Contractor** shall be responsible for protecting and preserving those reference points as well as any base lines and benchmarks provided for the Work.

2.2.2. The **Contractor** shall make no changes on any reference points, base lines, and benchmarks without the **Professional's** prior written approval. The **Contractor** shall report to the **Professional** whenever any reference point, base line or benchmark is lost, destroyed, or requires relocation. The **Contractor** shall replace and relocate any lost or destroyed reference points accurately, with professionally, licensed personnel, if so, directed by the **Professional**.

2.2.3. The **Contractor** shall bear its proportionate share of the Delay and costs resulting from any loss, destruction, replacement and/or relocation of reference points, base lines and/or benchmarks, to the extent any such loss, destruction, replacement and/or relocation results in whole or in part from any act or omission within the control of the **Contractor**.

2.3 Stop Work Order:

2.3.1. The **Owner** may order the **Contractor** in writing to stop the Work, in the whole or in part, in the event any of these situations occur: (a) any Work is Defective, (b) any Work, when completed, will not conform to the Contract Documents, (c) any materials or equipment are unsuitable, or (d) any workers are insufficiently skilled. The **Contractor** shall bear its proportionate share of the Delay and costs resulting from any such stop Work order unless the **Contractor** is/was not at fault.

2.3.2. If the **Contractor** is/was not at fault, the **Owner** will amend the Contract Documents to provide for any adjustments in Contract Price and/or Contract Time made necessary by any resulting Delay which is unreasonable under the circumstances. This authority to stop the Work or any Work shall not create or impose any duty or responsibility on the **Owner** to exercise such authority for the benefit of the **Contractor** or of any Subcontractor, Supplier, surety to any of them or any other third party.

2.4 Limitations on the Owner's Responsibilities:

2.4.1. The **Owner** is not responsible for the **Contractor's** Means and Methods, safety precautions and programs related to safety, or the **Contractor's** failure to execute the Work in accordance with the Contract Documents. Nor is the **Owner** responsible for any act or omission of the **Contractor** or of any Subcontractor, any Supplier or anyone for whose acts the **Contractor** or any Subcontractor or Supplier may be liable.

2.4.2. The **Owner** is not responsible for verifying whether the **Contractor's** Progress Schedule Submittals, any certificates and/or policies of insurance or any technical Submittals are in accordance with the Contract Documents, or for verifying their accuracy or completeness in any way.

2.4.3. Neither the **Owner's** authority to review any of those Submittals, nor the **Owner's** decision to raise or not raise any objections about any such Submittals, shall create or impose any duty or responsibility on the **Owner** to exercise any such authority or decision for the benefit of the **Contractor**, any Subcontractor or Supplier, any surety to any of them or any other third party.

2.5 Additional General Provisions:

2.5.1. Written communications from the **Owner** to the **Contractor** will generally be issued through the **Professional**. If there is need to issue communications directly, a copy will be sent concurrently to the **Professional**. Written communications from the **Contractor** to the **Owner** may be issued directly to the **Owner** or through the **Professional** if such is more appropriate. Any such communication shall also include concurrent copy of both parties.

2.5.2. The **State Facilities Administration** Representative shall be the representative for the **Owner.** The **State Facilities Administration** Representative may be represented on-site by a Field Representative(s). Neither the **State Facilities Administration** Representative nor the Field Representative shall have authority to interpret the requirements of the Contract Documents. Unless delegated by specific written notice from the **Owner**, the Field Representative does not have any authority to order any changes in the Work or authorize any adjustments in Contract Price or Contract Time.

2.6 Partnering Charter:

2.6.1. If the Contract Documents indicate the **Owner's** intent to implement a bilateral partnering charter, unless the **Contractor** declines in writing, the **Contractor** shall cooperate with the **Owner** in implementing such a partnering charter for the Contract. Unless the possibility is expressly allowed for in the Contract Documents, no provision, requirement, or other aspect of the Contract Documents shall be open for change, revision, or modification in any such partnering charter.

ARTICLE 3 THE PROFESSIONAL – GENERAL PROVISIONS

3.1 Owner's Representative:

3.1.1. The **Professional** shall be the **Owner's** representative during the Contract Time period. The **Professional's** duties, responsibilities and limits of authority set forth in the Contract Documents shall not be changed without the prior written consent of both the **Owner** and **Professional.**

3.1.2. The **Professional** will make On-Site Inspections at intervals appropriate to the stages of the Work to observe the quality and quantity of progress and completed Work; to determine actual quantities of Unit Price Work completed by the **Contractor** and to determine whether the Work is being executed so that the Work, when completed, will be in accordance with the Contract Documents. Based on the On-site Inspections, the **Professional** will endeavor to guard the **Owner** from Defective Work and to keep the **Owner** informed of the progress of the Work.

3.1.3. If the **Professional** assigns Resident Project Representatives, their duties, responsibilities, and limits of authority will be given in the Contract Documents or at the pre-construction conference. Unless delegated by specific written notice from the **Owner**, the Resident Project Representative does not have any authority to order any changes in the Work or authorize any adjustments in Contract Price or Contract Time.

3.1.4. The **Professional** will have authority to disapprove or reject Work that the **Professional** believes to be Defective, and to require inspection or testing of any Work, whether or not such Work is fabricated, installed, or completed. The **Contractor** shall take prompt corrective action upon receiving any Defective Work notice from the **Professional**.

3.1.5. On-Site Inspections by the **Professional** and/or Resident Project Representatives shall not create or impose any duty on the **Professional** or Resident Project Representatives to make the On-Site Inspections for the benefit of the **Contractor** or any other third party. On-Site Inspections will not relieve the **Contractor** from its obligation to provide the Work in accordance with the Contract Documents or represent acceptance of Defective Work.

3.1.6. Inspections by the Field Representative(s) shall not create or impose any duty on such Field Representative to make the observations for the benefit of the **Contractor** or any other third party. Any such inspection will not relieve the **Contractor** from its obligation to provide the Work in accordance with the Contract Documents or represent acceptance of Defective Work.

3.2 Clarifications and Interpretations:

3.2.1. The **Professional** will issue with reasonable promptness written clarifications or interpretations as the **Professional** may determine necessary or in response to a **Contractor** written request for interpretation. If the **Contractor** believes that a written clarification or interpretation issued by the **Professional** justifies an adjustment in Contract Price or Contract Time, the **Contractor** shall promptly notify the **Professional** in writing before proceeding with the Work Involved.

3.2.2. In any such case, if the **Contractor** is properly authorized in writing to proceed with the Work Involved before full agreement is reached on the extent of any such adjustments (if any are determined to be due at all), the **Contractor** shall furnish to the **Professional**, upon request from the **Professional**, those actual cost Records specified in paragraphs 11.4 and 11.5.

3.3 Minor Variations and No-Cost Changes; Minor Delays:

3.3.1. The **Professional** may authorize minor variations in the Work, order no-cost changes consistent with the Contract Documents or cause minor Delay if, in the **Professional's** judgment, such variation, no-cost change or Delay does not justify any adjustment in Contract Price or Contract Time. Minor variations will be ordered in writing; no-cost changes will be authorized by Change Authorization. If the **Contractor** believes any minor variation or no-cost change justifies an increase in Contract Price or Contract Time, the **Contractor** shall promptly notify the **Professional** in writing before proceeding with the Work Involved and follow the procedures in paragraph 3.2. Notice requirements for minor Delays are provided in paragraph 8.7.4.

3.4 Determinations by the Professional:

3.4.1. The **Professional** will be the interpreter of the requirements of the Contract Documents and, in such capacity, will render determinations on the acceptability of the Work. Notices, proposals, claims, or other matters relating to the acceptability of the Work, the interpretation of the requirements of the Contract Documents or any adjustment in Contract Price or Contract Time shall be referred to the **Professional** in writing requesting a formal, written determination, which the **Professional** will render within a reasonable time. If the **Contractor** disagrees with any such **Professional** determination, the **Contractor** may deliver notice of a claim and a claim submittal within twenty-one (21) Calendar Days in accordance with the procedures and within the deadlines set forth in Article 15 Disputes.

3.4.2. The rendering of any interpretation or of any determination on any notice, proposal, claim, or other matter relating to the acceptability of the Work or to any adjustment in Contract Price or Contract Time will be a prerequisite to the exercise by the **Contractor** of any rights or remedies the **Contractor** may otherwise have under the Contract Documents or by Law concerning any such issue.

3.5 Limitations on the Professional's Responsibilities:

3.5.1. The **Professional's** authority to act under this Article 3 or elsewhere in the Contract Documents, or any decision made by the **Professional** in good faith to exercise or not to exercise such authority, shall not give rise to any duty or responsibility of the **Professional** to the **Contractor**, to any Subcontractor or any Supplier, to any surety or to any third party.

3.5.2. The **Professional** is not responsible for the **Contractor's** Means and Methods, safety precautions and programs related to safety, or for the **Contractor's** failure to execute the Work in accordance with the Contract Documents. Furthermore, the **Professional** is not responsible for any act or omission of the **Contractor** or of any Subcontractor, Supplier, or anyone for whose acts the **Contractor** or any Subcontractor or Supplier may be liable.

ARTICLE 4 CONTROL OF WORK – GENERAL PROVISIONS

4.1 Review of the Contract Documents:

4.1.1. Before undertaking each part of the Work, the **Contractor** shall study and compare the Contract Documents with each other and against manufacturers' recommendations for installation and handling. Before undertaking each part of the Work, the **Contractor** shall verify dimensions and take field measurements, and the **Contractor** shall coordinate the location, dimensions, access, fit, completeness, etc. of dependent Work. The **Contractor** shall promptly notify the **Professional** in writing of any conflict, error or omission in the Contract Documents and deviation from manufacturers' recommendations for installation and handling discovered.

4.1.2. The **Contractor** shall bear its proportionate share of the Delay and costs resulting from any Work undertaken before apprising the **Professional** and/or obtaining a written clarification or interpretation from the **Professional,** if the **Contractor** knows or has reason to know that any such Work (a) involves a conflict, error or omission, or (b) is subject to a specified Means and Method which is inappropriate, unworkable or unsafe, or (c) is subject to a specified method of installation, performance or test procedure and/or result which is contrary to the recommendations provided by or for the respective manufacturer.

4.2 Management, Supervision and Personnel:

4.2.1. The **Contractor** shall manage, supervise, and direct the Work competently, applying the management, supervision, skills, expertise, scheduling, coordination, and attention necessary to provide the Work in accordance with the Contract Documents, while insuring timely and unhindered access to the site. The **Contractor** shall be responsible for any Means and Methods unless a specific Means and Method is indicated in or required by the Contract Documents. The **Contractor** shall verify that completed Work complies with the Contract Documents, all approved Submittals and all clarifications and interpretations.

4.2.2. The **Contractor** shall maintain a competent, full-time superintendent on the Work at all times during its progress. The superintendent shall be the **Contractor's** representative at the site and shall have authority to act on behalf of the **Contractor**. The Superintendent shall not be assigned or replaced without the **Owner's** consent. If the **Owner**, in the reasonable exercise of its discretion, objects to the superintendent, the **Contractor** shall use a replacement superintendent at no increase in Contract Price or Contract Time. All communications given to the superintendent shall be as binding as if given to the **Contractor**. The DTMB Superintendent Designation form must be completed by the Contractor and submitted before beginning any work.

4.2.3. The **Contractor** shall provide competent, suitably qualified personnel to survey and lay out the Work. As part of this responsibility, the **Contractor** shall engage a registered land surveyor to accurately locate base lines and Project elevations. The **Contractor** shall be required to furnish certifications that lines and grades for all concrete slabs were checked before and after placing of concrete, and that final grades are as required by the Contract Documents.

4.2.4. The **Contractor** shall provide competent and suitably qualified trade foremen and craft workers to construct the Work, in all cases as required by the Contract Documents. At all times, the **Contractor** shall maintain good discipline and order at the site.

4.2.5. Whenever activities of the **Contractor** are carried out beyond the limits of the site or the indications of temporary fences or barricades, the **Contractor** shall schedule trenching, utility Work, site development, landscaping and all other activities in the way that will cause minimum disturbance to or interference with adjoining property, service to the public or the normal operation of the **Owner** or others affected by such activities.

4.2.6. If a Means and Method is indicated in, or required by, the Contract Documents, a substitute Means, and Method may be used by the **Contractor** only after obtaining the **Professional's** approval that it meets the applicable criteria in paragraph 5.2 without increasing Contract Price or Contract Time. If any such substitution causes earlier completion of the Work, the **Owner** and **Contractor** may negotiate an appropriate shortening in Contract Time, a level of liquidated damages appropriate to the shortened Contract Time, and a decrease in the Contract Price. If the **Owner** and **Contractor** are unable to agree on the extent of any such adjustments, the **Owner** may deliver a claim in accordance with the procedures and within the deadlines set forth in Article 15.

4.2.7. The **Contractor** shall post appropriate construction signs to advice the occupants and visitors of occupied facilities of the limits of construction work areas, hardhat areas, excavations, construction parking and staging areas, etc.

4.3 Materials and Equipment:

4.3.1. Unless otherwise specified in the Contract Documents, the **Contractor** shall furnish and be responsible for all materials, commodities (including all fuel, gas, or other consumables necessary to operate any equipment), devices, equipment, transportation, construction equipment, tools, supplies, fuel, utilities, water for flushing and testing, temporary facilities and all other facilities and incidentals necessary for the furnishing and performance, which includes, without limitation, the testing and completion of the Work.

4.3.2. All materials and equipment shall be of good quality, free of defect and new, unless otherwise allowed in the Contract Documents. For each material and equipment, the **Contractor** shall provide complete information on preventive maintenance, operating requirements, parts lists, ordering of parts and other applicable conditions. Materials and equipment shall be protected against any damage at all times so that they remain new.

4.3.3. If required for the **Professional's** acceptance of any materials or equipment, the **Contractor** shall furnish satisfactory evidence (which shall include test procedures and reports of required tests) as to the kind and quality of the materials and equipment. Materials and equipment shall be applied, installed, connected, erected, used, cleaned, and conditioned following the manufacturer's and Suppliers' instructions, except as otherwise provided in the Contract Documents.

4.3.4. Paragraph 7.3, Section 00100 Instructions to Bidders, dealing with materials and equipment *listed* in Schedule 1.6 of Section 00440 Schedule of Materials and Equipment is made part of this Section 00700 General Conditions by this reference.

4.4 Concerning Control of Work:

4.4.1. The **Contractor** shall prosecute the Work in the way that will cause the least practicable interference with and avoid prolonged interruption of, or damage to, existing facilities. The **Contractor** shall obtain written approval from the **Owner** ten (10) Calendar Days before connecting to existing facilities or interrupting service. If the **Contractor's** Means and Methods require tapping into an existing system(s), the **Contractor** shall be responsible for the restoration of such system and of any extensions of such systems.

4.4.2. To the extent specified Work on an existing system may cause damage to, or imbalances in extensions of such systems, and restoration of the entirety of such systems is not designated in the Drawings and/or Specifications as required Work, the **Contractor** shall be responsible for seeking an appropriate clarification or interpretation from the **Professional** before proceeding with the Work Involved.

4.4.3. The **Contractor** shall perform Work and operate vehicles and construction equipment in a safe manner and without becoming a hazard to the public, while at the same time ensuring the least practicable interference with pedestrians and traffic. In addition, such operations shall be carried out without interfering with overhead utilities. When transporting materials or equipment, vehicles shall not be loaded beyond the capacity set by their manufacturers or applicable Laws. When crossing sidewalks, curbs or landscaped areas, the **Contractor** shall protect them from damage. Safe and adequate pedestrian and vehicular access shall be maintained to fire hydrants, commercial and industrial establishments, churches, schools, parking lots, hospitals, fire, and police stations and like establishments.

4.4.4. The **Contractor** shall be responsible for performing the pumping, draining, and controlling of surface water and groundwater in the way that will not endanger the Work or any adjacent facility or property, or interrupt, restrict or interfere with the use of any adjacent facility or property.

4.4.5. Paragraph 3.10, Section 00100 Instructions to Bidders, invoking the "Soil Erosion and Sedimentation Control," 1994 PA 451, Part 91, as amended, MCL 324.9101 et seq., is made part of Section 00700 General Conditions by this reference.

4.4.6. To the extent the **Contractor** knows, or has reason to know, the **Contractor** shall be responsible for performing the Work taking fully into account any dewatering, blasting, etc. operations from other work bearing a potential impact on the Work.

4.4.7. Any damaged Work corrected by the **Contractor** shall be corrected and made equal in all respects (quality, finish, appearance, function, etc.) to similar non-damaged Work otherwise required by the Contract Documents.

4.4.8. The **Contractor** shall verify that Work already *in-place* is in proper condition to receive *dependent* Work, and that dependent Work connecting to the *in-place* Work is properly coordinated. Whether or not expressly specified in the Contract Documents, the **Contractor** shall be responsible for all cutting, fitting, drilling, fixing-up and patching of concrete, masonry, gypsum board, piping and other materials that may be necessary to make *in-place* Work and *dependent* Work fit together properly.

4.4.9. The **Contractor** shall not obstruct access to municipal structures, hydrants, valves, manholes, fire alarms, etc., nor operate valves or otherwise interfere with the operation of any Public utilities without first securing the necessary approvals and permits. Except as may be otherwise provided in the technical Specifications, the **Owner** will charge the **Contractor** for all utilities used based on the charges the **Owner** actually incurs.

4.4.10. In the event of any unauthorized interruption of service to any operating facility, the **Contractor** shall take immediate action to restore that service as soon as practicable. The **Contractor** shall be directly responsible for the charges of any manufacturer's representative called to the site to repair or adjust any systems damaged by the **Contractor**.

4.4.11. Whenever the **Contractor** has caused an operating security system to go out of service or left unsecured openings in existing facilities or security fences, the **Contractor** shall furnish a security guard acceptable to the **Owner** to maintain security of the facility outside of normal working hours. The **Contractor** will be held responsible for any losses on account of the **Contractor's** interruption of security systems or barriers at existing facilities.

4.4.12. The **Contractor** shall take steps, procedures or means as may be required to prevent dust nuisance resulting from the **Contractor's** operations. The dust control measures shall be maintained at all times to the satisfaction of the **Owner** and any Political Subdivision with jurisdiction.

4.4.13. The **Contractor** shall, before final inspection, mark in a permanent and readily identifiable manner, all reference points provided by the **Owner**.

4.4.14 The Contractor shall note and comply with APPENDIX I SPECIAL WORKING CONDITIONS and APPENDIX II SPECIAL PROJECT PROCEDURES as part of and in conjunction with all other contract requirements. APPENDIX I & II immediately follow and are attached hereto SECTION 00800.

4.5 Patent Fees and Royalties:

4.5.1. The **Contractor** shall be responsible for paying all royalties and license fees and assuming all costs resulting from the use in the furnishing and performance of the Work and/or the incorporation into the Work of any invention, design, process, product, or device covered by patent rights or copyrights, whether specified in the Contract Documents or chosen by the **Contractor**. The **Contractor** shall sign suitable agreement(s) with the patentee or copyright owner and, if requested, provide copies to the **Owner.**

4.5.2. The **Contractor** shall defend, indemnify, and hold harmless the **Owner** and **Professional** from and against all claims, as construed in paragraph 1.4, arising from any patent or copyright infringement by the Contractor including, but not limited to, patent or copyright infringements resulting from "or equal" substitution of any invention, design, process, product, or device that is specified in the Contract Documents.

4.5.3. If the **Contractor** knows, or should know, that the specified invention, design, process, product, or device infringes on a patent or copyright, the **Contractor's** obligation to defend, indemnify and hold harmless **Owner** and **Professional** from and against all claims arising from any patent or copyright infringement shall apply, unless the **Contractor** promptly furnishes that information to the **Professional** in writing.

4.6 Use of Premises:

4.6.1. The **Contractor** shall confine its operations (including, but not limited to construction equipment and laydown and storage) to the site and lands, areas, properties, facilities, rights-of-way, and easements ("the premises") identified and permitted by the Contract Documents and shall not unreasonably encumber the premises. The **Contractor** shall be responsible for any damage to the premises (including, but not limited to, damage to any real and personal property) and for any damage to any adjacent lands, areas, properties, facilities, rights-of-way, and easements (including, but not limited to, damage to any real and personal property) resulting from the **Contractor's** operations.

The **Contractor** shall defend, indemnify, and hold harmless the **Owner** and **Professional** against all claims, as construed in paragraph 1.4, arising from any damage to such premises or adjacent lands, areas, properties, facilities, rights-of-way, and easements (inclusive of real and personal property), including loss of use, to the extent resulting from the **Contractor's** operations.

4.6.2. The **Contractor** shall keep the premises free from accumulations of waste materials, rubbish, and other debris, and shall not remove, injure, cut, alter, or destroy trees, shrubs, plants, or grass, unless otherwise provided elsewhere in the Contract Documents. At the completion of the Work, the **Contractor** shall remove all obstructions, waste and surplus materials, rubbish, debris, tools, and construction equipment and shall leave the site clean and ready for occupancy by the **Owner**.

4.6.3. The **Contractor** shall restore to pre-existing conditions all walks, roadways, paved or landscaped areas and other real and personal property not designated for alteration by the Contract Documents. To the extent the **Contractor** refuses, fails or neglects to replace all such altered premises and/or restore to its pre-existing condition any walk, roadway, paved or landscaped area and other property not designated for alteration by the Contract Documents, the **Contractor** shall bear its proportionate share of the Delay and costs resulting from the **Contractor's** refusal, failure, or neglect to do so.

4.6.4. The **Contractor** shall not load or permit any part of any structure to be loaded in any way that will endanger the structure. The **Contractor** shall not subject any part of the Work or adjacent property to stresses or pressures that will damage or endanger the Work or adjacent property, or both.

4.7 Record Documents:

4.7.1. The **Contractor** shall maintain at the site one copy of all Record Documents in good order and annotated in a neat and legible manner using a contrasting, reproducible color to show (a) all revisions made, (b) dimensions noted during the furnishing and performance of the Work, and (c) all deviations between the as-built installation and the Contract Documents, all approved Submittals and all clarifications and interpretations.

4.7.2. Record Documents, along with a properly annotated copy of all approved Submittals, shall be available to the **Professional** and **Owner** at all times during the progress of the Work. The finalized Record Documents and approved Submittals shall be required for processing final payment to the **Contractor.**

4.7.3. The **Contractor** shall maintain and make available to the **Owner** and **Professional** daily field reports and digital photos recording the on-site labor force and equipment (**Contractor** and Subcontractors); materials/equipment received (at the site or at another location); visits by Suppliers; significant in-progress and completed trade Work within major areas; and other pertinent information.

4.7.4. Such daily field reports shall be furnished by the **Contractor** promptly to the **Professional** and **Owner** upon their request and shall be accepted by the **Owner** for information only. Neither the **Owner** nor **Professional's** review of any daily field report shall be construed as agreement with the information contained in any such daily field report.

4.8 Emergencies:

4.8.1. In Emergencies affecting the safety or protection of Persons, the Work or property at or adjacent to the site, the **Contractor**, without any special instruction or authorization from the **Professional** and/or the **Owner**, is obligated to act to prevent threatened damage, death, injury, or loss.

4.8.2. The **Contractor** shall give the **Owner** prompt written notice of any changes in the Work resulting from the action taken. If the **Owner** concurs, the **Owner** will amend the Contract Documents to provide for those changes and, unless the Emergency results in whole or in part from any act or omission within the control of the **Contractor**, to provide for any corresponding adjustment in Contract Price and/or Contract Time.

4.9 Indemnification:

4.9.1. The **Contractor** shall defend, indemnify and hold harmless the **Owner** and **Professional** from and against all claims, as construed in paragraph 1.4, for bodily injury, sickness, disease or death, or injury to the destruction of property, including loss of use, arising out of, relating to, or being in any way connected with the Work, that are in any way (a) caused by any negligent act or omission of the **Contractor**, any Subcontractor or Supplier or anyone for whose acts any of them may be liable, or (b) related to the **Contractor's** failure to maintain the required insurance and coverages. As a point of emphasis, and as set forth in paragraph 1.4, such claims shall include, but are not limited to charges of architects, engineers, attorneys and others and all court, hearing, and other dispute resolution costs.

4.9.2. As a point of emphasis, as set forth in paragraph 1.4, this indemnification obligation shall include claims caused in part by the negligence or other liability-creating conduct or omissions of the **Owner** (including State departments, agencies, boards, commissions, officers, and employees) or **Professional**; however, the **Contractor** shall not be required to indemnify the **Owner** or **Professional** against liability for loss or damage resulting from the sole negligence of the **Owner** and/or **Professional**.

4.9.3. With respect to claims against the **Owner** or **Professional** by any employee of the **Contractor**, the indemnification obligation under this paragraph 4.9 shall not be limited in any way by any limitation on the amount or type of damages, compensation or benefits payable by or for the **Contractor**, any Subcontractor or Supplier under workers' compensation, disability benefit or other benefit acts.

ARTICLE 5 SUBCONTRACTORS AND SUPPLIERS

5.1 Employment of Subcontractors:

5.1.1. Upon due investigation, the **Owner** may revoke, because of subsequent violation of a material requirement of the Contract Documents, the **Owner's** consent to any Subcontractor previously given pursuant to the provisions of Article 8 of Section 00100 Instructions to Bidders and Section 00430 List of Subcontractors. Any such revocation of the **Owner's** consent shall not justify any increase in Contract Price or Contract Time.

5.1.2. After Contract Award, if the **Contractor** intends to add or substitute a Subcontractor for Work in a Division, Specification and/or trade for which Subcontractor nomination was required in Section 00430 List of Subcontractors, the **Contractor** shall nominate that Subcontractor for review by the **Owner** and/or **Professional**. The **Contractor** shall not award such Work to any Subcontractor to whom the **Owner** objects for good cause. No adjustment in Contract Price or Contract Time shall be allowed for any such newly nominated Subcontractor.

5.1.3. Whenever the **Owner** objects, for its convenience, to any Subcontractor nominated, but not objected to, before Contract Award or to any Subcontractor nominated after Contract Award, the **Contractor** shall nominate a substitute Subcontractor or shall proceed to self-perform the Work involved if the **Contractor** is so qualified. If any such **Owner** objection requires a Subcontractor substitution or the **Contractor** to self-perform the Work Involved, in either case at an increase of the **Contractor's** cost for the part of the Work Involved, the **Owner** will amend the Contract Documents to provide for a corresponding adjustment in Contract Price and/or Contract Time made necessary by the Subcontractor substitution or self-performance and by any resulting Delay which is not reasonably anticipatable under the circumstances and which is attributable to the **Owner** and/or **Professional.**

5.1.4. Failure of the **Owner** to object to any nominated Subcontractor shall not constitute a waiver of any right of the **Owner** or **Professional** to reject Defective Work; nor shall the authority given to the **Owner** under this paragraph create or impose any duty on the **Owner** or **Professional** to exercise such authority for the benefit of the **Contractor** or any other third party.

5.1.5. Installation of any self-performed or Subcontractor Work shall constitute acceptance by the **Contractor** of all previously placed dependent Work. Consistent with this responsibility, the **Contractor**, directly or through the **Contractor's** choice of Subcontractors, shall supply, install and/or cause items to be built into previously placed Work, shall verify dimensions of previously placed Work, and shall notify the **Professional** of previously placed Work that is unsatisfactory for, or prevents satisfactory installation of, other dependent Work.

5.1.6 Work performed by any Subcontractor or Supplier shall be through an appropriate written Sub agreement that expressly binds the Subcontractor or Supplier to the requirements of the Contract Documents and contains the waiver of rights of subrogation provisions of Article 7.

5.2 "Or Equal" and Substitute Materials and Equipment:

5.2.1. Materials or equipment described in the Contract Documents by using a brand name, make, manufacturer, supplier, or specification shall be intended to denote the essential characteristics desired and establish a standard.

5.2.2. For materials and equipment which are actually *listed* in Schedule 1.6 of Section 00440 Schedule of Materials and Equipment, no "or equal" or substitute material or equipment will be acceptable or permitted unless the **Contractor** complies with the terms and conditions of paragraphs 5.2.2.1 through 5.2.2.5.

5.2.2.1. Unless words are used in a technical Specification indicating that no "or equal" or substitution is permitted, a proposal for an "or equal" or substitution may be accepted by the **Professional** if, in the **Professional's** judgment, the proposal (a) meets the criteria set forth in paragraphs 5.2.2.2 through 5.2.2.5, (b) demonstrates a net positive deduction, i.e., the deductive value of the proposal exceeds all direct, indirect and consequential costs and damages attributable to the "or equal" or substitution, and (c) offers a Contract Price decrease of one hundred percent (100%) of the net deduction, or another percentage reflecting a sharing of the savings which is agreed between the **Owner** and **Contractor.**

5.2.2.2. The **Contractor's** written application for the "or equal" or substitute material or equipment shall provide sufficient information to allow the **Professional** to determine whether the material or equipment proposed (a) will equally perform the functions and achieve the results called for by the Contract Documents, (b) is at least of equal materials of construction, quality and necessary essential design features, (c) is suited to the same use as that named or specified, (d) conforms substantially to the desired detailed requirements, e.g., durability, strength, appearance, aesthetics (if aesthetics are significant), safety, useful life, reliability, economy of operation and ease of maintenance, (e) evidences a proven record of performance and the availability of responsive service, and (f) will not extend any Contract Times.

5.2.2.3. Each such application shall certify whether or not acceptance of the proposed "or equal" or substitute material or equipment will require a change in any of the Work or any of the Means and Methods indicated in or required by the Contract Documents, or in work performed by the **Owner** or others, and whether or not incorporation or use of the proposed material or equipment is subject to payment of any license fee or royalty. All variations of the proposed material or equipment from the material or equipment named or specified shall be identified (operation, materials or construction finish, thickness or gauge of material, dimensions, loads, tolerances, deleted and added features, etc.), and information regarding available maintenance, repair and replacement service shall be indicated.

5.2.2.4. The application shall contain an itemized estimate of all direct, indirect, and consequential costs and damages that will result from evaluation and acceptance of the proposed "or equal" or substitute material and equipment, including but not limited to costs and delays of redesign, or claims of other contractors affected by the proposed item, and changes in operating, maintenance, repair, replacement, or spare part costs. The **Professional** may require the **Contractor** to furnish a manufacturer's performance Bond, an analysis of the effects of the evaluation/acceptance of the “or equal” or substitution on the Progress Schedule, a list of locations of similar installations that have been in service for at least three (3) years before the date of the application, and any other relevant data.

5.2.2.5. The **Contractor** shall be responsible for verifying that "or equal" or substitute materials and equipment conform to the Contract Documents, and that all dimensions, arrangement, design and construction details and other features are suited to the specified purpose. If any "or equal" or substitute material or equipment differs materially from the material or equipment named or specified, and that difference was not expressly identified in the **Contractor's** application, or results in changes in the Work, the **Professional** has authority to require removal and replacement of that "or equal" or substitute material or equipment. The **Contractor** shall bear its proportionate share of the Delay and costs resulting from (a) any such removal and replacement of "or equal" or substitute materials or equipment, (b) making "or equal" or substitute materials or equipment conform to the requirements of the Contract Documents, and (c) any changes in the Work and/or in other work required to accommodate the "or equal" or substitute material or equipment, or both.

5.2.2.6. The **Contractor** shall reimburse the **Owner** for any costs incurred by the **Owner** in the evaluation of any "or equal" or substitution proposal. Such costs shall include, but are not limited to, related charges of the **Professional** made necessary by the evaluation and acceptance or rejection, as the case may be, of the proposed "or equal" or substitute material or equipment.

5.2.3. For materials and equipment *not listed* in Schedule 1.6 of Section 00440 Schedule of Materials and Equipment, no substitute material or equipment will be acceptable or permitted unless the **Contractor** meets with the requirements of paragraphs 5.2.2.1 through 5.2.2.5. Further, the reimbursement provisions of paragraph 5.2.2.6 shall apply equally to such substitutions.

5.2.4. Unless approved by the **Professional**, for materials and equipment *not listed* in Schedule 1.6 of Section 00440 Schedule of Materials and Equipment, no “or equal” material or equipment will be acceptable or permitted unless the **Contractor** complies with the requirements of paragraphs 5.2.2.2 – 5.2.2.5.

5.2.5. No "or equal" or substitute item shall be ordered, installed, or utilized without the **Owner's** prior acceptance. The **Owner's** acceptance shall be evidenced by a signed Change Order or Change Authorization, or if so, specifically designated by the **Professional**, by an approved Shop Drawing or sample.

5.3 The Contractor's Continuing Responsibilities:

5.3.1. The **Contractor** shall be fully responsible to the **Owner** and **Professional** for all acts and omissions of Subcontractors and Suppliers, at any tier, to the same extent as the **Contractor** is responsible for the **Contractor's** own acts and omissions. Nothing in the Contract Documents shall create any contractual relationship between the **Owner** or **Professional** and any Subcontractor or Supplier. No provision in Article 12 or in the other Contract Documents shall create or impose any express or implied duty or obligation on the **Owner** or **Professional** to any Subcontractor or Supplier or the **Contractor's** sureties to pay or to see to the payment of any monies owed to any of them.

ARTICLE 6 SUBMITTALS

6.1 Shop Drawing, Sample and Other Technical Submittals:

6.1.1. After complying with those requirements in paragraphs 6.1.2 through 6.1.5 and the technical Specifications, the **Contractor** shall submit to the **Professional** (a) an electronic file(s) of the drawing(s) compatible with the latest version of AutoCAD of all Shop Drawings required by the Contract Documents and bond copies if requested by the **Owner** or **Professional**; (b) all required samples (whether color or otherwise); and (c) all other technical Submittals (test results, test procedures, safety procedures, O&M manuals, etc.) that are required by the Contract Documents. In addition to electronic copies up to 2 hard copies of the approved O&M manuals may be required to be provided to the agency

6.1.2. Submissions shall be delivered to the **Professional** with due diligence, as delineated in or required by the Progress Schedule, and shall allow reasonable times, per 6.5.1, for the **Professional's** review and turnaround. Each Submittal shall be uniquely identified as the **Professional** and **Contractor** may agree.

6.1.3. Each Submittal shall bear a stamp or specific written indication certifying that the **Contractor** has satisfied the requirements of this Article and the technical Specifications and the **Contractor's** responsibilities for prior review of the submission. In addition, each sample shall have been checked and be accompanied by a certificate guaranteeing that the material sampled complies with the Contract Documents. Unless otherwise allowed by the **Professional**, Submittals without the **Contractor's** indication of approval will be returned without review.

6.1.4. Before each submission, the **Contractor** shall (a) determine and verify all field measurements, quantities, dimensions, instructions for installation and handling of equipment and systems, installation requirements (including location, dimensions, access, fit, completeness, etc.), materials, color, catalog numbers and other similar data as to correctness and completeness, and (b) have reviewed and coordinated that technical Submittal with other technical Submittals and the requirements of the Contract Documents. Technical Submittals of a Subcontractor or Supplier shall be coordinated with those of other Subcontractors or Suppliers (location, dimensions, fit, completeness, consistency, integration, etc.), and so represented in the **Contractor's** stamp or specific written approval before submission to the **Professional**.

6.1.5. With each submission, the **Contractor** shall give the **Professional** specific written notice of each variation from the requirements of the Contract Documents, and the **Contractor** shall cause a specific notation of each variation to be made on that Shop Drawing, sample, or other technical Submittal.

6.1.6. Where a Shop Drawing, sample or other technical Submittal is required by the technical Specifications, any related Work performed by the **Contractor** before the **Professional's** approval of the pertinent technical Submittal will be at the sole expense and responsibility of the **Contractor**.

6.1.7. The **Professional** shall be entitled to rely upon the accuracy or completeness of any designs, calculations or certifications made by licensed or certified professionals attached to a specific technical Submittal, whether or not that stamp, or written certification is required by the Contract Documents.

6.2 Review and Return of Technical Submittals:

6.2.1. The **Professional's** review of a technical Submittal will be to evaluate whether the items covered by the Submittal, after installation or incorporation into the Work, will conform to the general design intent of the Contract Documents and for compatibility with the design of the completed Work as a functioning whole as indicated in the Contract Documents.

6.2.2. The review of Submittals by the **Professional** shall not be conducted for the purpose of determining the accuracy and completeness of such details as dimensions or quantities shown or indicated on the Submittals, or for substantiating instructions for installation or performance of equipment and systems developed by or for the **Contractor**, the correctness of which shall remain the sole responsibility of the **Contractor.** Further, any such **Professional's** review and approval will not extend to any Means and Methods (except where a specific Mean and Method is indicated in or required by the Contract Documents) or to safety precautions or programs related to safety.

6.2.3. Approval by the **Professional** of a separate item or partial Submittal shall not translate to approval of the assembly in which the item functions or to the approval of related Submittals not yet reviewed and approved by the **Professional**.

6.3 Progress Schedule Submittals:

6.3.1. After complying with the appropriate Progress Schedule requirements in the technical Specifications, the **Contractor** shall submit to the **Professional** electronic copies of the Progress Schedule Submittal then due, which shall include both PDF format and active software files with the **Contractor's** specific schedule data. Each Progress Schedule Submittal shall bear the **Contractor's** stamp or written indication of approval as representation to the **Owner** that the **Contractor** has determined or verified all data on that Progress Schedule, and that the **Contractor** and Subcontractors and Suppliers have reviewed and coordinated the sequences in that Progress Schedule with the requirements of the Work. Progress Schedule Submittals are not Contract Documents.

6.3.2. Progress Schedule Submittals are intended to show: (a) the priority and sequencing by which the **Contractor** intends to execute the Work (or Work remaining) to comply with the Contract Times, those sequences of Work indicated in or required by the Contract Documents and any other requirements of the Contract Documents; (b) how the **Contractor** anticipates foreseeable events, site conditions and all other general, local and prevailing conditions that may in any manner affect cost, progress, schedule, performance and furnishing of the Work; (c) how the Means and Methods chosen by the **Contractor** translate into Activities and sequencing; (d) the actual timing and sequencing of completed Work; and (e) if required by the Contract Documents, the allocation of the Contract Price to the Activities.

6.4 Review and Return of Progress Schedule Submittals:

6.4.1. The **Owner's** and **Professional's** review of Progress Schedule Revision 0 Submittals may result in comments relating to conformance with (a) the Contract Times, (b) those sequences of Work indicated in or required by the Contract Documents, and (c) any other Contract Document requirements that may have a significant bearing on the use of Revision 0 Progress Schedule Submittals to resolve issues affecting Contract Price and/or Contract Time. Progress Schedule review comments may also result in the selection of Targets and recording of Target Times.

6.4.2. The review of Progress Schedule Revision Submittals may, in addition to the types of comments outlined in paragraph 6.4.1, result in comments as to whether the **Contractor's** scheduling of Work remaining continues to conform with the Contract Times and those sequences of Work indicated in or required by the Contract Documents. Progress Schedule Revision Submittal review comments may also respond to suggested **Contractor** schedule recovery plans, when and as appropriate, and to **Contractor** requests for extensions in Contract Time.

6.4.3. Progress Schedule reviews shall not impose on the **Owner** or **Professional** any responsibility for verifying whether Work is omitted; Activity durations are reasonable; the adequacy of the level of labor, materials, and construction equipment; the reasonableness of the **Contractor's** chosen Means and Methods; or whether Work sequences and Activity timing are practicable. Even if any comments or objections are noted from the reviews of Progress Schedule Submittals, no such reviews or objections noted shall be effective or construed to create or impose on the **Owner** or **Professional** any responsibility for the timing, planning, scheduling, or execution of the Work or for the correctness of any such Progress Schedule details. The correctness of the Progress Schedule shall remain the sole responsibility of the **Contractor**.

6.5 Additional Provisions Concerning Submittals:

6.5.1. Unless otherwise designated in a more specific technical Specification, a Submittal will be returned to the **Contractor** within fifteen (15) to twenty (20) Calendar Days, as designated by the **Professional** in writing. If a Submittal cannot be returned when it comes due, the **Professional** shall give appropriate notice to the **Contractor** of its return date. The **Contractor** shall revise, and correct Submittals returned for revision and resubmittal, and resubmit them to the **Professional** directing specific attention in writing to revisions other than the corrections called for by the **Professional** on previous submissions of the same Submittals.

6.5.2. No review or approval of Submittals shall relieve the **Contractor** of responsibility for the following: (a) variation from the requirements of the Contract Documents, unless the **Contractor** has called attention to each variation, as provided in paragraph 6.1.5, and the **Professional** has given written approval of that variation by a specific notation within or attached to the returned Submittal, (b) compliance with the "or equal" and substitution requirements of paragraph 5.2, (c) errors or omissions in the Submittal, or (d) compliance with the requirements of this Article.

6.5.3. Unless the **Professional** determines that additional resubmissions are reasonable under the circumstances, all costs incurred by the **Owner** made necessary by the **Professional's** review of a Submittal after the first resubmission of that Submittal shall be reimbursed by the **Contractor** to the **Owner**.

6.5.4. All time consumed by the resubmissions and rereviews of a particular Submittal shall constitute time required to furnish that Submittal or shall represent Delays not justifying any increase in Contract Time or Contract Price, or both.

ARTICLE 7 LEGAL REQUIREMENTS; INSURANCE

7.1 Laws; Permits (Which Include Approvals and Licenses):

7.1.1. The **Contractor** shall comply with and shall require all Subcontractors and Suppliers to comply with, all applicable Laws. The **Contractor** shall insure that everyone employed on the Work discharge their responsibilities consistent with all Laws.

*7.1.2. The **Contractor** shall secure from the State Department of Labor and Economic Growth and from all Political Subdivisions with jurisdiction, all construction permits necessary for the commencement, prosecution, and completion of the Work before starting any Work at the site. All fees for securing the permits shall be paid by the **Contractor**, including all inspection costs which may be legally assessed by the Bureau of Construction Codes according to authority granted under 1972 PA 230, as amended, MCL 125.1501 et seq. The time incurred by the **Contractor** in obtaining construction permits shall constitute time required to complete the Work and shall not justify any increases in Contract Time or Contract Price, except to the extent any related Delay is attributable to the fault of the Drawings or Specifications or to revisions to the Drawings and/or Specifications required by the Political Subdivision with jurisdiction.

7.1.3. Unless expressly required by any Laws or permits, neither the **Owner** nor **Professional** shall be responsible for monitoring the **Contractor's** compliance with any Law, the State Construction Code, or any permits. The **Contractor** is not responsible to make certain that the Contract Documents comply with applicable Laws and the State Construction Code; however, if the **Contractor** believes the Contract Documents deviate from the requirements of any Law, the State Construction Code or any permit, the **Contractor** shall give the **Professional** prompt written notice. If the **Contractor** provides any Work knowing or having reason to know such Work conflicts with any Laws, or the State Construction Code or any permits, the **Contractor** shall be responsible for that performance. The **Contractor** shall be proportionately responsible for the time required and the costs involved in complying with the obligations stated in this paragraph.

*7.1.4. All Work shall be provided in accordance with the State Construction Code and the requirements of paragraph 1.2.4. If the **Contractor** observes that any Contract Document is at variance with any Laws or the State Construction Code in any respect, the **Contractor** shall promptly notify the **Professional** in writing, and any necessary changes shall be accomplished by an appropriate Change Order. The **Contractor** shall pay all charges of Public Utilities for connections to the Work, unless otherwise provided by Cash Allowances specific to those connections.

*7.1.5. In accordance with the Michigan State Construction Code Act, 1972 PA 230, as amended, MCL 125.1501 et seq., the State Department of Labor and Economic Growth, Construction Code Commission has adopted and filed with the Secretary of State the following Construction Code Reference Standards: (a) Michigan Building Code; (b) Michigan Plumbing Code; (c) National Electric Code; (d) Michigan Mechanical Code; (e) State Elevator Code; (f) State Boiler Code; and (g) State Barrier Free Design Rules.

7.2 Sales and Use Tax and Other Similar Taxes, including Tariffs:

7.2.1. The **Contractor** shall be responsible for and pay all sales and use taxes and any other similar taxes covering the Work. The **Owner** shall make a corresponding adjustment in Contract Price for any increase or decrease in sales, use and other similar taxes (excluding payroll taxes) that are currently imposed by legislative enactment and as administered by the Michigan Department of Treasury, Revenue Division covering the Work that are enacted after the date of Bid opening.

7.2.2. The Contractor is solely responsible for all costs, fees, charges, and liabilities arising from or related to Tariffs for any goods, products, or materials incorporated into the Work. The Owner will not adjust the Contract prices for any increase in federal taxes or Tariffs covering the Work that are enacted after the date of Bid opening.

7.3 Safety and Protection:

7.3.1. The **Contractor** shall comply with and shall require all Subcontractors and Suppliers to comply with, all Laws governing the safety and protection of persons or property, including, but not limited to the Michigan Occupational Safety and Health Act (1974 PA 154, as amended, MCL 408.1001 et seq.) and all rules promulgated under the Act. The **Contractor** shall be responsible for all fines and penalties imposed for any related violation(s) of federal and State health and safety requirements. The **Contractor's** safety representative at the site shall be the superintendent required by the provisions of paragraph 4.2.2, unless otherwise designated in writing by the **Contractor**.

7.3.2. The **Contractor** shall be solely responsible for initiating, maintaining, and supervising all safety precautions and programs. The **Contractor** shall take all necessary precautions for the safety of, and shall erect and maintain all necessary safeguards and provide the necessary protection to prevent damage, injury or loss to: (a) all employees on the Work and other persons who may be affected by the Work, (b) all the Work and materials and equipment to be incorporated into the Work, whether stored on or off the site, and (c) other property at or adjacent to the site, including trees, shrubs, lawns, walks, pavements, roadways, structures, utilities and Underground Utilities not designated for removal, relocation or replacement. In the event of severe weather, the **Contractor** shall immediately inspect the Work and the site and take all reasonably necessary actions and precautions to protect the Work and ensure that public access and safety are maintained.

7.3.2.1. All damage, injury or loss to the Work, materials and equipment and such other property caused, directly or indirectly, in whole or in part, by the **Contractor** shall be remedied by the **Contractor**, except to the extent due to fault of the Drawings or Specifications or to act or omission of the **Owner** or **Professional**, and not due to, directly or indirectly, in whole or in part, to the fault or negligence of the **Contractor** or any Subcontractor or Supplier.

7.3.2.2. The **Contractor** shall notify owners of adjacent property and Underground Utilities when prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation, and replacement of their property.

7.3.2.3. Except as the division of responsibilities for safety may be otherwise delineated in writing between the **Owner** and **Contractor** in a Substantial Completion certificate, the **Contractor** duties and responsibilities for safety and protection shall continue until such time as the **Professional** is satisfied that the Work, or Work inspected, is completed and ready for final payment.

7.3.3. Use of Explosives – The **Contractor** shall comply with all federal, state, and local Laws governing the use of explosives, obtain and pay for any required permits before their use and furnish a copy of the permits to the **Professional** before using explosives. The **Contractor** shall, under the supervision of competent and suitably trained and qualified personnel, exercise the utmost care not to endanger life or damage property in the transportation, storage, handling, use and disposal of explosives, and in the use of Means and Methods. The **Contractor** shall be responsible for all injury, damage and adverse impacts outside the permit area resulting from the use of explosives (including an appropriate portion of the Delay and costs resulting from such injury, damage, and impacts).

7.4 Bonds and Insurance – General Requirements:

7.4.1. Both the Section 00610 Performance Bond and Section 00620 Payment Bond shall remain in full force and effect from the date of Contract Award until final completion of the Work or the end of the Correction Period, whichever comes later. The **Contractor** shall furnish any other bonds (e.g., manufacturer performance Bond or maintenance Bond) required by Section 00800 Supplementary Conditions or the technical Specifications.

7.4.2. The **Contractor** shall purchase and maintain insurance providing the coverages and limits designated in this Article. Insurance shall be provided by insurers authorized to do business as insurer in the State, as evidenced by a Certificate of Authority issued by the Department of Consumer and Industry Services – Insurance Bureau. Also, and unless otherwise authorized in writing by the **Owner**, insurers shall have an "A-" A.M. Best Company Rating and a Class VII or better financial size category as shown in the most current A.M. Best Company ratings. The **Contractor** shall not start to perform and furnish the Work, or continue with any part of the Work, unless the **Contractor** has in full force and effect all the required insurance.

7.4.3. Insurance policies shall contain a provision or endorsement stating that coverage will not be canceled or materially changed, or renewal refused unless at least thirty (30) Calendar Days prior written notice has been personally delivered or sent by registered mailed to the **Owner** and **Contractor**. Any coverage nearing expiration during the period in which it is to remain in full force and effect shall be renewed before its expiration, and an acceptable certificate of insurance shall be filed with the **Owner** at least thirty (30) Calendar Days before it expires.

7.4.4. If any of the **Contractor's** sureties or insurers is declared bankrupt or placed into receivership, ceases to meet the requirements of the Contract Documents or its authority to do business in the State is revoked or expires, the **Contractor** shall immediately substitute other Bonds/sureties or insurers/policies, which shall meet the requirements of the Contract Documents.

7.5 The Contractor's Liability Insurance:

7.5.1. The **Contractor** shall maintain Workers' Compensation and Employer's Liability, Commercial General Liability, Commercial Automobile Liability, Excess Liability, and such other insurance as may be designated in Section 00800 Supplementary Conditions or as is appropriate for the Work. The **Contractor's** liability insurance shall provide protection from claims which may arise out of or result from the **Contractor's** performance and furnishing of the Work and the **Contractor's** other obligations under the Contract Documents, whether performed or furnished by the **Contractor**, any Subcontractor, any Supplier, or anyone for whose acts any of them may be liable.

7.5.2. Liability Insurance shall be endorsed to list as additional insureds the **State of Michigan** (Owner), its departments, divisions, agencies, offices, commissions, officers, employees and agents, the **Owner's** consultants, and agents, the **Professional**, and the **Professional's** consultants and agents, including their respective subsidiaries and affiliates and their respective directors, officers, shareholders, agents, or employees. The **Contractor** shall use the current Insurance Services Office (ISO) Form CG 20 09 for general liability insurance or equivalent, ISO Form CA 20 01 for automobile liability insurance or equivalent, and manuscript form for excess liability insurance. The insurance afforded to the additional insureds shall be primary, and neither the coverages nor limits under the **Contractor's** policies shall be reduced or prorated by the existence of any other insurance applicable to any loss that the additional insureds may have sustained. Workers' Compensation, Employer's Liability Insurance and all other liability insurance policies shall be endorsed to include a waiver of rights to recover from the **Owner, Professional** and the other additional insureds.

7.5.3. The **Contractor's** liability insurance shall remain in effect through the Correction Period and through any special correction periods that are implemented pursuant to the requirements of paragraph 9.5.3. Liability insurance issued on a claims-made basis and completed operations insurance shall be maintained for two (2) years after final payment, and evidence of coverage shall be furnished to the **Owner** yearly.

7.5.4. For any employee, resident of and hired in Michigan, the **Contractor** shall have insurance for benefits payable under Michigan's Workers' Compensation Law. For any other employee protected by Worker's Compensation Laws of any other state, the **Contractor** shall have insurance or participate in a mandatory state fund, where applicable, to cover the benefits payable to any such employee.

7.5.5. Commercial General Liability Insurance shall be equivalent to that provided by the current edition of standard ISO Form CG 00 01, and shall include contractual liability and underground, explosion and collapse hazard exposure operations and pile driving operations (if risk is present).

7.5.6. Commercial Automobile Liability Insurance coverage shall be equivalent to that provided by the current edition of the ISO Form CA 00 01 and include Michigan statutory requirements.

7.5.7. Excess Liability Insurance shall provide the following protections: employer's liability, general liability, and automobile liability. Excess Liability Insurance shall be at least as broad as the underlying policies of liability insurance.

7.5.8. Coverage Limits - Workers' Compensation and Employer's Liability Insurance shall conform to statutory limits under Michigan Law. Commercial General Liability limits shall be $2,000,000.00 each occurrence, $2,000,000.00 general aggregate, $2,000,000.00 products and completed operations aggregate, and $2,000,000.00 personal and advertising injury.

Commercial Automobile Liability limits shall be $2,000,000.00 combined single limit. Excess Liability limits shall be $2,000,000.00 each occurrence and aggregate, if the Contract Price is less than $10,000,000.00, and $5,000,000.00 each occurrence and aggregate, otherwise. Deductible amounts shall not exceed $25,000.00.

7.5.9. The **Contractor** shall promptly notify the **Owner** in writing of (a) any reduction in coverage limits over $100,000.00 resulting from Work under the Contract Documents or otherwise, and (b) any claim notice involving the Work. Notification of a claim shall provide full details and an estimate of the amount of loss or liability. If it turns out that the aggregate limits have been impaired to the extent that they are no longer adequate for the Work, the **Contractor** shall promptly reinstate the coverage limits and submit to the **Owner** certificates of insurance confirming that coverage has been reinstated to the specified limits.

7.5.10. These requirements shall not be construed to limit the liability of the **Contractor** or its insurers. The **Owner** does not represent that the specified coverages or limits of insurance are sufficient to protect the **Contractor's** interests or liabilities.

7.6 Pollution Liability Insurance

7.6.1. Pollution Liability Insurance in the amounts of not less than $2,000,000 per occurrence is required.

7.7 Property Insurance (Builder's All Risk Insurance)

*7.7.1. Unless indicated otherwise in the bid document, the Contractor must purchase and maintain property insurance for 100% of the replacement cost value of the insurable Work (minimum amount to be the contract award amount) while in the course of construction, including foundations, additions, attachments, and all fixtures, machinery and equipment belonging to and constituting a permanent part of the building structures. The property insurance must cover temporary structures, materials and supplies to be used in completing the Work, whether stored offsite, in-transit, or on the building site premises. The property insurance insures the interests of the Owner, Contractor and all Subcontractors and Suppliers at any tier as their interest may appear and name the Owner as Loss Payee. The property insurance insures against "all risk" of physical loss or damage to the extent usually provided in policy forms of insurers authorized to transact this insurance in Michigan. A copy of the master insurance policy must be available for review by the State, upon request. The deductible amount and the payment of any deductible is the responsibility of the **Contractor**.

*7.7.2. A certificate or other proof of coverage shall be provided prior to final contract execution by the State. A copy of the master insurance policy will be made available to the **Owner** upon request.

7.7.3. The **Contractor** and **Owner** will cooperate in determining the actual cash replacement value of any insured loss. Any deductible amount shall be assumed or shared by the **Contractor** and Subcontractors, at any tier, in accordance with any agreement the parties in interest may reach.

7.7.4. The **Owner** may purchase and maintain for its benefit boiler and machinery insurance for boiler and machinery required to be registered and inspected by Law.

7.8 Waiver of Rights:

7.8.1. To the extent any losses and damages caused by any of the perils covered by property insurance covering the Work (whether under paragraph 7.7 or otherwise) are covered and payments are made, the **Owner** and **Contractor** waive all rights against each other for any such losses and damages and also waive all such rights against the **Professional** and all other Persons named as insureds or additional insureds in such policies. Each Sub agreement shall contain similar waiver provisions by the Subcontractor or Supplier in favor of the **Owner**, **Professional**, and all other Persons named as insureds or additional insureds. None of these waivers shall extend to the rights that any of the insureds may have to the proceeds of insurance held by the **Owner** as trustee or otherwise payable under a policy so issued.

7.8.2. The **Owner** and **Contractor** intend that the required policies of property insurance shall protect all the parties insured and provide primary coverage for all losses and damages caused by the perils covered. Accordingly, all such policies shall be endorsed to provide that in the event of payment of any loss or damage the insurer will have no rights of subrogation or other recovery against any of the parties named as insureds or additional insureds, and if the insurers require separate waiver forms to be signed by the **Professional** or the **Owner's** and **Professional's** consultants, the **Owner** will obtain such waiver forms, and if required of any Subcontractor or Supplier, the **Contractor** will obtain such waiver forms as well.

7.9 Receipt and Application of Proceeds:

7.9.1. Any insured loss under the policies of property insurance will be adjusted with the **Owner** and will be made payable to the **Owner** as trustee for the insureds, as their interests may appear, subject to the conditions of paragraph 7.9.2. The **Owner** shall deposit, in a separate account, and shall distribute monies received based on any agreement the parties in interest may reach. If no other distribution agreement is reached, the damaged Work shall be replaced or repaired, the monies received shall be used for that purpose and the Work Involved and resulting costs shall be covered by Change Order.

7.9.2. The **Owner**, as trustee, shall have power to adjust and settle any loss with the insurers unless a party in interest objects in writing within fifteen (15) Calendar Days after the occurrence of loss to the **Owner's** exercise of this power. If an objection is made, the **Owner** as trustee shall settle with the insurers pursuant to any agreement the parties in interest may reach.

***7.10 Unfair Labor Practice:**

*7.10.1. The **Owner**, pursuant to 1980 PA 278, as amended by MCL 423.321(b), may void and rescind the Contract if, at any time, the **Contractor** or any Subcontractor or Supplier appears on the register maintained by the Michigan Department of Consumer and Industry Services of employers who have been found in contempt of court by a Federal Court of Appeals on not less than three occasions involving different violations during the preceding seven (7) years for failure to correct unfair labor practices as prohibited by Section 8 of Chapter 372 of the National Labor Relations Act, 29 U.S.C. 158.

***7.11 Michigan Right-To-Know Law:**

*7.11.1. The **Contractor** shall comply with Section 14a-14n of the Michigan Occupational Safety and Health Act (MIOSHA), 1974 PA 154, as amended, MCL 408.1014a – MCL 408.1014n, commonly referred to as the "Michigan Right-to-Know Law" and the rules promulgated under the Act. The Act places certain requirements on employers to develop a communication program designed to safeguard the handling of hazardous chemicals through labeling of chemical containers and development and availability of Safety Data Sheets (SDS), and to provide training for employees who work with these chemicals and develop a written hazard communications program.

*7.11.2. Provisions of the Michigan Right-to-Know Law may be found in those sections of the Michigan Occupational Safety and Health Act (MIOSHA), which contain Right-to-Know provisions, and the Federal Hazard Community Standard, which is part of the MIOSHA Right-to-Know Law through adoption. The Act, rules and standards should be reviewed for additional requirements.

*7.11.3. The Michigan Right-to-Know Law also provides for specific employee rights, including the right to be notified of the location of SDS and to be notified at the site of new or revised SDS within five (5) Business Days after receipt and to request SDS copies from their employers. The **Contractor**, employer or Subcontractor shall post and update these notices at the site.

***7.12 Nondiscrimination:**

*7.12.1. The **Contractor** and each Subcontractor and Supplier covenants to comply with the following requirements:

*7.12.1.1. Not to discriminate against any employee or employment applicant because of race, religion, color, national origin, age, sex, sexual orientation, gender identity or expression, height, weight, marital status, partisan considerations, any mental or physical disability, or genetic information that is unrelated to the person's ability to perform the duties of a particular job or position.

*7.12.1.2. To take action to ensure that applicants are employed and that employees are treated during employment without regard to their race, religion, color, national origin, age, sex, sexual orientation, gender identity or expression, height, weight, marital status, partisan considerations, any mental or physical disability, or genetic information that is unrelated to the person's ability to perform the duties of a particular job or position. Such action shall include, but is not limited to employment upgrading, demotion or transfer; recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship.

*7.12.1.3. To state, in all solicitations or advertisements for employees, that all qualified applicants will receive consideration for employment without regard to race, religion, color, national origin, age, sex, sexual orientation, gender identity or expression, height, weight, marital status, partisan considerations, any mental or physical disability, or genetic information that is unrelated to the person's ability to perform the duties of a particular job or position.

*7.12.1.4. To send, or have its collective bargaining representative send, each labor union or representative of workers with which it has a collective bargaining agreement or other contract or understanding, a notice advising that labor union or worker's representative of commitments under this provision.

*7.12.1.5. To comply with the Elliot-Larsen Civil Rights Act, 1976 PA 453, as amended, MCL 37.2201 et seq.; the Michigan Persons With Disabilities Civil Rights Act, 1976 PA 220, as amended, MCL 37.1101 et seq.; *Executive Directive 2019-09*; and all published rules, regulations, directives, and orders of the Michigan Civil Rights Commission which may be in effect on or before the date of Bid opening.

*7.12.1.6. A breach of the covenants set forth in paragraphs 7.12.1.1 through 7.12.1.5 shall be regarded as a material breach of the Contract.

*7.12.2. The **Contractor** shall furnish and file compliance reports within the times, and using the forms, prescribed by the Michigan Civil Rights Commission. Compliance report forms may also elicit information as to the practices, policies, programs, and employment statistics of the **Contractor** and Subcontractors. The **Contractor** shall permit access to Records by the Michigan Civil Rights Commission and its agent for the purposes of ascertaining compliance with the Contract Documents and with rules, regulations, and orders of the Michigan Civil Rights Commission.

*7.12.3. If, after a hearing held pursuant to its rules, the Michigan Civil Rights Commission finds that the **Contractor** has not complied with the nondiscrimination requirements of the Contract Documents, the Michigan Civil Rights Commission may, as part of its order, certify said findings to the **Board**. Upon receipt of certification, the **Board** may order the cancellation of the Contract and/or declare the **Contractor** ineligible for future contracts with the State, until the **Contractor** complies with said order of the Michigan Civil Rights Commission.

***7.13 Michigan Residency for Employees:**

*7.13.1. Fifty percent (50%) of the persons employed on the Work by the **Contractor** shall have been residents of the State of Michigan for not less than one year before beginning employment on the Work. This residency requirement may be reduced or omitted in writing, at the sole discretion of the **Owner**, to the extent that Michigan residents are not available or to the extent necessary to comply with federal Law concerning federal funds used for the Project. A breach of this requirement shall be considered a material breach of the Contract.

*7.13.2. This residency requirement shall not apply to the **Contractor** or to any Subcontractor if the **Contractor** or any such Subcontractor is signatory to collective bargaining agreements which allow for the portability of employees on an interstate basis (The Management and Budget Act, 1984 PA 431, as amended, MCL 18.1241a).

***7.14 Prevailing Wages:**

*7.14.1. To the extent applicable, Contractor will comply with federal and state prevailing wage requirements. The wage and classification schedules applicable for this project/location are included in Appendix III.

*7.14.2. Federal Prevailing Wages - If a project is funded in whole or in part by federal dollars, the Contractor and all Subcontractors must comply with the most recent version of Federal Provisions Addendum and all Laws pertaining to occupational classifications and prevailing wage requirements as follows:

1. FEDERAL PROVISIONS ADDENDUM

    a. The most current version of Federal Provisions Addendum shall apply to this contract and is included in Appendix III.

2. DAVIS BACON ACT WAGE AND CLASSIFICATIONS

a. If applicable, the Contractor (and its Subcontractors) for prime construction contracts in excess of $2,000 must comply with the Davis-Bacon Act (40 USC 3141-3148) as supplemented by Department of Labor regulations (29 CFR Part 5, “Labor Standards Provisions Applicable to Contracts Covering Federally Financed and Assisted Construction”).

b. The Contractor (and its Subcontractors) shall pay all mechanics and laborers employed directly on the site of the work, unconditionally and at least once a week, and without subsequent deduction or rebate on any account, the full amounts accrued at time of payment, computed at wage rates not less than those stated in the advertised specifications, regardless of any contractual relationship which may be alleged to exist between the Contractor or subcontractor and the laborers and mechanics.

c. The Contractor will post the scale of wages to be paid in a prominent and easily accessible place at the site of the work.

d. There may be withheld from the Contractor so much of accrued payments as the contracting officer considers necessary to pay to laborers and mechanics employed by the Contractor or any Subcontractor on the work the difference between the rates of wages required by the Contract to be paid laborers and mechanics on the work and the rates of wages received by the laborers and mechanics and not refunded to the Contractor or Subcontractors or their agents.

e. The Contractor shall maintain payrolls and basic records relating thereto for a period of three (3) years after the project; contractor shall submit Certified Payroll Reports using US Department of Labor Wage and Hour Division Form WH-347 for each weekly payroll to support and document compliance with the Davis Bacon Wage rates.

f. Davis Bacon wage and classification schedules applicable for this project/location are included in Appendix III.

7.14.3. State Prevailing Wages - The following provisions apply when 2023 PA 10, as amended, MCL 408.1101 et seq. applies.

7.14.3.1. Prevailing Wage and Fringe Benefits--The rates of wages and fringe benefits to be paid to each class of Construction Mechanic by Contractor and Subcontractors must not be less than the wage and fringe benefit rates prevailing in the locality in which the work is performed.

7.14.3.2 Nondiscrimination, Nonretaliation- Contractor or a Subcontractor shall not discharge, discipline, retaliate against, or otherwise discriminate against a Construction Mechanic, or threaten to do any of these things, because the Construction Mechanic reported or was about to report a violation or suspected violation of the act.

7.14.3.3. Construction Mechanics under this Contract are intended beneficiaries of the contractual prevailing wage, fringe benefit, and nondiscrimination nonretaliation requirements of the Contract. Any such Construction Mechanic aggrieved by failure of a contractor or subcontractor to pay prevailing wages or benefits as specified in the Contract, or by violation of section 7 of 2023 PA 10, in addition to any other remedies provided by law, may bring an action in a court of competent jurisdiction against such contractor or subcontractor for damages or injunctive relief and may be awarded reinstatement or other appropriate relief, and all damages sustained, together with actual costs and attorney fees at trial and on appeal.

7.14.3.4. Contractor and Subcontractors shall keep posted on the construction site, in a conspicuous place, a copy of all prevailing wage and fringe benefit rates prescribed in this Contract and shall keep an accurate record showing the name and occupation of and the actual wages and benefits paid to each Construction Mechanic employed by it in connection with the Contract. This record shall be available for reasonable inspection by the State.

7.14.3.5 **Contractor** must immediately notify the **Owner** if **Contractor's** state project registration or a **Subcontractor's** state project registration is no longer valid (i.e. suspended, revoked or not renewed) at any time during the term of the Contract.

7.14.3.6. Contractor is to submit certified payrolls, including contractor and subcontractor, not later than 10-days after the end of a pay period to the Department of Labor and Economic Opportunity database via the internet through the Online Certified Payroll Submission process the Contractor signed up for to receive their State Project Registration, 2023 PA 10 as amended, MCL 408.1122. State certified payroll is not to be submitted to DTMB at any time.

7.15 Asbestos Abatement:

7.15.1 For projects requiring Asbestos Abatement, the Contractor must comply with PA 59 of 2024, MCL 338.3371 et seq. as applicable and with APPENDIX II – ASBESTOS ABATEMENT PROJECT PROCEDURES as part of and in conjunction with all other contract requirements.

ARTICLE 8 PROSECUTION; SUBSTANTIAL COMPLETION

8.1 Starting the Work:

8.1.1. Within fifteen (15) Calendar Days after the **Owner** executes the Section 00500 Agreement, a pre-construction conference will be held. The conference will be intended, without limitation, to (a) review the **Contractor's** Schedule of Shop Drawing submissions; (b) review the qualifications of key **Contractor** personnel; (c) review the **Contractor's** proposed normal working hours and plans for laydown, staging, construction traffic, access to the site, parking and other similar matters; (d) review procedures for Submittals, clarifications and interpretations (including reasonable times for response turnaround), Change Orders, Change Authorizations and Record Documents; and (e) exchange twenty-four (24) hour emergency telephone numbers for key personnel.

8.1.2. The **Contractor** shall start the Work on the Date of Commencement of the Contract Time. No Work shall be started at the site before such is allowed by the Contract Documents.

8.2 Revision 0 (Rev. 0) Schedule and Cost Submittals:

8.2.1. The **Contractor** shall deliver the interim Rev. 0 Progress Schedule, Schedule of Shop Drawing submissions and Rev. 0 Progress Schedule as required in the Contract Documents. The **Contractor** shall correct and adjust any Rev. 0 Submittal returned for revision. The finalized Revision 0 *As-Planned* Schedule shall be the Progress Schedule from which Revision Schedules shall be developed and used by the **Contractor** when making proposals or claims for adjustments in Contract Time and/or Contract Price.

8.3 Compliance with Contract Time Requirements:

8.3.1. The **Contractor** shall prosecute the Work with the diligence necessary to ensure its completion within the Contract Times. The **Contractor** shall provide sufficient management, supervision, labor, materials and equipment, and the **Contractor** shall undertake appropriate action promptly to recover schedule when necessary to comply with the Contract Times.

8.3.2. Unless disallowed by any Law or modified in another Section of the Specifications, a daily schedule from 06:00 AM to 06:00 PM, during Business Days, shall be normal working hours. Except in an Emergency, or as may be required by the **Contractor's** safety and protection obligations, or as the **Owner** and **Contractor** may otherwise agree, all Work at the site shall take place during normal working hours. The **Contractor** shall provide written notice to the **Owner** at least twenty-four (24) hours and up to seventy-two (72) hours if so, noted for projects specific requirements such as Correctional Facilities, before performing Work outside of normal working hours.

8.3.3. Unless otherwise agreed in writing by the **Owner**, for any Work actually performed outside of normal working hours, the **Contractor** shall reimburse the **Owner** any related increases in costs the **Owner** incurs, provided those costs are costs which the **Contractor** could reasonably have foreseen, and which are not offset through the earlier completion of the Work resulting from working outside of normal working hours. Examples of **Owner** costs include, but are not limited to, overtime charges of the **Professional** and payments for custodial and security personnel.

8.3.4. Early Dates in the Progress Schedule shall be based on proceeding with all or part of the Work exactly on the date when the corresponding Contract Time commences to run. Late Dates shall be based on completing all or part of the Work exactly on the corresponding Contract Time, regardless of whether the **Contractor** anticipates early completion or not. If sequences of Work are indicated in or required by the Contract Documents, the Progress Schedule shall show in sufficient detail the **Contractor's** approach to conforming with those sequences.

8.3.5. The Progress Schedule shall reflect the **Contractor's** approach to Work remaining, be employed when reporting on progress or schedule recovery and facilitate the evaluation of Requests for Payment, as provided in the Contract Documents.

8.3.6. The **Contractor** shall carry on the Work with due diligence during all disputes or disagreements with the **Owner.** No Work shall be delayed or postponed pending resolution of any disputes or disagreements. The **Contractor** shall exercise reasonable precautions, efforts, and measures to avoid or mitigate situations that would cause Delays.

8.4 Substantial Completion:

8.4.1. The **Contractor** shall conduct inspections of the Work to verify the extent of completion. The **Contractor** shall provide to the **Owner** a list of items to be completed or corrected resulting from the inspections whenever the **Contractor,** upon completing all pre-requisite testing of the Work, considers that the Work, or any portion of the Work designated in the Contract Documents as having a separate, specified Substantial Completion, has progressed to the point that it is substantially complete.

8.4.2. Within a reasonable time after receiving the **Contractor's** list of items to be completed or corrected, the **Owner**, **Professional** and **Contractor** shall jointly conduct a Substantial Completion inspection. If, after consulting with the **Owner**, the **Professional** does not consider the Work, or portion of the Work inspected, substantially complete, the **Professional**, within twenty (20) Calendar Days after the inspection, will deliver to the **Owner** and **Contractor** a list of incomplete or Defective Work sufficient to demonstrate the basis for that determination.

8.4.3. If the **Professional** and **Owner** agree that the entire Work, or that the portion of the Work inspected, is substantially complete, the **Professional** will deliver to the **Owner** and **Contractor** a certificate of Substantial Completion with a Punch List.

The certificate shall (a) fix a reasonable date of Substantial Completion, (b) fix a date for completion of the Punch List to the satisfaction of the **Professional**, and (c) recommend the division of responsibilities between the **Owner** and **Contractor**. Neither the Work, nor any portion of the Work inspected, shall be substantially complete, unless the **Owner** can use the Work, or designated portion of the Work inspected, for the use intended.

8.4.4. Upon Substantial Completion of the Work, or designated part of the Work on which separate Substantial Completion and Contract Price are specified, payment may be made in full subject to (a) a withholding of two hundred percent (200%) of the value of any uncompleted Work, as determined by the **Professional**, and (b) any other deductions as the **Professional** may recommend or the **Owner** may withhold to cover Defective Work, liquidated damages and the fair value of any other items entitling the **Owner** to a withholding.

8.4.5. To the extent **Owner** training is required before Substantial Completion, the **Contractor** will provide the **Owner** copies of all related operating and maintenance (O&M) documentation before the start of training. Where **Owner** training for a portion of the Work is not required before Substantial Completion, the related O&M documentation will be provided no later than Substantial Completion. Final O&M documentation (with revisions made after Substantial Completion), will be furnished by the **Contractor** to the **Owner** before the request for final payment.

8.5 Partial Use:

8.5.1. Before Substantial Completion of the entire Work, the **Owner** may, at its sole option, use any portion of the Work for which a separate Substantial Completion has been specified in the Contract Documents. Before Substantial Completion of the entire Work, the **Owner** may, at its sole option, use any portion of the Work considered by the **Owner**, **Professional** and **Contractor** to be separately functioning Work that can be used without significant interference with the **Contractor's** completion of the balance of the Work, even though a Substantial Completion for such Work is not specified in the Contract Documents.

8.5.2. If the **Owner** decides to use any portion of the Work, it shall inform the **Contractor** in writing. Unless such portion of the Work has undergone a Substantial Completion inspection under paragraph 8.4.2, within a reasonable time after receipt of the notice, the **Owner**, **Contractor** and **Professional** shall jointly make an inspection to determine the extent of completion. If the portion of the Work inspected is substantially complete, the provisions of paragraph 8.4.3 shall be followed by the **Owner**, **Professional** and **Contractor**. If the portion of the Work inspected is not substantially complete, the **Professional** will prepare a list of items remaining to be completed or corrected before that portion of the Work is considered substantially complete. Upon completing the list, the **Professional** will deliver the prepared list of items to the **Owner** and **Contractor**.

8.5.3. There shall be attached to the list a written recommendation about the division of responsibilities between the **Owner** and **Contractor** for those matters enumerated in paragraph 8.6.1 with respect to that portion of the Work, pending Substantial Completion of that portion of the Work and the entire Work. During Partial Use, and before Substantial Completion of the portion of the Work under Partial Use, the **Owner** shall allow the **Contractor** reasonable access to complete or correct listed items and to complete other Work. The **Owner** will not start any Partial Use unless the property insurer, by endorsement or like acceptable procedure, has acknowledged receipt of notice of and consent to Partial Use.

8.6 Division of Responsibilities:

8.6.1. A certificate of Substantial Completion will include the **Professional's** recommendation about the division of responsibilities between the **Owner** and **Contractor** for utilities, security, safety, insurance, maintenance, etc. The **Owner** and **Contractor** will accept the division of responsibilities recommended by the **Professional** or shall negotiate a mutually agreeable split of responsibilities, which shall bind the **Owner** and **Contractor** when the **Owner** starts Partial Use.

8.7 Suspension of Work:

8.7.1. Suspension of Work Order – The **Owner** may, at any time, order the **Contractor** in writing to defer, stop, slow down, suspend or interrupt all or any part of the Work for such period as the **Owner** may determine appropriate for its convenience. If any such written order Delays performance for an unreasonable period, the **Owner** will amend the Contract Documents to provide for a corresponding adjustment in Contract Time and/or Contract Price (excluding Fee under paragraph 11.11).

8.7.2. Constructive Suspension of Work – If performance of all or any part of the Work is, for an unreasonable period, deferred, stopped, slowed down, suspended or interrupted by any other act or failure to act of the **Owner** or **Professional**, or act or event attributable to the **Owner** under the Contract Documents, the **Owner** will negotiate with the **Contractor** or authorize an adjustment in Contract Time and/or Contract Price (excluding Fee under paragraph 11.11.1) for any increase in the time required to complete the Work and/or the **Contractor's** cost of performance.

8.7.3. Suspension of Work Limitation – No adjustment in Contract Price under paragraphs 8.7.1 or 8.7.2 shall be made to the extent performance is delayed by any other cause, including any act or omission within the control of the **Contractor**. Further, no suspension of

Work shall justify an increase in Contract Price or Contract Time unless the resulting Delay exceeds the time allowed in the Contract Documents for the act or failure to act.

8.7.4. If the **Contractor** believes a suspension of Work justifies an increase in Contract Price or Contract Time, the **Contractor** shall give prompt written notice to the **Owner** and submit a written proposal promptly after the extent of the Delay becomes known. However, no proposal or claim by the **Contractor** on account of a suspension of Work shall be allowed (a) for any Delay or costs incurred more than thirty (30) Calendar Days before the **Contractor** gives written notice (except for written orders under paragraph 8.7.1), or (b) if made after final payment.

8.8 Sharing of Total Float On Non–Critical Paths:

8.8.1. The Progress Schedule shall be in the form of a Critical Path Schedule, Total Float on non-Critical Paths shall be available to the **Owner**, to the extent the **Owner's** use is reasonable given the Total Float remaining for the Work affected. If any such **Owner's** use of Total Float causes Delay which materially increases the **Contractor's** cost to complete the Work affected, and the **Contractor** notifies the **Owner** in writing and proceeds to support the assertion to the **Owner's** satisfaction, the **Owner** will correspondingly adjust Contract Price for any such material changes in the **Contractor's** cost to complete the Work.

8.8.2. The amount of Total Float available in the Progress Schedule shall not be artificially reduced by suppressing Total Float merely for the sake of voiding Total Float. Total Float hidden through the use of such techniques as preferential sequencing; slow or late starts of follow-on trades; restraining a Contract Time by Work actually required for a later Contract Time; the use of small crews, extended durations, imposed dates; and so forth, shall be Total Float otherwise available for sharing with the **Owner** under the provisions of paragraph 8.8.1.

ARTICLE 9 WARRANTY; TESTS, INSPECTIONS AND APPROVALS; CORRECTION OF WORK

9.1 Warranty:

9.1.1. The **Contractor** warrants to the **Owner** that all Work will conform to the Contract Documents and will not be Defective. Reasonably prompt notice of Defective Work of which the **Owner** or **Professional** has actual knowledge shall be given to the **Contractor**, but failure to do so will not void the **Contractor's** warranty unless actual prejudice results from such untimely notice. The **Contractor's** warranty excludes defect or damage caused by (a) abuse, modification by others, insufficient or improper operation or maintenance, or (b) normal wear and tear under normal usage.

9.1.2. Manufacturer warranties for materials and equipment received by the **Contractor** shall be assigned and promptly delivered to the **Owner**. Manufacturer warranties shall be in full force and effect for the entire duration of the Correction Period.

9.2 Tests, Inspections and Approvals:

9.2.1. The **Owner**, **Professional**, their representatives and consultants, testing agencies and those State agencies and Political Subdivisions with jurisdiction shall be permitted access to the Work at reasonable times while the Work is in progress for On-Site Inspection and/or inspection, testing or approval. The **Contractor** shall provide proper and safe conditions for such access. The **Contractor** shall give the **Professional** timely notice whenever any Work is ready for inspections, tests, or approvals, so that the **Professional** may observe such inspections, tests, or approvals. Tests, inspections, or approvals shall not in any way relieve the **Contractor** from the **Contractor's** obligations to perform the Work in accordance with the Contract Documents or warrant the Work as provided in the Contract Documents.

9.2.2. Unless otherwise provided in Section 00800 Supplementary Conditions, the **Owner** will retain a testing agency, directly or through the **Professional**, to perform inspections, tests or approvals required by the Contract Documents except for those inspections, tests or approvals specifically designated to the Contractor in the Contract Documents. The **Owner** will pay the charges of the testing agency, except if related to tests, inspections or approvals required by Law or otherwise charged to the **Contractor** under the provisions of paragraph 9.2.4 or 9.3.

9.2.3. The **Contractor** shall assume full responsibility for any testing, inspection, or approval (a) required by Law, (b) indicated in or required by the Contract Documents as designated to the Contractor, or (c) required for the **Professional's** acceptance of a Supplier, materials or equipment or mix designs submitted for prior approval by the **Contractor**. The **Contractor** shall (a) pay all related costs, except costs assumed by the **Owner** under paragraph 9.2.2, (b) schedule related activities, and (c) secure and furnish to the **Professional** the required certificates of inspection, testing or approval.

9.2.4. The **Contractor** shall be responsible for any testing, inspection or approval that reveals Defective Work, including an appropriate portion of the Delay and costs occasioned by such discovery of Defective Work. Examples of such costs assumed by the **Contractor** include, but are not limited to, charges of the **Professional** for repeated On-Site Inspections and, to the extent designated in the pertinent Specification, repeat testing, inspection, or approval charges by testing agencies.

9.3 Uncovering Work:

9.3.1. Any Work covered without the **Professional's** prior written concurrence shall, when requested by the **Professional**, be uncovered, exposed, or otherwise made available for On-Site Inspection, testing, inspection, or approval as the **Professional** may require, and replaced, if necessary. This requirement applies to Work, which requires On-Site Inspection by the **Professional**, based on the Contract Documents or on specific On-Site Inspection procedures of which the **Professional** notifies the **Contractor** in advance. This requirement also applies to Work, which is to be inspected, tested, or approved by others. The **Contractor** shall be responsible for any such uncovering, exposure, On-Site Inspection, testing, inspection, and satisfactory reconstruction, including an appropriate portion of the Delay and costs, unless the **Contractor** gave the **Professional** timely written notice of the **Contractor's** intentions to cover such Work and the **Professional** failed to act with reasonable promptness in response to such written notice.

9.3.2. The **Contractor**, at the **Professional's** request, shall uncover, expose, or otherwise make available for On-Site Inspection, inspection, testing or approval any covered Work otherwise not required to be observed or inspected, tested, or approved before covering, if the **Professional** determines that such covered Work shall be on-site inspected by the **Professional** or inspected, tested, or approved by others. The **Contractor** shall be responsible for any such uncovering, exposure, On-Site Inspection, inspection, testing and satisfactory reconstruction, including an appropriate portion of the Delay costs, whenever any such uncovered Work is found to be Defective. If, however, any such Work uncovered at the **Professional's** request is not found Defective, the **Owner** will amend the Contract Documents to provide for a corresponding adjustment in Contract Price and/or Contract Time.

9.4 Correction of Work:

9.4.1. Before the Correction Period – If required by the **Professional**, the **Contractor** shall correct all Defective Work, whether fabricated, installed or completed or not. If any Work is rejected by the **Professional** or if any testing, inspection, or approval reveals Defective Work, the **Contractor** shall promptly, as direct, remove the Defective Work from the site and replace it with non-Defective Work. The **Contractor** shall bear responsibility for its proportionate share of the Delay and costs resulting from the correction and/or the removal and replacement of Defective Work.

9.4.1.1. If the **Contractor**, within reasonable time after receipt of written notice, (a) fails to correct Defective Work or remove and replace rejected Work, or (b) fails to correct or complete items on any Punch List, or (c) fails to perform Work in accordance with the Contract Documents, or (d) fails to comply with any other provision of the Contract Documents, the **Owner**, after seven (7) Calendar Days' written notice to the **Contractor**, may correct and remedy the deficiency. To the extent necessary to correct and remedy such deficiency, the **Owner** shall be allowed to exclude the **Contractor** from all or part of the site; take possession of all or part of the Work and stop related operations of the **Contractor**; take possession of the **Contractor's** tools, plant and office and construction equipment at the site; and incorporate into the Work materials and equipment for which the **Owner** has paid the **Contractor**. The **Contractor** shall allow the **Owner** and **Professional** access to the site as the **Owner** may require completing corrective and remedial action. The **Owner** shall be entitled to an appropriate decrease in Contract Price for all claims, costs, losses, damages, and Delay incurred or sustained by the **Owner** which are attributable to the **Contractor**. Costs assumed by the **Contractor** under this provision include, without limitation, costs of correction or removal and replacement of Defective Work, costs of repair and replacement of other work destroyed or damaged by the action and related charges of the **Professional**.

9.4.1.2. Instead of requiring correction or removal and replacement of any Defective Work, the **Owner**, with the advice of the **Professional**, may prefer to accept any Defective Work. In any such case, the **Contractor** shall bear its proportionate share of the Delay and costs associated with the **Owner's** determination to accept the Defective Work. If the **Owner's** acceptance of the Defective Work takes place before the **Professional's** recommendation of final payment, a Change Order will be issued incorporating the necessary revisions in the Contract Documents, and the Contract Price shall be adjusted accordingly.

9.4.2. Correction Period – The Contract Documents provide for one Correction Period for the entire Work, whether Partial Use of any portion of the Work is designated as eligible by the Contract Documents or not. The Correction Period shall start on the date of Substantial Completion of the Work, or on a later date, if so, provided in the Contract Documents. The Correction Period shall last one year, or longer, if so, specified in the Contract Documents.

9.4.3. Correction of Work During the Correction Period – The **Contractor** shall correct Defective Work or, if rejected by the **Owner**, remove from the site, and replace any Defective Work with non-Defective Work. The **Contractor's** corrective action shall be in accordance with the **Owner's** written instructions and shall be accomplished at the **Contractor's** sole expense. If the Defective Work causes an Emergency or unacceptable risk of loss or damage, the **Contractor** shall take immediate action to correct or remove and replace the Defective Work.

9.4.3.1. If the **Contractor** fails to take corrective action in accordance with the terms of any such **Owner** written instruction, the **Owner**, directly or through others under contract with the **Owner**, may correct or remove and replace the Defective Work.

In any such case, the **Contractor** shall bear its proportionate share of all resulting claims, costs, losses, and damages. If the **Owner** and the **Contractor** are unable to agree as to the amounts due by the **Contractor** to the **Owner** under the provisions of this paragraph, the **Owner** may deliver a claim, in accordance with the procedures and within the deadlines set forth in Article 15. If the discovery of the Defective Work takes place after final payment and the **Contractor** fails to pay the **Owner** any of the amounts due under the provisions of this paragraph, the **Owner** shall demand due performance under Section 00610 Performance Bond and Article 14 or deliver a claim, in accordance with the procedures and within the deadlines set forth in Article 15, or both.

9.4.4 After the Correction Period – Until the period of limitation provided by Michigan Law, the **Contractor** shall promptly correct Defective Work upon receipt of written notice from the **Owner**. If appropriate under the circumstances or, in the event of an Emergency or unacceptable risk of loss or damage, the **Owner**, directly or through others under contract with the **Owner**, may correct or remove and replace the Defective Work.

9.4.5. It is not the intent of paragraph 9.4 or paragraph 9.5 to establish a period of limitations for the **Contractor's** warranty or to limit the obligations of the **Contractor** to warrant that the Work will not be Defective. The specified correction of Work requirements relates only to the specific obligation of the **Contractor** to correct or remove and replace Defective Work. The specified correction of Work requirements has no limitation on the rights of the **Owner** to have Defective Work corrected or removed and replaced, if rejected, except as otherwise provided by Michigan Law.

9.5 Special Correction Period Requirements:

9.5.1. Whenever the **Owner** undertakes Partial Use of any portion of the Work specifically designated as eligible for Partial Use in the Contract Documents, the warranties for all materials and equipment incorporated into that portion of the Work shall remain in full force and effect between the start of such Partial Use and the date when the Correction Period starts. If no separate price for such special correction period was requested in Section 00300 Bid Form and made part of the Contract Documents, the **Owner** will appropriately adjust the Contract Price.

9.5.2. Whenever the **Owner** undertakes Partial Use of any portion of the Work because any act or omission within the control of the **Contractor** Delays completion of the Work, or any portion of the Work, within a designated Contract Time, the warranties for all materials and equipment incorporated into that portion of the Work shall, at no adjustment in Contract Price, be maintained in full force and effect between the beginning date of such Partial Use and the date when the Correction Period stars.

9.5.3. The correction period for any Defective Work that is corrected or rejected and replaced within the last three (3) months of the Correction Period shall be extended by an additional six (6) months, starting on the date such Work was made non-Defective.

9.5.4. The Contract Documents may require the Correction Period to start on a date later than the date of Substantial Completion of the entire Work. If such is the case, and the **Owner** advances or defers the start of the Correction Period, the **Contractor** shall maintain the warranties for materials and equipment until the revised starting date of the Correction Period. If no separate price for such advance or deferment was requested in Section 00300 Bid Form and made part of the Contract Documents, the **Owner** will amend the Contract Documents to appropriately adjust the Contract Price.

9.6 Special Maintenance Requirements:

9.6.1. If the Contract Documents specify that the entire Work, or a portion of the Work, upon reaching Substantial Completion, shall not be placed in use by the **Owner**, the **Contractor** shall maintain the Work, or specified part of the Work, in good order and proper working condition and shall take all other actions necessary for its protection between the certified date of Substantial Completion and the date when the Work, or designated part of the Work, is placed in use.

9.6.2. If no separate price for such special maintenance period was requested in Section 00300 Bid Form and made part of the Contract Documents, the **Owner** will amend the Contract Documents to appropriately increase the Contract Price.

ARTICLE 10 CHANGES

10.1 Changes in the Work:

10.1.1. Changes in the Work – The **Owner** is entitled to make changes within the general scope of the Work consisting of (a) additions, deletions or other revisions in the Specifications and Drawings, any Means and Methods or the **Owner**-furnished lands, equipment, materials, or services, or (b) directing acceleration of the Work. Changes in the Work may be accomplished through negotiated, *bilateral* Change Orders or *unilateral* Change Orders or result from any other properly authorized written order from the **Owner** or **Professional** which represents a constructive change.

10.1.1.1 Tariffs Not a Change. Changes in trade or customs laws or government action affecting Tariffs or other import-related federal assessments will not constitute a Change in the Work and will not entitle the Contractor to an adjustment of the Contract Price or Contract Time.

10.1.2. Negotiated Changes – The **Owner** may negotiate changes in the Work by directing the **Professional** to prepare a Bulletin in numerical sequence describing the change being considered. Upon receiving a Bulletin, the **Contractor** (with the appropriate Subcontractors) shall evaluate the described change and quote the Bulletin. In estimating adjustments in Contract Price and/or Contract Time, the **Contractor** shall follow the provisions, including the breakdown requirements, specified in Article 11.

10.1.3. Constructive Changes – Any written order (including instruction, interpretation, determination, authorization, or approval) from the **Owner** or **Professional** that causes a change in the Contract Documents shall constitute a change in the Work, provided the **Contractor**

or the **Owner** gives prompt, written notice of a change to the other (with copy to the **Professional**) stating the date, circumstances, and source of the change.

10.1.3.1. Upon receipt and evaluation of the written notice, if the **Owner** agrees, with the **Professional's** advice, that a change within the general scope of the Work has been ordered, the **Owner** shall, by Change Order or Change Authorization, correspondingly amend the Contract Documents. If the **Owner** finds that a change within the general scope of the Work has not been ordered, and the **Contractor** disagrees, the **Contractor** may deliver notice of a claim and a claim Submittal in accordance with the procedures and within the deadlines set forth in Article 15.

10.1.3.2. **No proposal or claim** by the **Contractor** on account of changes under paragraphs 3.2.1, 10.1.3 or any other matter for which Contractor asserts added cost or time **shall be allowed unless initiated by written notice** of such proposal or claim to the Professional and Owner **within 21 days after the occurrence of the event giving rise to such proposal or claim or within 21 days after the contractor first recognizes the condition giving rise to the proposal or claim**. A full and detailed breakdown of cost and time requested, with supporting documentation, if not provided with initial notice shall be delivered to Professional and Owner within 15 days of the notice, as noted in article 11.1.2, unless otherwise agreed in writing, by the Owner prior to expiration of such time.

10.1.4. Unilateral Changes – If, in negotiations, the **Owner** and **Contractor** are unable to agree on the adjustment in Contract Price or Contract Time corresponding to any change in the Work, the **Owner** may issue a *unilateral* Change Order. Upon receiving any such Change Order, the **Contractor** shall promptly proceed or continue with the Work Involved as required by the Change Order.

10.1.4.1. *Unilateral* Change Orders may adjust Contract Price and/or Contract Time, as the **Owner**, with the advice of the **Professional**, may determine appropriate. Contract Price may be adjusted on a *lump sum* basis or an *actual cost*, *not to exceed* basis. If the **Contractor** disagrees with the extent of the adjustments in Contract Price and/or Contract Time made by any such *unilateral* Change Order, the **Contractor** may deliver notice of a claim and a claim Submittal in accordance with the procedures and within the deadlines set forth in Article 15.

10.2 Differing Subsurface or Physical Site Conditions:

10.2.1. The Contract Documents make available Authorized Technical Data concerning subsurface site conditions and physical conditions of existing surface and subsurface facilities at the site. Consistent with Section 00100 Instructions to Bidders, except for reasonable reliance on the accuracy of Authorized Technical Data, the **Owner** does not warrant that Authorized Technical Data is necessarily sufficient and complete for the purposes of selecting Means and Methods, initiating, maintaining, and supervising safety precautions and programs or discharging any other obligation assumed by the **Contractor** under the Contract Documents.

10.2.2. The **Contractor** or **Owner** shall notify the other in writing if the **Contractor** or **Owner**, respectively, discovers that (I) actual subsurface conditions or latent physical conditions of existing surface and subsurface facilities encountered at the site differ materially from those shown or indicated in the Contract Documents, or (II) unknown subsurface conditions or unknown physical conditions of existing surface and subsurface facilities encountered at the site, of an unusual nature, differ materially from those ordinarily encountered and recognized as inherent in work similar in character to the Work. A written notice from the **Contractor** shall be delivered promptly before the conditions are disturbed and before proceeding with the affected Work. A written notice from the **Owner** shall be delivered promptly after the **Owner** has knowledge of the differing subsurface or physical conditions.

10.2.2.1. Upon receipt or delivery of any such notice, the **Owner** shall investigate the differing conditions asserted. If, with the **Professional's** advice, the **Owner** determines that conditions on which the **Contractor** is entitled to rely do differ materially, the **Owner** will amend the Contract Documents to provide for any changes in the Work and adjustments in Contract Price and Contract Time made necessary by the differing conditions and any resulting Delay which is not reasonably anticipatable under the circumstances and which is attributable to the **Owner** and/or **Professional.** Unless the **Owner** and **Contractor** otherwise agree, no increase in Contract Time shall be made for any suspension of Work made necessary by any differing subsurface conditions, if the suspension of Work lasts less than ten (10) Calendar Days.

10.2.2.2. If the **Owner** determines that the actual conditions encountered and those conditions on which the **Contractor** is entitled to rely do not differ materially, and the **Contractor** disagrees with the **Owner's** determination, the **Contractor** may deliver notice of a claim and a claim Submittal in accordance with the procedures and within the deadlines set forth in Article 15.

10.2.2.3. No proposal or claim by the **Contractor** due to differing site conditions shall be allowed (a) if the **Contractor** knew of their existence before submitting its Bid or if those conditions could have been discovered by any reasonable examinations for which the **Contractor**, as Bidder, was made responsible under the Bidding Requirements, **and/or** (b) unless the **Contractor's written notice** is provided **within not more than 21 days after the contractor first recognizes the condition giving rise to the proposal or claim and gives the Owner adequate opportunity to investigate the asserted differing site conditions**. A full and detailed breakdown of cost and time requested, with supporting documentation, if not provided with initial notice shall be delivered to Professional and Owner within 15 days of the notice, as noted in article 11.1.2, unless otherwise agreed in writing, by the Owner prior to expiration of such time.

10.2.3. The provisions of paragraph 10.2.2 through 10.2.2.3 also shall apply to situations where the **Contractor** or **Owner** discovers that any reference points provided by the **Owner** need correction to enable the **Contractor** to proceed with the Work.

10.3 Responsibilities for Underground Utilities:

10.3.1. The **Contractor** shall comply with 2013 PA 174, as amended, MCL 460.721 et seq., and all other Laws concerning Underground Utilities. In addition, the **Contractor** shall be responsible for immediately notifying the **Owner** of any contact with or damage to Underground Utilities, and for the safety, protection of and repairing of any damage done to any Work and any surface and subsurface facilities. Except as provided under 2013 PA 174, as amended, MCL 460.721 et seq., paragraph 10.3.2 or by any Allowance specific to Underground Utilities, the **Contractor** shall bear an appropriate portion of the Delay and costs relating to the obligations set forth in this paragraph.

10.3.2. Shown or Indicated – If the **Contractor** encounters Underground Utilities shown or indicated (whether in the Contract Documents or those documents itemized in Section 00210 Information for Bidders) that are inaccurately shown or are inaccurately located, responsibility for any damage shall be as provided in MCL 460.701 et seq. To the extent the Drawings and/or Specifications inaccurately show or locate, through error or omission, the actual physical conditions and/or location of existing Underground Utilities (when compared with the information and data provided by the owners of such Underground Utilities), the **Owner** will amend the Contract Documents to provide for a corresponding adjustment in Contract Price and/or Contract Time.

10.3.3. Not Previously Located – If the **Contractor** encounters not previously located Underground Utilities, which could not reasonably have been foreseen, the **Owner** will amend the Contract Documents to provide for any changes in the Work and corresponding adjustments in Contract Price and/or Contract Time made necessary by such changes in the Work and by any resulting Delay which is not reasonably anticipatable under the circumstances and which is attributable to the **Owner** and/or **Professional.**

10.4 Hazardous Material Conditions:

10.4.1. The **Contractor** shall use, handle, store, dispose of, process, transport and transfer any material considered a Hazardous Material in accordance with all federal, state, and local Laws. If the **Contractor** encounters material reasonably believed to be a Hazardous Material and which may present a substantial danger, the **Contractor** shall immediately stop all affected Work, give written notice to the **Owner** of the conditions encountered, and take appropriate health and safety precautions.

10.4.2. Upon receipt of the written notice, the **Owner** will investigate the conditions. If (a) the material is a Hazardous Material that may present a substantial danger and which was not described in the Drawings and/or Specifications, or identified in the Contract Documents as Work under the Contract Documents, and (b) the Hazardous Material was not brought to the site by the **Contractor**, or does not result in whole or in part from any violation by the **Contractor** of any Laws covering the use, handling, storage, disposal of, processing, transport and transfer of Hazardous Materials, the **Owner** shall order a suspension of Work in writing. The **Owner** shall proceed to have the Hazardous Material removed or rendered harmless by negotiating a change in the Work with the **Contractor**, by means of separate contract or as the **Owner** may deem otherwise expedient. In the alternative, the **Owner** shall terminate the affected Work or the Contract for the **Owner's** convenience.

10.4.3. Once the Hazardous Material has been removed or rendered harmless by any of the means outlined in paragraph 10.4.2, the affected Work shall be resumed as directed in writing by the **Owner**. Any determination by the Michigan Department of Health & Humans Services and/or the Michigan Department of Environment, Great Lakes, and Energy (whichever is applicable) that the Hazardous Material has either been removed or rendered harmless shall be binding upon the **Owner** and **Contractor** for the purposes of resuming the Work. If any such incident with Hazardous Material results in Delay not reasonable anticipatable under the circumstances and which is attributable to the **Owner** or **Professional**, the **Owner** will amend the Contract Documents to provide for a corresponding adjustment in Contract Price or Contract Time, or both, made necessary by such Delay.

10.4.4. If the Hazardous Material was brought to the site by the **Contractor**, or results in whole or in part from any violation by the **Contractor** of any Law covering the use, handling, storage, disposal of, processing, transport and transfer of Hazardous Materials or from any other act or omission within its control, the **Contractor** shall bear its proportionate share of the Delay and costs involved in cleaning up the site and removing and rendering harmless the Hazardous Material to the satisfaction of the **Owner**, State and all Political Subdivisions with jurisdiction. If the **Contractor** fails to proceed with due diligence to take appropriate action pursuant to applicable Law and consistent with the **Owner** requirements, the **Owner** may act accordingly, in which case the **Contractor** shall defend, indemnify, and hold harmless the **Owner** from and against all claims, as construed in paragraph 1.4, arising from the **Owner's** exercise of such appropriate action.

10.5 Incidents with Archaeological Features:

10.5.1. The **Contractor** shall at once notify in writing the **Owner** of any Archaeological Feature deposits that are encountered or unearthed during the execution of the Work. The **Contractor** shall protect the deposits in a satisfactory manner and no further disturbance of the Archaeological Features shall take place until Work is allowed to be resumed in the affected areas.

10.5.2. If the **Owner**, with the advice of the **Professional**, concludes that the Contract Documents require changes because of Archaeological Features encountered, the **Owner** will amend the Contract Documents to provide for any changes in the Work and corresponding adjustment in Contract Price and/or Contract Time made necessary by the changes due to the Archaeological Features encountered and by any resulting Delay which is not reasonably anticipatable under the circumstances, and which is attributable to the **Owner** and/or **Professional.**

10.6 Unit Price Work:

10.6.1. If the Contract Documents specify Unit Price Work, the Contract Price shall contain the sum of each unit price times its estimated quantity. The **Contractor** shall be responsible for completing, within the Contract Times, one hundred twenty (120%) of the estimated quantities of Specified Unit Price Work and reasonable quantities of Contingent Unit Price Work.

10.6.2. The **Contractor** shall promptly, **before proceeding with any affected Unit Price Work**, deliver a written notice to the **Professional** (a) whenever actual quantities for an item of Specified Unit Price Work differs materially from those estimated and request an adjustment in the estimated quantity, or (b) requesting authorization to provide any or differing quantities of any item of Contingent Unit Price Work. The **Contractor** or the **Owner** shall submit to the other and the **Professional**, a proposal for adjusting that item's unit price and/or the Contract Time. The proposal shall be properly substantiated.

10.6.2.1. Promptly after being notified by the **Contractor**, the **Professional** will evaluate the affected Unit Price Work and provide its determination to the **Owner** and **Contractor**. If the **Owner** adjusts the estimated quantity of Specified Unit Price Work or authorizes any, or any additional, quantities of Contingent Unit Price Work, the **Contractor** shall proceed with that Unit Price Work as directed by the **Professional.** The **Contractor** shall proceed with the Unit Price Work regardless of whether the **Owner**, after conferring with the **Professional** determines that a variation in quantity justifies an adjustment in the unit price, or that the existing unit price is valid for the additional or reduced quantities, or that no adjustment in the Contract Time is warranted. In the event the **Contractor** disagrees with any such determination, the **Contractor** shall deliver a notice of claim and a claim submittal in accordance with the procedures and within the deadlines set forth in Article 15.

10.6.2.2. Any adjusted Unit Price agreed upon by the **Owner** will only apply to the actual quantities above one hundred twenty percent (120%) or to the actual quantities less than eighty percent (80%) of the estimated quantity. For additional quantities over one hundred twenty percent (120%) or reduced quantities below eighty percent (80%) of the estimated quantity, the **Owner** may negotiate a Unit Price with the **Contractor**, or direct a unilateral change as provided by Article 10 or rebid that Work. In no case, however, will a Unit Price change resulting from a reduction in quantity be renegotiated such that the changed Unit Price produces a modified Bid Price for any line item that exceeds the initial Bid Price for that line item.

10.6.3. No adjustment due to quantity variations shall be allowed (a) unless the **Contractor** met the notice requirements of paragraph 10.6.2, (b) to the extent that the Bid Price for a line item will increase due to reduced quantities at a higher unit, (c) for under runs in any quantities of Contingent Unit Price Work, unless the unit price times the estimated quantity exceeds the lesser of $50,000.00 or two percent (2%) of the Contract Price, or (d) if any unit price increase results in whole or in part from any act or omission within the control of the Contractor (errors in the Contractor's Bid, unbalanced unit prices, etc.).

10.7 Cash Allowances; Provisionary Allowances:

10.7.1. The **Contractor** shall obtain the **Professional's** written acceptance before providing materials, equipment or other items covered by a Cash Allowance. Payments under a Cash Allowance shall be on actual costs, and exclude costs for supervision, handling, unloading, storage, installation, testing, etc., which shall be considered to be included within other elements of the Contract Price. Payments within the limits of an Allowance shall exclude Fee and Bond and insurance premiums since these are already included within other elements of the Contract Price.

10.7.2. The **Contractor** shall complete Work covered by Provisionary/Contingency Allowances as approved in writing by the **Owner** and directed by the **Professional**. The Cost of the Work Involved for Work authorized under any Provisionary/Contingency Allowance shall be determined pursuant to Article 11, except those payments within the limits of any Allowance shall exclude Bond and insurance premiums under paragraph 11.8.1.5, since these costs are already included within other elements of the Contract Price.

10.8 Change Orders; Change Authorizations:

10.8.1. The terms "Change Order" and "Change Authorization" are defined in Section 00020 Glossary. Further, Division 1 includes prototype Change Order and Change Authorization forms which shall be used by the **Owner** and **Contractor** in connection with modifications to the Contract.

*10.8.2. A *bilateral* Change Order which does not incorporate a **Contractor** reservation of rights to claim additional adjustments, shall memorialize the **Owner's** and **Contractor's** agreement as to the adjustments in Contract Price and/or Contract Time made by the Change Order. Any such *bilateral* Change Order shall constitute an all-inclusive settlement for all changes, Delay, and costs, whatsoever, and the **Contractor's** signature on the Bulletin and proposal incorporated into that Change Order represents a waiver of all rights to file a subsequent proposal or a claim under Article 15 on account of that Change Order or the Work.

10.8.3. A presumed *bilateral* Change which includes a proposal signed by the **Contractor** with a reservation to claim additional adjustments shall be regarded as a notice of claim as to those adjustments and shall be pursued as provided in Article 15, except as the **Owner** and **Contractor** may otherwise agree.

10.8.4. A Change Order issued by the **Owner** after unsuccessful Contract Price and/or Contract Time negotiations with the **Contractor** and stating the **Owner's** proposed basis for the necessary adjustments in Contract Price and/or Contract Time shall be a *unilateral* Change Order.

10.8.5. The **Owner** will issue Change Orders to amend the Contract Documents for changes in the Work and for any adjustments in Contract Price or Contract Time agreed to in total or in part by both the **Owner** and **Contractor**; or to correspondingly adjust the Contract Price for Work furnished under Cash Allowances, Work completed that was authorized under Provisionary/Contingency Allowances and actual quantities of Unit Price Work. Amounts for Work Involved in a Change Order signed by the **Owner** may be included in subsequent Requests for Payment.

10.8.6. The **Owner** may use Change Authorizations (a) to document agreed-upon minor variations in the Work, and/or (b) to document or order changes in the Work not warranting any adjustment in Contract Price or Contract Time. Examples of the second category include but are not limited to the **Owner's** authorization for drawing payments against a Provisionary/Contingency Allowance or the **Owner's** consent to quantity variations not increasing the Contract Price.

10.8.7. Before, or in conjunction with, the **Professional's** certification of final payment, an appropriate Change Order will be issued, with the **Professional's** advice, to correspondingly adjust the Contract Price for the value of Work furnished under Cash Allowances, Work completed that was authorized under Provisionary/Contingency Allowances and actual quantities of Unit Price Work.

10.8.8. Subject to the provisions of paragraphs 10.8.2 through 10.8.4, it is a requirement of the Contract Documents that all Change Orders duly signed and issued by the **Owner** shall incorporate Bulletins, which are duly signed by the **Contractor**, regardless of whether the **Contractor** uses a reservation of rights.

ARTICLE 11 CHANGES IN CONTRACT PRICE; CHANGES IN CONTRACT TIME

11.1 General Provisions:

11.1.1. Contract Price or Contract Time may be changed only by Change Order duly signed by the **Owner**. Neither Contract Price nor Contract Time may be changed by Change Authorization (subject to the provisions for constructive changes).

11.1.2. **Contractor** proposals for adjusting Contract Price and/or Contract Time shall be due within fifteen (15) Calendar Days after the **Contractor** receives a Bulletin or delivers to the **Owner** a notice of a change or a Delay. Proposals not complying with the requirements of paragraphs 11.1.4 and 11.1.5 shall be returned for resubmission. This turnaround period is of the essence and any Delay in delivering a bulletin or resulting from resubmission of an incomplete Bulletin shall not justify any increase in Contract Price or Contract Time. The **Owner,** in its sole discretion, may extend or shorten the 15–Day period for Bulletin quotations estimated at more than $250,000 or less than $25,000.

11.1.3. The **Professional** will review each **Contractor** proposal, and the **Profession**al will recommend to the **Owner**, within a reasonable time, whether or not the Bulletin quotation is acceptable. Due to the time required to obtain **Board** and **Director** approvals, a **Contractor** proposal shall be irrevocable for sixty (60) Calendar Days after it is submitted to the **Professional**.

11.1.4. **Contractor** proposals or claims for Work Involved shall detail all affected items of Work, whether increased, revised, added, or deleted, and shall be fully documented and itemized as to (a) individual adds and deducts in Work quantities and labor manhours; (b) corresponding itemized Cost of Work Involved (paragraphs 11.4 through 11.9; and (c) Fee. Proposals or claims including Fee of five percent (5%) for Work Involved of a Subcontractor shall nominate the performing Subcontractor and enclose the Subcontractor's pricing data.

11.1.5. For **Contractor** proposals or claims for adjustments in Contract Price arising from Delays (whether or not such Delays extend any Contract Time or any early completion date), the **Contractor's** estimates shall be as comprehensive and detailed as may be appropriate to support the proposal or claim. Examples of germane information include labor productivity, labor manpower levels, production data and Progress Schedule revisions.

11.1.6. If the **Contractor's** surety requires notice of any adjustment in Contract Price and/or Contract Time, whether made pursuant to Article 11 or otherwise; any "or equal" material or equipment or substitution approved by the **Professional**; any change within the scope of Article 10; or any other addition, deletion or revision in the requirements of the Contract Documents, whether made by Change Order or Change Authorization, it shall be the **Contractor's** responsibility, and not the **Owner's**, to give notice to the **Contractor's** surety. It is agreed that none of these modifications to the Contract Documents and/or the Work shall invalidate the Agreement.

11.1.7. No Adjustment for Tariff Changes**.** The **Contractor** will not be entitled to any adjustment to the Contract Price or Contract Time because of the: (a) imposition of new Tariffs; (b) increases or decreases in existing Tariffs; (c) reclassification, reinterpretation, or enforcement actions by federal agencies; or (d) any change in trade or customs law or other governmental action affecting importation or Tariffs.

11.2 Changes in Contract Time:

11.2.1. An extension in Contract Time will be justified only to the extent that the **Contractor** demonstrates, with comprehensive and detailed documentation, that the Delay is not reasonably anticipatable under the circumstances, is not caused by act or omission within the control of the **Contractor**, and, furthermore, that the Delay necessarily extends the Work, or portion of the Work in question, beyond the pertinent Contract Time.

If the **Owner** determines that the **Contractor's** documentation is insufficient to allow a thorough evaluation of the time extension request, the **Contractor** shall further support the request through a detailed analysis of the Progress Schedule Revision Submittal.

11.2.2. Examples of events that may justify an extension in Contract Time include acts of God or the public enemy; acts of the U.S. Government, the State or a Political Subdivision, each acting in its public capacity (including acts as permitting agency); acts of a Public Utility acting in its public capacity; fires, floods, epidemics, quarantine restrictions; strikes, freight embargoes; unusual weather (unusual in the sense of frequency or severity vis-à-vis the prior five (5) year average); unusually severe shortages of construction materials (considering all feasible sources of supply); Underground Utilities which the Contract Documents, through error or omission, inaccurately show or indicate; Underground Utilities not previously located; objection, for the **Owner's** convenience, to a nominated Subcontractor; Archaeological Features; suspension of Work; changes in the Work, differing site conditions; variation in quantities; and Delay, as provided in this paragraph, of Subcontractors or Suppliers, at any tier, not caused in whole or in part by any act or omission within the control of both the **Contractor** and any such Subcontractors and Suppliers.

11.2.3. If upon evaluation of the **Contractor's** analysis, the **Owner** approves an extension in Contract Time for Delay not caused in whole or in part by any act or omission within the control of the **Owner** and/or **Professional**, the **Owner** shall authorize the necessary adjustment in Contract Time *only*. If the **Owner** approves an extension in Contract Time for Delay caused in whole or in part by any act or omission within the control of the **Owner** and/or **Professional**, the **Owner** shall authorize the necessary adjustments in Contract Time and Contract Price.

11.3 Methods for Making Adjustments in Contract Price:

11.3.1. The method to be used to determine any adjustment in Contract Price shall be selected by the **Owner** from one of the methods in paragraph 11.3.1.1 through 11.3.1.3, or otherwise shall be limited to the methods in paragraph 11.3.1.4 or 11.3.1.5.

11.3.1.1. If any Work Involved is covered by lump sum prices or unit prices contained in the Contract Documents, those prices shall be used (subject to the terms and conditions of paragraph 10.6 Unit Price Work). In the latter case, the unit prices shall be applied to the quantity of Unit Price Work Involved.

11.3.1.2. If any Work Involved is not covered by lump sum or unit prices contained in the Contract Documents, then application of a lump sum price may be negotiated using the **Contractor's** itemized estimate of the *anticipated* Cost of the Work Involved, as specified in this Article, and a Fee for the Work Involved, as specified in paragraph 11.11.1.

11.3.1.3. If the Work Involved is not covered by the first two methods, the **Owner** may direct the **Contractor** to proceed with the Work Involved on an *actual cost* basis, with or without a guaranteed maximum, based on an itemized breakdown of the *actual* Cost of the Work Involved, as specified in this Article, and a Fee for the Work Involved, as specified in paragraph 11.11.2.

11.3.1.4. If the Work Involved is not covered by the first two methods, the **Owner** may direct the **Contractor** to proceed through a *unilateral* Change Order on a lump sum basis or a not-to-exceed basis, based on the **Professional's** estimate of the anticipated Cost of Work Involved and a Fee for the Work Involved, as specified in paragraph 11.11.1 or 11.11.2.

11.3.1.5. If payment for the Work Involved is to be determined by the Michigan Court of Claims or a AAA arbitration panel, it is agreed by the **Contractor** that the *actual cost* and Fee method in paragraph 11.3.1.3 shall represent the appropriate method for determining such payment.

11.3.2. Items making-up the Cost of the Work Involved shall be allowable to the extent (a) consistent with those prevailing in the Project locality, (b) necessary, reasonable, and clearly allocable to the Work Involved, and (c) limited to labor costs, Subcontract costs, material and equipment costs, construction equipment costs and general conditions costs, as specified in this Article.

11.4 Labor, Subcontract and Material/Equipment Costs:

11.4.1. The Cost of any Work Involved includes the **Contractor's** payroll costs for craft workers resident at the site (through crew foremen) assigned to furnishing and incorporating materials and equipment into the Work Involved. If craft labor manhours exceed those that can be gleaned from the Means Cost Data, or other cost guide acceptable to the **Owner**, the **Contractor** shall provide proper justification, which shall be acceptable to the **Professional**.

11.4.1.1. Payroll costs shall include wages, labor burdens and a factor for field supplies and purchase costs (less market value if not consumed) of tools not owned by the workers. Labor burdens shall be certified by an authorized financial representative of the **Contractor** and may include social security, unemployment taxes, workers' compensation, health and retirement benefits, vacation, and holiday pay. The factor for field supplies and tools (individually valued at less than $1,000.00) shall not exceed four percent (4%) of the wages without burdens, unless the **Contractor** furnishes detailed data which supports a higher factor. For actual payroll costs, **Contractor** time sheets verified by the **Professional** and/or certified payrolls shall be the only valid Records. For actual payroll costs under paragraph 11.3.1.5, time sheets shall be valid only if they expressly correlate to the Work Involved and were recorded at that time and/or used for certified payrolls.

11.4.2. The Cost of the Work Involved includes the **Contractor's** costs for the labor costs, (lower tier) Subcontract costs, material and equipment costs and general conditions costs of Subcontractors nominated for the Work Involved. Except for a higher six percent (6%) limit on the factor for field supplies and small tools, the methods for calculating Subcontractors' costs shall be the same as those for **Contractor** costs,

except that the term "Subcontractor" shall replace the term "**Contractor**," context permitting. If the **Owner** and **Contractor** agree in advance, the **Contractor** shall obtain detailed quotations and shall nominate at least two (2) Subcontractors, acceptable to both the **Contractor** and **Professional**, for selection by the **Owner**.

11.4.3. The Cost of any Work Involved includes the **Contractor's** costs for materials, commodities (including all fuel, gas, or other consumables necessary to operate any equipment), devices, equipment, transportation, storage, and necessary Suppliers' field services. All trade discounts, rebates and refunds and returns from surplus sales that can be realized at the time of pricing shall accrue to the **Owner**, and the **Contractor** shall make arrangements so that they may be obtained. If the Bulletin for the Work Involved *lists* specific Suppliers, the **Contractor** shall obtain written quotations from them and shall nominate one of the *listed* Suppliers to allow a comprehensive review of the proposal by the **Professional**. Invoices segregating items relating to the Work Involved shall be valid Records in support of actual Supplier costs.

11.5 Construction Equipment Costs:

11.5.1. The cost of any Work Involved includes costs for individual construction equipment with replacement value in excess of $1,000.00. Transportation, loading and unloading, installation, dismantling and removal and shipping costs shall be allowed to the extent required by the Work Involved and reasonable under the circumstances. Equipment costs shall cease when the equipment is no longer needed for the Work Involved. Payroll costs for labor operating the equipment are as specified in paragraph 11.4.1. Equipment costs shall be computed using the same accounting and estimating rules and prices, whether related to added or deleted Work.

11.5.2. When determining actual construction equipment costs (a) under paragraph 11.3.1.3, daily logs of the equipment, operators, and actual usage, verified by the **Professional**, shall be the valid Records; (b) under paragraph 11.3.1.5, such daily Records shall be valid only if developed when any such Work Involved was performed and used for accounting purposes.

11.5.3. Rented (or owned) equipment, idled solely by actions of the **Owner** or **Professional**, shall be paid at the rate for rented equipment (or at fifty percent (50%) of the rate for owned equipment) provided the idle period exceeds what is normal for the equipment and occurs during normal working hours.

11.6 Rented or Leased Construction Equipment:

11.6.1. Construction equipment rented or leased from third parties shall be priced using the rates negotiated between the **Owner** and **Contractor**. If no agreement is reached, those rates listed in the Rental Rate "Blue Book" published by PRIMEDIA Information Inc. of San Jose, Ca, for the region where the Project is located applicable to the equipment (model number and year) shall be used. For equipment leased or rented on an hourly basis, the rate for second or third shifts shall not exceed fifty percent (50%) of the base rate. Operating costs shall not exceed the hourly operation rate in the Blue Book. Hourly rates for equipment previously in use at the site for a month or longer shall use the monthly rate divided by 176 hours. Equipment previously in use for only one week or not previously in use at the site shall be invoiced to the **Owner** using the following schedule of equipment use:

Less than 8 hours	Hourly Rate
1 Day but less than 7 Calendar Days	Daily Rate
1 week but less than 30 Calendar Days	Weekly Rate
30 Calendar Days or more (when in use)	Monthly Rate

11.7 Owned Construction Equipment:

11.7.1. Construction equipment owned by the **Contractor** or rented or leased from lessors associated with or owned by the **Contractor**, shall be priced using the rates negotiated between the **Owner** and **Contractor** based on the **Contractor's** normal accounting practices. If no agreement is reached, the hourly rates in the "Contractor's Equipment Cost Guide," published by PRIMEDIA Information Inc. for the region where the Project is located shall be used. Operating costs shall not exceed the hourly operation rate in the Blue Book. For multiple shifts, rates shall not exceed the shift Work adjustments recommended in the Cost Guide.

11.8 General Conditions Costs:

11.8.1. The Cost of any Work Involved may include necessary general conditions costs to the extent those costs increase or decrease on account of, or are directly attributable to, the performance of Work Involved, or are required due to an extension in Contract Time or Delay under paragraph 11.13.5. Categories of general conditions which are allowable under this paragraph (subject to the provisions of paragraph 11.9) include:

11.8.1.1. To the extent agreed to in advance by the **Owner**, payroll costs for the **Contractor's** project manager or construction manager, but not both, for Work activities conducted at the site.

11.8.1.2. Payroll costs for the **Contractor's** superintendent and full-time general foremen, if any are assigned to the Work, for Work Involved performed beyond normal working hours and/or to the extent those costs and subsistence expenses arise solely from an extension in Contract Time or Delay under paragraph 11.13.5.

11.8.1.3. If agreed to in advance by the **Owner**, payroll costs for management personnel resident and working at the site and for workers not covered under paragraph 11.4.1, resident at the site and engaged as support workers (i.e., loading/unloading, clean-up, etc.) to workers covered under paragraph 11.4.1.

11.8.1.4. Costs of office and temporary facilities at the site, including office materials, office supplies, office equipment, minor expenses, utilities, fuel, sanitary facilities, internet, and telephone service at the site, provided those cost arise solely from an extension in Contract Time or Delay under paragraph 11.13.5.

11.8.1.5. Costs of liability insurance premiums for insurance not included within the labor burdens charged under paragraph 11.4.1, and costs of Bond premiums.

11.8.1.6. Costs of consultants not in the direct employ of the **Contractor**, or Subcontractors not covered under paragraph 11.4.2; to the extent authorized by the **Owner** before proceeding with the Work Involved, and provided that those costs are neither covered by paragraph 11.4 nor excluded by paragraph 11.10; and

11.8.1.7. Taxes on the Work Involved, and for which the **Contractor** is liable; and royalty payments and fees for permits and licenses, provided they relate solely to the Work Involved.

11.9 Limitations on Allowable Costs:

11.9.1. The **Contractor** shall not include as part of the Cost of any Work Involved any construction equipment costs, small tool costs, or general conditions costs that do not increase on account of, or are not directly attributable to, the furnishing and/or performance of any Work Involved. Examples of such unallowable costs include:

11.9.1.1. Charges for **Contractor's** superintendent, general foremen and management personnel assigned full-time to the Work, if the charges relate to Work Involved which does not extend the Contract Time or cause Delay under paragraph 11.13.5, or to Work Involved not performed beyond normal working hours.

11.9.1.2. Fixed percent mark-ups for construction equipment (as opposed to specific construction equipment costs); or

11.9.1.3. Cost of field supplies and/or small tools solely for extensions in Contract Time or Delay under paragraph 11.13.5.

11.9.2. Changes in Contract Price for extensions in Contract Time or Delay under paragraph 11.13.5 shall exclude any costs that are unaffected or do not relate to the extension in Contract Time or the Delay in early completion. Examples include:

11.9.2.1. Operating costs of construction equipment assigned to the Work for the duration, to the extent used in the incorporation of materials and equipment into the Work, provided the equipment is not subject to increased usage because of the extension in Contract Time or the Delay in early completion.

11.9.2.2. Operating costs plus owned/rental costs of construction equipment brought to the site for a specific activity (crane used for specific lifts, concrete pump used for pours, etc.), provided the equipment is not subject to increased usage because of the extension in Contract Time or the Delay in early completion.

11.9.2.3. Construction equipment and site facilities which are fully paid under the Contract Price for the Work, as awarded.

11.9.3. The **Contractor** shall not include as part of the Cost of any Work Involved acceleration costs incurred, for the **Contractor's** benefit, to make-up Delay which warrant extensions in Contract Time but do not justify increases in Contract Price.

11.10 Costs Covered by the Fee for the Work Involved (and not Allowable as Cost of the Work Involved):

11.10.1. **Contractor** administrative costs and home office overhead, whether at the **Contractor's** principal or branch offices, shall not be allowable as elements of the Cost of Work Involved. Rather, those administrative costs and home office overhead shall be non-reimbursable expenses covered by the Fee for the Work Involved. Examples of administrative costs or home office overhead covered by this provision include, without limitation:

11.10.1.1. Payroll costs and other compensation of executives, general and administrative managers, estimators (except to the extent agreed to in advance by the **Owner**), claim consultants, attorneys, accountants, labor relation coordinators, purchasers, expeditors, and other administrative staff, whether resident at the **Contractor's** principal or branch offices.

11.10.1.2. Payroll costs and other compensation of project managers, construction managers, architects, engineers, schedulers, detailers, safety personnel, clerks, and other administrative staff not resident at the site and who are not part of the **Contractor's** general conditions personnel contingent.

11.10.1.3. Costs of engineers, architects, accountants, consultants, attorneys, and others, in the direct employ of the **Contractor** or otherwise, utilized for services related to a controversy or claim about the acceptability of the Work.

11.10.1.4. Costs incurred in the preparation of Contract Change Orders (whether or not ultimately authorized by the **Owner**), except as otherwise authorized by the **Owner**; and costs incurred in the preparation or filing of claims; and

11.10.1.5. Any interest on the Work Involved, unless otherwise allowed by the Michigan Court of Claims or an arbitration panel; charges for delinquent payments; lost interest on unpaid withholdings; lost profits and lost opportunities; and home office storage and yard facilities.

11.11 Limits on the Fee for the Work Involved:

11.11.1. Any adjustment in Contract Price made by *bilateral* Change Order which stipulates a lump sum price (developed from the **Contractor's** itemized estimate of the *anticipated* Cost of the Work Involved) without incorporating a **Contractor** reservation of rights to claim additional adjustments, shall include a Fee for costs under paragraph 11.10 and for profit, not to exceed the following:

11.11.1.1. For Work Involved to be self-performed by the **Contractor**, the **Contractor's** Fee shall not exceed fifteen percent (15%) of the Cost of the Work Involved. For Work Involved to be performed by any nominated Subcontractor, regardless of tier, the nominated, performing Subcontractor's Fee also shall not exceed fifteen percent (15%) of the Cost of the Work Involved.

11.11.1.2. For Work Involved to be performed by any nominated Subcontractor, the **Contractor's** Fee shall be five percent (5%) of the performing Subcontractor's Cost of the Work Involved, excluding that Subcontractor's Fee. For Work Involved of any nominated lower tier Subcontractor, any corresponding higher tier Subcontractors and the Contractor shall share equally a Fee of five percent (5%) of the performing lower tier Subcontractor's Cost of the Work Involved, excluding the lower tier Subcontractor's Fee.

11.11.2. Any adjustment in Contract Price made by a *bilateral* Change Order (whether based on a *lump sum* or on the *actual cost* of the Work Involved) which incorporates a **Contractor** reservation of rights to claim additional adjustments, shall include a Fee of only two-thirds (2/3) of the Fee otherwise resulting from the application of paragraphs 11.11.1 or 11.11.2.

11.11.3. The credit to be allowed to the **Owner** for any individual change consisting of deletions, or additions and deletions, that yields a negative net Cost of the Work Involved, shall be the amount of the net decrease and, if the negative net Cost of the Work Involved exceeds $10,000.00, a Fee credit of one-fifth of the Fee resulting from the application of paragraphs 11.11.1.1 through 11.11.1.3 shall be added to that amount.

11.11.4. For any change in the Work combining additions, revisions, and deletions, one single Fee for the Work Involved shall be added to the net Cost of the Work Involved, unless the change in the Work combines self-performed **Contractor** Work and Subcontractor Work, or Work of more than one Subcontractor, or both, in which case separate Fees for the **Contractor** Work and for the Subcontractor Work shall be calculated, as appropriate.

11.11.6. In the event unrelated changes in the Work are grouped in a Bulletin, or included in a claim, and each of the changes yields a net increase or decrease in the Cost of the Work Involved, the combined Fee for the changes in the Work so grouped shall be computed as the sum of the individual Fees otherwise calculated under paragraphs 11.11.1 through 11.11.5.

11.12 Fee for Unabsorbed Home Office Overhead:

11.12.1. It is intended that the Fee for the Work Involved allowed under paragraph 11.11 shall be included with any adjustment in Contract Price for any Cost of Work Involved. However, the Fee under paragraph 11.11.1 shall not be intended to cover unabsorbed home office overhead resulting from an extension of the Contract Time stated in paragraph 4.1.1 of Section 00500 Agreement. When justified under the Contract Documents, Fee for unabsorbed home office overhead shall be calculated as detailed in paragraph 11.12.2.

11.12.2. If an extension of the Contract Time stated in paragraph 4.1.1 of Section 00500 Agreement and an increase in Contract Price for such an extension in Contract Time is justified under the Contract Documents, the **Owner** shall negotiate with the **Contractor** the reimbursement of an amount for the **Contractor's** home office overhead (under paragraph 11.10) that will be or were unabsorbed before the expiration of that Contract Time. Any such reimbursement shall be based on the lesser of: (a) the product of the ratio of the **Contractor's** home office overhead to its contract billings times the Contract Price in paragraph 3.1 of Section 00500 Agreement that remains unbilled on the expiration of that Contract Time, or (b) that amount derived from the Eichleay formula.

11.13 Changes in Contract Time for Early Completion:

11.13.1. The Contract Times specified in paragraph 4.1 of Section 00500 Agreement represent the **Professional's** best estimate of the time required to complete the Work and take into account comparisons with completed work similar in scope and character to the Work and constructed under similar conditions.

11.13.2. Since "time is of the essence" in performing this Contract, any early completion Rev. 0 Progress Schedule considered acceptable by the **Owne**r shall be construed as setting forth a corresponding amount of Contract Float, unless the **Contractor** delivers notice of a request for a shortening of the Contract Time within thirty (30) Calendar Days after receiving the **Owner's** written notice of "no objection" to such Rev. 0 Progress Schedule.

11.13.3. If the **Contractor** requests that the Contract Times be shortened to eliminate the Contract Float on any such early completion Progress Schedule, and the **Owner** agrees to the **Contractor's** request, the **Owner** and **Contractor** may negotiate a reduction in the affected Contract Time. Concurrently, the **Owner** will develop a level of liquidated damages appropriate to the revised Contract Time(s) or, if more appropriate under the circumstances, the **Owner** will specify actual damages, applicable from the negotiated, earlier Contract Time to the Contract Time under revision. In such case, the aggregate actual damages shall not exceed the sum liquidated damages that may have resulted from the originally specified liquidated damages. Such agreement shall be memorialized through an appropriate Change Order.

11.13.4. If the **Owner** and **Contractor** are unable to agree to such reduction in the Contract Times, or the **Contractor** rejects the **Owner's** assessment of liquidated or the stipulation of actual damages, or both, the Contract Times in question shall remain unaltered and the early completion Progress Schedule shall be employed as provided in the Contract Documents.

11.13.5. To the extent that the Progress Schedule supports an early completion date, and a Delay extends performance of the Work beyond the **Contractor's** early completion date but not beyond the corresponding Contract Time, if the **Contractor** pursues an increase in Contract Price for such Delay in early completion, the **Owner** shall consider such request, subject to the following: (a) the early completion is reasonably achievable, i.e., includes proper allowances for weather, **Owner** and **Professional** activities, rework and other foreseeable events within the control of the **Contractor**, (b) the Progress Schedule used to support the request is loaded with Activity manpower data, and (c) the adjustment in Contract Price shall equal fifty percent (50%) of the **Contractor's** Delay costs otherwise allowable under this Article.

11.13.6. As a point of emphasis, under these provisions, an increase in Contract Time and an increase in Contract Price equaling the **Contractor's** costs occasioned by the Delay (as opposed to only fifty percent (50%) of the **Contractor's** Delay costs), shall be justified only if the Delay attributable to the **Owner** and/or **Professional** necessarily extends Substantial Completion of the Work, or the portion of the Work having a specified Contract Time, beyond the correspondingly specified Contract Time.

11.14 Access to Records:

11.14.1. The **Contractor** shall maintain and keep and shall require all Subcontractors and Suppliers to maintain and keep, in accordance with generally accepted accounting principles, Records pertaining to the bidding, award and performance of the Work, including, but not limited to payroll and employment Records and all data used in estimating the **Contractor's** Bid and in pricing and negotiating Work covered by any Change Order, Change Authorization, proposal or claim.

11.14.2. For changes payable on an *actual cost* basis, or in the event of any claim, dispute, litigation, audit exception or appeal or termination, the **Owner** and any of the **Owner's** duly authorized representatives shall have access to those Records for the purpose of inspection, audit/review and scanning/copying. The **Contractor** shall provide appropriate facilities for access promptly after receiving a request. The **Owner** and any of its duly authorized representatives shall have the right to interview **Contractor** employees. The **Contractor** shall make employees available on Business Days between 8:00 AM and 4:00 PM, as requested.

11.14.3. Certified payroll and other employment Records of workers assigned to the site, including apprentices and trainees, maintained to comply with the requirements of this provision, shall contain the name and address of each worker, correct wage classification, rate of pay (including contributions, or costs assumed to provide, for fringe benefits), daily and weekly number of hours worked, deductions made, and actual wages paid. The **Contractor** shall maintain Records that show: (a) the anticipated costs or actual costs incurred in providing such benefits, (b) that the commitment to provide such benefits is enforceable, and (c) that the plan or program is financially responsible and has been communicated in writing to the workers affected.

11.14.4. Access to Records, as prescribed in this paragraph, shall be allowed at any time during the execution of the Work and shall remain in full force and effect for five (5) years after final payment, or termination (in the event of termination), or date of final resolution of any dispute, litigation, audit exception or appeal – whichever event actually applies to this Contract.

11.15 Price Reduction for Defective Cost and Pricing Data:

11.15.1. If at any time during the prosecution of the Work, there is good cause to doubt the **Contractor's** compliance with the Defective Cost and Pricing Data requirements of this paragraph 11.15, the **Owner** shall be entitled to make an appropriate withholding from any payment otherwise owed to the **Contractor**.

11.15.2. Whenever the **Contractor** signs a proposal for a Contract Price or Contract Time adjustment, a Change Order or a claim settlement, the **Contractor** will be deemed to have certified, to the **Contractor's** best knowledge and belief, that the representations made and data submitted in pricing and negotiating the Cost of the Work Involved in that price proposal, Change Order, or claim settlement: (a) were made in good faith and are consistent with the facts, (b) are consistent with the provisions of Articles 10 and 11, and (c) are complete, accurate and current as of the date agreement was reached on the corresponding adjustments in Contract Price and/or Contract Time. This certification shall apply in each and every respect to any Subcontractor and Supplier who signs any cost and pricing data attached to any such a proposal for a Contract Price or Contract Time adjustment, Change Order or claim settlement.

11.15.3. If any adjustment in Contract Price or Contract Time made by any Change Order, claim or dispute settlement was increased by a material and significant amount because the **Contractor**, or any Subcontractor or Supplier, at any tier, made representations or furnished cost or pricing data of any kind that were false, contained math errors or were incomplete, the Contract Price shall be correspondingly reduced by Change Order.

ARTICLE 12 PROGRESS PAYMENTS; FINAL PAYMENT

12.1 Schedule of Values:

12.1.1. The Schedule of Values shall be approved by the **Professional** and accepted by the Owner and divide the Work into pay items for significant Sections and areas, facilities, or structures, with subtotals for first tier Subcontractors. If required in Division 1, the Schedule of Values shall be supported by a more detailed breakdown allocating the pay items to the Progress Schedule Activities.

12.1.2. The Schedule of Values shall tabulate labor costs, Subcontract costs and material and equipment costs. Labor costs shall include appropriate sums for construction equipment costs, general conditions costs, administrative costs (paragraph 11.10) and profit, unless separate pay items are itemized for those costs.

*12.1.3. The Schedule of Values shall include the following close-out pay items: (a) two percent (2%) of the Contract Price for Fire Marshall approval, certificate of occupancy and other code approvals, as specified in the Contract Documents, (b) two percent (2%) of the Contract Price for manufacturer warranties, finalized operating and maintenance documentation, **Owner** training documentation, and test and balance reports, and (c) two percent (2%) of the Contract Price to cover finalized Record Documents.

12.2 Requests for Payment:

12.2.1. Once each month, the **Contractor** shall submit to the **Professional** a Request for Payment on the **Owner's** form signed by the **Contractor** certifying Work completed and enclosing all supporting documentation. Each Request for Payment shall certify that all monies owed by the **Contractor** to Subcontractors and Suppliers for which payment previously has been sought has been paid from payments received and include a sworn statement. No Request for Payment shall include amounts for a Subcontractor or Supplier if the **Contractor** does not intend to use the payments requested, when received, to reduce the **Contractor's** outstanding obligations on the Work.

12.2.2. **The State will only disburse payments under this Contract through Electronic Funds Transfer (EFT)**. Contractor must register with the State at SIGMA VSS to receive electronic fund transfer payments. If Contractor does not register, the State is not liable for failure to provide payment. Without prejudice to any other right or remedy it may have, the State reserves the right to set off at any time any amount then due and owing to it by Contractor against any amount payable by the State to Contractor under this Contract.

12.2.3. Payment to the **Contractor**, if approved by the **Owner**, will be made within thirty (30) Calendar Days after the **Owner** receives and approves a certified Request for Payment from the **Professional**. Payment for authorized reimbursable expenses shall be made monthly in the amount incurred before the cut-off date, provided each payment request expense is properly documented in spreadsheet form detailing the information about the request. The **Contractor** will provide a certification in writing that the payment request submittal is true and accurate.

12.2.4. If payment is requested based on materials and equipment stored at the site or at another location agreed to in writing, the Request for Payment also shall be accompanied by (a) consent of surety, (b) a bill of sale, invoice or other documentation warranting that the **Owner** has received the materials and equipment free and clear of all liens, and (c) evidence that the materials and equipment are covered by appropriate property insurance and other arrangements to protect them and the **Owner's** interests. If the documentation provided by the **Contractor** to comply with the intent of this paragraph is unsatisfactory, the **Owner** shall be entitled to withhold an appropriate amount from that Request for Payment until the **Contractor** provides documentation acceptable to the **Owner.**

12.2.5. The **Contractor** warrants and guarantees that title to all Work, materials and equipment covered by any Request for Payment, whether incorporated in the Work or not, will pass to the **Owner** free and clear of all liens no later than at the time of payment by the **Owner** to the **Contractor**.

12.3 Review of Request for Payment; Intent of Review:

12.3.1. Within ten (10) Calendar Days after receipt of a Request for Payment, the **Professional** shall certify to the **Owner** the amount the **Professional** determines to be due or shall return the Request for Payment to the **Contractor** indicating the reasons for withholding certification.

Certification shall be based on the **Professional's** review of the Request for Payment and enclosed documentation, On-Site Inspections, and on-site Project representation, if any has been provided. If a Request for Payment is returned to the **Contractor**, the **Contractor** shall make the necessary corrections and resubmit that Request for Payment.

12.3.2. The **Professional's** certification of any Request for Payment constitutes a representation to the **Owner** that the Work has progressed to the point indicated; that to the best of the **Professional's** knowledge, information and belief, the quality of the Work is in accordance with the Contract Documents; and that the **Contractor** is entitled to payment in the amount certified. Any such representation by the **Professional**, however, shall be subject to an evaluation of the Work as a functioning whole before and upon Substantial Completion; to the results of any subsequent tests called for in the Contract Documents; to a final determination of quantities and classifications of Unit Price Work (if any is specified) and to any other qualifications stated in the certification.

12.3.3. In the case of final payment, the **Professional's** certification of final payment and recommendation that the Work is acceptable shall be a further representation that conditions governing final payment to the **Contractor** have been met.

12.4 Refusal to Make or to Recommend Payment:

12.4.1. The **Owner** may withhold from any payment an amount based on the **Professional's** refusal to recommend payment or the **Owner's** estimate of the fair value of items entitling the **Owner** to a withholding. Such may include, but not be limited to liquidated damages, claims made against the **Owner** arising out of or related to the Work, payment claims, or failure by the **Contractor** to reimburse the **Owner** any costs the **Owner** is entitled to recover. The **Owner** will give the **Contractor** reasonably prompt written notice supporting such action.

12.4.2. The **Professional** may refuse to recommend all or any part of any payment, or because of subsequently discovered evidence, inspections or tests or the value of the Punch List, nullify all or any portion of any payment previously recommended, as the **Professional** may consider necessary to protect the **Owner** from loss because (a) the Work is Defective or completed Work has been damaged requiring correction or replacement, (b) a defective work/non-compliance notice has not been acknowledged by the Contractor, (c) the Contract Price has been reduced by Change Order, (d) it has been necessary that the **Owner** correct Defective Work or complete Work, (e) reasonable evidence exists that all or a part of the Work will not be completed within the corresponding Contract Time, (f) of the **Contractor's** failure to comply with all material requirements of the Contract, including, but not limited to the failure to submit Progress Schedule Submittals or Record Documents when due, (g) stored materials for which payment has been made or is sought has been determined by the **Professional** to be damaged or missing, (h) amounts are requested for a Supplier which is not the Supplier named in the **Contractor's** completed Section 00440 Schedule of Materials and Equipment or a Supplier approved by the **Professional** through an "or equal" or substitution procedure, or (i) the **Professional** reasonably believes or knows of the occurrence of an event justifying termination for cause.

12.5 Request for Final Payment:

12.5.1. The **Contractor** shall complete the Substantial Completion Punch List within the Contract Time and date fixed by the **Professional**. The **Contractor** shall assemble all requisite documentation before requesting final inspection.

12.5.2. Upon written notice from the **Contractor** that the **Contractor** considers the entire Work, or a part of the Work for which final payment is specified in the Contract Documents, to be complete and ready for final payment, the **Professional** will make a final completion inspection with the **Owner** and **Contractor** and notify the **Contractor** in writing of all instances of incomplete or Defective Work revealed by the final inspection. The **Contractor** shall immediately undertake all necessary measure to complete Work in the final completion inspection.

12.5.3. The **Contractor** may request final payment after completing the incomplete or Defective Work to the satisfaction of the **Professional** and delivering final operating and maintenance documentation (with revisions made after Substantial Completion), warranties, inspection certificates, Record Documents (with revisions made after Substantial Completion), release of payment claim forms and all other required documents.

12.5.4. The **Contractor's** request for final payment shall enclose evidence of completed operations insurance and affidavit certifying that the insurance coverage will not be canceled, materially changed or renewal refused except as provided in paragraph 7.4.3, and an affidavit certifying that the surety agrees that final payment shall not relieve the surety of any of its obligations under the Performance Bond and Payment Bond. The **Contractor's** request for final payment shall further include (a) a **Contractor's** "Guarantee and Statement" (available from the **Owner**, form DTMB-0437) containing a statement of guaranteed indebtedness acceptable to the **Owner** in the full amount of the Contract Price, or a release of payment claims in the form of a release of liens, or a Bond or other security acceptable to the **Owner** to indemnify the **Owner** against any payment claim, and (b) a list of all pending insurance claims arising out of or resulting from the Work being handled by the **Contractor** and/or its insurer.

12.6 Final Payment and Acceptance:

12.6.1. If the **Professional** is satisfied that the Work, or a part of the Work for which separate final payment is specified in the Contract Documents, has been completed and the **Contractor's** other obligations under the Contract Documents have been fulfilled, the **Professional** will, within thirty (30) Calendar Days after receipt of the final payment request, furnish to the **Owner** and **Contractor** the **Professional's** certification of final payment and acceptance. If the **Professional** is not satisfied, the **Professional** will return that request to the **Contractor**, indicating in writing the reasons for not certifying final payment, in which case the **Contractor** shall make the necessary corrections and request that final payment again be considered.

12.6.2. If the **Owner** concurs with the **Professional's** certification of final payment, the **Owner** will, within thirty (30) Calendar Days after receipt by the **Owner** of the **Professional's** certified recommendation of final acceptance, pay the balance of the Contract Price, subject to those provisions governing final payment specified in the Contract Documents. If the **Owner** does not concur with the **Professional's** determination, the **Owner** will return the request for final payment to the **Contractor** indicating in writing the reasons for refusing final payment and acceptance. In that case, the **Contractor** shall make the necessary corrections and shall request that final payment be again considered by the **Owner**. The **Owner's** written determination will be binding upon the **Contractor**, unless the **Contractor** delivers a notice of a claim and a claim Submittal within the deadlines set forth in Article 15.

12.6.3. If final completion of the Work is significantly delayed through no fault of the **Contractor**, the **Owner** may, upon receipt of the **Contractor's** final Request for Payment, and without terminating the Agreement, make payment of the balance due for that portion of the Work fully completed and accepted. Payment of the balance due shall be made under the provisions for final payment but shall not constitute a waiver of claims.

12.6.4. The **Owner** shall pay with reasonable promptness any amounts deducted from the final payment, upon resolution of the claims justifying withholding of such monies.

12.7 Contractor's Continuing Obligation:

12.7.1. The following does not constitute acceptance of the Work in the event the Work or any Work is not in accordance with the Contract Documents, and therefore does not release the **Contractor** from its obligation to perform and furnish the Work in accordance with the Contract Documents: (a) a certification by the **Professional** of any Request for Payment or final payment; (b) the issuance of a Substantial Completion certificate; (c) any payment by the **Owner** to the **Contractor**; (d) any Partial Use; (e) any act of acceptance by the **Owner** or any failure to do so; (f) any review and approval of a Shop Drawing, sample, test procedure or other Submittal; (g) any review of a Progress Schedule; (h) any On-Site Inspection; (i) any inspection, test or approval; (j) any issuance of a notice of acceptability by the **Professional**; or (k) any correction of Defective Work or any completion of Work by the **Owner**.

12.8 Waiver of Claims:

12.8.1. The making and acceptance of final payment do not constitute a waiver by the **Owner** of any rights as to the **Contractor's** continuing obligations under the Contract Documents, nor will it constitute a waiver of any claims by the **Owner** against the **Contractor** still unsettled, or arising from unsettled payment claims, Defective Work appearing after final inspection or failure by the **Contractor** to comply with the Contract Documents or the terms of any special warranties provided by the Contract Documents or by Law.

12.8.2. The making and acceptance of final payment will constitute a waiver of all claims by the **Contractor** against the **Owner**, other than those claims previously made in writing, on a timely basis in accordance with Article 15, and still unsettled.

ARTICLE 13 OTHER WORK

13.1 Related Work at Site:

13.1.1. During the period allowed for the furnishing and performance and completion of the Work, the **Owner** may undertake other work at the site with its own forces, or have other work performed at the site by other parties (including, but not limited to contractors or Public Utilities). If the Contract Documents do not note the performance of any such other work, written notice will be given to the **Contractor** before starting that work.

13.1.2. Whenever work to be performed by the **Contractor** interfaces with other work, the **Contractor** shall coordinate that work with the interfacing work. Paragraphs 13.2 and 13.3 outline representative duties and responsibilities assumed by the **Contractor** under this requirement.

Such duties and responsibilities are for the benefit of the parties on the other work to the extent there are comparable provisions for the benefit of the **Contractor** in the contracts between those parties and the **Owner**.

13.2 Coordination Requirements:

13.2.1. If other work is ongoing concurrently with the Work, the **Contractor** shall afford the responsible party proper and safe access to the site. The **Contractor** shall afford the other party a reasonable opportunity for the handling, unloading and storage of their materials and equipment and for the execution of their work.

13.2.2. If any part of the Work, for proper execution or results, interfaces on the work of the **Owner** or another party, the **Contractor** shall inspect and promptly report to the **Professional** in writing conditions in that work that render it unavailable or unsuitable for proper execution and results. The **Contractor's** failure to do so will constitute an acceptance of such other work as fit and proper for integration with the Work except for latent or non-apparent defects and deficiencies in the other work.

13.2.3. The **Contractor** shall do all cutting, fitting, patching, and interfacing of the Work that may be required to make any part of the Work come together properly and integrate with other work. The **Contractor** shall not cut, excavate, or otherwise alter any other work without prior written consent of the party responsible for such other work.The **Contractor** shall supply, install and/or cause items to be built into interfacing Work, verify dimensions of interfacing Work, and notify the **Professional** of interfacing work that is unsatisfactory for, or prevents satisfactory installation of, any Work. Installation of any Work shall constitute acceptance by the **Contractor** of all previously placed interfacing work.

13.2.4. The **Contractor** shall be responsible for cooperating with the **Professional** fully in the coordination of the **Contractor** Submittals with interfacing submittals of other parties whose work in any way integrates with the Work or vice versa. Any such coordinated Submittal of the **Contractor** shall identify, by specific written notation, Work which integrates with the other work and of which the **Contractor** knows or has reason to know.

13.2.5. If the **Owner** contracts for other work, the **Owner** will have authority and responsibility for coordinating the operations of the **Contractor** and the other work. The **Owner** may delegate the specific authority and responsibility for coordinating the operations of the **Contractor** and of those parties performing the other work to another organization either by provision in Section 00800 Supplementary Conditions or at the pre-construction conference.

13.3 Claims Between the Contractor and Other Parties:

13.3.1. If the **Contractor** causes damage to the work or property of others, or if a claim arising out of the **Contractor's** execution of Work is made by another party against the **Contractor**, **Owner** or **Professional**, the **Contractor** shall promptly attempt to settle with that party by agreement or otherwise resolve the claim. The **Contractor** shall in any event, defend, indemnify, and hold harmless the **Owner** and **Professional** from and against all claims, as provided in paragraph 1.4, and/or judgments arising out of or resulting from damage by the **Contractor** to the work or property of others.

13.3.2. If another party causes damage to the Work or property of the **Contractor**, or if the performance of other work results in any claim by the **Contractor**, the **Contractor** shall promptly resolve the issue by agreement or otherwise resolve the claim. The **Contractor** shall not begin any action against the **Owner** (or its departments, agencies, boards, commissions, officers, and employees) or **Professional** (or their consultants, agents or any of their directors, officers, shareholders, agents, or employees), or permit any action against them to be maintained in the **Contractor's** name or for the **Contractor's** benefit before any court or tribunal, which action seeks to impose liability or recover damages from the **Owner** or **Professional** for such claim.

13.3.3. If the **Contractor** becomes involved in settling or otherwise resolving claims and disputes with other parties performing other work from events covered under paragraphs 13.3.1 or 13.3.2, or because of any other similar controversy, including damage to the Work or other work, or a dispute about responsibility for clean-up or any other issue, neither the **Owner** or **Professional** nor any of their respective consultants, agents, directors, shareholders, officers or employees will be involved in any way in such action (unless subpoenaed or ordered by a court). If the **Owner** incurs costs or damages of the types barred by the provisions paragraphs 13.3.1 and 13.3.2, the **Contractor** shall reimburse those costs and damages to the **Owner**.

13.3.4. Except as excluded in paragraph 13.3.5, if any party performing other work causes Delay upon the Work and if, upon a request from the **Contractor**, the **Owner** determines that any such Delay justifies an increase in Contract Price and/or Contract Time, the **Owner** shall amend the Contract Documents to provide the necessary adjustment in Contract Price or Contract Time, or both.

13.3.5. If a party performing other work is granted an extension in a contract time only (on account of Delay not reasonably anticipatable under the circumstances nor caused, in whole or in part, by any act or omission of the other party, the **Owner**, **Professional** or the **Owner's** representative on that other work), and if, upon a request from the **Contractor**, the **Owner** determines that the time extension granted to the other work requires a change in a coterminous Contract Time in the Contract Documents, the **Owner** shall amend the Contract Documents to provide for the necessary change in Contract Time only.

ARTICLE 14 TERMINATION

14.1 Notice Requiring Assurance of Due Performance:

14.1.1. The **Owner** may request the **Contractor** (with copy to the surety) to provide written assurance of due performance if, at any time, any of the following non-conformances occur, any of which, if not corrected, may justify defaulting the **Contractor**:

14.1.1.1. The **Contractor** fails to complete the Work, or a specified part of the Work, within the corresponding Contract Time; fails or refuses to supply sufficient management, supervision, workers, materials, or equipment; or otherwise fails to prosecute the Work, or any specified part of the Work, with the diligence required to comply with the Contract Time(s).

*14.1.1.2. The **Contractor** persistently disregards the authority of the **Professional** or violates or disregards a provision of the Contract Documents or the Laws of any Political Subdivision with jurisdiction; or

14.1.1.3. The **Contractor** admits in writing, or the **Owner** otherwise establishes, the **Contractor's** inability or refusal to pay the **Contractor's** debts generally as they become due; or in response to the **Owner's** demand, fails to provide adequate, written assurance that the **Contractor** has the financial resources necessary to complete the Work within the Contract Time.

14.1.2. Within seven (7) Calendar Days after the **Contractor** receives a notice requiring assurance of due performance, the **Contractor** shall meet with the **Owner** and present the **Contractor's** plan to correct the non-performance with supporting documentation. If the **Owner** determines that the **Contractor's** plan provides adequate assurance of due performance, that determination shall not waive the **Owner's** right to subsequently default the **Contractor** or affect any rights or remedies of the **Owner** against the **Contractor** and/or surety then existing or that may accrue in the future.

14.2 Contractor Default and Termination for Cause:

14.2.1. The **Owner**, after giving the **Contractor** and surety seven (7) Calendar Days' written notice of intent to default, may declare the **Contractor** in default and terminate the services of the **Contractor** of upon the occurrence of one or more of the following events:

14.2.1.1. At or after the meeting referred to in paragraph 14.1.2, the **Owner** determines that there is sufficient cause, giving the issues raised, to default the **Contractor.**

*14.2.1.2. The **Contractor** fails to comply with the Michigan Residency requirements (1984 PA 431, as amended, MCL 18.1241a); or is found to be in violation of Section 4 of 1980 PA 278 concerning unfair labor practices, or any nondiscrimination requirements imposed by Law.

14.2.1.3. The **Contractor** violates or breaches any material provision of the Contract Documents which provides contractually for the for-cause termination or rescission of the Contract or of the **Contractor's** right to complete the Work.

14.2.1.4. A trustee, receiver, custodian, or agent of the **Contractor** is appointed under contract, as opposed to under bankruptcy Law, whose appointment or authority to take over the **Contractor's** property is for the purpose of enforcing a lien against such property or for the general administration of such property for the benefit of the **Contractor's** creditors; or

14.2.1.5. It is determined that gratuities, including, but not limited to entertainment, gifts or donations were given by or on behalf of the **Contractor** to an official, agent, servant, or employee of the **Owner** or **Professional** to secure the Contract or favorable treatment with respect to the awarding or amending or the making of any determination relative to the execution of the Work.

14.2.2. Unless otherwise agreed between the **Owner** and **Contractor,** at the expiration of the seven (7) Day (intent to default) period, the **Contractor** shall immediately stop all Work and proceed in accordance with the **Owner's** instructions. Following receipt, and expiration, of a second seven (7) Day written notice period intended to allow the surety to complete an investigation of the default, the surety shall immediately:

14.2.2.1. If approved by the **Owner,** arrange for the **Contractor** to continue with performance and prosecution of the Work to completion; or

14.2.2.2. Undertake to perform and complete the Work, in accordance with the Contract Documents, in place of the **Contractor**, either through the surety's agents or by executing Sub agreements with qualified contractors (excluding the **Contractor** and any of the **Contractor's** affiliates), or both; and

14.2.2.3. If agreed to by the **Owner**, waive the surety's rights set forth elsewhere in this Article, and with reasonable promptness under the circumstances, after investigating in good faith and with due care and diligence, determine the amount for which it may be liable to the **Owner**, and present that determination to the **Owner**. If the **Owner** rejects that amount, the surety shall negotiate a sum acceptable to the **Owner** and promptly pay that amount to the **Owner** in full and with interest from the date the termination of the **Contractor's** services became effective. If the **Owner** rejects the sum determined by the surety, or if the surety fails to negotiate an agreement with the **Owner** on the amount of the surety's liability, the **Owner** shall have full power and authority to default the surety.

14.2.3. If the **Owner** has terminated the **Contractor**, and the surety elects to act under paragraph 14.2.2.2, the **Owner** will determine in good faith the amount necessary to cover the total direct, indirect and consequential costs (including, but not limited to liquidated damages, costs of correcting Work, fees and charges of engineers, architects, attorneys and others and any other costs and damages for which the surety is liable under Section 00610 Performance Bond) that the **Owner** believes it will sustain from that default. The **Owner** will communicate its determination to the surety, and the **Owner** will deduct that amount in its entirety from Requests for Payment under the Contract Documents. Upon completion of the Work, if the unpaid balance of the Contract Price is not sufficient to reimburse the **Owner** for all actual direct, indirect, and consequential costs resulting from the default of the **Contractor**, the surety and **Contractor**, jointly and severally, are liable to the **Owner** for the difference, which they shall pay to the **Owner** promptly.

14.2.4. If the **Owner** has terminated the **Contractor**, and the surety elects to act under paragraph 14.2.2.2, the surety's contract with another contractor makes that contractor a Subcontractor under the Contract, in which case: (a) the provisions of Article 11 shall remain in full force and effect, (b) the methods and criteria to be used to compute the surety's (in lieu of the **Contractor's**) and that contractor's Cost of and Fee for any Work involved shall be limited to those provided in Article 11, and (c) all Work performed by any such contractor pursuant to a Sub agreement with the surety shall be governed by the flow-through requirement in paragraph 5.1.6, the waiver of rights of subrogation provision in paragraph 7.8 and any other requirements of the Contract Documents governing Sub agreements.

14.2.5. If the **Owner** has terminated the **Contractor**, any such termination will not affect any rights or remedies of the **Owner** against the **Contractor** or surety, or both, then existing or that may accrue after termination. All provisions of the Contract Documents that, by their nature, survive final acceptance of the Work shall remain in full force and effect after a termination for cause of the **Contractor** or default of the surety, or both.

14.2.6. The **Owner** may, in its sole discretion, permit the **Contractor** to continue to perform Work when the **Contractor** is in default or has been defaulted. Such decision by the **Owner** shall in no way operate as a waiver of any of the **Owner's** rights under the Contract Documents or Section 00610 Performance Bond, nor in the event of a subsequent default, entitle the **Contractor** or surety to continue to perform or prosecute the Work to completion.

14.3 Surety Default:

14.3.1. If upon receipt of a notice of termination for cause, the surety fails to proceed immediately and as provided in paragraph 14.2.2, the **Owner** shall declare the surety in default under Section 00610 Performance Bond in accordance with the terms and conditions of this paragraph.

14.3.1.1. No default of the surety under the Section 00610 Performance Bond shall be declared, however, until the expiration of fifteen (15) Calendar Days after receipt by the surety of an additional written notice from the **Owner** demanding that the surety perform its obligations under Section 00610 Performance Bond.

14.3.2. If the **Owner** declares the surety in default, the **Owner** shall have full power and authority to exclude the surety and **Contractor** from the site, assume any Sub agreements that the **Owner** so selects and take possession of the Work and of all the surety's and **Contractor's** tools, plant and office, and construction equipment at the site (without liability to the surety or **Contractor** for trespass, rent or conversion). The **Owner** will (a) proceed to the full extent that the surety and **Contractor** could have proceeded, (b) incorporate into the Work all materials and equipment stored at the site or elsewhere, and (c) prosecute the Work to completion as the **Owner** may deem expedient. When the **Owner** exercises any of the rights or remedies provided in this paragraph, the **Owner** shall not be required to obtain the lowest price for Work performed.

14.3.3. If the **Owner** has defaulted the surety, any such termination or default will not affect any rights or remedies of the **Owner** against the **Contractor** or surety, or both, then existing or that may accrue after termination. Any retention or payment of monies due the **Contractor** or surety by the **Owner** will not release the **Contractor** or surety from liability. All provisions of the Contract Documents that, by their nature, survive final acceptance of the Work shall remain in full force and effect after a termination for cause of the **Contractor** or default of the surety, or both.

14.4 Termination for Convenience of the Owner:

14.4.1. Upon fifteen (15) Calendar Days' written notice to the **Contractor** and surety, or sooner if reasonable under the circumstances, the **Owner** may, without cause and without prejudice to any other right or remedy it may have, elect to terminate any part of the Work, or the Agreement in whole or in part, as the **Owner** may deem appropriate for its convenience. Upon receipt of any such termination notice, the **Contractor** shall immediately proceed in accordance with any specific instructions, protect and maintain the Work, and make reasonable and diligent efforts to mitigate costs associated with the termination.

14.4.2. In any termination for convenience, the **Contractor** shall be paid for (a) Work completed, in accordance with the Contract Documents, before receipt of the notice of termination, and (b) reasonable termination settlement costs for commitments that had become firm before the termination. The **Contractor** shall not be paid any anticipated and unrealized general conditions costs, administrative expenses, and profit for uncompleted Work. If no agreement can be reached as to reasonable termination costs, the **Owner** will make a determination in writing which shall be final and binding on the **Contractor** unless the **Contractor** delivers notice of a claim and a claim Submittal in accordance with the procedures and within the deadlines set forth in Article 15.

14.4.3. Upon termination for convenience, the **Owner** shall have full power and authority to take possession of the Work, assume any Sub agreements with Subcontractors and Suppliers that the **Owner** selects, and prosecute the Work to completion by contract or as the **Owner** may deem expedient.

14.4.4. If after notice of termination of the services of the **Contractor**, it is determined the **Contractor** was not in default, the termination shall be deemed to have been for the convenience of the **Owner**. In such event the **Contractor** may recover from the **Owner** payment in accordance with paragraph 14.4.2.

14.5 The Contractor May Suspend Work:

14.5.1. In addition to being entitled to earning interest on unpaid Requests for Payment, the **Contractor** may, upon fifteen (15) Calendar Days written notice to the **Owner**, suspend the Work for the **Owner's** convenience if, through no act or fault of the **Contractor**, the **Professional** fails, for thirty (30) Calendar Days, to initiate processing of any Request for Payment or the **Owner** fails, for ninety (90) Calendar Days, to pay the **Contractor** any Request for Payment finally certified by the **Professional** to be due

14.5.2. Except as specifically provided in paragraph 14.5.1, this provision shall not relieve the **Contractor** of the **Contractor's** obligations to prosecute the Work in accordance with the Progress Schedule and without Delay during any disputes and disagreements with the **Owner**.

ARTICLE 15 DISPUTES

15.1 Claims Under This Article:

15.1.1. All claims, counterclaims, disputes, and other matters in question between the **Owner** and **Contractor** arising out of or relating to the Contract Documents or the breach thereof, shall be submitted in writing to the **Professional** and otherwise processed and resolved as provided in this Article.

15.1.2. A claim means a written demand or assertion by the Owner or Contractor, which is properly certified, seeking an adjustment in Contract Price and/or payment of moneys due, an extension or shortening in Contract Time, the adjustment or interpretation of Contract terms, or other relief arising under or relating to the Contract. If a Bulletin or specific request for proposal has been issued by the Professional or Owner and quoted by the Contractor, it may become a claim or dispute with proper written notice per 15.1.2.1 should the Contractor is object to a written determination and/or rejection by the Professional or Owner under the appropriate provision of the Contract Documents.

15.1.2.1. Claims by either the Owner or Contractor must be initiated by written notice to the other party and to the Initial Decision Maker (Professional/PSC). Claims by either party must be initiated within 21 days after the occurrence of the event giving rise to such Claim or within 21 days after the claimant first recognized the condition giving rise to the claim. Provided such timely notice is delivered, a full and detailed breakdown of cost and time requested, with supporting documentation, if not provided with initial notice shall be delivered to Professional and Owner within 15 days of the notice, as noted in Article 11.1.2, unless otherwise agreed in writing, by the Owner prior to expiration of such time.

15.1.2.2. Pending final resolution of a Claim, except as otherwise agreed in writing or as provided under conditions of failure of timely progress payment or Article 14, the Contractor shall ensure the Work diligently proceeds with the performance of the Contract and the Owner shall continue to make payments in accordance with the Contract Documents. The Owner shall prepare Change Orders and PSC shall certify payment requests in accordance with the decisions of the Initial Decision Maker.

15.1.3. Unless otherwise agreed between the parties, any claim that can be resolved under a provision of the Contract Documents providing for or excluding the relief sought by the claimant shall be resolved in accordance with that provision.

15.1.4. Notice of Claim - Except for **Owner** claims for liquidated damages, no claim shall be valid unless it is based upon written notice delivered by the claimant to the other party and the Professional/PSC within 21 days as per 15.1.2 and 15.1.2.1. The notice shall include a supporting statement stating the nature of the dispute, the amount involved, if any, and the remedy sought. The claim submittal with all supporting data shall be delivered within thirty (30) Calendar Days after Notice (unless the **Professional** allows an extension). The responsibility to substantiate claims shall rest with the claimant.

*15.1.5. A claim by the **Contractor** shall be submitted to the **Professional** and **Owner** for a recommendation or decision from the **Professional** and, if necessary, an **Owner** determination. A claim by the **Owner** shall be submitted to the **Contractor** and the **Professional** for a written recommendation or decision by the **Professional**. The **Owner** reserves the right to audit, using the provisions in paragraph 11.14, any **Contractor** claim (or claim package) that the **Contractor** values at more than $50,000.00.

15.1.6. Pending final resolution of any claim under this Article, the **Contractor** shall proceed diligently with the Work and comply with any decision of the **Owner** and/or **Professional**

15.2 Requirement for Certification of Contractor Claims:

15.2.1. For all **Contractor** claims seeking an increase in Contract Price or Contract Time, the **Contractor** shall submit an affidavit, certifying that the amount claimed accurately reflects any Delay and all costs that the **Contractor** is entitled from the occurrence of the claimed event and that supporting cost and pricing data are current, accurate, complete and represent the **Contractor's** best knowledge and belief. The affidavit shall be executed by an officer or partner of the **Contractor** with proper authority or his/her designee.

15.3 Recommendations or Decisions from the Professional:

*15.3.1. For **Contractor** claims under $100,000.00, if requested in writing by the **Contractor**, the **Professional** will render a recommendation or decision within thirty (30) Calendar Days after the request and the **Owner** will issue, if necessary, a determination within thirty (30) Calendar Days after the **Professional's** recommendation or decision. For **Contractor** claims exceeding $100,000.00, the **Professional** will issue its recommendation or decision and the **Owner**, if necessary, will issue its determination, within sixty (60) Calendar Days after completing an audit of the claim, or after deciding not to conduct such an audit or, in the alternative, will notify the **Contractor** of the date when the determination will be made. In the latter case, a final determination will be concluded within sixty (60) Calendar Days from the date of such notification.

*15.3.2. For **Owner** claims under $100,000.00, the **Professional** will render a recommendation or decision within thirty (30) Calendar Days of the request. For **Owner** claims over $100,000.00, the **Professional**, within sixty (60) Calendar Days, will render a recommendation or decision or notify the **Owner** and **Contractor** when such will be rendered.

*15.3.3. To the extent any **Professional's** decision is to deny a **Contractor** claim or to agree with an **Owner** claim, that decision shall be final and binding on the **Contractor**, without any determination by the **Owner**, unless the **Contractor** files a request for a presentation with the **Director-DCD** within twenty-one (21) Calendar Days as required by paragraph 15.4.1. Unless a claim is made in accordance with these requirements, it shall be waived.

*15.3.4. To the extent that any recommendation from the **Professional** is partly or wholly adverse to a claim from the **Owner**, that determination shall be final and binding on both the **Owner** and **Contractor** unless either party files a request for a presentation with the **Director-DCD** as required in paragraph 15.4.1.

*15.3.5. To the extent the **Professional** recommends payment of any **Contractor** claim which increases the Contract Price, that recommendation shall be subject to a determination from the **Owner** in a written opinion. In the event any such determination from the **Owner** is partly or wholly adverse to the preceding recommendation from the **Professional**, that determination shall be final and binding on the **Contractor** unless the **Contractor** files suit in the Michigan Court of Claims within thirty (30) Calendar Days after receipt of such determination. Unless a claim is made in accordance with these requirements, it shall be waived.

15.4 Determinations by the Director-DCD:

*15.4.1. If either the **Contractor** or **Owner** is not satisfied with any decision of the **Professional** rendered pursuant to paragraph 15.3.3 or 15.3.4, that party shall, within twenty-one (21) Calendar Days of receiving that decision, file a written appeal with the **Director-DCD**. If a **Contractor** or **Owner** appeal is timely filed, the claimant shall be entitled to present its claim, unless waived, to the **Director-DCD**, or his/her designee, provided that a claim narrative with complete supporting documentation is delivered to the **Director-DCD**, or his/her designee, within thirty (30) Calendar Days of that party's written notice of appeal.

*15.4.2. Within thirty (30) Calendar Days after receipt of any such claim narrative, the **Director-DCD**, or his/her designee, shall schedule the time to start the presentations taking into account the dispute's complexity and the urgency of its resolution. Subject to any recognized privilege, discovery shall be available to either party as provided by the **Director-DCD**, and his/her designee, and shall be concluded thirty (30) Calendar Days before the start of the presentations.

*15.4.3. During the presentations, the **Director-DCD**, or his/her designee, shall hear presentations and receive evidence on the matters in dispute, as supported by the statement of the dispute. The **Director-DCD**, or his/her designee, shall have discretion concerning the allowability of evidence submitted, and shall not be bound to any rules of evidence other than those he/she promulgates.

*15.4.4. If the right to a presentation is waived or if a presentation is conducted and the dispute remains unresolved, the **Director-DCD**, or his/her designee, at his/her sole option, shall specify in which forum the dispute shall thereafter be conducted by issuing a written determination to the **Contractor** that the dispute if the **Contractor** so elects, be submitted in writing to:

*15.4.4.1. The Court of Claims maintained by the State of Michigan for the purpose of adjudicating claims against the State or other appropriate court, or

*15.4.4.2. Arbitration in accordance with the construction industry rules of arbitration of the American Arbitration Association, subject to the provisions of paragraphs 15.5.1 and 15.5.2, unless the parties mutually agree otherwise.

*15.4.5. The **Director-DCD's**, or his/her designee's, determination on the forum in which the dispute shall be conducted is final and binding upon the **Owner** and **Contractor**. The **Director-DCD's**, or his/her designee's determination on the dispute shall be final and binding on the **Contractor** unless the **Contractor** files a lawful action in the forum so chosen (Michigan Court of Claims or arbitration) within thirty (30) Calendar Days after receiving the **Director-DCD's**, or his/her designee's, determination.

*15.4.6. If, after such determination from the **Director-DCD**, or his/her designee, the **Contractor** properly submits the dispute to the Michigan Court of Claims or requests arbitration, and the final determination of either forum does not increase the **Contractor's** recovery by thirty (30%) percent or more above that awarded by the **Director-DCD**, or his/her designee, or voluntarily withdraws the action, the **Contractor** shall pay all resulting expenses of the **Owner** (including, but not limited to reasonable charges of attorneys, engineers, others and court or arbitration costs)

15.5 Supplements to AAA Arbitration:

*15.5.1. No arbitration, arising out of, or relating to the Contract Documents shall include, by consolidation, joinder or in any other manner, any additional party not a party to this Contract, except by written consent containing a specific reference to the Agreement and signed by all the parties involved. Consent shall be deemed given by any party who has executed an agreement directly with the **Owner** affected by the Project and containing provisions comparable to those in this Article 15.

Any consent to arbitration involving any additional party or parties shall not constitute consent to arbitration of any dispute not permitted in this Article. The agreement to arbitrate with any additional party or parties duly consented to by the parties to this Contract shall be specifically enforceable under the prevailing arbitration Law.

15.5.2. Subject to any recognized privilege, discovery shall be available to each party to the arbitration as it would be available under the general court rules of the Michigan Court of Claims which shall be enforced by the American Arbitration Association. All discovery and amendments to the prehearing summary shall conclude thirty (30) Calendar Days before the arbitration date. Failure to provide the foregoing discovery shall render any claim supported by witnesses or documents not so disclosed excludable by the arbitration panel in its discretion.

15.6 Interest on a Judgment; Payment of Judgment:

*15.6.1. If, subsequent to a determination by the **Director-DCD**, or his/her designee, the **Owner** or **Contractor** files a Michigan Claims Court or AAA arbitration action, and the party filing for such action increases its recovery by thirty (30%) percent or more above that awarded by the **Director-DCD**, or his/her designee, that party shall be entitled to interest calculated in accordance with MCL 600.6013, as amended, whether the action is filed with the Michigan Court of Claims or the American Arbitration Association.

*15.6.2. After settlement or final adjudication of any claim under this Article if, upon demand, payment by the **Contractor** is not made to the **Owner**, the **Owner** may offset the appropriate amounts against (a) payments due to the **Contractor** under any other contract between the **Owner** and the **Contractor**, or (b) any amounts for which the **Owner** may be obligated to the **Contractor** in any capacity.

15.7 Venue; Flow-Through Provision:

15.7.1. The **Contractor** agrees to waive jurisdiction and venue, to consent and submit to the jurisdiction of, and not commence any action in other than, a competent State court in Ingham County, Michigan, unless original jurisdiction is vested in the Michigan Court of Appeals, the Michigan Court of Claims, or the Michigan Supreme Court, regardless of residence or domicile, for any action or suit at law or in equity arising out of or under the Contract Documents. The **Contractor** further agrees that it will have each of its Suppliers and Subcontractors provide similar waivers as those required in this paragraph.

15.7.2. The **Contractor** shall insert the provisions of this Article in all Sub agreements, altering those paragraphs only to identify properly the contracting parties.

END OF SECTION 00700

SECTION 00800 SUPPLEMENTARY CONDITIONS

PROFESSIONAL – DLZ Michigan, Inc.
WORK – Flint Bishop Airport Landfill Cap Construction

FILE No. – 761/25250.SAR

The provisions of this Section 00800 Supplementary Conditions amend or supplement Section 00700 General Conditions and those other provisions of the Contract Documents, as indicated below. All other provisions of the Contract Documents that are not so amended or supplemented remain in full force and effect.

1. The following conditions must supplement the general conditions:

   - The Contractor's Liability Insurance: Add the following at the end of Paragraphs 7.5.2 of Section 00700 General Conditions:

     The Contractor shall also list DLZ Michigan, Inc. as ADDITIONAL INSUREDS.

END OF SECTION 00800

SECTION 01310 PROGRESS SCHEDULE

PART 1 - GENERAL

1.01 SUMMARY

A. The **Contractor** will submit CPM Progress Schedules to the **Owner** depicting its approach to prosecution of the Work. This includes but is not limited to the **Contractor's** approach to recovering schedule and managing the effect of changes, substitutions, and Delays on Work sequencing.

B. The Progress Schedule will include the Rev. 0 Submittal (par. 3.02), Update Submittals (par. 3.03) and Revision Submittals (par. 3.04). Each Submittal will be assigned a unique number. For a resubmission, the initial number will be modified by the letter A, B, C, etc., as appropriate.

C. Through the Progress Schedule, the **Owner** will seek to stay current on progress, updated Activity and Milestone Dates, and the **Contractor's** approach to Work remaining.

D. References to the Critical Path Method (CPM) are to CPM construction industry standards that are consistent with the requirements of this Section 01310.

1.02 RELATED SECTIONS

A. Section 00440 Schedule of Materials and Equipment; Section 00500 Agreement; Section 00700 General Conditions; and Section 00800 Supplementary Conditions.

1.03 GLOSSARY OF TERMS

A. Capitalized terms not already defined in any Division 0 Specification have the following intent and meanings:

1. Milestone–A key point of progress, designating interim targets toward the Contract Times. They may pinpoint critical path foundations, key deliveries, building framing, start of MEP rough-in, building enclosure, partitions, interior finishes, conditioned space, commissioning stages, Substantial Completion, and other events of like import.
2. Official Schedule–The most recent Revision Submittal returned to the **Contractor** as Resubmittal Not Required. The Rev. 0 Official Schedule is the *As-Planned* Schedule.
3. Revision 0 Submittal–Progress Schedule submitted by the **Contractor** depicting the entire Work as awarded.
4. Update Submittal–A monthly Progress Schedule update reflecting progress and minor adjustments on the Activities, sequencing and restraints for Work remaining.

1.04 QUALITY ASSURANCE

A. The **Contractor** will obtain a written interpretation from the **Professional,** if the **Contractor** believes the selection of Activities, logic ties or restraints requires an interpretation of the Contract Documents. With each submission, the **Contractor** will point out by specific, written notation, any Progress Schedule feature that may reflect variations from any requirements of the Contract Documents.

B. The **Contractor** is responsible to obtain information from each Subcontractor and Supplier when scoping their respective Activities, Values, logic ties and restraints

C. No review of any Progress Schedule by or on behalf of the **Owner** will relieve the **Contractor** from complying with the Contract Times and any required sequence of Work or from completing Work omitted from the Progress Schedule. No review will imply approval of any variation from or interpretation of the Contract Documents, unless approved by the **Professional** through a written interpretation or by means of a separate, written notation.

1.05 ALLOWANCES

A. Work covered by Cash Allowances will be completed within the Contract Times. To the extent reasonable and consistent with the **Contractor's** plan, Work authorized by contingency allowances will be completed within the Contract Times. The Progress Schedule will incorporate the **Contractor's** best estimate of the Activities, logic and restraints required, using the information in the Contract Documents, or as indicated by the **Professional** in writing.

1.06 "OR EQUALS" AND SUBSTITUTIONS

A. Activities in the Rev. 0 Progress Schedule will be based on materials and equipment required by the Contract Documents and will not reflect any "or equal" or substitute materials or equipment, even if the **Contractor** intends to pursue "or equal" and substitution proposals. This limitation also applies to any Means and Methods indicated in or required by the Contract Documents.

1.07 MEASUREMENT AND PAYMENT

A. The Schedule of Values will include a Progress Schedule *pay item*. Fifteen percent (15%) of this *pay item* will be eligible for payment upon delivery of the *complete* Rev. 0 Submittal. The balance of this *pay item* will be eligible for payment, on a prorated basis, with each Request for Payment attaching an Update Submittal.

PART 2 - WORK PRODUCTS

2.01 PROGRESS SCHEDULE SUBMITTALS

A. Each Progress Schedule Submittal will consist of an electronic disk with the **Contractor's** files, a narrative and three (3) copies of the required reports and plots.

B. The CPM scheduling software will be Primavera Project Planner®, SureTrak® or Microsoft Project®.

2.02 PRINTOUTS

A. Schedule Reports will include Activity (ID) code and description, duration, calendar, Early Dates, Late Dates and Total Float, all of which will comport with the requirements of paragraph 8.3.4 of Section 00700 General Conditions.

1. Late Finish Date for an Activity pinpointing a Contract Time will equal that Contract Time. Early Start Date for an Activity designating a Contract restraint will equal the proper Notice to Proceed date. Schedule Reports may or may not append CPM Plots (time-scaled Activity/logic).
2. For Precedence Diagram Method, separate Schedule Reports will tabulate, for each Activity, all preceding and succeeding logic types and lead times, whether CPM Plots displaying vertical logic ties are appended or not.

B. CPM Schedule Plots will be plotted on a suitable time scale and identify the Contract Times, Critical Paths, and sub-Critical Paths. Activities will be shown on the Early Dates with Total Floats noted by Late Date flags.

C. Line of Balance Plots will reflect industry practice for repetitive construction and will segregate the production lines for all trades within the hammock Activities.

2.03 NARRATIVE REQUIREMENTS

A. In general, a narrative will describe the **Contractor's** approach to prosecution of the Work, subject to the requirements of the Contract Documents. Further, each narrative will list the Critical Path Activities and compare Early and Late Dates with Contract Times and Milestone Dates. The basis for restraint dates will be explained.

B. For each Update Submittal, the narrative will compare current Dates to the respective Milestone Dates, describe changes in crewing and construction equipment and identify new Delays. For each Revision Submittal, the narrative also will itemize changes in Activities, logic ties and restraint dates made necessary by each change, Delay, schedule recovery, substitution and **Contractor**-initiated revision occurring since the previous Submittal.

2.04 ACTIVITY REQUIREMENTS

A. The Progress Schedule will detail Work sequencing only to the extent necessary to allow the **Owner** to correlate percent complete, compare actual dates with Milestones and Contract Times and the data in Requests for Payment.

B. Separate Activities will designate permits, construction, Submittal preparation/review (and resubmission and re-review, for same); MEP coordination drawings; deliveries; commissioning; and Punch List. Separate Activities will designate **Owner**-furnished items, interface with other work and the **Owner** and **Professional's** responsibilities.

B. Activities will be detailed only to the extent required to show the transition of trade Work. Activities will detail the progression through site/excavation, foundations, building framing, start/completion of interior partitions, MEP rough-in, building enclosure, interior finishes, conditioned space, and commissioning.

1. Submittal Activities will segregate long-lead items, any item requiring structural access and other procurements that, in the **Contractor's** judgment, may bear on the rate of progress. Separate MEP coordination drawing Activities will be used for each floor. Beyond these requirements, it is not necessary to burden the Progress Schedule with Activities for less significant Submittals and deliveries.
2. For multiunit Work (e.g., rough-in overhead MEP for each floor, etc.), detailed Activities will be shown for a typical (often, the first) unit). Other or follow-on units may be replicated, as appropriate, or modeled with a hammock Activity combining the sum total of the typical detailed Activities. Separate Activities, as may be suitable to the Divisions of Work involved, will be identified for single-unit Work. This requirement applies to such scope as Work in mechanical rooms, building framing, commissioning, etc.
3. Activities will not combine separate or non-concurrent items of Unit Price or lump sum Work, Work in separate structures and Work in distinct areas, locations or floors within an area or structure; or rough-in and finish Work.

C. Activity durations will equal the Business Days required to sufficiently complete the Work designated by the Activity (i.e., when finish-to-start successors may start, even if the Activity is not quite 100% complete). Installation Activities will last from twenty (20) to forty (40) Days.

D. Activities will be assigned consistent descriptions and identification codes. Sort codes will group Activities by building or structure, floor or area, Change Order and Change Authorization and other meaningful scheme

PART 3 – EXECUTION

3.01 FLOAT TOLERANCES

A. Any Progress Schedule with Early Dates after a Contract Time will yield negative Total and Contract Floats, whether shown/calculated or not. Any Revision Submittal with less than negative twenty (20) Days of Float will be returned as "Revise and Resubmit," unless a time extension is requested, or the **Owner** withholds liquidated damages or asserts intent to do so in the event schedule is not recovered.

B. Floats calculated from the definitions given in Section 00020 Glossary supersede any conflicting Float values calculated within any early completion Progress Schedule.

3.02 REVISION 0 (Rev. 0) SUBMITTAL

A. The complete Revision 0 Submittal will be due with the first Request for Payment. The Rev. 0 Submittal will show the Work as awarded, without Delays, "or equal" or substitutions, Change Orders or Change Authorizations.

1. The Rev. 0 narrative will detail the **Contractor's** management of the site (lay down, parking, etc.). Further, the Rev. o narrative will identify shifts, weekend Work, Activity calendars, Delays since award and all pending and anticipated "or equal" and substitution proposals.

E. Once endorsed by the **Owner** and returned as "Resubmittal Not Required," the Rev. 0 Progress Schedule (or Rev. 0A, etc.) will be the As-Planned Schedule and the basis for Update Submittals until the Rev. 1 Official Schedule is established. Once the As-Planned Schedule is established, the **Owner** will select Milestones and note Milestone Early and Late Dates. As the Official Schedule evolves, Milestone Dates will be revised accordingly.

F. If the **Owner** refuses to endorse the Rev. 0 Submittal (or Rev. 0A, for a resubmission) as "Resubmittal Not Required," the As-Planned Schedule will not be established. In that event, the **Contractor** will continue to submit Update and Revision Submittals reflecting progress and the **Contractor's** approach to remaining Work. The **Owner** will rely on the available Update and Revision Submittals, subject to whatever adjustments it determines appropriate.

3.03 UPDATE SUBMITTALS

A. Update Submittals with progress up to the closing date and updated Early and Late Dates for progress and remaining Activities will be due with each Request for Payment. As-built data will consist of actual start dates, percent complete, actual finish dates, changes, Delays, and other significant events occurring before the closing date.

3.04 REVISION SUBMITTALS

A. Progress Schedule Revisions will be submitted with the third Request for Payment and every two (2) months after that, or more often, if necessary due to schedule recovery or other Progress Schedule revisions. Revisions will revise the Update Submittal attached to the prior Request for Payment.

B. Progress Schedule revisions will detail all impacts on pre-existing Activity scope, logic ties and restraint dates and reflect the Contractor's current approach to Work remaining. Revisions may be required because of changes in the Work, substitutions, schedule recovery and Delays.

C. Once endorsed by the **Owner** and returned as "Resubmittal Not Required," a Revision Submittal becomes the Rev. 1, Rev. 2, etc. Official Schedule and the basis for subsequent Update Submittals until a more current Official Schedule is established. If the **Owner** refuses to endorse a Revision Submittal as "Resubmittal Not Required," the **Contractor** will continue to submit Update and Revision Submittals when and as required in this Section.

3.05 RETROSPECTIVE DELAY ANALYSIS

A. If the **Owner** refuses to endorse any Revision Submittal as "Resubmittal Not Required," the **Contractor** and **Owner** will use the latest Official Schedule when evaluating the effect of Delays on Contract Time and/or Contract Price. The procedure will consist of progressively revising the latest Official Schedule at key Revision Submittal closing dates. For each Progress Schedule iteration, slippage between actual Milestone Dates and Rev. 0 Milestone Dates will be correlated to Delays occurring solely in that iteration. Revisions affecting Work after any iteration will be included only to the extent consented by the **Owner** at that time and/or if actually confirmed by as-built progress.

END OF SECTION 01310

This 01310 Specification uses the FORMSPEC™ Section 01310 Model Progress Schedule Specification (CPM Short Form). Title to and use of this Specification is strictly restricted. Except as may be appropriate for use in the bidding and execution of the Work, reproduction, translation or substantial use or quotation of any part of this Specification beyond that permitted by the 1976 United States Copyright Act without prior written permission of PMA Consultants LLC is unlawful.

APPENDIX I

SPECIAL WORKING CONDITIONS

ENVIRONMENT, GREAT LAKES AND ENERGY

The Work comprising this Project will be performed at a site of the Environment, Great Lakes and Energy (EGLE). The Contractor must comply with all rules and regulations pertaining to such sites and must conform to the following rules:

1. The Contractor must provide a competent Superintendent satisfactory to EGLE on the work site at all times during working hours with full authority to act for him or her. It must be the Contractor's responsibility to furnish EGLE with the name, address and telephone number of the responsible person to contact for Emergency during after hour, weekend and holiday periods;
2. Site work shall be performed Monday through Friday between 8:00 a.m. and 6:00 p.m., or until dark, whichever is earlier. Work shall not be performed at the site prior to 8:00 a.m., after 6:00 p.m., on Saturdays, Sundays, or holidays without written permission from EGLE.
3. No firearms, weapons, alcoholic beverages, or explosives are allowed on site;
4. Heavy equipment such as bulldozers and power shovels must be locked or immobilized in an acceptable manner when not in use. No tools, small pipe, copper or wire must remain on the site overnight, unless acceptably locked inside shanties or tool chests. There will be no exchange, loaning or borrowing of tools, equipment or manpower between EGLE and the Contractor.

APPENDIX II

SPECIAL PROJECT PROCEDURES

SOIL EROSION AND SEDIMENTATION CONTROL PROJECT PROCEDURES FOR CONTRACTORS ON DTMB OWNED AND MANAGED PROPERTIES

1. Comply with Part 91, Soil Erosion and Sedimentation Control of the Natural Resources and Environmental Protection Act 1994 PA 451, as amended.

2. Contact the DTMB, SFA, Design and Construction Division to discuss the implementation of soil erosion and sedimentation control (SESC) on the Project with DTMB SESC Officer. Phone **(517) 388-3045** or Email DTMB-SESC@michigan.gov.

3. Following the award of a contract, the Contractor will be required to prepare and issue for approval an SESC Implementation Plan, which indicates the Contractor's intended implementation of SESC on the project including a schedule and sequence. The Environmental Health and Safety Section, upon approval of the implementation plan, will issue to the Contractor an "Authorization to Proceed with Earth Change" document, which is to be posted at the job site. This document is issued in lieu of a permit from the county. Earthwork shall not begin prior to the issuance of this Authorization. Upon receipt of the Authorization document, the Contractor may begin earth change activities.

4. See below the "Checklist for Contractor's SESC Implementation Plan" for details of the required information necessary for the Contractor to create the SESC Implementation Plan. The intent of this plan is to ensure that the Contractor has reviewed and understands the SESC provisions within the plans and specifications.

5. CHECKLIST FOR CONTRACTOR'S SOIL EROSION AND SEDIMENTATION CONTROL IMPLEMENTATION PLAN (For projects that include earth changes or disturb existing vegetation):

DEPARTMENT OF TECHNOLOGY, MANAGEMENT AND BUDGET
STATE FACILITIES ADMINISTRATION, DESIGN AND CONSTRUCTION DIVISION
SOIL EROSION AND SEDIMENTATION CONTROL PROGRAM
P.O. Box 30026, Lansing, Michigan 48909

PROJECT TITLE:
PROJECT LOCATION:
PROJECT FILE NUMBER:
INDEX NUMBER:

Prior to the start of earthwork, the Contractor must submit a Soil Erosion and Sedimentation Control (SESC) Implementation Plan to the Michigan Department of Technology, Management and Budget, Soil Erosion and Sedimentation Control Program. The intent of this plan is to ensure that the Contractor has reviewed and understands the SESC provisions within the plans and specifications. The following checklist will provide Contractors with assistance in creating the SESC Implementation Plan.

The SESC Implementation Plan must include:

1. ☐ A written plan or letter demonstrating:
- ☐ The Contractor's means and methods for the implementation of SESC provisions included within the plans and specifications and compliance with the provisions of Part 91 of PA 451 of 1994, as amended.
- ☐ The Contractor's plan for dust control.
- ☐ The Contractor's plan for inspection and maintenance of temporary SESCs.

2. ☐ A map, location plan, drawing, or amended copy of the Project SESC or grading plan showing:

- ☐ The locations of any stockpiles of soil associated with the Project
- ☐ The temporary SESC controls associated with stockpiles of soil
- ☐ The Contractor's suggested or proposed additions or relocations of any temporary or permanent SESCs. associated with the Project plans and specifications (subject to approval by Engineer and DTMB)
- ☐ Location of site entrances, exits and vehicle routes
- ☐ Location of site superintendent's/project manager's site trailer or office (for SESC Inspector check-in)

3. ☐ A schedule for the installation and removal of temporary controls and the installation of permanent soil erosion and sedimentation controls in relation to the overall construction schedule.

Submit the above items to the above address.

Upon approval of the Contractor's plan, an "Authorization to Proceed with Earth Change" will be issued by DTMB, Design and Construction Division

HAZARDOUS MATERIALS PROJECT PROCEDURES

1. The Contractor must use, handle, store, dispose of, process, transport and transfer any material considered a Hazardous Material in accordance with all federal, state, and local Laws. If the Contractor encounters material reasonably believed to be a Hazardous Material and which may present a substantial danger, the Contractor must immediately stop all affected work, give written notice to the Owner of the conditions encountered, and take appropriate health and safety precautions.

2. This project has been identified by the DTMB-SFA as having a possibility of containing Hazardous Waste materials to be legally removed from the Project job site in order to complete the Work as described in the Proposal And Contract. If removal of friable asbestos material is required, the Contractor must contact the Air Quality Division, Department of Environment, Great Lakes, and Energy, at **(5l7) 284-6773**, for a permit and furnish all training, labor, materials, services, insurance, and equipment necessary to carry out the removal operations of all Hazardous Materials from the Project job site, as identified by the Scope of Work, or encountered on the Project job site, in accordance with State and Federal Hazardous Waste Codes. A Contract Change Order will be written to modify the existing Contract to pay for the additional cost.

3. Environmental Hazards (air, water, land and liquid industrial) are handled by the Waste and Hazardous Materials Division, Michigan Department of Environment, Great Lakes, and Energy (EGLE) in carrying out the requirements of the Federal Environmental Protection Agency (EPA). For general information and/or a copy of the latest regulations and publications call (517) 335-2690.

4. The Michigan Occupational Safety and Health Administration (MIOSHA) provides protection and regulations for the safety and health of workers. The Department of Licensing and Regulatory Affairs provides for the safety of workers. The Department of Health & Human Services provides for the health of workers (517/373-3740) (TDD 517/373-3573).

   4.1 Contractor must post any applicable State and/or Federal government regulations at the job site in a prominent location.

   4.2 Contractor must be responsible for training their workers in safe work practices and in proper removal methods when coming in contact with hazardous chemicals.

5. Applicable Regulations:

   5.1 Natural Resources and Environmental Protection Act – PA 451 of 1994, as amended, including Part 111 – Hazardous Waste Management, Part 121 – Liquid Industrial Waste and Part 147 – PCB compounds.

   5.2 RCRA, 1976 - Resource Conservation and Recovery Act: This federal statute regulates generation, transportation, treatment, storage, or disposal of hazardous wastes nationally.

   5.3 TSCA, 1979 – Toxic Substances Control Act: This statute regulates the generation, transportation, storage, and disposal of industrial chemicals such as PCBs.

6. Definitions: Hazardous substances are ignitable, corrosive, reactive, and/or toxic, based on their chemical characteristics.

   6.1 Under Federal and Michigan Law, a Small Quantity Generator of hazardous waste provides from 220 to less than 2,000 lbs./month or never accumulates 2,200 lbs. or more.

   6.2 A Generator size provider of hazardous waste provides 2,200 lbs. or more/month or accumulates above 2,200 lbs.

7. Disposals: To use an off-site hazardous waste disposal facility, the Contractor must use the Uniform Hazardous Waste Manifest (shipping paper). Small quantities of hazardous waste may not be disposed of in sanitary landfills used for solid waste.

8. Federal, state, and local Laws and regulations may apply to the storage, handling and disposal of Hazardous Materials and wastes at each State Agency. Contact the **Environmental Assistance Center** of the Michigan Department of Environment, Great Lakes, and Energy (EGLE) at **1-800-662-9278**, Fax to: 517-241-0673 or e-mail to: DEQ-EAD-env-assist@michigan.gov for general EGLE information including direct and referral assistance on air, water and wetlands permits; contaminated site clean-ups; underground storage tank removals and remediation; hazardous and solid waste disposal; pollution prevention and recycling; and compliance-related assistance. The Center provides businesses, municipalities, and the general public with a single point of access to EGLE's environmental programs.

APPENDIX III
PREVAILING WAGE RATE SCHEDULES

Prevailing Wage Rates for State Of Michigan Funded Projects

Official Rate Schedule

Genesee

Classification Name	Last Updated
3.1 Power Equip. Operator - Highway & Heavy	**11/01/2025**

Wage Rates	Straight Time	Time and a Half	Double Time
Journeyman	$71.46	$94.57	$117.67
Apprentice: Level 1 0 - 6 Months	$57.61	$73.79	$89.97
Apprentice: Level 2 7 -12 Months	$59.93	$77.28	$94.61
Apprentice: Level 3 13 - 18 Months	$62.23	$80.73	$99.21
Apprentice: Level 4 19 - 24 Months	$64.54	$84.19	$103.83
Apprentice: Level 5 25 - 30 Months	$66.85	$87.66	$108.45
Apprentice: Level 6 31 - 36 Months	$69.15	$91.10	$113.05

Four 10-hour days allowed? - Yes

Make Up Day Allowed? - Yes

Prevailing Wage Rates for State Of Michigan Funded Projects

Official Rate Schedule

Genesee

Classification Name	Last Updated
3.2 Power Equip. Operator - Highway & Heavy	**11/01/2025**

Wage Rates	Straight Time	Time and a Half	Double Time
Journeyman	$70.31	$92.84	$115.37
Apprentice: Level 1 0 - 6 Months	$56.81	$72.59	$88.37
Apprentice: Level 2 7 -12 Months	$59.06	$75.97	$92.87
Apprentice: Level 3 13 - 18 Months	$61.31	$79.35	$97.37
Apprentice: Level 4 19 - 24 Months	$63.56	$82.72	$101.87
Apprentice: Level 5 25 - 30 Months	$65.81	$86.09	$106.37
Apprentice: Level 6 31 - 36 Months	$68.06	$89.47	$110.87

Four 10-hour days allowed? - Yes

Make Up Day Allowed? - Yes

Prevailing Wage Rates for State Of Michigan Funded Projects

Official Rate Schedule

Genesee

Classification Name			Last Updated
3.3 Power Equip. Operator - Highway & Heavy			**11/01/2025**
Wage Rates	**Straight Time**	**Time and a Half**	**Double Time**
Journeyman	$63.58	$82.75	$101.91
Apprentice: Level 1 0 - 6 Months	$52.10	$65.53	$78.95
Apprentice: Level 2 7 -12 Months	$54.02	$68.41	$82.79
Apprentice: Level 3 13 - 18 Months	$55.92	$71.26	$86.59
Apprentice: Level 4 19 - 24 Months	$57.84	$74.14	$90.43
Apprentice: Level 5 25 - 30 Months	$59.75	$77.00	$94.25
Apprentice: Level 6 31 - 36 Months	$61.67	$79.89	$98.09

Four 10-hour days allowed? - Yes

Make Up Day Allowed? - Yes

Prevailing Wage Rates for State Of Michigan Funded Projects

Official Rate Schedule

Genesee

Classification Name	Last Updated
3.4 Power Equip. Operator - Highway & Heavy	**11/01/2025**

Wage Rates	Straight Time	Time and a Half	Double Time
Journeyman	$63.02	$81.91	$100.79
Apprentice: Level 1 0 - 6 Months	$51.70	$64.93	$78.15
Apprentice: Level 2 7 -12 Months	$53.59	$67.76	$81.93
Apprentice: Level 3 13 - 18 Months	$55.48	$70.60	$85.71
Apprentice: Level 4	$57.36	$73.42	$89.47
Apprentice: Level 5 25 - 30 Months	$59.25	$76.25	$93.25
Apprentice: Level 6 31 - 36 Months	$61.13	$79.07	$97.01

Four 10-hour days allowed? - Yes

Make Up Day Allowed? - Yes

Prevailing Wage Rates for State Of Michigan Funded Projects

Official Rate Schedule

Genesee

Classification Name			Last Updated
3.5 Power Equip. Operator - Highway & Heavy			**11/01/2025**
Wage Rates	**Straight Time**	**Time and a Half**	**Double Time**
Journeyman	$44.80	$60.98	$77.15
Apprentice: Level 1 0 - 6 Months	$35.09	$46.42	$57.73
Apprentice: Level 2 7 -12 Months	$36.71	$48.84	$60.97
Apprentice: Level 3 13 - 18 Months	$38.33	$51.27	$64.21
Apprentice: Level 4 19 - 24 Months	$39.95	$53.71	$67.45
Apprentice: Level 5 25 - 30 Months	$41.57	$56.13	$70.69
Apprentice: Level 6 31 - 36 Months	$43.18	$58.55	$73.91

Four 10-hour days allowed? - Yes

Make Up Day Allowed? - Yes

Prevailing Wage Rates for State Of Michigan Funded Projects

Official Rate Schedule

Genesee

Classification Name	Last Updated
4.1 Power Equip. Operator - Commercial	**10/31/2025**

Wage Rates	Straight Time	Time and a Half	Double Time
Journeyman	$71.22	$94.21	$117.19
Apprentice: Level 1 0 - 6 Months	$57.43	$73.52	$89.61
Apprentice: Level 2 7 - 12 Months	$59.73	$76.97	$94.21
Apprentice: Level 3 13 - 18 Months	$62.03	$80.42	$98.81
Apprentice: Level 4 19 - 24 Months	$64.32	$83.86	$103.39
Apprentice: Level 5 25 - 30 Months	$66.62	$87.31	$107.99
Apprentice: Level 6 31 - 36 Months	$68.92	$90.76	$112.59

Four 10-hour days allowed? - Yes

Make Up Day Allowed? - Yes

Prevailing Wage Rates for State Of Michigan Funded Projects

Official Rate Schedule

Genesee

Classification Name	Last Updated
4.2 Power Equip. Operator - Commercial	**10/31/2025**

Wage Rates	Straight Time	Time and a Half	Double Time
Journeyman	$70.93	$93.77	$116.61
Apprentice: Level 1 0 - 6 Months	$57.22	$73.21	$89.19
Apprentice: Level 2 7 - 12 Months	$59.51	$76.65	$93.77
Apprentice: Level 3 13 - 18 Months	$61.80	$71.52	$89.80
Apprentice: Level 4 19 - 24 Months	$64.07	$83.48	$102.89
Apprentice: Level 5 25 - 30 Months	$66.36	$86.92	$107.47
Apprentice: Level 6 31 - 36 Months	$68.64	$90.33	$112.03

Four 10-hour days allowed? - Yes

Make Up Day Allowed? - Yes

Prevailing Wage Rates for State Of Michigan Funded Projects

Official Rate Schedule

Genesee

Classification Name	Last Updated
4.3 Power Equip. Operator - Commercial	**11/01/2025**

Wage Rates	Straight Time	Time and a Half	Double Time
Journeyman	$70.11	$92.55	$114.97
Apprentice: Level 1 0 - 6 Months	$56.66	$72.37	$88.07
Apprentice: Level 2 7 - 12 Months	$58.90	$75.73	$92.55
Apprentice: Level 3 13 - 18 Months	$61.14	$79.09	$97.03
Apprentice: Level 4 19 - 24 Months	$63.38	$82.45	$101.51
Apprentice: Level 5 25 -30 Months	$65.63	$85.82	$106.01
Apprentice: Level 6 31 - 36 Months	$67.87	$89.18	$110.49

Four 10-hour days allowed? - Yes

Make Up Day Allowed? - Yes

Prevailing Wage Rates for State Of Michigan Funded Projects

Official Rate Schedule

Genesee

Classification Name	Last Updated
4.4 Power Equip. Operator - Commercial	**11/01/2025**

Wage Rates	Straight Time	Time and a Half	Double Time
Journeyman	$69.25	$91.25	$113.25
Apprentice: Level 1 0 - 6 Months	$56.05	$71.45	$86.85
Apprentice: Level 2 7 - 12 Months	$58.25	$74.75	$91.25
Apprentice: Level 3 13 -18 Months	$60.45	$78.06	$95.65
Apprentice: Level 4 19 - 24 Months	$62.65	$81.35	$100.05
Apprentice: Level 5 25 - 30 Months	$64.85	$84.66	$104.45
Apprentice: Level 6 31 -36 Months	$67.05	$87.96	$108.85

Four 10-hour days allowed? - Yes

Make Up Day Allowed? - Yes

Prevailing Wage Rates for State Of Michigan Funded Projects

Official Rate Schedule

Genesee

Classification Name **Last Updated**

4.5 Power Equip. Operator - Commercial			11/01/2025
Wage Rates	**Straight Time**	**Time and a Half**	**Double Time**
Journeyman	$68.28	$89.80	$111.31
Apprentice: Level 1 0 - 6 Months	$55.37	$70.44	$85.49
Apprentice: Level 2 7 -12 Months	$57.53	$73.68	$89.81
Apprentice: Level 3 13 - 18 Months	$61.83	$80.12	$98.41
Apprentice: Level 5 25 - 30 Months	$63.98	$83.35	$102.71
Apprentice: Level 6 31 - 36 Months	$66.13	$86.58	$107.01

Four 10-hour days allowed? - Yes

Make Up Day Allowed? - Yes

Prevailing Wage Rates for State Of Michigan Funded Projects

Official Rate Schedule

Genesee

Classification Name	Last Updated
4.6 Power Equip. Operator - Commercial	**11/01/2025**

Wage Rates	Straight Time	Time and a Half	Double Time
Journeyman	$66.57	$87.24	$107.89
Apprentice: Level 1 0 - 6 Months	$54.17	$68.64	$83.09
Apprentice: Level 2 7 -12 Months	$56.24	$71.74	$87.23
Apprentice: Level 3 13 - 18 Months	$58.30	$74.82	$91.35
Apprentice: Level 4 19 -24 Months	$60.37	$77.93	$95.49
Apprentice: Level 5 25 - 30 Months	$62.44	$81.04	$99.63
Apprentice: Level 6 31 - 36 Months	$64.50	$84.13	$103.75

Four 10-hour days allowed? - Yes

Make Up Day Allowed? - Yes

Prevailing Wage Rates for State Of Michigan Funded Projects

Official Rate Schedule

Genesee

Classification Name	Last Updated
4.7 Power Equip. Operator - Commercial	**11/01/2025**

Wage Rates	Straight Time	Time and a Half	Double Time
Journeyman	$59.26	$67.72	$84.72
Apprentice: Level	$54.15	$68.61	$83.05
Apprentice: Level 1 0 - 6 Months	$49.05	$60.95	$72.85
Apprentice: Level 2 7 -12 Months	$50.76	$63.52	$76.27
Apprentice: Level 3 13 - 18 Months	$52.46	$66.07	$79.67
Apprentice: Level 5 25 - 30 Months	$55.85	$71.16	$86.45
Apprentice: Level 6 31 - 36 Months	$57.55	$73.71	$89.85

Four 10-hour days allowed? - Yes

Make Up Day Allowed? - Yes

Prevailing Wage Rates for State Of Michigan Funded Projects

Official Rate Schedule

Genesee

Classification Name	Last Updated
4.8 Power Equip. Operator - Commercial	**11/01/2025**

Wage Rates	Straight Time	Time and a Half	Double Time
Journeyman	$58.23	$74.72	$91.21
Apprentice: Level 1 0 - 6 Months	$48.34	$59.88	$71.43
Apprentice: Level 2 7 -12 Months	$49.99	$62.37	$74.73
Apprentice: Level 3 13 - 18 Months	$51.63	$64.82	$78.01
Apprentice: Level 4 19 - 24 Months	$53.29	$67.31	$81.33
Apprentice: Level 5 25 - 30 Months	$54.93	$69.78	$84.61
Apprentice: Level 6 25 - 30 Months	$56.59	$72.27	$87.93

Four 10-hour days allowed? - Yes

Make Up Day Allowed? - Yes

Prevailing Wage Rates for State Of Michigan Funded Projects

Official Rate Schedule

Genesee

Classification Name			Last Updated
5.1 Truck Driver Class			**01/05/2026**
Wage Rates	**Straight Time**	**Time and a Half**	**Double Time**
Journeyman	$54.10	$70.52	$86.94

Four 10-hour days allowed? - Yes

Make Up Day Allowed? - No

Prevailing Wage Rates for State Of Michigan Funded Projects

Official Rate Schedule

Genesee

Classification Name	Last Updated
Articulated Hauler	**10/28/2025**

Wage Rates	Straight Time	Time and a Half	Double Time
Journeyman	$63.02	$81.91	$100.79
Apprentice: Apprentice Level 1	$51.70	$64.93	$78.15
Apprentice: Apprentice Level 2	$53.59	$67.76	$81.93
Apprentice: Apprentice Level 3	$55.48	$70.60	$85.71
Apprentice: Apprentice Level 4	$57.36	$73.42	$89.47
Apprentice: Apprentice Level 5	$59.25	$76.25	$93.25
Apprentice: Apprentice Level 6	$61.13	$79.07	$97.01

Four 10-hour days allowed? - No

Make Up Day Allowed? - No

Prevailing Wage Rates for State Of Michigan Funded Projects

Official Rate Schedule

Genesee

Classification Name	Last Updated
Asbestos abatement worker or environmental remediation worker	**11/01/2025**

Wage Rates	Straight Time	Time and a Half	Double Time
Journeyman	$56.20	$73.24	$90.28
Apprentice: Trainee 600 hours +1 year	$43.12	$55.01	$66.90

Four 10-hour days allowed? - Yes

Make Up Day Allowed? - No

Prevailing Wage Rates for State Of Michigan Funded Projects

Official Rate Schedule

Genesee

Classification Name			Last Updated
Boilermaker			**10/29/2025**
Wage Rates	**Straight Time**	**Time and a Half**	**Double Time**
Journeyman	$79.64	$119.12	$158.58
Apprentice: 1st Period	$58.07	$86.78	$115.44
Apprentice: 2nd Period	$59.89	$89.50	$119.08
Apprentice: 3rd Period	$61.81	$92.24	$122.74
Apprentice: 4th Period	$63.50	$94.91	$126.30
Apprentice: 5th Period	$65.26	$97.54	$129.82
Apprentice: 6th Period	$68.89	$103.00	$137.08
Apprentice: 7th Period	$72.46	$108.36	$144.22
Apprentice: 8th Period	$76.07	$113.77	$151.44

Four 10-hour days allowed? - Yes

Make Up Day Allowed? - No

Prevailing Wage Rates for State Of Michigan Funded Projects

Official Rate Schedule

Genesee

Classification Name	Last Updated
Boom Truck	**10/28/2025**

Wage Rates	Straight Time	Time and a Half	Double Time
Journeyman	$70.31	$92.84	$115.37
Apprentice: Apprentice Level 1	$56.81	$72.59	$88.37
Apprentice: Apprentice Level 2	$59.06	$75.97	$92.87
Apprentice: Apprentice Level 3	$61.31	$79.35	$97.37
Apprentice: Apprentice Level 4	$63.56	$82.72	$101.87

Four 10-hour days allowed? - No

Make Up Day Allowed? - No

Prevailing Wage Rates for State Of Michigan Funded Projects

Official Rate Schedule

Genesee

Classification Name			Last Updated
Bricklayer			**10/29/2025**
Wage Rates	**Straight Time**	**Time and a Half**	**Double Time**
Journeyman	$63.77	$81.75	$99.73
Apprentice: Apprentice Level 1	$43.54	$54.94	$66.34
Apprentice: Apprentice Level 2	$45.67	$58.06	$70.45
Apprentice: Apprentice Level 3`	$47.66	$61.05	$74.43
Apprentice: Apprentice Level 4	$49.64	$64.02	$78.39
Apprentice: Apprentice Level 5	$51.62	$66.99	$82.35
Apprentice: Apprentice Level 6	$53.61	$69.97	$86.33
Apprentice: Apprentice Level 7 & 8	$55.59	$72.94	$90.29

Four 10-hour days allowed? - No

Make Up Day Allowed? - No

Prevailing Wage Rates for State Of Michigan Funded Projects

Official Rate Schedule

Genesee

Classification Name			Last Updated
Carpenter			**11/01/2025**
Wage Rates	**Straight Time**	**Time and a Half**	**Double Time**
Journeyman	$60.20	$78.38	$96.56
Apprentice: Apprentice Level 1	$49.29	$62.02	$74.74
Apprentice: Apprentice Level 2	$51.11	$64.75	$78.38
Apprentice: Apprentice Level 3	$54.75	$70.21	$85.66
Apprentice: Apprentice Level 4	$58.95	$76.51	$94.06

Four 10-hour days allowed? - No

Make Up Day Allowed? - No

Prevailing Wage Rates for State Of Michigan Funded Projects

Official Rate Schedule

Genesee

Classification Name			Last Updated
Carpet layers (linoleum)			**11/03/2025**
Wage Rates	**Straight Time**	**Time and a Half**	**Double Time**
Journeyman	$53.72	$70.77	$87.81
Apprentice: Level 1	$43.49	$55.42	$67.35
Apprentice: Level 2	$45.20	$57.99	$70.77
Apprentice: Level 3	$48.61	$63.10	$77.59
Apprentice: Level 4	$52.02	$68.22	$84.41

Four 10-hour days allowed? - Yes

Make Up Day Allowed? - Yes

Prevailing Wage Rates for State Of Michigan Funded Projects

Official Rate Schedule

Genesee

Classification Name			Last Updated
Cement Mason			**10/29/2025**
Wage Rates	**Straight Time**	**Time and a Half**	**Double Time**
Journeyman	$58.41	$74.70	$90.98
Apprentice: Apprentice Level 1	$43.67	$55.79	$67.90
Apprentice: Apprentice Level 2	$45.47	$58.49	$71.50
Apprentice: Apprentice Level 3	$47.27	$61.19	$75.10
Apprentice: Apprentice Level 4	$49.08	$63.90	$78.72
Apprentice: Apprentice Level 5 & 6	$50.88	$66.60	$82.32

Four 10-hour days allowed? - No

Make Up Day Allowed? - No

Prevailing Wage Rates for State Of Michigan Funded Projects

Official Rate Schedule

Genesee

Classification Name	Last Updated
Drywall Taper	**10/31/2025**

Wage Rates	Straight Time	Time and a Half	Double Time
Journeyman	$51.67	$68.44	$85.21
Apprentice: Apprentice Level 1	$39.93	$50.83	$61.73
Apprentice: Apprentice Level 2	$43.29	$55.87	$68.45
Apprentice: Apprentice Level 3	$48.32	$63.42	$78.51

Four 10-hour days allowed? - No

Make Up Day Allowed? - No

Prevailing Wage Rates for State Of Michigan Funded Projects

Official Rate Schedule

Genesee

Classification Name	Last Updated
Electrician	**10/31/2025**

Wage Rates	Straight Time	Time and a Half	Double Time
Journeyman	$74.61	$106.29	$137.94
Apprentice: Level 1 Apprentice	$33.59	$45.90	$58.20
Apprentice: Level 2 Apprentice	$36.33	$50.02	$63.68
Apprentice: Level 3 Apprentice	$39.07	$54.12	$69.16
Apprentice: Level 4 Apprentice	$41.81	$58.23	$74.64
Apprentice: Level 5 Apprentice	$44.54	$62.32	$80.10
Apprentice: Level 6 Apprentice	$51.00	$72.02	$93.02

Four 10-hour days allowed? - Yes

Make Up Day Allowed? - Yes

The Employer, with 48 hours prior notice to the Union, or the approval of the business manager, may institute a work week consisting of four (4) consecutive ten (10) hour days between the hours of 7:00 a.m. and 6:00 p.m., Monday through Thursday, with one-half hour allowed for a lunch period. Friday

Prevailing Wage Rates for State Of Michigan Funded Projects

Official Rate Schedule

Genesee

Classification Name	Last Updated
Elevator Constructor	**10/29/2025**

Wage Rates	Straight Time	Time and a Half	Double Time
Journeyman	$110.76	$143.49	$176.21
Apprentice: 4th Year	$95.57	$121.75	$147.93

Four 10-hour days allowed? - No

Make Up Day Allowed? - No

Prevailing Wage Rates for State Of Michigan Funded Projects

Official Rate Schedule

Genesee

Classification Name			Last Updated
Elevator Constructors			**11/01/2025**
Wage Rates	**Straight Time**	**Time and a Half**	**Double Time**
Journeyman	$110.76	$143.49	$176.21

Four 10-hour days allowed? - Yes

Make Up Day Allowed? - Yes

Prevailing Wage Rates for State Of Michigan Funded Projects

Official Rate Schedule

Genesee

Classification Name			Last Updated
Glaziers			**10/31/2025**
Wage Rates	**Straight Time**	**Time and a Half**	**Double Time**
Journeyman	$56.55	$76.37	$96.20
Apprentice: Level 1	$40.70	$52.61	$64.50
Apprentice: Level 2	$44.66	$58.55	$72.42
Apprentice: Level 3	$48.63	$64.50	$80.36
Apprentice: Level 4	$52.59	$70.44	$88.28

Four 10-hour days allowed? - Yes

Make Up Day Allowed? - Yes

Prevailing Wage Rates for State Of Michigan Funded Projects

Official Rate Schedule

Genesee

Classification Name			Last Updated
Ground Person			**11/01/2025**
Wage Rates	**Straight Time**	**Time and a Half**	**Double Time**
Journeyman	$50.85	$72.32	$93.78

Four 10-hour days allowed? - Yes

Make Up Day Allowed? - Yes

Prevailing Wage Rates for State Of Michigan Funded Projects

Official Rate Schedule

Genesee

Classification Name			Last Updated
Heating and frost Insulators			**11/03/2025**
Wage Rates	**Straight Time**	**Time and a Half**	**Double Time**
Journeyman	$63.85	$83.85	$103.85
Apprentice: 1st period	$44.28	$56.28	$68.28
Apprentice: 2nd period	$49.17	$63.17	$77.17
Apprentice: 3rd period	$54.06	$70.06	$86.06
Apprentice: 4th period	$58.96	$76.96	$94.96

Four 10-hour days allowed? - Yes

Make Up Day Allowed? - Yes

Friday for cancelled work in a 4 10 schedule

Prevailing Wage Rates for State Of Michigan Funded Projects

Official Rate Schedule

Genesee

Classification Name	Last Updated
Ironworker	**10/31/2025**

Wage Rates	Straight Time	Time and a Half	Double Time
Journeyman	$75.42	$93.70	$111.97
Apprentice: Apprentice Level 1	$57.42	$70.40	$83.37
Apprentice: Apprentice Level 2	$59.59	$73.12	$86.64
Apprentice: Apprentice Level 3	$61.54	$75.43	$89.32
Apprentice: Apprentice Level 4	$64.59	$79.40	$94.20
Apprentice: Apprentice Level 5	$67.64	$83.36	$99.07
Apprentice: Apprentice Level 6	$75.42	$93.70	$111.97

Four 10-hour days allowed? - No

Make Up Day Allowed? - No

Prevailing Wage Rates for State Of Michigan Funded Projects

Official Rate Schedule

Genesee

Classification Name	Last Updated
Laborer, Common - Commercial	**11/04/2025**

Wage Rates	Straight Time	Time and a Half	Double Time
Journeyman	$50.13	$63.66	$77.18
Apprentice: Apprentice Level 1	$43.37	$53.52	$63.66
Apprentice: Apprentice Level 2	$46.07	$57.56	$69.06
Apprentice: Apprentice Level 3	$48.32	$61.17	$74.02

Four 10-hour days allowed? - No

Make Up Day Allowed? - No

Prevailing Wage Rates for State Of Michigan Funded Projects

Official Rate Schedule

Genesee

Classification Name	Last Updated
Laborer, Common - Highway & Heavy	**11/05/2025**

Wage Rates	Straight Time	Time and a Half	Double Time
Journeyman	$50.32	$65.58	$80.83
Apprentice: Level 1	$42.69	$54.13	$65.57
Apprentice: Level 2	$44.22	$56.43	$68.63
Apprentice: Level 3	$45.74	$58.71	$71.67
Apprentice: Level 4	$48.79	$63.28	$77.77

Four 10-hour days allowed? - Yes

Make Up Day Allowed? - Yes

Prevailing Wage Rates for State Of Michigan Funded Projects

Official Rate Schedule

Genesee

Classification Name	Last Updated
Laborer, Landscaping	**11/03/2025**

Wage Rates	Straight Time	Time and a Half	Double Time
Journeyman	$36.87	$49.23	$61.58
Apprentice: Apprentice Level 1	$30.69	$39.96	$49.22
Apprentice: Apprentice Level 2	$31.93	$41.82	$51.70
Apprentice: Apprentice Level 3	$33.16	$43.66	$54.16
Apprentice: Apprentice Level 4	$35.63	$47.37	$59.10

Four 10-hour days allowed? - No

Make Up Day Allowed? - No

Prevailing Wage Rates for State Of Michigan Funded Projects

Official Rate Schedule

Genesee

Classification Name	Last Updated
Laborer, Skilled - Highway & Heavy	**11/05/2025**

Wage Rates	Straight Time	Time and a Half	Double Time
Journeyman	$51.22	$66.93	$82.63
Apprentice: Level 1	$43.37	$55.15	$66.93
Apprentice: Level 2	$44.94	$57.51	$70.07
Apprentice: Level 3	$46.51	$59.86	$73.21
Apprentice: Level 4	$49.65	$64.57	$79.49

Four 10-hour days allowed? - Yes

Make Up Day Allowed? - Yes

Prevailing Wage Rates for State Of Michigan Funded Projects

Official Rate Schedule

Genesee

Classification Name			Last Updated
Landscaping equipment			**10/28/2025**
Wage Rates	**Straight Time**	**Time and a Half**	**Double Time**
Journeyman	$39.09	$52.56	$66.02

Four 10-hour days allowed? - No

Make Up Day Allowed? - No

Prevailing Wage Rates for State Of Michigan Funded Projects

Official Rate Schedule

Genesee

Classification Name			Last Updated
Lineman			**10/30/2025**
Wage Rates	**Straight Time**	**Time and a Half**	**Double Time**
Journeyman	$76.81	$111.26	$145.70
Apprentice: Level 1 0-1000 hours	$49.26	$69.94	$90.60
Apprentice: Level 2 1001-2000 Hours	$52.71	$75.11	$97.50
Apprentice: Level 3 2001-3000 Hours	$56.15	$80.28	$104.38
Apprentice: Level 4 3001-4000 hours	$59.60	$85.44	$111.28
Apprentice: Level 5 4001-5000 Hours	$63.04	$90.60	$118.16
Apprentice: Level 6 5001-6000 Hours	$66.48	$95.77	$125.04
Apprentice: Level 7	$69.93	$100.94	$131.94

Four 10-hour days allowed? - Yes

Make Up Day Allowed? - Yes

Prevailing Wage Rates for State Of Michigan Funded Projects

Official Rate Schedule

Genesee

Classification Name	Last Updated
Low Voltage Technician	**02/04/2026**

Wage Rates	Straight Time	Time and a Half	Double Time
Journeyman	$55.21	$72.46	$89.71
Apprentice: Level 1	$24.76	$34.25	$43.74
Apprentice: Level 2	$26.56	$36.91	$47.26
Apprentice: Level 3	$31.87	$40.15	$51.36
Apprentice: Level 4	$36.01	$48.95	$61.89

Four 10-hour days allowed? - Yes

Make Up Day Allowed? - Yes

Prevailing Wage Rates for State Of Michigan Funded Projects

Official Rate Schedule

Genesee

Classification Name			Last Updated
Millwright			**11/05/2025**
Wage Rates	**Straight Time**	**Time and a Half**	**Double Time**
Journeyman	$82.65	$126.09	$165.30
Apprentice: Level 1	$60.79	$91.21	$121.58
Apprentice: Level 2	$68.09	$102.15	$136.18
Apprentice: Level 3	$75.36	$113.05	$150.72
Apprentice: Level 4	$79.01	$118.54	$158.02

Four 10-hour days allowed? - Yes

Make Up Day Allowed? - Yes

Prevailing Wage Rates for State Of Michigan Funded Projects

Official Rate Schedule

Genesee

Classification Name			Last Updated
Off-Road Truck			**10/29/2025**
Wage Rates	**Straight Time**	**Time and a Half**	**Double Time**
Journeyman	$63.02	$81.91	$100.79
Apprentice: Apprentice Level 1	$51.70	$64.93	$78.15
Apprentice: Apprentice Level 2	$53.59	$67.76	$81.93
Apprentice: Apprentice Level 3	$55.48	$70.60	$85.71
Apprentice: Apprentice Level 4	$57.36	$73.42	$89.47
Apprentice: Apprentice Level 5	$59.25	$76.25	$93.25
Apprentice: Apprentice Level 6	$61.13	$79.07	$97.01

Four 10-hour days allowed? - No

Make Up Day Allowed? - No

Prevailing Wage Rates for State Of Michigan Funded Projects

Official Rate Schedule

Genesee

Classification Name	Last Updated
Painter	**10/31/2025**

Wage Rates	Straight Time	Time and a Half	Double Time
Journeyman	$50.90	$67.19	$83.48
Apprentice: Apprentice Level 1	$37.87	$47.65	$57.42
Apprentice: Apprentice Level 2	$41.13	$52.54	$63.94
Apprentice: Apprentice Level 3	$44.38	$57.41	$70.44
Apprentice: Apprentice Level 4	$47.64	$62.30	$76.96

Four 10-hour days allowed? - No

Make Up Day Allowed? - No

Prevailing Wage Rates for State Of Michigan Funded Projects

Official Rate Schedule

Genesee

Classification Name			Last Updated
Piledriver			**11/01/2025**
Wage Rates	**Straight Time**	**Time and a Half**	**Double Time**
Journeyman	$60.20	$78.38	$96.56
Apprentice: Apprentice Level 1	$49.29	$62.02	$74.74
Apprentice: Apprentice Level 2	$51.11	$64.75	$78.38
Apprentice: Apprentice Level 3	$54.75	$70.21	$85.66
Apprentice: Apprentice Level 4	$58.95	$76.51	$94.06

Four 10-hour days allowed? - No

Make Up Day Allowed? - No

Prevailing Wage Rates for State Of Michigan Funded Projects

Official Rate Schedule

Genesee

Classification Name			Last Updated
Pipefitters—Steamfitters			**11/03/2025**
Wage Rates	**Straight Time**	**Time and a Half**	**Double Time**
Journeyman	$70.71	$105.22	$139.72
Apprentice: Level 1	$36.10	$53.70	$71.29
Apprentice: Level 2	$45.33	$68.00	$90.66
Apprentice: Level 3	$50.07	$75.11	$100.14
Apprentice: Level 4	$54.80	$82.21	$109.60
Apprentice: Level 5	$59.54	$89.32	$119.08

Four 10-hour days allowed? - Yes

Make Up Day Allowed? - Yes

Prevailing Wage Rates for State Of Michigan Funded Projects

Official Rate Schedule

Genesee

Classification Name			Last Updated
Plasterer			**10/29/2025**
Wage Rates	**Straight Time**	**Time and a Half**	**Double Time**
Journeyman	$58.68	$75.07	$91.46
Apprentice: Apprentice Level 1	$43.94	$56.07	$68.20
Apprentice: Apprentice Level 2	$45.77	$58.82	$71.86
Apprentice: Apprentice Level 3	$47.60	$61.56	$75.52
Apprentice: Apprentice Level 4	$49.43	$64.31	$79.18
Apprentice: Apprentice Level 5	$51.27	$67.07	$82.86
Apprentice: Apprentice Level 6	$51.27	$67.07	$82.86

Four 10-hour days allowed? - No

Make Up Day Allowed? - No

Prevailing Wage Rates for State Of Michigan Funded Projects

Official Rate Schedule

Genesee

Classification Name			Last Updated
Plumbers			**10/29/2025**
Wage Rates	**Straight Time**	**Time and a Half**	**Double Time**
Journeyman	$70.71	$105.22	$139.72
Apprentice: Level 1	$36.10	$53.70	$71.29
Apprentice: Level 2	$45.33	$68.00	$90.66
Apprentice: Level 3	$45.33	$68.00	$90.66
Apprentice: Level 5	$50.07	$75.11	$100.14
Apprentice: Level 7	$54.80	$82.21	$109.60
Apprentice: Level 8	$59.54	$89.32	$119.08

Four 10-hour days allowed? - Yes

Make Up Day Allowed? - Yes

Prevailing Wage Rates for State Of Michigan Funded Projects

Official Rate Schedule

Genesee

Classification Name			Last Updated
Roofer/Waterproofer			**11/03/2025**
Wage Rates	**Straight Time**	**Time and a Half**	**Double Time**
Journeyman	$49.76	$63.95	$78.14
Apprentice: Apprentice 1	$35.27	$42.22	$49.16
Apprentice: Apprentice 2	$36.91	$44.68	$52.44
Apprentice: Apprentice 3	$36.31	$43.78	$51.24
Apprentice: Apprentice 4	$37.93	$46.20	$54.48
Apprentice: Apprentice 5	$34.45	$40.98	$47.52
Apprentice: Apprentice 6	$41.18	$51.08	$60.98
Apprentice: Apprentice 7	$42.51	$53.08	$63.64
Apprentice: Apprentice 8	$44.42	$55.94	$67.46

Four 10-hour days allowed? - Yes

Make Up Day Allowed? - Yes

Prevailing Wage Rates for State Of Michigan Funded Projects

Official Rate Schedule

Genesee

Classification Name			Last Updated
Sheet Metal Worker			**04/17/2026**
Wage Rates	**Straight Time**	**Time and a Half**	**Double Time**
Journeyman	$63.20	$81.64	$100.07

Four 10-hour days allowed? - Yes

Make Up Day Allowed? - Yes

Saturday

Prevailing Wage Rates for State Of Michigan Funded Projects

Official Rate Schedule

Genesee

Classification Name			Last Updated
Sprinkler Fitters			**11/03/2025**
Wage Rates	**Straight Time**	**Time and a Half**	**Double Time**
Journeyman	$60.34	$78.45	$96.56
Apprentice: Class 1	$24.57	$32.72	$40.87
Apprentice: Class 10	$52.07	$68.37	$84.67
Apprentice: Class 2	$26.38	$35.43	$44.49
Apprentice: Class 3	$39.14	$49.10	$59.06
Apprentice: Class 4	$40.95	$51.82	$62.68
Apprentice: Class 5	$43.01	$54.78	$66.55
Apprentice: Class 6	$44.82	$57.49	$70.17
Apprentice: Class 7	$46.63	$60.21	$73.79
Apprentice: Class 8	$48.45	$62.94	$77.43
Apprentice: Class 9	$50.26	$65.65	$81.05

Four 10-hour days allowed? - Yes

Make Up Day Allowed? - Yes

Prevailing Wage Rates for State Of Michigan Funded Projects

Official Rate Schedule

Genesee

Classification Name	Last Updated
Terrazzo Workers	**04/17/2026**

Wage Rates	Straight Time	Time and a Half	Double Time
Journeyman	$56.86	$72.84	$88.81
Apprentice: Level 1	$43.04	$53.11	$63.17
Apprentice: Level 2	$44.96	$55.99	$67.01
Apprentice: Level 3	$46.55	$58.37	$70.19
Apprentice: Level 4	$48.47	$61.25	$74.03
Apprentice: Level 5	$51.98	$66.52	$81.05
Apprentice: Level 6 and 7	$53.90	$69.40	$84.89

Four 10-hour days allowed? - Yes

Make Up Day Allowed? - Yes

Prevailing Wage Rates for State Of Michigan Funded Projects

Official Rate Schedule

Genesee

Classification Name			Last Updated
Tile Finishers			**04/17/2026**
Wage Rates	**Straight Time**	**Time and a Half**	**Double Time**
Journeyman	$49.30	$62.80	$76.30
Apprentice: Level 1	$40.55	$50.68	$60.80
Apprentice: Level 2	$42.17	$53.11	$64.04
Apprentice: Level 3	$43.79	$55.53	$67.28
Apprentice: Level 4	$45.14	$57.56	$69.98
Apprentice: Level 5	$46.76	$59.99	$73.22

Four 10-hour days allowed? - Yes

Make Up Day Allowed? - Yes

Prevailing Wage Rates for State Of Michigan Funded Projects

Official Rate Schedule

Genesee

Classification Name			Last Updated
Tile Setters			**04/17/2026**
Wage Rates	**Straight Time**	**Time and a Half**	**Double Time**
Journeyman	$56.36	$72.09	$87.81
Apprentice: Level 1	$42.72	$52.63	$62.53
Apprentice: Level 2	$44.61	$55.46	$66.31
Apprentice: Level 3	$46.18	$57.82	$69.45
Apprentice: Level 4	$48.07	$60.65	$73.23
Apprentice: Level 5	$51.53	$65.84	$80.15
Apprentice: Level 6	$53.42	$68.68	$83.93

Four 10-hour days allowed? - Yes

Make Up Day Allowed? - Yes

Prevailing Wage Rates for State Of Michigan Funded Projects

Official Rate Schedule

Genesee

Classification Name			Last Updated
Tunnel Miner			**11/03/2025**
Wage Rates	**Straight Time**	**Time and a Half**	**Double Time**
Journeyman	$52.82	$70.02	$87.22
Apprentice: Level 1	$44.22	$57.12	$70.02
Apprentice: Level 2	$45.94	$59.70	$73.46
Apprentice: Level 3	$47.66	$62.28	$76.90
Apprentice: Level 4	$51.10	$61.35	$75.66

Four 10-hour days allowed? - Yes

Make Up Day Allowed? - Yes

Prevailing Wage Rates for State Of Michigan Funded Projects

Official Rate Schedule

Genesee

Classification Name	Last Updated
Underground and Open Cut Laborer	**01/06/2026**

Wage Rates	Straight Time	Time and a Half	Double Time
Journeyman	$48.76	$63.91	$79.05
Apprentice: Level 1	$41.19	$52.55	$63.91
Apprentice: Level 2	$42.70	$54.82	$66.93
Apprentice: Level 3	$44.22	$57.10	$69.97
Apprentice: Level 4	$47.25	$61.64	$76.03

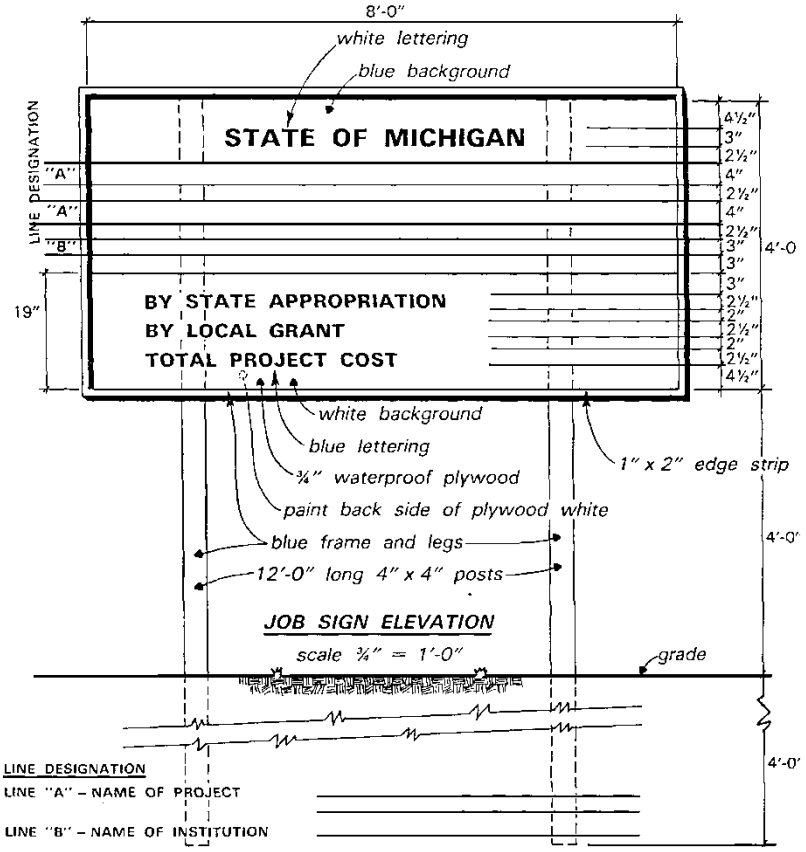
Four 10-hour days allowed? - Yes

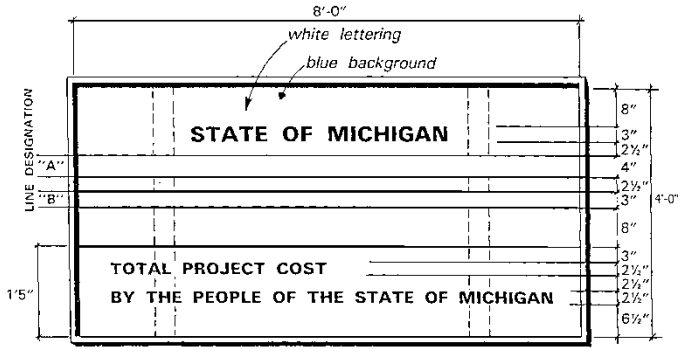
Make Up Day Allowed? - Yes

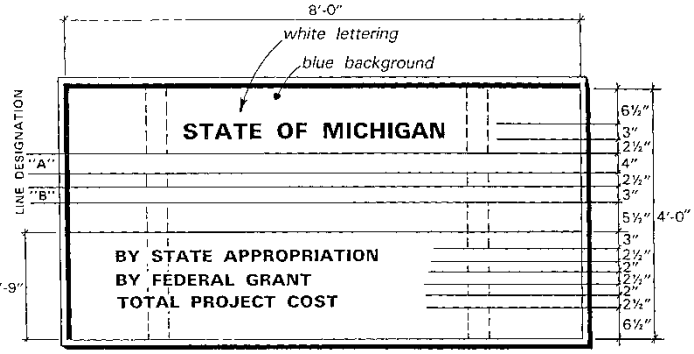
APPENDIX IV – PROJECT SIGNAGE

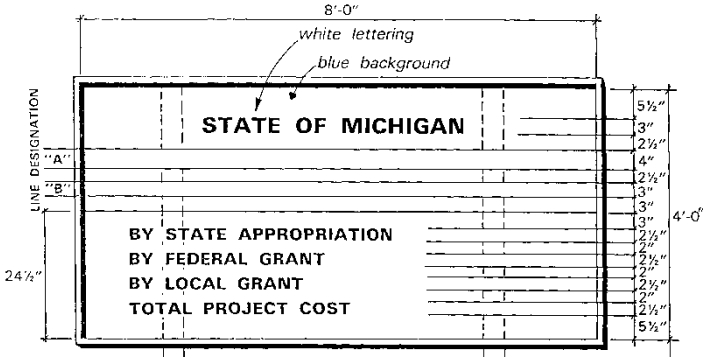
REQUIRED PROJECT SIGN FOR PROJECTS COSTING IN EXCESS OF $500,000.00

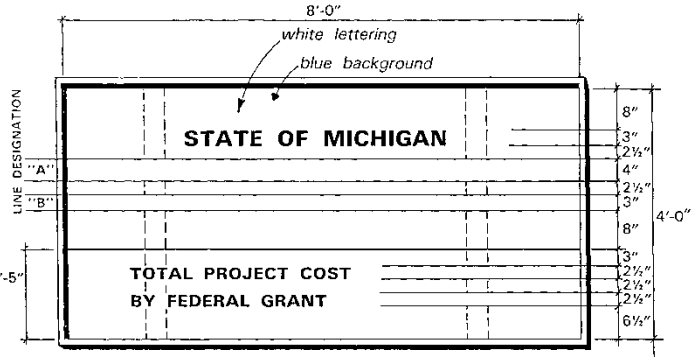
Five examples of project signs. Sign lettering corresponds with the funding arrangement of the project. Alternate signs may be considered; please contact the DTMB Project Director.











APPENDIX V
HISTORIC REPORTS

Technical Memorandum

Environmental Assessment
Flint Bishop Airport Landfill

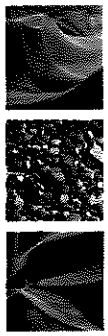
City of Flint
Dept. of Public Works & Utilities, Water Pollution Control Division
G-4652 Beecher Road, Flint, Michigan 48532

April 26, 2013
NTH Project No. 62-100065-07



NTH Consultants, Ltd.
41780 Six Mile Road
Northville, MI 48168

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MAY 24 2013
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MDEQ-RD
C DISTRICT OFFICE



Technical Memorandum

To: Robert Case & Brad Hill, City of Flint

From: Alan Erickson, P.E. & Richard Burns, NTH Consultants, Ltd.

Date: April 26, 2013

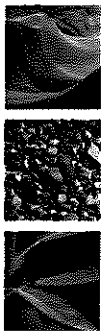
Re: Environmental Assessment – Bishop Airport Landfill, Flint, Michigan

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INTRODUCTION

This technical memorandum presents the results of an environmental assessment conducted by NTH Consultants, Ltd. (NTH) at the site of the former Bishop Airport Landfill in Flint, Michigan. This investigation was conducted in accordance with the City of Flint's Request for Proposal (RFP) No. 593, and associated Addenda. The scope of work was based on the "Work Plan for Bishop Airport Landfill Disposal Area," (Work Plan) prepared by GEO-Environmental Resources, Inc., dated August 15, 2007. The Work Plan provides a thorough review of the site location, ownership, and history. In summary, the landfill is located on what is now part of the Flint Bishop International Airport, near the western end of the primary east-west runway (Runway 9-27). The landfill is comprised of two separate disposal areas. Landfill I occupies approximately 22 acres and is generally bounded by the South Branch of Swartz Creek to the east, the airport runway to the south, the Hewitt Drain to the west, and a ditch adjoining the Grand Trunk Western Railroad right-of-way to the north. The current environmental assessment focused primarily on Landfill I, in accordance with the Work Plan. Landfill II occupies approximately 30 acres and is generally bounded by the same ditch along the north side, the Hewitt Drain to the east, the Bishop Airport property boundary to the south, and Linden Road to the west.

The site was licensed by the City of Flint under the Michigan Department of Public Health, beginning in 1966. The site was used for disposal of municipal waste until 1975. Regulations in place at the time of landfill closure did not require the installation of an impermeable cap. So, consistent with prevailing practice at the time, the waste was likely covered with a mixture of granular and clay soils. Since closure of the landfill, extension of the airport runway necessitated realignment of Swartz Creek, which resulted in a portion of the creek being enclosed in a culvert under the runway. In addition, additional fill soil has been placed on portions of the landfill, and a perimeter fence was installed.



Technical Memorandum

To: Robert Case & Brad Hill, City of Flint

From: Alan Erickson, P.E. & Richard Burns, NTH Consultants, Ltd.

Date: April 26, 2013

Re: Environmental Assessment – Bishop Airport Landfill, Flint, Michigan

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INTRODUCTION

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In 2006, the Michigan Department of Environmental Quality (MDEQ) noted a leachate seep along the northern side of Landfill I. Liquid was apparently observed discharging to the unnamed ditch adjacent to the landfill, which ultimately discharges to Swartz Creek. Subsequently, City of Flint staff has documented and monitored a number of groundwater seeps and vents along the landfill boundaries, which recur seasonally. Periodically during these site inspections by City personnel, indications of methane generation from the landfill have also been observed, including bubbling in surface water puddles on the landfill.

ENVIRONMENTAL ASSESSMENT SCOPE OF WORK

Below is a brief description of the individual tasks that were completed in accordance with the RFP developed by the City of Flint. All on-site activities on Airport property were completed under FAA security procedures, including full-time escort by Airport Public Safety offices, as necessary. The tasks completed during this investigation included the following:

1) An aerial thermal photography survey was completed by our subcontractor, Predictive Service, LLC (Predictive), to identify ground surface temperature anomalies that may be indicative of groundwater seeps or methane emissions. This survey was completed by an aerial flyover, followed by ground surface temperature verification, by Predictive in June 2011. The results are presented on Figure 1, Aerial Thermal Photograph, included in Attachment I, and are discussed in the next section.

2) A total of 17 soil borings were completed by our subcontractor Fibertec Environmental Services, Inc. (Fibertec) using direct-push (geoprobe) drilling techniques. The locations of the borings, designated as HP-1-07 through HP-17-07, are shown on Figure 2, Soil Boring Location Plan, included in Attachment I. Four of the borings (HP-10-07 through HP-13-07) were located within the interior of the landfill area and were advanced into the gray silty clay that underlies the waste. The remaining 13 borings were placed at various locations around the perimeter of the landfill area. Several of these borings were placed at the top of the landfill perimeter slope directly above springs or vents previously identified by City of Flint staff. City staff assisted NTH to select appropriate locations for these borings. These exterior borings also generally extended into the gray silty clay soil and ranged in depth from approximately 25 to 40 feet below ground surface (bgs). A field engineer with NTH observed the soil boring activities and described the soil samples on a field log as they were recovered. The subsurface conditions encountered in the borings have been evaluated and are shown on a Log of Geoprobes, included in Attachment II. The log includes information on subsurface materials, groundwater conditions, and field screening for volatile organic compounds (VOCs) with a photoionization detector ("HNu Readings"). Our field engineer also screened the soil

samples and the completed boreholes for methane. The methane detections, where encountered, are noted on the geoprobe logs.

3) Selected soil or fill samples from the borings were submitted to Fibertec's analytical laboratory in Holt, Michigan, for analysis of metals and VOCs. The results are summarized on Table 1, Soil Analytical Results – Subsurface Soil Samples from Borings, included in Attachment III. This table also includes the Part 201 generic non-residential soil cleanup criteria (GNCC) developed by the MDEQ. The laboratory analytical reports are included in Attachment IV. Discussion of the soil analytical results is presented in a separate section below.

4) Our field engineer collected surface soil samples at eight of the springs and vents previously identified by City of Flint staff. These soil samples were obtained from the area on the landfill perimeter slope or drain bank directly below the point where historic liquid seepage was evident. In most cases, the seepage was not active, but the soil was stained. At each location, we used a stainless steel hand auger to obtain a sample of the upper approximately 6 inches of soil. The approximate locations of the surficial soil samples, identified as HAB-1-07 through HAB-8-07, are shown on Figure 2.

5) The surficial soil samples from the hand auger borings were submitted to Fibertec for analysis of metals, VOCs, semi-volatile organic compounds (SVOCs), pesticides, herbicides, and polychlorinated biphenyls (PCBs). The results are summarized on Table 2, Soil Analytical Results – Surficial Soil Samples from Hand Auger Borings, included in Attachment III. This table also includes the Part 201 GNCC. The laboratory analytical reports are included in Attachment IV. Discussion of the surficial soil analytical results is presented in a separate section below.

6) Sixteen of the geoprobe borings (See Task #1) were converted to monitoring wells or piezometers. The locations and designations of these wells/piezometers are shown on Figure 3, Monitoring Well Location Map, included in Attachment I. Piezometers, designated as PZ-1-07 through PZ-4-07, were installed in the four borings located within the interior of the landfill area (HP-10-07 through HP-13-07). Monitoring wells, designated as MW-1-07 through MW-12-07, were installed in borings located around the perimeter of the landfill area (all except boring HP-2-07). Each of the piezometers and monitoring wells was constructed with 2-inch diameter, PVC well casing and screen. In accordance with FAA requirements, seven of the wells that are located within runway airspace were completed at the ground surface with flush-mounted protective covers. The remaining wells were completed with above ground steel protective covers fitted with padlocks for security. Following well installation, a survey was completed by Inland Seas Engineering to establish the location coordinates and elevations of the wells. The locations were established relative to State Plane Coordinates and the ground surface and top of casing elevations were surveyed to the nearest 0.1 foot

and 0.01 foot, respectively, relative to mean sea level. Further details regarding construction materials, dimensions, survey data, and other pertinent information for the monitoring wells and piezometers is presented on individual well construction logs presented in Attachment III.

7) NTH collected groundwater samples from the monitoring wells and piezometers using low-flow sampling methods. The samples were submitted to Fibertec for analysis of metals, VOCs, SVOCs, pesticides, herbicides, PCBs, and dissolved methane. The results are summarized on Table 3, Water Analytical Results – Groundwater, Leachate, and Seeps, included in Attachment III. This table includes the Part 201 generic non-residential groundwater cleanup criteria (GNCC) developed by the MDEQ. The laboratory analytical reports are included in Attachment IV. Discussion of the groundwater analytical results is presented in a separate section below.

8) During completion of the groundwater sampling, we obtained static groundwater level measurements at each well and piezometer. We also obtained surface water elevation measurements in Swartz Creek and Hewitt Drain adjacent to the investigation area. These readings were collected by measuring the depth to the water surface from reference points (staff gauges) that were established on structures above the surface water feature. The elevations of these reference points were surveyed by Inland Seas Engineering and their locations are shown on Figure 3. The static water level measurements are presented on Table 4, Groundwater and Surface Water Elevations, included in Attachment III. Based on the static groundwater and surface water measurements, we developed Figure 4, Groundwater Elevation Contour Map, included in Attachment I and discussed below.

9) Concurrent with the groundwater sampling, we also collected samples of liquid emanating from the three "vents" that were previously identified by City personnel along the north landfill perimeter. The samples were collected by excavating a small depression immediately downslope from each vent and placing a glass jar in the depression. Liquid was then allowed to flow into the jar, and was subsequently transferred to laboratory prepared sample containers. For reference, the sampling locations are identified as Vent #1 (adjacent to HAB-4-07), Vent #2 (adjacent to HAB-3-07), and Vent #3 (adjacent to HAB-2-07). The water samples were submitted to Fibertec for analysis of metals, VOCs, SVOCs, pesticides, herbicides, PCBs, and dissolved methane. The results are summarized on Table 3, included in Attachment III. This table includes the Part 201 groundwater GNCC. The laboratory analytical reports are included in Attachment IV. Discussion of the vent water analytical results is presented in a separate section below.

10) Also at the time the wells were sampled, our field engineer collected methane measurements within the headspace of each monitoring well and piezometer. These measurements were obtained using an RKI Eagle™ meter with an infrared detector, which provides the explosive

gas concentration as a percentage of the Lower Explosive Limit (LEL), or as the percentage of methane by volume if the concentration is greater than 100 percent LEL. The Eagle meter also provides measurements of oxygen content (percent by volume) and carbon monoxide (parts per million). The headspace measurements were obtained by attaching an approximate 3-foot section of flexible tubing to the methane meter and extending the tubing into the well to sample the ambient atmosphere. The well headspace methane measurements are presented on Table 5, Monitoring Well Methane Measurements, included in Attachment III.

11) We compiled and reviewed records of water supply wells in the vicinity of the Bishop Airport Landfill, which were available in the MDEQ's database. A regional map showing the reported locations of water supply wells within an approximate 3-mile radius of the site is included as Figure 6, Regional Water Supply Wells, in Attachment I. A more focused map, encompassing a little more than a 1-mile radius is included as Figure 7, Local Water Supply Wells. This map includes the MDEQ well identification number (Well ID) corresponding to the well record. Copies of the MDEQ Water Well and Pump Records for the nearest wells are included in Attachment V, and the information provided is discussed in a separate section of this memorandum.

FINDINGS & DISCUSSION

The following sections present the information developed as a result of the investigation activities.

Subsurface Conditions

Subsurface conditions encountered at the individual borings completed during this investigation are depicted on the Log of Geoprobe and are summarized on a series of Generalized Subsurface Profiles, presented on Figure 5, in Attachment I. The locations of the profile lines are shown on Figure 2. Generalized Subsurface Profile A-A' is oriented generally east-west through the landfill; Profiles B-B' and C-C' are oriented generally north-south. As shown on these profiles, at the borings located within the interior of the landfill (HP-10-07 through HP-13-07), the waste is overlain by fill soil ranging in thickness from approximately 3.5 to 6 feet. At each location, the cover soil included at least some clay, ranging from about 1 to 3.5 feet in thickness. Note that at HP-11-07, we encountered mostly fill soil with no appreciable waste. Either this boring is located outside the landfill limits or was placed within an internal berm between individual waste fill areas. Three other borings located near the perimeter of the landfill (HP-3-07, HP-4-07, and HP-7-07). Cover soils above the waste at these locations ranged from 2 to 14 feet thick and was composed of clay or a mixture of clay and sand layers.

In general, the waste materials identified as waste consisted of dark gray or black granular material with varying amounts of broken glass, metal, plastic and wood). The waste was generally highly decomposed with relatively little organic material. As mentioned above, while advancing the soil

borings, we screened the soil samples and the completed boreholes for methane, which was detected at only one location (HP-10-07) during drilling. As shown on Table 5 in Attachment III, measurements in the monitoring wells/piezometers indicated that methane was more prevalent, being detected in nine of the wells, with six wells exhibiting methane concentrations above the LEL.

As shown on the profiles, the waste extends to a maximum depth of approximately 22.5 feet bgs (HP-12-07), which corresponds to approximately Elevation 743 feet msl. The waste is underlain by a laterally continuous deposit of cohesive soil described on the boring logs as gray silty clay with varying amounts of sand and gravel. Based on our experience, this material is glacial till that has a very low permeability. Typical values for hydraulic conductivity of the till are in the 10^{-8} centimeter per second (cm/sec) range.

The two borings located outside the landfill limits along the south side of the site (HP-15-07 and HP-16-07) encountered native brown clay underlain by the gray silty clay layer at a depth of about 10 feet. At HP-14-07, a layer of native brown silty sand was encountered from 2.5 to 8 feet bgs. The borings located outside the landfill limits along the west, north, and east sides of the site generally encountered fill soils underlain by native brown clay or gray clay. At some locations (e.g., HP-1-07, HP-6-07, & HP-8-07) native sand or gravel was encountered beneath the fill soils.

Neither of the two borings located east of Swartz Creek (HP-16-07 and HP-17-07) encountered waste. However, access to the proposed drilling locations was restricted due to soil stockpiles. Therefore, the presence of waste on the east side of Swartz Creek cannot be precluded.

Groundwater Elevations & Flow Pattern

The evaluation of groundwater conditions at the Flint Bishop Airport Landfill is based on observations made during advancement of the soil borings along with measurements of static groundwater levels in the completed wells and piezometers. As shown on the geoprobe logs, groundwater was encountered in the borings at depths ranging from 2.5 to 18.5 feet bgs. In general, groundwater was encountered at less than 5 feet bgs at borings located near the western landfill perimeter (HP-01-07) and northern landfill perimeter (HP-02-07 through HP-05-07). At a few locations (e.g., HP-12/PZ-3 and HP-15/MW-10), the static groundwater level measured in the well or piezometer rose to a level that was considerably higher than the level at which groundwater was first encountered during advancement of the boring. This was primarily due to confinement of the groundwater surface by overlying clay soils.

We prepared a contour map of the groundwater surface based on static groundwater elevations measured in the monitoring wells and piezometers, along with surface water elevations measured at the staff gauges in the Hewitt Drain and Swartz Creek. As shown on Figure 4, this contour map shows that groundwater elevations within the landfill area are considerably higher than

groundwater elevations around the perimeter. The highest groundwater elevations occur at PZ-3-07 and PZ-4-07, located in the center and western portions of the landfill, where the groundwater elevation was measured at approximately Elevation 764 feet msl. This corresponds to less than 3 feet bgs. Other locations where the measured static groundwater elevation was relatively close to the ground surface (i.e., less than 4 feet) included MW-1-07, MW-2-07, MW-3-07, MW-9-07, and MW-10-07. Monitoring wells MW-1-07 through MW-3-07 were located adjacent to previously identified groundwater vents or springs. Monitoring wells MW-9-07 and MW-10-07 were located in slight localized topographic depressions where surface water runoff appears to periodically accumulate. Note that ponded water was present around MW-2-07 and MW-9-07 at the time of the initial groundwater sampling event, necessitating that these wells had to be sampled on a separate date.

The groundwater contour map (Figure 4) also illustrates that groundwater exhibits an apparent radial flow pattern from within the landfill area outward toward the surrounding surface water drains. Based on the elevated groundwater level within the landfill compared to the surface water elevations (i.e., 15 to 20 feet higher), the soil berms that were evidently constructed around the perimeter of the landfill are effective in containing groundwater within the landfill and limiting groundwater migration to the adjoining surface water features. The underlying clay barrier also restricts vertical groundwater infiltration, creating a "bath tub" of groundwater, as conceptualized in the Work Plan. Recharge most likely occurs primarily through direct infiltration of surface runoff that periodically accumulates on the landfill surface.

Soil Analytical Results

The test results from samples collected from the geoprobe borings are summarized on Table 1 in Attachment III. A variety of materials were tested, including samples of the cover soils, fill soils from the perimeter dikes, landfill waste, and apparent native soils. The type of sample is noted on Table 1. These testing results provide information on source composition, background concentrations, and potential impact and exposure pathways.

Samples of the landfill waste were collected from five locations (HP-7-07, HP-10-07, HP-11-07, HP-12-07, and HP-13-07). The analytical data shows detections of each of the analyzed metals (except thallium) and several VOCs. Comparison to the Part 201 Soil GNCC indicates several naturally occurring metals above the Drinking Water Protection criteria, including aluminum, arsenic, cobalt, iron, and magnesium. However, some of the detected concentrations, particularly those for aluminum, cobalt, and magnesium may be within local background, based on the analytical results for native soil samples and published information. Metals that were detected above the Groundwater – Surface Water Interface (GSI) Protection criteria in one or more of the waste samples included arsenic, chromium, cobalt, manganese, mercury, and zinc. Again, some of these concentrations (i.e., arsenic, chromium, cobalt, manganese) may be within local background

levels for soil. Only one parameter (lead at HP-7-07) was detected in the waste samples above the Part 201 Direct Contact soil criteria.

As shown on Table 1, a number of VOCs were detected in the waste samples. One compound (trichloroethene at HP-12-07) was detected above the Part 201 Drinking Water Protection criteria. Three compounds (chlorobenzene, ethylbenzene, and xylenes) were detected at concentrations above the Part 201 GSI Protection criteria.

The majority of the samples submitted from the geoprobe borings represent the cover soils above the waste. A total of eleven of these samples from a variety of locations around the site were analyzed. These samples were generally collected from the upper 2 to 4 feet of cover soil, although one sample (from HP-7-07) was collected from an interval of 7.5 to 9 feet bgs. Review of Table 1 shows that aluminum, arsenic, cobalt, iron, magnesium, and manganese were detected in one or more the of cover soil samples at concentrations above the Part 201 Drinking Water Protection criteria. Concentrations of arsenic, cobalt, lead, manganese, and selenium were reported above the GSI Protection criteria in one or more of the cover soil samples. As with the waste samples, some of the detected concentrations may be within local background concentrations.

VOCs were detected in one of the cover soil samples (HP-3-07). One of the detected compounds (1,4-dichlorobenzene) was reported slightly above the GSI Protection criteria. No VOCs or metals were detected in the cover soil samples above the Part 201 Direct Contact criteria.

A number of samples of fill soil representing the constructed berms or dikes around the perimeter of the landfill or other fill soils outside the landfill limits were also tested. These samples generally showed similar composition as the cover soils, with the same metals exceeding the respective Part 201 criteria. Exceptions included copper, mercury, and zinc, which were detected above the GSI Protection criteria in the sample of fill collected from HP-8-07. Two VOCs were also detected in this same sample (chlorobenzene and 1,4-dichlorobenzene). One of these compounds (1,4-dichlorobenzene) was reported above the Part 201 GSI Protection criteria. No VOCs or metals were detected in the fill soil samples above the Part 201 Direct Contact criteria.

Two samples of apparent native soils collected from the borings located outside the waste limits were submitted for laboratory analysis. These samples generally showed detected concentrations of most of the analyzed metals (except antimony, beryllium, mercury, silver, or thallium) and no detected VOCs. The concentrations of most of the metals were similar to the reported concentrations in most of the fill soil and cover soil samples. Two metals (aluminum and iron) were detected at concentrations above the Part 201 Drinking Water Protection criteria, further confirming that elevated levels of these and other metals are naturally occurring.

The analytical results for surficial soil samples collected from eight of the groundwater vents and springs previously identified around the perimeter of the site are presented on Table 2. These samples were tested to evaluate the surficial soils that are visibly impacted by the groundwater seepage. Review of Table 2 indicates that one parameter (arsenic) was detected above the Part 201 Direct Contact criteria at two locations (HAB-1-07 and HAB-6-07). Arsenic was also above the GSI Protection criteria in these samples and at one other location (HAB-7-07). Only one other parameter (1,4-dichlorobenzene at HAB-3-07) was detected above the Part 201 GSI Protection criteria in these samples. Three metals, aluminum, arsenic, and iron were detected above Part 201 Drinking Water Protection criteria.

In addition to metals and VOCs, these surficial soil samples were also analyzed for SVOCs, pesticides, herbicides, and PCBs. No pesticides, herbicides, and PCBs were were detected in any of the samples. Two SVOCs (benzo[b]fluoranthene and bis[2-ethylhexyl]phthalate) were detected in two separate samples. Neither of the reported concentrations of these SVOCs exceeded Part 201 criteria.

Water Analytical Results

The test results from water samples collected as part of this investigation are summarized on Table 3 in Attachment III. These samples include leachate samples collected from wells or piezometers located within the landfill area, groundwater samples collected from wells located outside the landfill limits, and samples of the liquid venting through the perimeter dike.

Review of the well logs and location map indicates that the four piezometers along with monitoring wells MW-2 and MW-3 are located within the landfill waste. Therefore, these samples represent leachate in contact with waste, or the potential source liquid. Review of Table 3 shows that one or more of these samples exhibited concentrations above the Part 201 Drinking Water criteria for aluminum, antimony, boron, iron, lead, and manganese. Of the organic compounds tested, one SVOC (bis[2-ethylhexyl]phthalate) and one VOC (benzene) were detected above the Part 201 Drinking Water criteria. With respect to the GSI criteria, only on metal (selenium) was detected above the criteria in these samples. Among the organic compounds, exceedances of the GSI criteria occurred for one PCB isomer (Aroclor 1254), DDT, naphthalene, chlorobenzene, 1,4-dichlorobenzene, ethylbenzene, 1,2,4-trichlorobenzene, and xylenes in one or more of the leachate samples. Each of the leachate samples also exhibited dissolved methane at concentrations above the Part 201 screening level for explosivity.

The remaining monitoring wells provide groundwater quality outside the landfill. Review of Table 3 for these samples shows that aluminum, arsenic, boron, iron, lead, and manganese were detected in one or more of the groundwater samples above the Part 201 Drinking Water criteria. Among the organic compounds that were tested, only one SVOC (bis[2-ethylhexyl]phthalate) was detected

above the Drinking Water criteria. Comparison to the GSI criteria shows arsenic and barium above the limit in one of more groundwater samples. For the organics, DDT, bis[2-ethylhexyl]phthalate, phenanthrene, and 1,2,4-trimethylbenzene exceeded the GSI criteria. Most of the groundwater samples also contained dissolved methane above the Part 201 screening level.

The analytical results for the three vent liquid samples are also presented on Table 3. Review of this data shows concentrations above the Drinking Water criteria for aluminum, boron, iron, lead, manganese, and benzene. Comparison to the GSI criteria shows exceedances for selenium, silver, DDT, naphthalene, chlorobenzene, 1,4-dichlorobenzene, and 1,2,4-trimethylbenzene. Vent #2 generally exhibited a greater number of detected organic compounds and higher concentrations of organics than the other two vents. Each of the vent water samples contained dissolved methane above the Part 201 screening level.

Aerial Thermal Photography

The results of the aerial thermal photographic survey conducted during this investigation are depicted on Figure 1. This figure shows areas exhibiting positive temperature anomalies ("hot spots") that are potentially indicative of near surface methane and negative temperature anomalies ("cool spots") that are potentially indicative of near surface groundwater. As shown, hot spots were detected at several locations primarily within the interior of both Landfills I and II. Note that several of these areas also exhibit apparent vegetation distress, which is typical effect of methane accumulation in surface soil. Note that the apparent hot spot shown on the end of the paved runway was a surface calibration point and not a true temperature anomaly.

Several cool spots, representing apparent near surface groundwater are shown within the interior of both Landfills I and II, along the northern perimeter of Landfill I. During the field investigation, these areas periodically were observed to contain accumulated surface water within shallow topographic depressions. Note that no cool spots that would indicate additional groundwater vents were detected along the slope of the landfill immediately adjoining the ditch or surrounding drains. Vegetation in these areas evidently obstructed the thermal signature preventing the survey from completely covering these areas.

Water Supply Well Records

As shown on Figure 6, most of the area surrounding Flint Bishop Airport is not within the City of Flint and evidently does not have municipal water supply. Information from the MDEQ database indicates numerous water supply well records in the area. Review of these records shows that nearly all of the wells are completed in the bedrock (sandstone) regional aquifer at depths generally ranging from approximately 90 to 220 feet bgs. The records also indicate that the soils above the bedrock include one or more relatively thick layers of clay.

As shown on Figure 7, according to the information available in the MDEQ database, we identified six water supply well records located within approximately 0.2 mile of the FBAL. Copies of the Water Well and Pump Records for these six wells are included in Attachment V, and the information is summarized as follows.

WELL ID	LOCATION	DEPTH	SCREENED UNIT	COMMENTS
25000013974	0.3 mile east	160 ft	Sandstone	Well location incorrect based on address; actual location is 2 miles east
25000002050	0.3 mile northeast	140 ft	Sandstone	Installed at residence 1967; No longer exists
25000002052	0.4 mile north	142 ft	Sandstone	Installed at residence 1982; Apparently still in use
25000002057	0.4 mile northwest	110 ft	Sandstone	Installed at residence 1971; Original residence no longer present
25000002077	0.2 mile southwest	140 ft	Sandstone	Installed at residence 1986; Apparently still in use
25000015091	0.4 mile south	160 ft	Sandstone	Well location incorrect based on address; actual location is 1.5 miles west

As shown, the water supply wells that are apparently in use near the site are completed in the bedrock aquifer, which represents the uppermost groundwater unit used for drinking water. This aquifer is isolated from the shallow groundwater and surface water by a thick layer of confining clay. Based on these findings, groundwater impact to drinking water is not a relevant exposure pathway.

SUMMARY OF FINDINGS & RECOMMENDATIONS

The results of this investigation generally confirmed the conceptual site model as presented in the Work Plan. The landfill waste and contact groundwater are contained horizontally and vertically by fill and natural soils. The natural clay soils below the waste are effective in preventing vertical migration of impacted groundwater to underlying aquifers. Regional groundwater supply wells are consistently screened in the deep bedrock aquifer that is isolated from surface water and shallow groundwater by a thick, low permeability glacial clay deposit.

The waste is covered by a minimum of 2 feet of fill soil, which is predominantly clay. However, the relatively flat topography of the site promotes periodic accumulation of surface runoff that infiltrates the landfill cover and enters the landfill. The resulting groundwater surface exhibits a considerable "mound" centered on the landfill area with groundwater flow outward in a radial

pattern toward the adjoining surface water drains and ditch. Therefore, the primary exposure pathways for environmental impact are direct contact of surface soils and venting of groundwater to surface water via the GSI.

Analytical testing shows no exceedances of the Part 201 soil Direct Contact criteria for the landfill cover soils. Near surface soils associated with two of the groundwater "vents" exhibited arsenic above the Direct Contact criteria.

Samples of the liquid venting from the landfill and potentially impacting surface water contain concentrations of two metals (selenium and silver), a pesticide (DDT), one SVOC (naphthalene), and three VOCs (chlorobenzene, 1,4-dichlorobenzene, and 1,2,4-trimethylbenzene) above the GSI criteria.

Based on the conditions encountered, the environmental impact at the site can be addressed by improving the landfill cover by adding low permeability soil and/or regarding the existing soil to promote surface water runoff and reduce infiltration. Alternatively, a geosynthetic membrane could be installed. Leachate seepage could be mitigated by installing a groundwater barrier along the landfill perimeter or a groundwater collection system. A combination of the two techniques could also be employed.

regrading?

ATTACHMENT I

FIGURES

LEGEND

AREA EXHIBITING POSITIVE TEMPERATURE ANOMALY ("HOT SPOT") INDICATIVE OF POTENTIAL NEAR SURFACE METHANE

AREA EXHIBITNG NEGATIVE TEMPERATURE ANOMALY ("COOL SPOT") INDICATIVE OF POTENTIAL NEAR SURFACE GROUNDWATER

NOTE

THERMAL IMAGE AND AERIAL PHOTOGRAPH ACQUIRED BY PREDICTIVE SERVICE, LLC IN JUNE 2011.



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j:\62\62100065\reports\flint bishop airport\100065-atp.dwg Plotted: 4/23/2013 9:22 AM by kostrowski

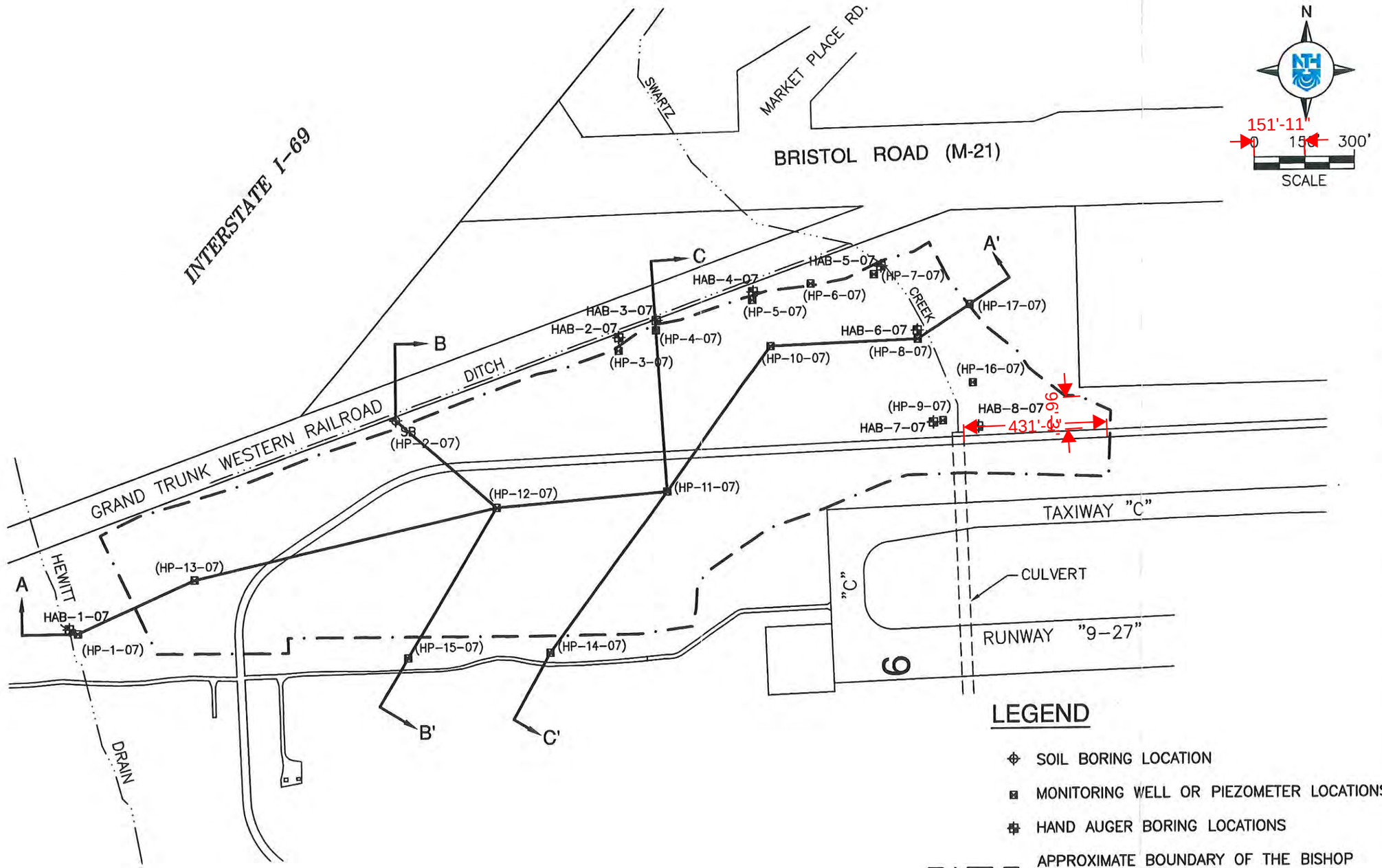
NTH Consultants, Ltd.
Infrastructure Engineering and Environmental Services

NTH PROJECT No.: 62-100065	CAD FILE NAME: 100065-ATP
DESIGNED BY: ACE	PLOT DATE: 4/23/2013
DRAWN BY: KRO	DRAWING SCALE: NONE
CHECKED BY: ACE	INCEPTION DATE: 4/23/2013

AERIAL THERMAL PHOTOGRAPH

FLINT BISHOP AIRPORT LANDFILL
FLINT, MICHIGAN

FIGURE: 1



LEGEND

- SOIL BORING LOCATION
- MONITORING WELL OR PIEZOMETER LOCATIONS
- HAND AUGER BORING LOCATIONS
- APPROXIMATE BOUNDARY OF THE BISHOP AIRPORT LANDFILL I
- A A' LINE OF SUBSURFACE PROFILE

NOTE:
BASE MAP PROVIDED BY INLAND SEAS ENGINEERING, INC.

NTH Consultants, Ltd.
Infrastructure Engineering and Environmental Services

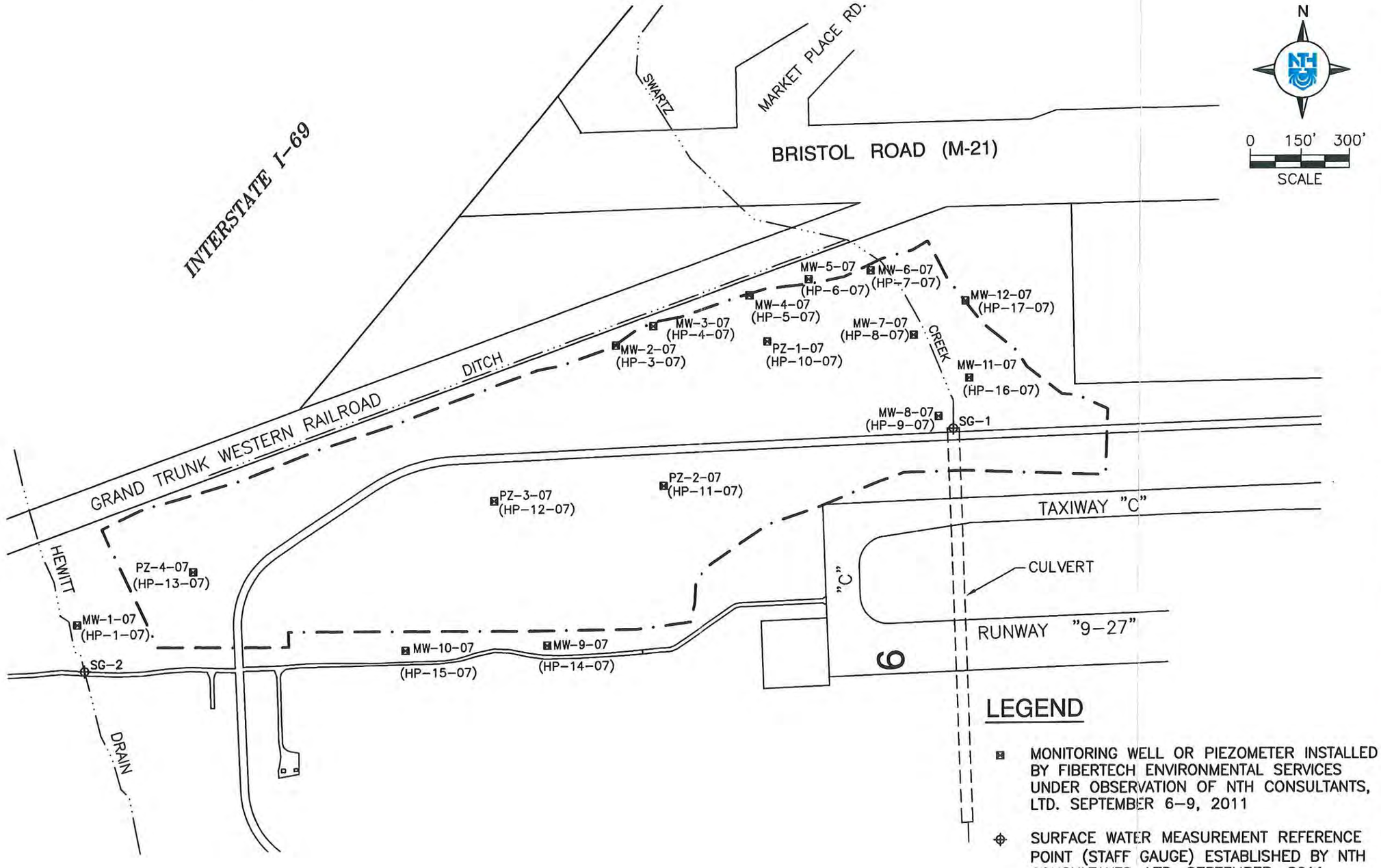
NTH PROJECT No.: 62-100065-05	CAD FILE NAME: 100065-SBL		
DESIGNED BY: ACE	PLOT DATE: 4/22/2013	DRAWING SCALE: 1" = 300'	INSPECTION DATE: 2/7/2013
DRAWN BY: CWS			
CHECKED BY: ACE			

SOIL BORING LOCATION MAP

FLINT BISHOP AIRPORT
FLINT, MICHIGAN

FIGURE: 2

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LEGEND

- ■ MONITORING WELL OR PIEZOMETER INSTALLED BY FIBERTECH ENVIRONMENTAL SERVICES UNDER OBSERVATION OF NTH CONSULTANTS, LTD. SEPTEMBER 6–9, 2011
- ⊕ SURFACE WATER MEASUREMENT REFERENCE POINT (STAFF GAUGE) ESTABLISHED BY NTH CONSULTANTS, LTD. SEPTEMBER, 2011
- APPROXIMATE BOUNDARY OF THE BISHOP AIRPORT LANDFILL I

NOTE:
BASE MAP PROVIDED BY INLAND SEAS ENGINEERING, INC.

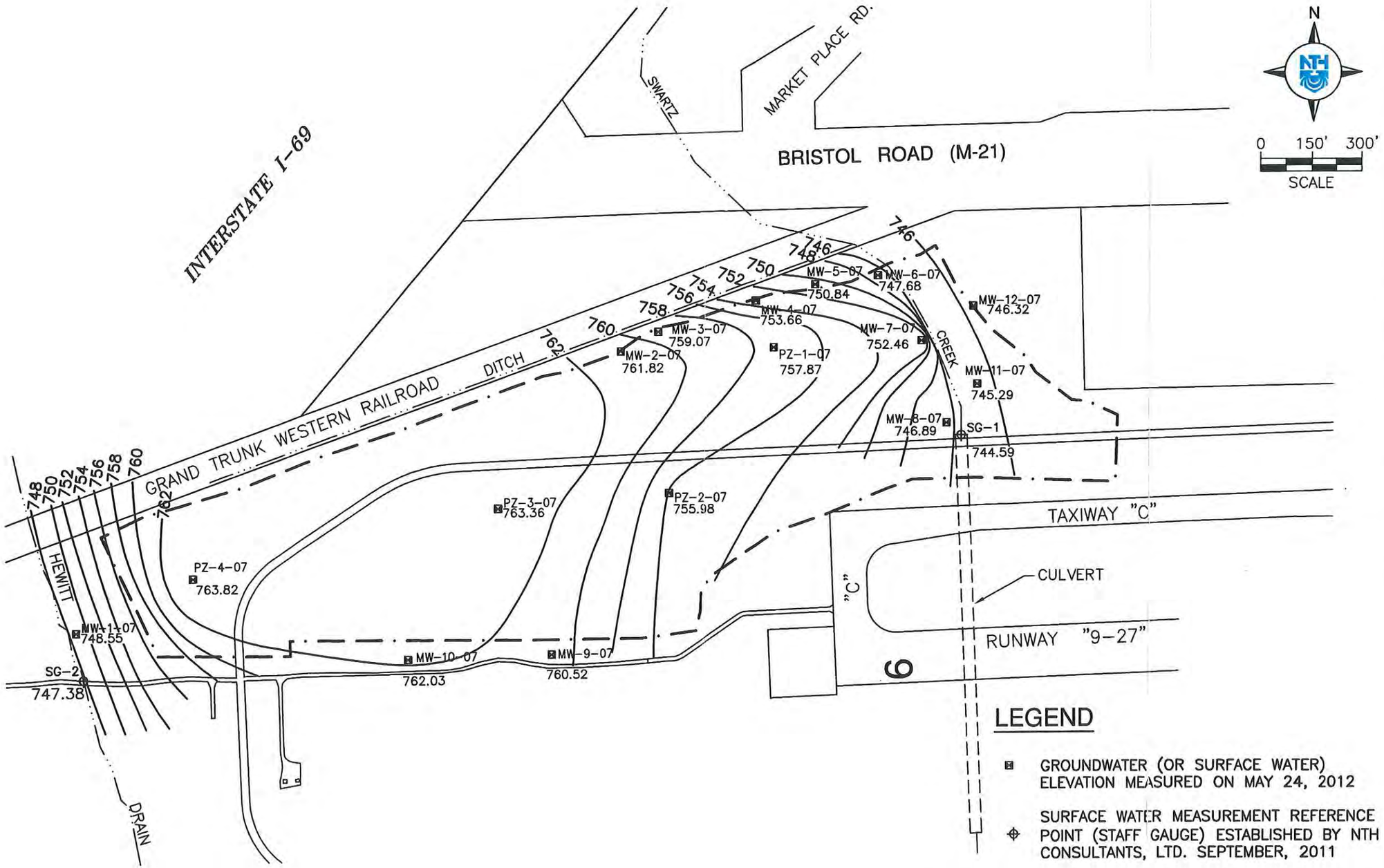
NTH Consultants, Ltd.
Infrastructure Engineering and Environmental Services

NTH PROJECT No.: 62-100065-05	CAD FILE NAME: 100065-MWL
DESIGNED BY: ACE	PLOT DATE: 4/22/2013
DRAWN BY: CWS	DRAWING SCALE: 1" = 300'
CHECKED BY: ACE	INCEPTION DATE: 2/7/2013

MONITORING WELL LOCATION MAP
FLINT BISHOP AIRPORT
FLINT, MICHIGAN

FIGURE: 3

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LEGEND

- GROUNDWATER (OR SURFACE WATER) ELEVATION MEASURED ON MAY 24, 2012
- SURFACE WATER MEASUREMENT REFERENCE POINT (STAFF GAUGE) ESTABLISHED BY NTH CONSULTANTS, LTD. SEPTEMBER, 2011
- APPROXIMATE BOUNDARY OF THE BISHOP AIRPORT LANDFILL I
- 760 GROUNDWATER ELEVATION CONTOUR

NOTE:
1. BASE MAP PROVIDED BY INLAND SEAS ENGINEERING, INC.
2. GROUNDWATER ELEVATION CONTOUR LINES PRESENTED ON THIS FIGURE ARE GENERALIZED BASED ON WATER LEVEL MEASUREMENTS AT INDIVIDUAL MONITOR WELL LOCATIONS.THE ACTUAL PIEZOMETRIC ELEVATIONS AT LOCATIONS AWAY FROM THE WELLS MAY BE DIFFERENT

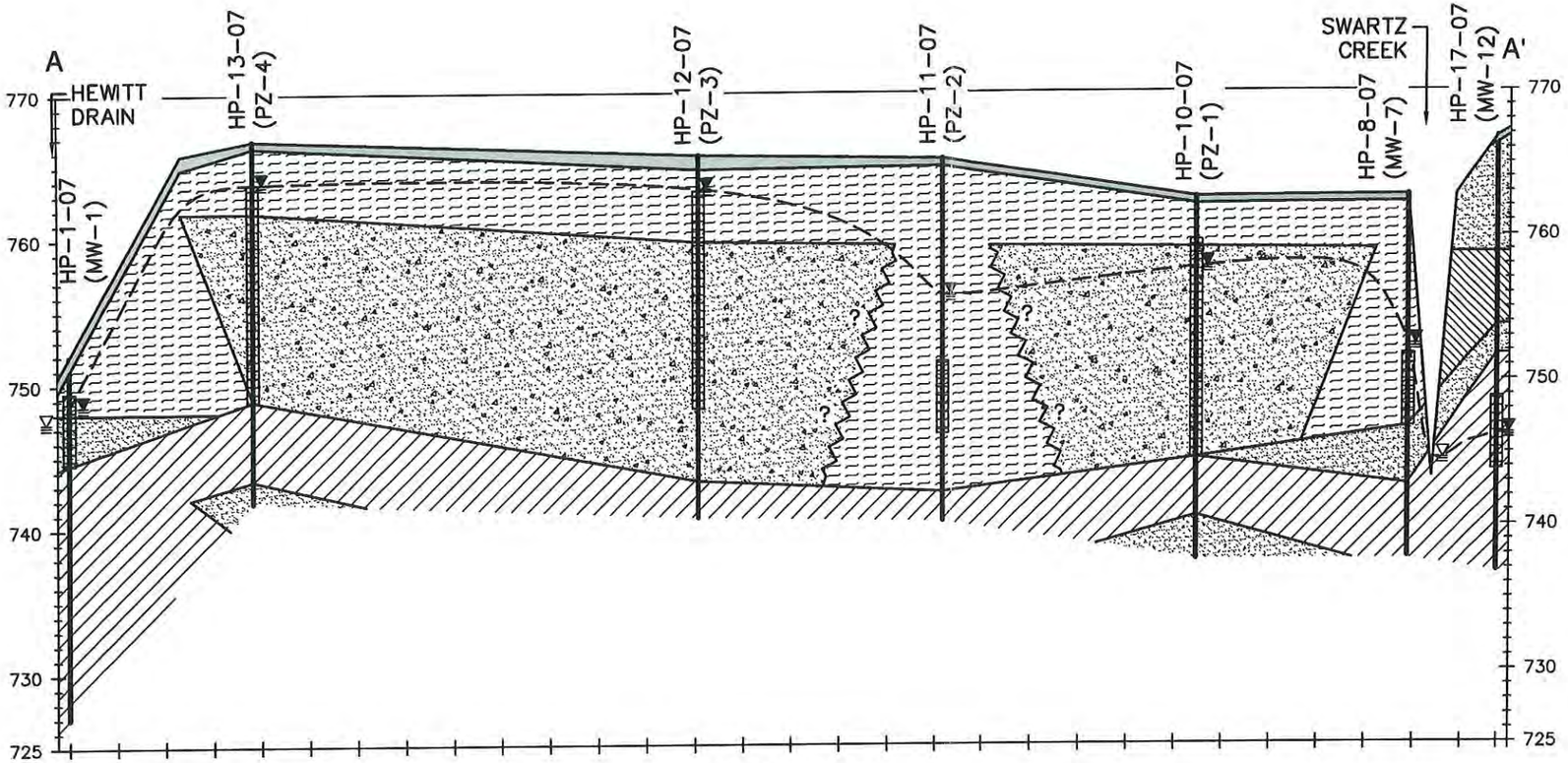
NTH Consultants, Ltd.
Infrastructure Engineering and Environmental Services

NTH PROJECT No.: 62-100065-05	CAD FILE NAME: 100065-GCM
DESIGNED BY: ACE	PLOT DATE: 4/22/2013
DRAWN BY: CWS	DRAWING SCALE: 1" = 300'
CHECKED BY: ACE	INCEPTION DATE: 2/7/2013

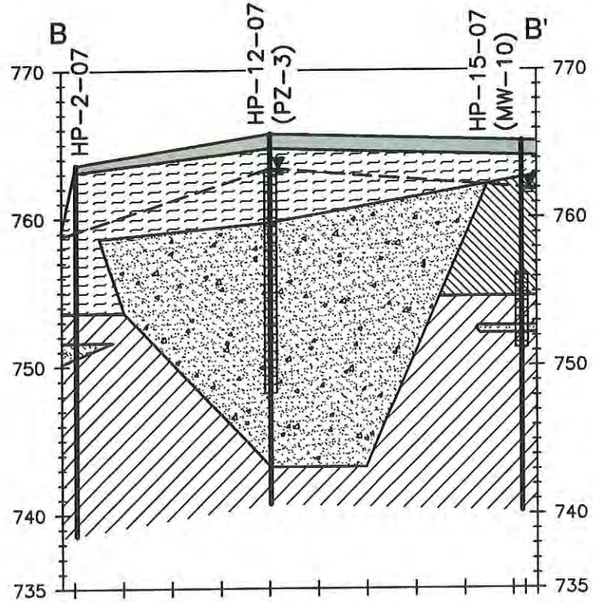
GROUNDWATER ELEVATION CONTOUR MAP
FLINT BISHOP AIRPORT
FLINT, MICHIGAN

FIGURE: 4

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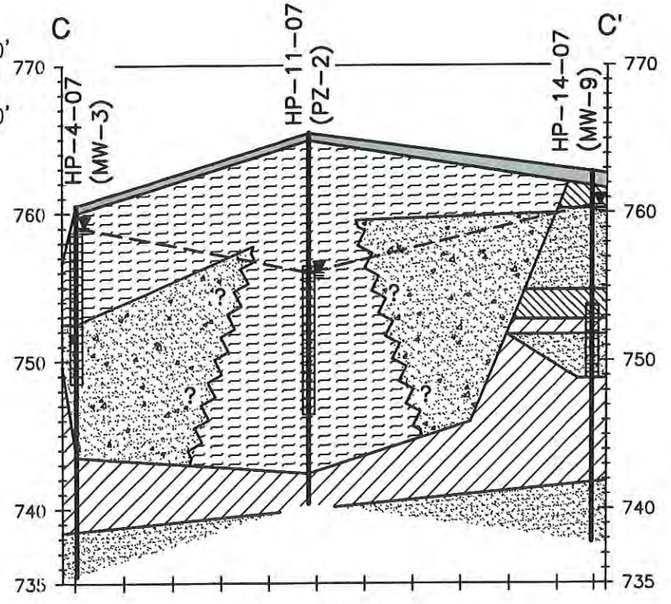


Profile A-A'



Profile B-B'

HORIZ. SCALE:
0 15' 30' 60'
0 5' 10' 20'
VERT. SCALE:



Profile C-C'

LEGEND

- TOPSOIL
- FILL-SOIL
- FILL-WASTE
- SAND OR SILTY SAND
- BROWN CLAY
- GRAY CLAY
- GROUNDWATER ELEVATION MEASURED IN MONITORING WELL ON MAY 24, 2012
- SURFACE WATER ELEVATION MEASURED AT STAFF GAUGE ON MAY 24, 2012
- WELL SCREEN

NOTES:

1. THE GEOLOGIC STRATA SHOWN ON THIS FIGURE ARE GENERALIZED BASED ON CONDITIONS ENCOUNTERED AT INDIVIDUAL SOIL BORING LOCATIONS. THE CONDITIONS BETWEEN SOIL BORINGS HAVE BEEN INFERRED AND MAY DIFFER FROM WHAT IS SHOWN.
2. REFER TO FIGURE 2 FOR LOCATIONS OF PROFILES.

NTH Consultants, Ltd.
Infrastructure Engineering and Environmental Services

NTH PROJECT No.: 62-100065
CAD FILE NAME: 100065-PR
DESIGNED BY: ACE
PLOT DATE: 4/25/2013
DRAWN BY: KRO
DRAWING SCALE: 1" = 300'
CHECKED BY: ACE
INCEPTION DATE: 4/22/2013

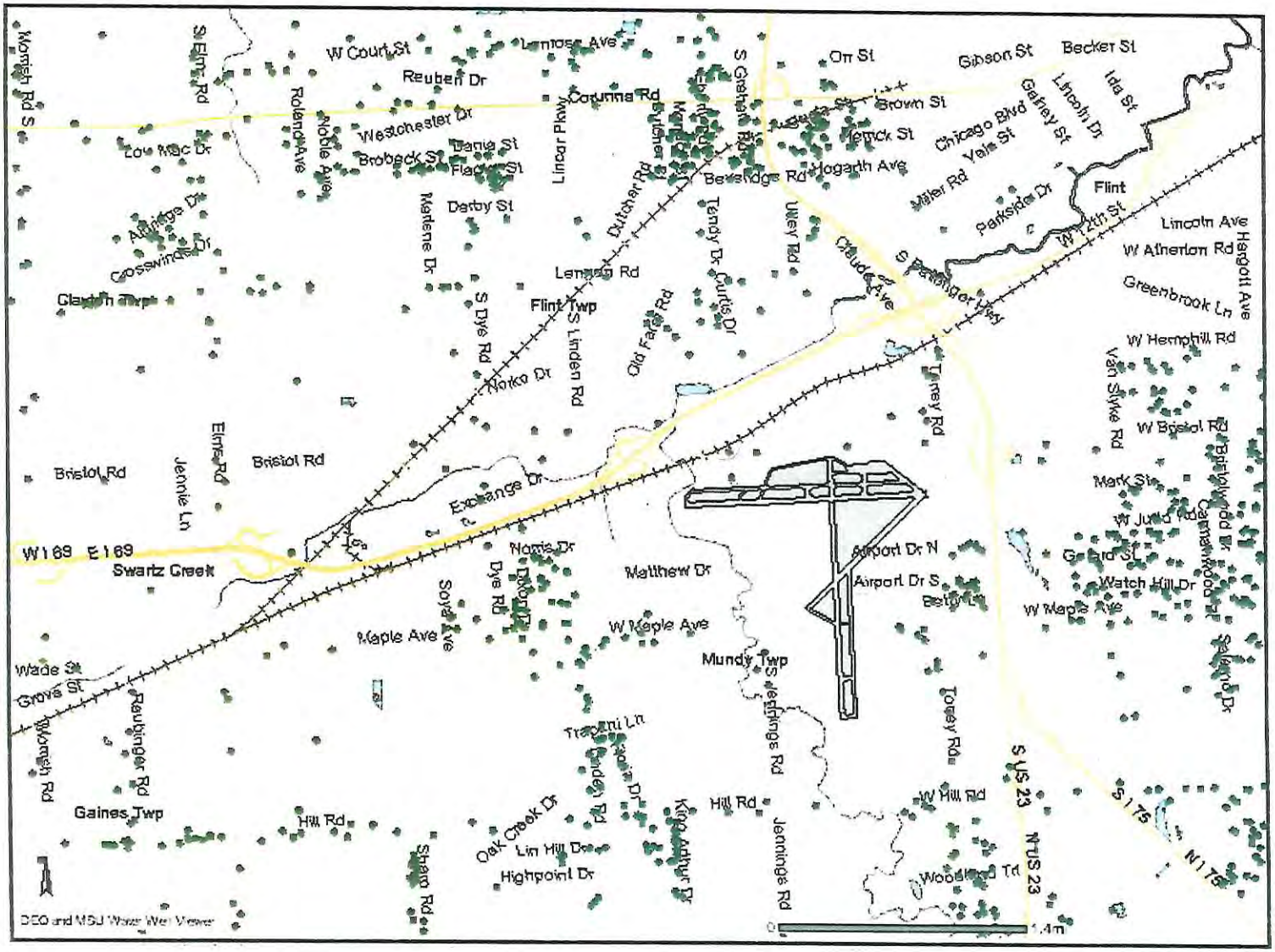
GENERALIZED SUBSURFACE PROFILES

FLINT BISHOP AIRPORT LANDFILL
FLINT, MICHIGAN

FIGURE: 5

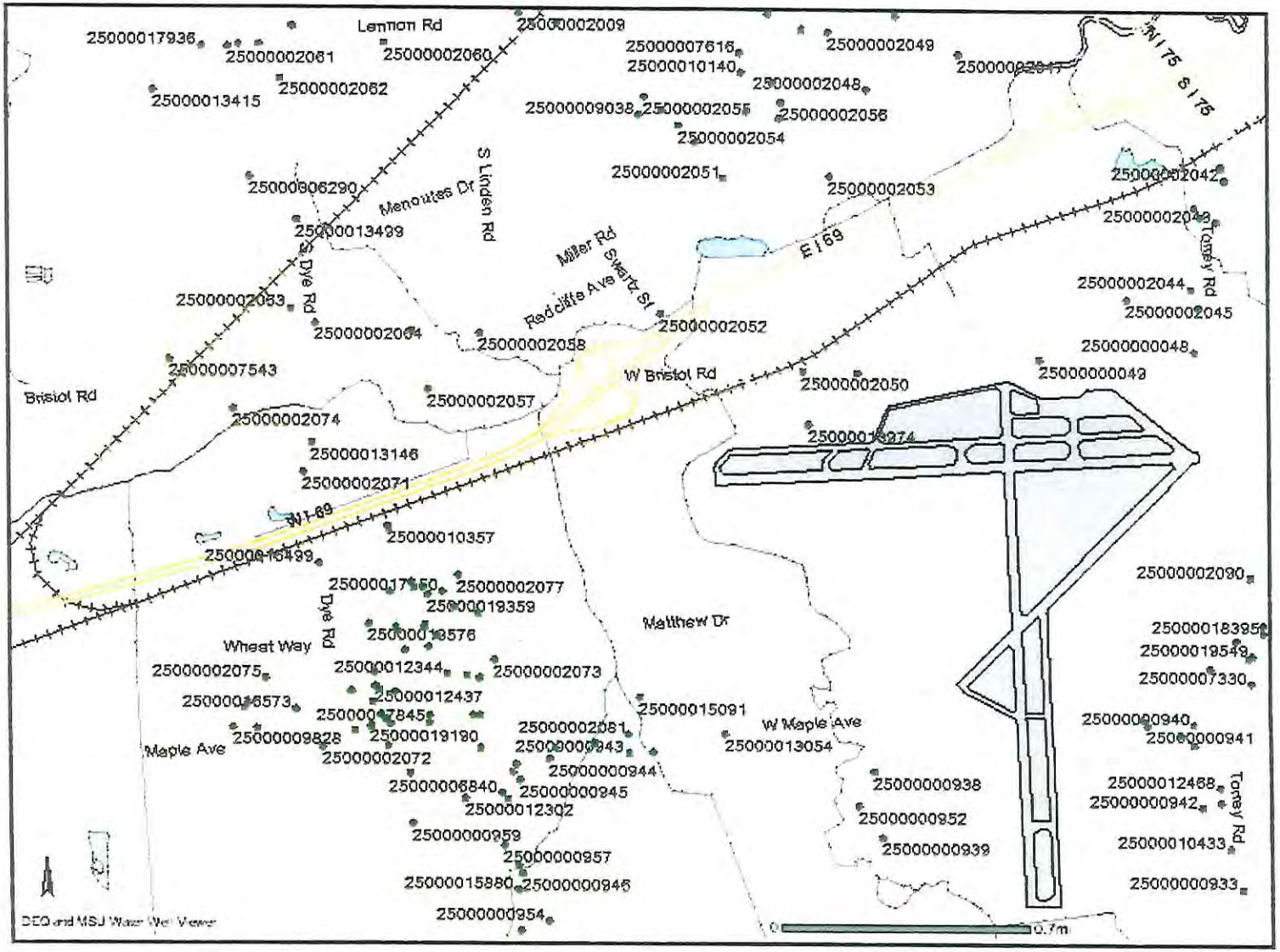
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DEQ Water Well Viewer



REGIONAL WATER SUPPLY WELLS	FIGURE:	NTH PROJECT NO.	NTH Consultants, Ltd.
FLINT BISHOP AIRPORT LANDFILL FLINT, MICHIGAN	6	62-100065-07 CHECKED BY: ACE	Infrastructure Engineering and Environmental Services

DEQ Water Well Viewer



LOCAL WATER SUPPLY WELLS	FIGURE:	NTH PROJECT NO. 62-100065-07	NTH Consultants, Ltd.
FLINT BISHOP AIRPORT LANDFILL FLINT, MICHIGAN	7	CHECKED BY: ACE	Infrastructure Engineering and Environmental Services

ATTACHMENT II

- LOG OF GEOPROBES
- LOGS OF MONITORING WELL
- LOGS OF PIEZOMETER

PROJECT NO: 62-100065-01	NTH CONSULTANTS, LTD.	SHEET 1 OF 7

LOG OF GEOPROBES

PROBE NO.	GROUND SURFACE ELEV.	DEPTH (FT)	SOIL DESCRIPTION	DISCRETE SAMPLE INFO.			
				SAMPLE NO.	DEPTH (FT) FROM	DEPTH (FT) TO	HNU READING (PPM)
HP-1-07	752.0	0.0-1.0	TOPSOIL: BROWN **CLAYEY SAND** WITH SOME SILT & TRACE OF GRAVEL	---	0.0	1.0	1.0
		1.0-2.5	FILL: BROWN **SANDY CLAY** WITH SOME SILT & TRACE OF GRAVEL	---	1.0	2.0	1.4
		2.5-4.0	FILL: BROWN & GRAY **SILTY SAND** WITH TRACE OF GRAVEL	S-1*	1.5	2.5	2.1
		4.0-7.5	BROWN & GRAY **SILTY MEDIUM TO COARSE SAND** WITH TRACE TO SOME GRAVEL	---	2.5	4.0	1.5
				---	4.0	5.5	2.3
				---	5.5	7.5	<1
				---	7.5	10.0	<1
		7.5-20.0	GRAY **SILTY CLAY** WITH SOME SAND, TRACE OF GRAVEL & OCCASIONAL SAND PARTINGS & SILT PARTINGS	---	10.0	12.0	<1
				---	12.0	14.0	<1
				---	14.0	16.0	<1
				---	16.0	18.0	<1
		20.0-25.0	GRAY **SILTY CLAY** WITH SOME SAND & GRAVEL (6" STONE/GRAVEL SEAM AT 21')	---	18.0	20.0	<1
				---	20.0	22.5	<1
			[WATER ENCOUNTERED AT 3.0' BGS; MONITORING WELL MW-1-07 INSTALLED WITH SCREEN TIP SET AT 7.5' BGS]	---	22.5	25.0	<1
HP-2-07	763.6	0.0-0.5	TOPSOIL: BROWN **SILTY SAND** WITH LITTLE CLAY, TRACE OF GRAVEL & ORGANIC MATTER	---	0.0	0.5	1.4
		0.5-5.0	FILL: BROWN & GRAY **SILTY CLAY** WITH SOME SAND & TRACE OF GRAVEL	S-1*	0.5	2.5	2.1
		5.0-10.0	[NO RECOVERY; TRASH IN SAMPLER TIP]	---	2.5	5.0	1.4
		10.0-12.0	GRAY **SILTY CLAY** WITH SOME SAND & TRACE OF GRAVEL	---	5.0	7.5	---
		12.0-13.0	GRAY **SILTY MEDIUM TO COARSE SAND**	---	7.5	10.0	---
		13.0-25.0	GRAY **SILTY CLAY** WITH SOME SAND, TRACE OF GRAVEL & FREQUENT SAND/SILT PARTINGS (6" FINE SAND SEAMS AT 21' & 23')	---	10.0	12.0	1.3
				---	12.0	13.0	1.4
				---	13.0	15.0	1.1
				---	15.0	17.0	1.0
				---	17.0	19.0	0.7
				---	19.0	21.0	0.1
				---	21.0	23.0	<1
			[WATER ENCOUNTERED AT 4.5' BGS; HOLE BACKFILLED WITH BENTONITE CHIPS AFTER COMPLETION]	---	23.0	25.0	<1
HP-3-07	762.8	0.0-2.0	FILL: BROWN **SILTY CLAY** WITH SOME SAND, TRACE OF GRAVEL & ORGANIC MATTER	S-1*	0.0	2.0	<1
		2.0-16.0	FILL: **WASTE** (PAPER, PLASTIC, WOOD, FOAM, NYLON FIBERS, METAL) WITH SOME SAND & CLAY	---	2.0	4.0	<1
		16.0-18.0	FILL: **CRUSHED CONCRETE**	---	4.0	6.0	<1
		18.0-23.0	FILL: BROWN & GRAY TO BLACK **SILTY SAND** WITH SOME GRAVEL	---	6.0	8.0	<1
		23.0-24.0	FILL: **CRUSHED CONCRETE**	---	8.0	10.0	<1
		24.0-25.0	FILL: BROWN & GRAY TO BLACK **SILTY SAND** WITH SOME GRAVEL & TRACE OF BRICK DEBRIS	---	10.0	12.0	<1
				---	12.0	14.0	<1
				---	14.0	16.0	<1
				---	16.0	18.0	<1
				---	18.0	21.0	<1
				---	21.0	23.0	<1
				---	23.0	24.0	<1
				---	24.0	25.0	<1
		25.0-35.0	[NO RECOVERY]	---	25.0	27.5	---
				---	27.5	30.0	---
		35.0-40.0	GRAY **SILTY CLAY** WITH SOME SAND & TRACE OF GRAVEL	---	30.0	32.5	---
				---	32.5	35.0	---
			[WATER ENCOUNTERED AT 2.5' BGS; MONITORING WELL MW-2-07 INSTALLED WITH SCREEN TIP SET AT 12.0' BGS]	---	35.0	37.5	<1
				---	37.5	40.0	<1

NOTES:

[1] GEOPROBE DRILLING INSPECTED BY S. VENMAN OF NTH CONSULTANTS, LTD.
[2] SOIL CLASSIFICATION BASED SOLELY ON VISUAL OBSERVATION.
[3] * - SAMPLE SUBMITTED FOR ANALYTICAL TESTING.

DRILLED BY: FIBERTEC ENVIRONMENTAL SERVICES (RYAN) **DATE:** 09-06-2011 to 09-09-2011 **FIGURE NO:**

PROJECT NO: 62-100065-01	NTH CONSULTANTS, LTD.	SHEET 2 OF 7

LOG OF GEOPROBES

PROBE NO.	GROUND SURFACE ELEV.	DEPTH (FT)	SOIL DESCRIPTION	DISCRETE SAMPLE INFO. SAMPLE NO.	DEPTH (FT) FROM	DEPTH (FT) TO	HNu READING (PPM)
HP-4-07	760.5	0.0-0.5	TOPSOIL: BROWN **SANDY TO SILTY CLAY** WITH TRACE OF GRAVEL & ORGANIC MATTER	---	0.0	0.5	<1
				S-1*	0.5	2.5	<1
		0.5-8.0	FILL: BROWN & GRAY **SILTY CLAY** WITH SOME SAND & TRACE OF GRAVEL	---	2.5	4.0	<1
				---	4.0	6.0	<1
		8.0-17.0	FILL: **WASTE** (WOOD, PLASTIC, METAL, PAPER) WITH GRAY CLAYEY SAND (6" BROWN SILTY SAND & GRAVEL SEAM AT 14.5')	---	6.0	8.0	<1
				---	8.0	10.0	<1
				---	10.0	12.0	<1
		17.0-22.0	GRAY **SILTY CLAY** WITH SOME SAND & TRACE OF GRAVEL	---	12.0	14.0	<1
		22.0-25.0	GRAY **SILTY FINE TO MEDIUM SAND** WITH TRACE OF GRAVEL	---	14.0	17.0	<1
				---	17.0	19.0	<1
			[WATER ENCOUNTERED AT 2.5' BGS;	---	19.0	22.0	<1
			MONITORING WELL MW-3-07 INSTALLED WITH SCREEN TIP SET AT 12.0' BGS]	---	22.0	23.5	<1
				---	23.5	25.0	<1
HP-5-07	760.0	0.0-0.5	TOPSOIL: BROWN **SILTY CLAY** WITH SOME SAND, TRACE OF GRAVEL & ORGANIC MATTER	---	0.0	0.5	<1
				---	0.5	2.5	<1
				S-1*	2.5	4.5	<1
		0.5-4.5	FILL: BROWN & GRAY **SILTY CLAY** WITH SOME SAND & TRACE OF GRAVEL	---	4.5	6.0	<1
		4.5-7.5	FILL: GRAY **SILTY CLAY** WITH TRACE OF SAND & GRAVEL	---	6.0	7.5	<1
				---	7.5	8.5	<1
		7.5-10.0	FILL: GRAY **SILTY CLAY & WOOD** WITH SOME SAND, TRACE OF GRAVEL & PLASTIC (MOTH-BALL LIKE ODOR)	---	8.5	10.0	<1
				---	10.0	15.0	---
		10.0-15.0	[NO RECOVERY – ASSUMED WASTE]	---	15.0	17.0	<1
				---	17.0	18.5	<1
		15.0-17.0	GRAY **SILTY CLAY** WITH SOME SAND & TRACE OF GRAVEL	---	18.5	20.0	<1
		17.0-20.0	GRAY **SILTY MEDIUM TO COARSE SAND**	---	20.0	21.0	<1
		20.0-21.0	GRAY **SILTY CLAY** WITH TRACE OF SAND & GRAVEL	---	21.0	23.0	<1
		21.0-25.0	GRAY **SILTY FINE TO MEDIUM SAND** WITH TRACE OF GRAVEL	---	23.0	25.0	<1
			[WATER ENCOUNTERED AT 4.5' BGS;				
			MONITORING WELL MW-4-07 INSTALLED WITH SCREEN TIP SET AT 20.0' BGS]				
HP-6-07	760.6	0.0-0.5	TOPSOIL: BROWN **SILTY SAND** WITH SOME GRAVEL & ORGANIC MATTER (ROOTS)	---	0.0	0.5	<1
		0.5-5.5	FILL: BROWN **SILTY SAND** WITH SOME GRAVEL (OCCASIONAL BLACK STAINING, NO ODOR, POSSIBLY ASPHALT)	---	0.5	2.5	<1
				---	2.5	4.5	<1
				S-1*	4.5	5.5	<1
		5.5-6.5	FILL: GRAY **SANDY TO SILTY CLAY** WITH TRACE OF GRAVEL	---	5.5	6.5	<1
		6.5-7.5	FILL: **CRUSHED CONCRETE**	---	6.5	7.5	<1
				---	7.5	8.0	<1
		7.5-8.0	FILL: GRAY **SILTY CLAY** WITH SOME SAND & TRACE OF GRAVEL	S-2*	8.0	8.5	<1
				---	8.5	9.5	<1
		8.0-8.5	FILL: BLACK **SAND & GRAVEL** (PETROLEUM-LIKE ODOR)	---	9.5	10.0	<1
				---	10.0	12.5	<1
		8.5-9.5	FILL: GRAY **SILTY CLAY** WITH SOME SAND & TRACE OF GRAVEL	---	12.5	15.5	<1
				---	15.5	16.0	<1
		9.5-10.0	FILL: **CRUSHED CONCRETE**	---	16.0	18.0	<1
				---	18.0	20.0	<1
		10.0-15.5	FILL: GRAY **SILTY SAND** WITH DEBRIS (WOOD, PLASTIC, GLASS, ALUMINUM)	---	20.0	22.0	<1
		15.5-16.0	GRAY **SILTY SAND & GRAVEL**	---	22.0	25.0	<1
		16.0-25.0	GRAY **SILTY CLAY** WITH SOME SAND & TRACE OF GRAVEL				
			[WATER ENCOUNTERED AT 11.5' BGS;				
			MONITORING WELL MW-5-07 INSTALLED WITH SCREEN TIP SET AT 16.0' BGS]				

NOTES:

[1] GEOPROBE DRILLING INSPECTED BY S. VENMAN OF NTH CONSULTANTS, LTD.
[2] SOIL CLASSIFICATION BASED SOLELY ON VISUAL OBSERVATION.
[3] * - SAMPLE SUBMITTED FOR ANALYTICAL TESTING.

DRILLED BY: FIBERTEC ENVIRONMENTAL SERVICES (RYAN) **DATE:** 09-06-2011 to 09-09-2011 **FIGURE NO:**

PROJECT NO: 62-100065-01	NTH CONSULTANTS, LTD.	SHEET 3 OF 7

LOG OF GEOPROBES

PROBE NO.	GROUND SURFACE ELEV.	DEPTH (FT)	SOIL DESCRIPTION	DISCRETE SAMPLE INFO.			
				SAMPLE NO.	DEPTH (FT) FROM	DEPTH (FT) TO	HNu READING (PPM)
HP-7-07	762.8	0.0-0.5	TOPSOIL: BROWN **SANDY CLAY** WITH SOME GRAVEL, SILT & ORGANIC MATTER	---	0.0	0.5	<1
		0.5-5.5	FILL: DARK BROWN **SANDY TO SILTY CLAY** WITH TRACE OF GRAVEL & ORGANIC MATTER (WOOD) (POSSIBLE CONCRETE PIECES AT 4.5")	---	0.5	2.5	<1
				---	2.5	4.5	<1
				---	4.5	5.5	<1
		5.5-9.0	FILL: BROWN **CLAYEY SAND** WITH SOME ORGANIC MATTER (WOOD) & TRACE OF GRAVEL	---	5.5	7.5	<1
				S-1*	7.5	9.0	<1
		9.0-14.0	FILL: GRAY **SANDY TO SILTY CLAY** WITH TRACE OF GRAVEL	---	9.0	11.0	<1
				---	11.0	14.0	<1
		14.0-15.5	FILL: **WASTE** (BLACK WOOD) WITH SILTY SAND, TRACE OF GLASS & PLASTIC	S-2*	14.0	15.5	<1
		15.5-17.0	GRAY **SILTY TO SANDY CLAY** WITH TRACE OF GRAVEL	---	15.5	17.0	<1
		17.0-20.0	GRAY **SILTY FINE TO MEDIUM SAND** WITH TRACE OF GRAVEL	---	17.0	18.5	<1
		20.0-25.0	GRAY **SILTY CLAY** WITH SOME SAND & TRACE OF GRAVEL	---	18.5	20.0	<1
				---	20.0	22.5	<1
			[WATER ENCOUNTERED AT 17.0' BGS; MONITORING WELL MW-6-07 INSTALLED WITH SCREEN TIP SET AT 20.0' BGS]	---	22.5	25.0	<1
HP-8-07	762.8	0.0-0.5	TOPSOIL: BROWN **SILTY SAND** WITH SOME GRAVEL & ORGANIC MATTER	---	0.0	0.5	<1
		0.5-8.0	FILL: BROWN **SILTY SAND** WITH LITTLE CLAY & SOME GRAVEL (4" ASPHALT SEAM AT 4.5')	---	0.5	3.0	<1
				---	3.0	5.0	<1
		8.0-10.0	FILL: GRAY **SILTY CLAY** WITH SOME SAND & TRACE OF GRAVEL (6"' TRASH SEAM AT 7.5')	---	5.0	7.0	<1
				S-1*	7.0	7.5	<1
		10.0-12.0	FILL: BLACK **SILTY CLAY** WITH DEBRIS	---	8.0	10.0	<1
		12.0-14.0	FILL: BROWN **SILTY SAND** WITH SOME GRAVEL	---	10.0	12.0	<1
				---	12.0	14.0	<1
		14.0-16.0	FILL: BLACK **SILTY CLAY** WITH DEBRIS	---	14.0	16.0	<1
		16.0-20.0	GRAY **SILTY FINE TO MEDIUM SAND** WITH TRACE OF GRAVEL	---	16.0	18.0	<1
		20.0-25.0	GRAY **SILTY CLAY** WITH TRACE OF SAND, GRAVEL & OCCASIONAL SAND PARTINGS	---	18.0	20.0	<1
				---	20.0	22.5	<1
			[WATER ENCOUNTERED AT 12.0' BGS; MONITORING WELL MW-7-07 INSTALLED WITH SCREEN TIP SET AT 16.0' BGS]	---	22.5	25.0	<1

NOTES:

[1] GEOPROBE DRILLING INSPECTED BY S. VENMAN OF NTH CONSULTANTS, LTD.
[2] SOIL CLASSIFICATION BASED SOLELY ON VISUAL OBSERVATION.
[3] * - SAMPLE SUBMITTED FOR ANALYTICAL TESTING.

DRILLED BY: FIBERTEC ENVIRONMENTAL SERVICES (RYAN) **DATE:** 09-06-2011 to 09-09-2011 **FIGURE NO:**

PROJECT NO: 62-100065-01	NTH CONSULTANTS, LTD.	SHEET 4 OF 7

LOG OF GEOPROBES

PROBE NO.	GROUND SURFACE ELEV.	DEPTH (FT)	SOIL DESCRIPTION	DISCRETE SAMPLE INFO.			
				SAMPLE NO.	DEPTH (FT) FROM	DEPTH (FT) TO	HNu READING (PPM)
HP-9-07	752.9	0.0-0.5	TOPSOIL: BROWN **CLAYEY SAND** WITH SOME SILT, TRACE OF GRAVEL & ORGANIC MATTER	---	0.0	0.5	<1
				---	0.5	2.0	<1
				---	2.0	4.5	<1
		0.5-5.0	FILL: BROWN & GRAY **SANDY CLAY** WITH TRACE OF GRAVEL	S-1*	4.5	5.5	<1
		5.0-8.5	DARK GRAY **SILTY TO CLAYEY SAND** WITH TRACE OF GRAVEL & ORGANIC MATTER	---	5.5	8.5	<1
				---	8.5	10.0	<1
		8.5-12.0	GRAY **SILTY CLAY** WITH SOME SAND & TRACE OF GRAVEL (6" COARSE SAND & GRAVEL SEAM AT ≈8.0'-8.5')	---	10.0	12.0	<1
				---	12.0	14.0	<1
				---	14.0	16.0	<1
		12.0-19.0	GRAY & BROWN **SILTY FINE TO MEDIUM SAND** WITH TRACE OF GRAVEL	---	16.0	19.0	<1
				---	19.0	21.0	<1
		19.0-25.0	GRAY **SILTY CLAY** WITH SOME SAND & TRACE OF GRAVEL (6" FINE SAND SEAM AT 23')	---	21.0	23.0	<1
				---	23.0	25.0	<1
			[WATER ENCOUNTERED AT 8.5' BGS; MONITORING WELL MW-8-07 INSTALLED WITH SCREEN TIP SET AT 13.0' BGS]				
HP-10-07	762.7	0.0-0.5	TOPSOIL: BROWN **SILTY SAND** WITH SOME GRAVEL & ORGANIC MATTER	---	0.0	0.5	<1
		0.5-3.5	FILL: BROWN **SANDY CLAY** WITH SOME SILT & GRAVEL	S-1*	0.5	2.0	<1
				---	2.0	3.5	<1
		3.5-14.0	FILL: **WASTE** (WOOD, GLASS, PLASTIC, STYROFOAM, METAL) WITH SAND, GRAVEL & CLAY (BLACK STAINED; WASTE ODOR)	---	3.5	5.5	1.5
				---	5.5	7.0	2.6
				---	7.0	9.0	2.6
		14.0-16.0	FILL: BROWN **SILTY SAND** WITH SOME GRAVEL	---	9.0	11.0	3.1
				---	11.0	14.0	4.5
		16.0-18.0	FILL: **WASTE** (WOOD, GLASS, PLASTIC, STYROFOAM, METAL) WITH SAND, GRAVEL & CLAY (BLACK STAINED; WASTE ODOR)	---	14.0	16.0	2.6
				---	16.0	18.0	3.4
				---	18.0	20.0	1.1
		18.0-22.0	GRAY **SILTY CLAY** WITH SOME SAND & TRACE OF GRAVEL	---	20.0	22.0	<1
		22.0-25.0	GRAY **SILTY FINE TO MEDIUM SAND**	---	22.0	25.0	<1
			[WATER ENCOUNTERED AT 4.0' BGS; PIEZOMETER PZ-1-07 INSTALLED WITH SCREEN TIP SET AT 18.0' BGS]	COMPOSITE SAMPLE S-2* AT 3.5' TO 18.0'			
			[METHANE ENCOUNTERED AND DRILLING HALTED TWICE DUE TO ELEVATED LEVELS; METER READINGS AT 12 TO 20% LEL]				
HP-11-07	765.4	0.0-0.5	TOPSOIL: BROWN **SILTY SAND** WITH TRACE OF GRAVEL & ORGANIC MATTER	---	0.5	1.0	<1
				---	1.5	2.0	<1
		0.5-3.0	FILL: BROWN **SILTY SAND** WITH SOME GRAVEL	S-1*	2.0	3.0	<1
				---	3.5	4.0	<1
		3.0-11.0	FILL: BROWN & GRAY **SANDY CLAY** WITH SOME SILT & TRACE OF GRAVEL	---	4.5	5.0	<1
		11.0-23.0	FILL: BROWN & GRAY **SILTY CLAY** WITH SOME SAND & TRACE OF GRAVEL	---	5.0	7.0	<1
				---	7.0	8.5	<1
			[REFUSAL AT 15' DUE TO DEBRIS: WOOD, GLASS, ALUMINUM, PLASTIC, PAPER. MOVED 5' NORTHWEST AND PROFILE DRILLED TO 15']	---	8.5	10.0	<1
				---	10.0	11.0	<1
			(SWEET DEGREASER-LIKE ODOR AT 15' – 20')	---	11.0	13.0	<1
				---	13.0	15.0	<1
		23.0-25.0	GRAY **SILTY CLAY** WITH SOME SAND & TRACE OF GRAVEL	---	15.0	17.0	<1
				---	17.0	19.0	<1
			[WATER ENCOUNTERED AT 11.0' BGS; PIEZOMETER PZ-2-07 INSTALLED WITH SCREEN TIP SET AT 19.0' BGS]	---	19.0	21.0	<1
				---	21.0	23.0	<1
				---	23.0	25.0	<1
				COMPOSITE SAMPLE S-2* AT 11.0' TO 23.0'			

NOTES:

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[2] SOIL CLASSIFICATION BASED SOLELY ON VISUAL OBSERVATION.
[3] * - SAMPLE SUBMITTED FOR ANALYTICAL TESTING.

DRILLED BY: FIBERTEC ENVIRONMENTAL SERVICES (RYAN) **DATE:** 09-06-2011 to 09-09-2011 **FIGURE NO:**

PROJECT NO: 62-100065-01	NTH CONSULTANTS, LTD.	SHEET 5 OF 7

LOG OF GEOPROBES

PROBE NO.	GROUND SURFACE ELEV.	DEPTH (FT)	SOIL DESCRIPTION	DISCRETE SAMPLE INFO.			
				SAMPLE NO.	DEPTH (FT) FROM	DEPTH (FT) TO	HNu READING (PPM)
HP-12-07	765.7	0.0-1.0	TOPSOIL: BROWN **SILTY SAND** WITH TRACE OF GRAVEL	---	0.5	1.0	---
		1.0-2.5	FILL: BROWN **SILTY SAND & GRAVEL**	---	1.5	2.0	---
		2.5-3.0	FILL: GRAY **SILTY CLAY** WITH SOME SAND & TRACE OF GRAVEL	S-1*	2.5	3.5	---
		3.0-6.0	FILL: BROWN & GRAY **SILTY CLAY** WITH TRACE OF SAND & GRAVEL (TRASH AT 5')	---	3.5	4.0	---
		6.0-22.5	FILL: **WASTE** (GRASS CLIPPINGS, NEWSPAPER, PLASTIC, PAPER, METAL, ALUMINUM, GLASS, STYROFOAM) & BROWN & GRAY **SILTY CLAY** WITH TRACE OF SAND & GRAVEL (BLACK STAINED SAND AND GRAVEL AT 21'-22')	---	4.5	5.0	<1
				---	5.0	7.0	<1
				---	7.0	9.0	<1
				---	9.0	10.0	<1
				---	10.0	12.0	1.5
				---	12.0	14.0	0.6
				---	14.0	15.0	4.3
		22.5-25.0	GRAY **SILTY CLAY** WITH SOME SAND, TRACE OF GRAVEL & OCCASIONAL FINE SAND SEAMS & PARTINGS	---	15.0	17.0	1.5
				---	17.0	19.0	13.7
				---	19.0	20.0	3.1
			[WATER ENCOUNTERED AT 12.0' BGS; PIEZOMETER PZ-3-07 INSTALLED WITH SCREEN TIP SET AT 17.5' BGS]	---	21.0	22.0	<1
				---	22.0	24.0	<1
				---	24.0	25.0	<1
			[HAND AUGERED FIRST 5' BEFORE COMMENCING GEOPROBE DRILLING]	COMPOSITE SAMPLE S-2* AT 6.0' TO 22.5'			
HP-13-07	766.8	0.0-0.5	TOPSOIL: BROWN **SILTY SAND** WITH SOME CLAY, TRACE OF GRAVEL & ORGANIC MATTER	---	0.0	0.5	0.4
				---	0.5	2.0	0.4
		0.5-4.0	FILL: BROWN **SILTY SAND** WITH SOME CLAY & TRACE OF GRAVEL	S-1*	2.0	4.0	0.6
		4.0-5.0	FILL: GRAY **SILTY CLAY** WITH SOME SAND & TRACE OF GRAVEL	---	4.0	5.0	1.0
		5.0-18.0	FILL: **WASTE** (PLASTIC, PAPER, ALUMINUM, GLASS, WOOD) WITH SEAMS OF GRAY SILTY CLAY WITH SOME SAND & GRAVEL (DECAY ODORS AND PETROLEUM-LIKE ODORS)	---	5.0	7.5	13.7
				---	7.5	10.0	2.5
				---	10.0	12.5	3.0
				---	12.5	15.0	8.4
				---	15.0	18.0	27.8
		18.0-23.5	GRAY **SILTY CLAY** WITH SOME SAND & TRACE OF GRAVEL	---	18.0	20.0	1.3
		23.5-25.0	GRAY **SILTY FINE TO MEDIUM SAND** WITH TRACE OF GRAVEL (SOME BLACK STAINING)	---	20.0	23.5	1.2
				---	23.5	25.0	1.0
			[WATER ENCOUNTERED AT 4.5' BGS; PIEZOMETER PZ-4-07 INSTALLED WITH SCREEN TIP SET AT 18.0' BGS]	COMPOSITE SAMPLE S-2* AT 5.0' TO 18.0'			
HP-14-07	762.8	0.0-1.0	TOPSOIL: DARK BROWN **SILTY SAND** WITH TRACE OF ORGANIC MATTER	---	0.5	1.0	<1
		1.0-2.5	BROWN & GRAY **SILTY CLAY** WITH SOME SAND & TRACE OF GRAVEL	---	1.5	2.0	<1
		2.5-8.0	BROWN **SILTY SAND** WITH TRACE OF GRAVEL (6" BROWN CLAY SEAM AT 5')	S-1*	2.5	3.5	<1
		8.0-10.0	BROWN **SILTY CLAY** WITH TRACE OF SAND & GRAVEL	---	3.5	4.0	<1
		10.0-11.0	GRAY **SILTY CLAY** WITH TRACE OF SAND & GRAVEL	---	4.5	5.0	<1
		11.0-14.0	GRAY **SILTY MEDIUM TO COARSE SAND** WITH TRACE OF GRAVEL	---	5.0	8.0	<1
		14.0-21.0	GRAY **SILTY CLAY** WITH SOME SAND & TRACE OF GRAVEL	---	8.0	10.0	<1
		21.0-25.0	GRAY **SILTY FINE TO MEDIUM SAND** WITH TRACE OF GRAVEL	---	10.0	11.0	<1
				---	11.0	13.0	<1
				---	13.0	14.0	<1
				---	14.0	16.0	<1
				---	16.0	18.0	<1
				---	18.0	20.0	<1
				---	20.0	21.0	<1
			[WATER ENCOUNTERED AT 11.0' BGS; MONITORING WELL MW-9-07 INSTALLED WITH SCREEN TIP SET AT 14.0' BGS]	---	21.0	23.0	<1
				---	23.5	25.0	<1
			[HAND AUGERED FIRST 5' BEFORE COMMENCING GEOPROBE DRILLING]				

NOTES:

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[3] * - SAMPLE SUBMITTED FOR ANALYTICAL TESTING.

DRILLED BY: FIBERTEC ENVIRONMENTAL SERVICES (RYAN) **DATE:** 09-06-2011 to 09-09-2011 **FIGURE NO:**

PROJECT NO: 62-100065-01	NTH CONSULTANTS, LTD.	SHEET 6 OF 7

LOG OF GEOPROBES

PROBE NO.	GROUND SURFACE ELEV.	DEPTH (FT)	SOIL DESCRIPTION	DISCRETE SAMPLE INFO.			
				SAMPLE NO.	DEPTH (FT) FROM	DEPTH (FT) TO	HNu READING (PPM)
HP-15-07	765.2	0.0-1.0	TOPSOIL: DARK BROWN **SILTY SAND** WITH SOME ORGANIC MATTER	---	0.0	1.0	<1
				S-1*	1.0	2.0	<1
		1.0-2.5	FILL: BROWN **SILTY SAND** WITH TRACE OF GRAVEL & CLAY PIECES	---	2.0	3.0	<1
		2.5-3.5	BROWN & GRAY **SANDY CLAY** WITH SOME SILT & TRACE OF GRAVEL	---	3.0	4.0	<1
		3.5-4.5	BROWN & GRAY **SILTY CLAY** WITH TRACE OF SAND, GRAVEL & ORGANIC MATTER	---	4.0	5.0	<1
		4.5-10.5	BROWN & GRAY **SANDY CLAY** WITH SOME SILT & TRACE OF GRAVEL	---	5.0	6.0	<1
			(BROWN SILTY MEDIUM TO COARSE SAND SEAM AT 7'-7.5')	---	6.0	7.0	<1
				---	7.0	8.0	<1
				---	8.0	10.0	<1
				---	10.0	12.0	<1
				---	12.5	13.0	<1
				---	13.0	14.5	<1
		10.5-12.5	GRAY **SILTY CLAY** WITH TRACE OF SAND & GRAVEL	---	14.5	16.0	<1
		12.5-13.0	BROWN & GRAY **SILTY MEDIUM TO COARSE SAND**	---	16.0	18.0	<1
		13.0-17.5	GRAY **SILTY TO SANDY CLAY** WITH TRACE OF GRAVEL & FREQUENT SAND PARTINGS & SEAMS	---	18.0	20.0	<1
				---	20.0	22.0	<1
				---	22.0	23.0	<1
		17.5-25.0	GRAY **SILTY CLAY** WITH TRACE OF SAND & GRAVEL (4" SILTY FINE SAND SEAM AT 22')	---	23.0	25.0	<1
			[WATER ENCOUNTERED AT 5.3' BGS; MONITORING WELL MW-10-07 INSTALLED WITH SCREEN TIP SET AT 14.0' BGS]				
			[HAND AUGERED FIRST 8' BEFORE COMMENCING GEOPROBE DRILLING]				
HP-16-07	757.8	0.0-0.5	TOPSOIL: BROWN **CLAYEY SAND** WITH SOME SILT, GRAVEL & ORGANIC MATTER	---	0.0	0.5	<1
		0.5-4.0	FILL: BROWN **CLAYEY SAND** WITH SOME SILT & GRAVEL (2" ASPHALT SEAM AT 2')	---	0.5	2.0	<1
				S-1*	1.5	2.5	<1
				---	2.0	4.0	<1
				---	4.0	6.0	<1
		4.0-10.0	BROWN & GRAY **SILTY CLAY** WITH SOME SAND, TRACE OF GRAVEL, OCCASIONAL SAND SEAMS & PARTINGS	---	6.0	8.0	<1
				---	8.0	10.0	<1
				---	10.0	12.0	<1
		10.0-18.5	GRAY **SILTY CLAY** WITH SOME SAND & TRACE OF GRAVEL	---	12.0	14.0	<1
		18.5-24.0	GRAY **SILTY FINE SAND** WITH TRACE OF GRAVEL	---	14.0	16.0	<1
		24.0-25.0	GRAY **SILTY CLAY** WITH TRACE OF SAND & GRAVEL	---	16.0	18.0	<1
				---	18.0	20.0	<1
				---	20.0	22.0	<1
				---	22.0	24.0	<1
			[WATER ENCOUNTERED AT 18.5' BGS; MONITORING WELL MW-11-07 INSTALLED WITH SCREEN TIP SET AT 22.0' BGS]	---	24.0	25.0	<1

NOTES:

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[3] * - SAMPLE SUBMITTED FOR ANALYTICAL TESTING.

DRILLED BY: FIBERTEC ENVIRONMENTAL SERVICES (RYAN) **DATE:** 09-06-2011 to 09-09-2011 **FIGURE NO:**

PROJECT NO: 62-100065-01	NTH CONSULTANTS, LTD.	SHEET 7 OF 7

LOG OF GEOPROBES

PROBE NO.	GROUND SURFACE ELEV.	DEPTH (FT)	SOIL DESCRIPTION	DISCRETE SAMPLE INFO.			
				SAMPLE NO.	DEPTH (FT) FROM	DEPTH (FT) TO	HNu READING (PPM)
HP-17-07	766.8	0.0-0.5	TOPSOIL: BROWN **SAND** WITH SOME SILT, GRAVEL & ORGANIC MATTER	---	0.0	0.5	<1
				---	0.5	1.0	<1
		0.5-8.0	BROWN & GRAY **CLAYEY SAND** WITH SOME SILT & TRACE OF GRAVEL	S-1*	1.0	2.0	<1
				---	2.0	4.0	<1
		8.0-13.0	BROWN **SILTY CLAY** WITH SOME SAND, TRACE OF GRAVEL & OCCASIONAL SAND PARTINGS	---	4.0	6.0	<1
				---	6.0	8.0	<1
		13.0-15.0	BROWN **CLAYEY SAND** WITH SOME SILT & GRAVEL	---	8.0	10.0	<1
				---	10.0	12.0	<1
		15.0-30.0	GRAY **SILTY CLAY** WITH TRACE OF SAND, GRAVEL & OCCASIONAL SAND PARTINGS (SAND SEAM AT 30')	---	12.0	13.0	<1
				---	13.0	15.0	<1
				---	15.0	17.0	<1
			[WATER ENCOUNTERED AT 19.0' BGS;	---	17.0	19.0	<1
				---	19.0	21.0	<1
			MONITORING WELL MW-12-07 INSTALLED WITH SCREEN TIP SET AT 23.0' BGS]	---	21.0	23.0	<1
				---	23.0	25.0	<1
				---	25.0	27.5	<1
				---	27.5	30.0	<1

NOTES:

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[3] * - SAMPLE SUBMITTED FOR ANALYTICAL TESTING.

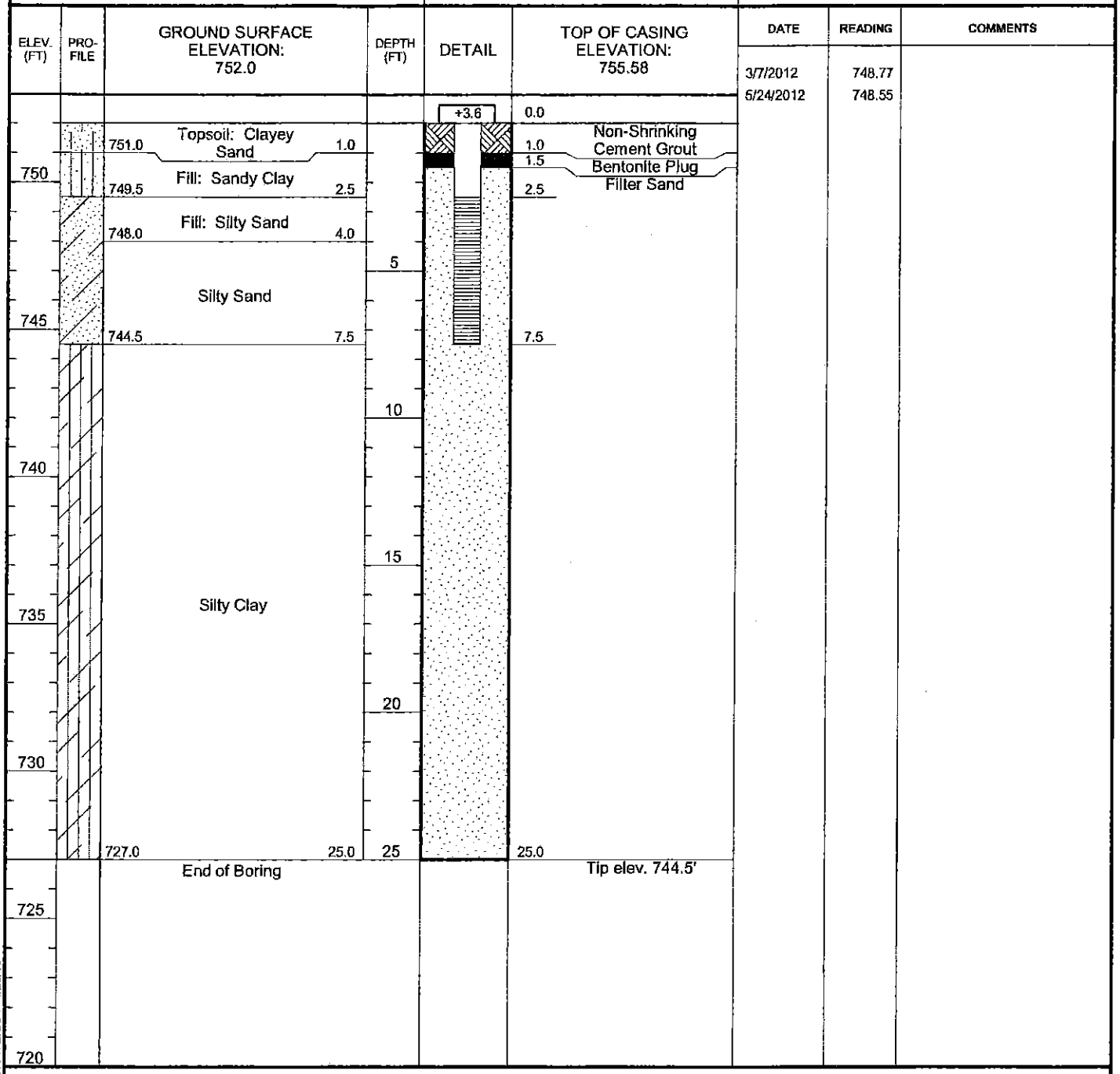
DRILLED BY: FIBERTEC ENVIRONMENTAL SERVICES (RYAN) **DATE:** 09-06-2011 to 09-09-2011 **FIGURE NO:**

MONITORING WELL NO: MW-1-07

Project Name: *Flint Bishop Airport Landfill*

Project Location: *Flint, Michigan*

NTH Consultants, Ltd.
NTH Proj. No.: 62-100065-00
Checked By: ACE



Total Depth: *25.0 ft*
Drilling Date: *09-09-2011*
Inspector: *S. Venman*
Contractor: *Fibertec Environmental Services*
Driller: *Ryan*
Equipment: *6620DT GeoProbe*

Casing Diameter: *2 in*
Casing Length: *6.1 ft*
Casing Type: *PVC*

Screen Diameter: *2 in*
Screen Length: *5 ft*
Screen Mesh: *0.010 in*
Screen Type: *PVC*

Protective Casing: *4"-dia. Steel*

Notes:

For details of subsurface strata, see Log of Geoprobes, HP-1-07.

Coordinates: *N 536026.9 E 13283506.8*

FIGURE NO.

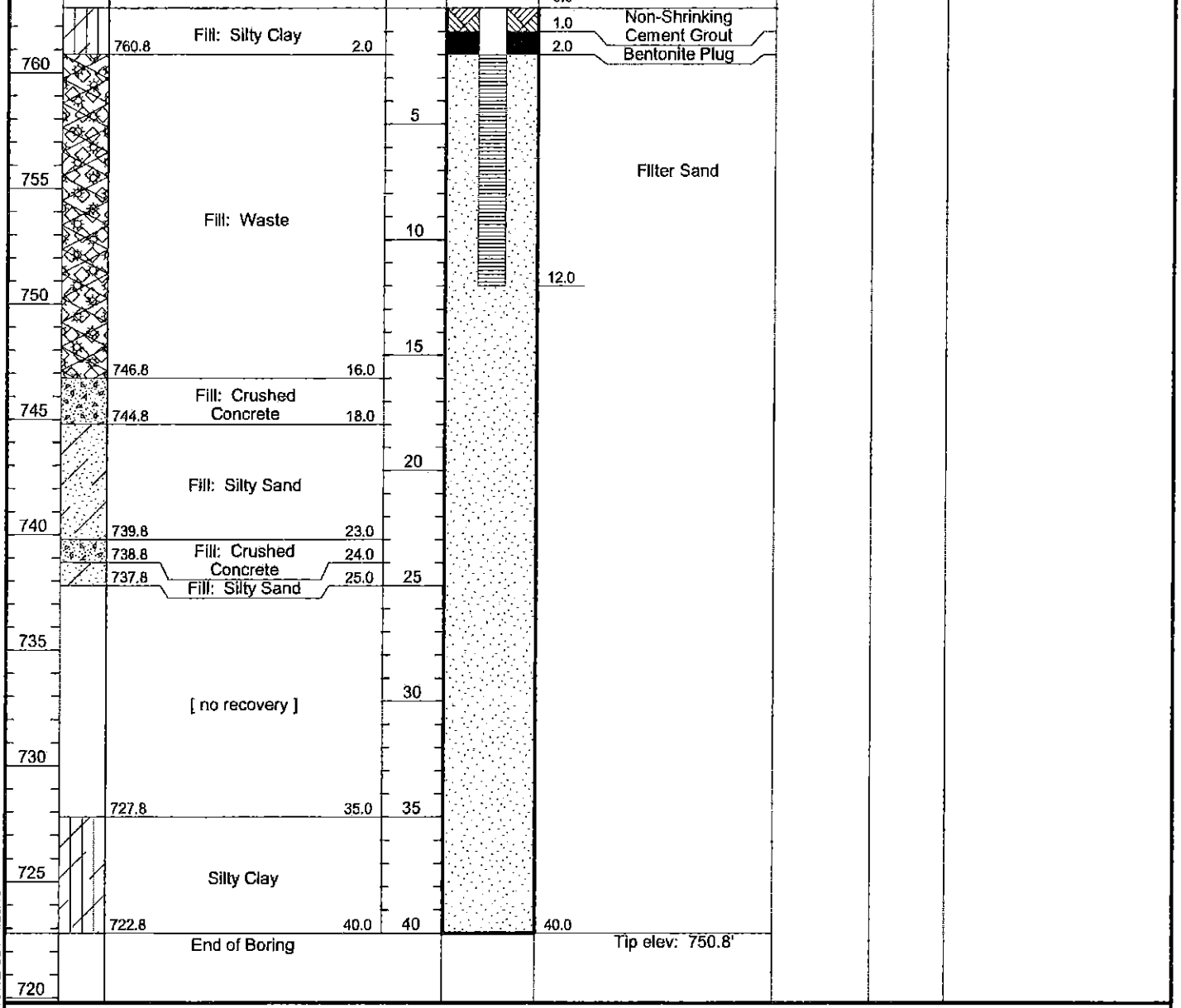
WELL LOG 62-100065-01.GPJ NTH CORPORATE.GDT 4/23/13

MONITORING WELL NO: MW-2-07

Project Name: *Flint Bishop Airport Landfill*

Project Location: *Flint, Michigan*

NTH Consultants, Ltd.
NTH Proj. No.: 62-100065-00
Checked By: ACE



Total Depth: *40.0 ft*
Drilling Date: *09-08-2011*
Inspector: *S. Venman*
Contractor: *Fibertec Environmental Services*
Driller: *Ryan*
Equipment: *6620DT GeoProbe*

Casing Diameter: *2 in*
Casing Length: *2.0 ft*
Casing Type: *PVC*

Screen Diameter: *2 in*
Screen Length: *10 ft*
Screen Mesh: *0.010 in*
Screen Type: *PVC*

Protective Casing: *8"-dia. Steel*

Notes:

For details of subsurface strata, see Log of Geoprobes, HP-3-07. Localized ponded water was present at time well was surveyed, preventing opening of lid. Top of casing reference elevation taken as top of protective cover lid.

Coordinates: *N 536837.5 E 13285129.9*

FIGURE NO.

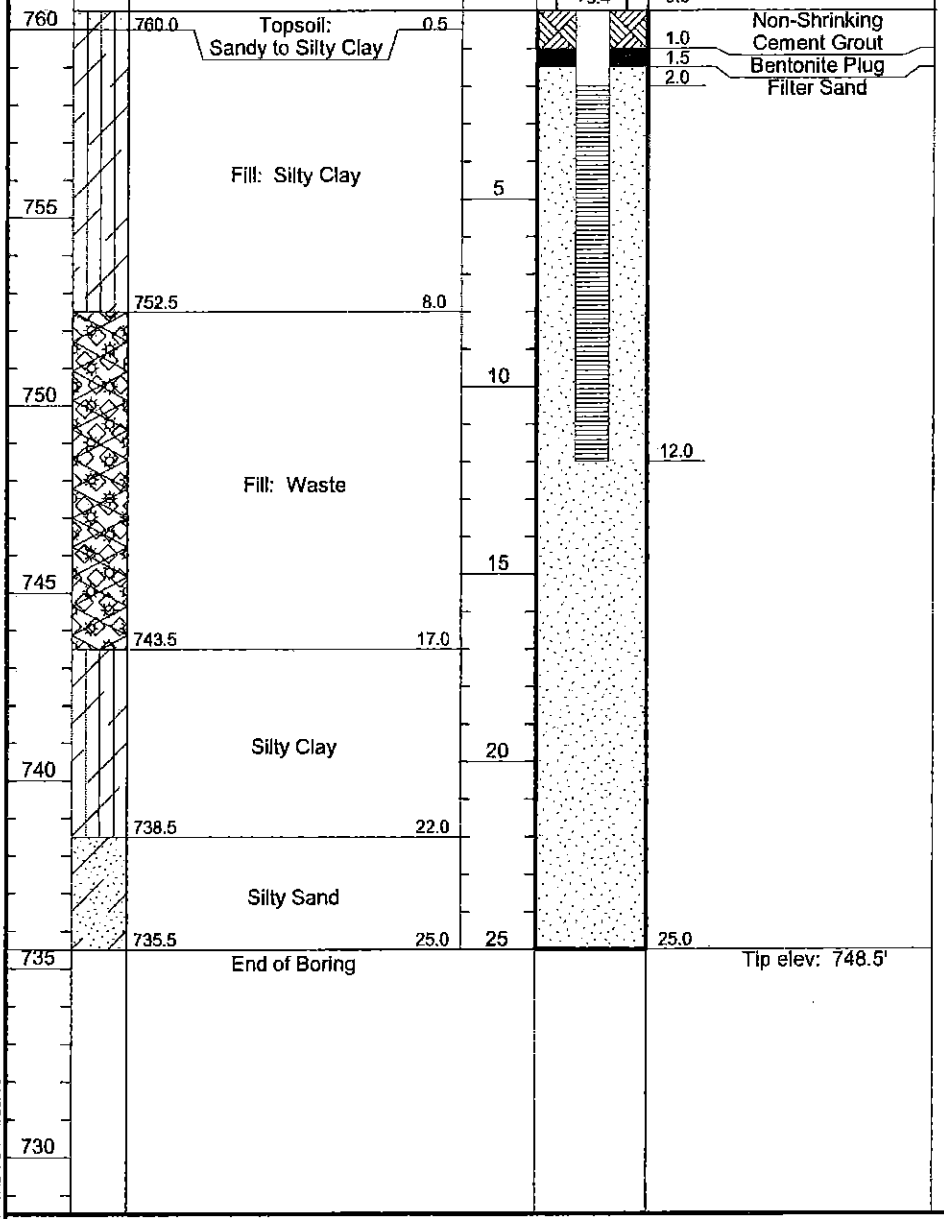
WELL LOG 62-100065-01.GPJ NTH CORPORATE.GDT 4/23/13

MONITORING WELL NO: MW-3-07

Project Name: *Flint Bishop Airport Landfill*

Project Location: *Flint, Michigan*

NTH Consultants, Ltd.
NTH Proj. No.: 62-100065-00
Checked By: ACE



WATER LEVEL DATA		
DATE	READING	COMMENTS
3/7/2012	758.87	
5/24/2012	759.07	

Total Depth: *25.0 ft*
Drilling Date: *09-08-2011*
Inspector: *S. Venman*
Contractor: *Fiberfec Environmental Services*
Driller: *Ryan*
Equipment: *6620DT GeoProbe*

Casing Diameter: *2 in*
Casing Length: *5.4 ft*
Casing Type: *PVC*

Screen Diameter: *2 in*
Screen Length: *10 ft*
Screen Mesh: *0.010 in*
Screen Type: *PVC*

Protective Casing: *4"-dia. Steel*

Notes:

For details of subsurface strata, see Log of Geoprobes, HP-4-07.

Coordinates: *N 536896.6 E 13285239.1*

FIGURE NO.

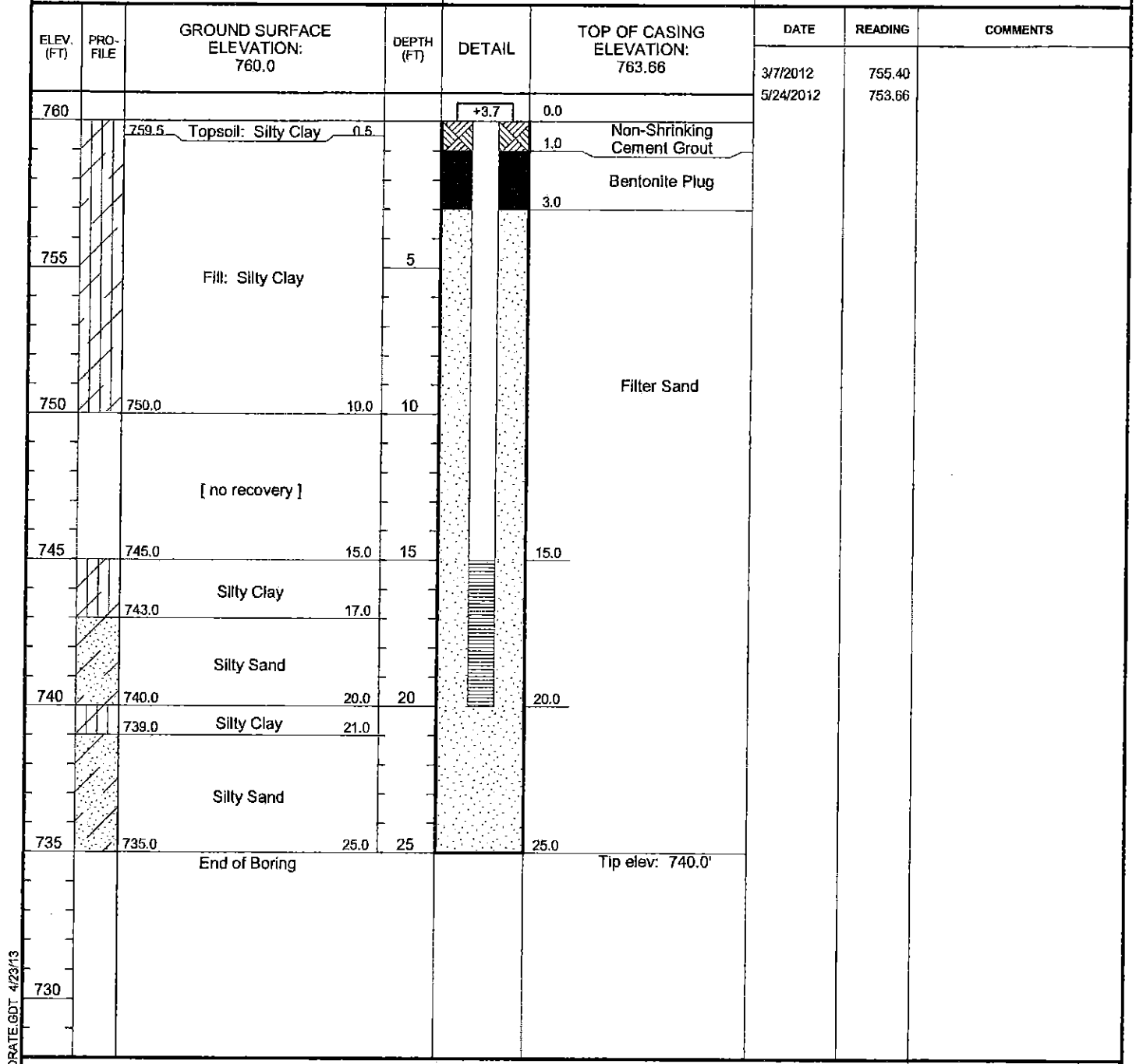
WELL LOG 62-100065-01.GPJ NTH CORPORATE.GDT 4/23/13

MONITORING WELL NO: MW-4-07

Project Name: *Flint Bishop Airport Landfill*

Project Location: *Flint, Michigan*

NTH Consultants, Ltd.
NTH Proj. No.: 62-100065-00
Checked By: ACE



DATE	READING	COMMENTS
3/7/2012	755.40	
5/24/2012	753.66	

Total Depth: *25.0 ft*
Drilling Date: *09-08-2011*
Inspector: *S. Venman*
Contractor: *Fibertec Environmental Services*
Driller: *Ryan*
Equipment: *6620DT GeoProbe*

Casing Diameter: *2 in*
Casing Length: *18.7 ft*
Casing Type: *PVC*

Screen Diameter: *2 in*
Screen Length: *5 ft*
Screen Mesh: *0.010 in*
Screen Type: *PVC*

Protective Casing: *4"-dia. Steel*

Notes:
For details of subsurface strata, see Log of Geoprobes, HP-5-07.

Coordinates: *N 536982.6 E 13285531.3*

FIGURE NO.

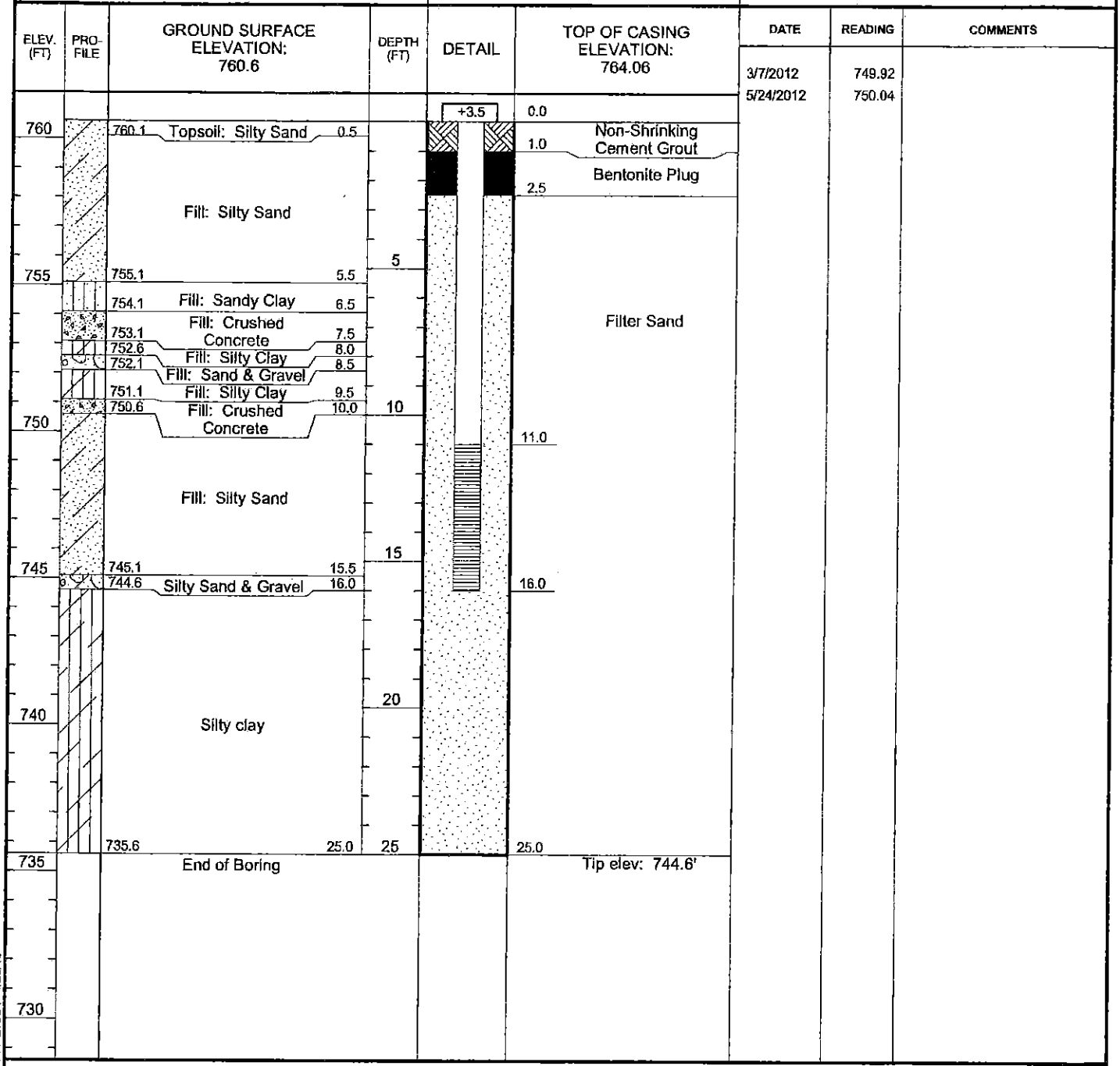
WELL LOG 62-100065-01.GPJ NTH_CORPORATE.GDT 4/23/13

MONITORING WELL NO: MW-5-07

Project Name: *Flint Bishop Airport Landfill*

Project Location: *Flint, Michigan*

NTH Consultants, Ltd.
NTH Proj. No.: 62-100065-00
Checked By: ACE



Total Depth: *25.0 ft*
Drilling Date: *09-08-2011*
Inspector: *S. Venman*
Contractor: *Fibertec Environmental Services*
Driller: *Ryan*
Equipment: *6620DT GeoProbe*

Casing Diameter: *2 in*
Casing Length: *14.5 ft*
Casing Type: *PVC*

Screen Diameter: *2 in*
Screen Length: *5 ft*
Screen Mesh: *0.010 in*
Screen Type: *PVC*

Protective Casing: *4"-dia. Steel*

Notes:

For details of subsurface strata, see Log of Geoprobes, HP-6-07.

Coordinates: *N 537028.9 E 13285705.1*

FIGURE NO.

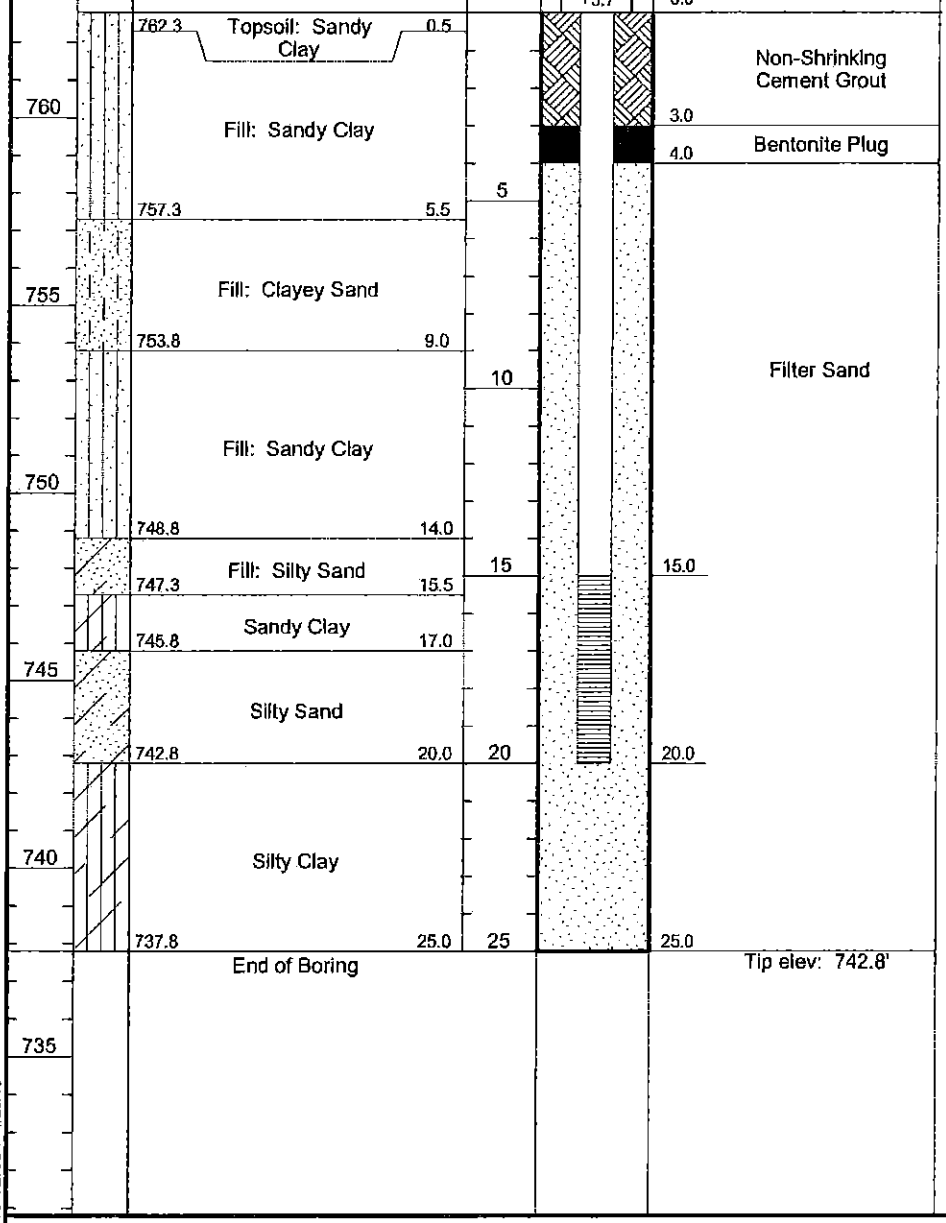
WELL LOG 62-100065-01.GPJ NTH CORPORATE.GDT 4/23/13

MONITORING WELL NO: MW-6-07

Project Name: *Flint Bishop Airport Landfill*

Project Location: *Flint, Michigan*

NTH Consultants, Ltd.
NTH Proj. No.: 62-100065-00
Checked By: ACE



Total Depth: *25.0 ft*
Drilling Date: *09-08-2011*
Inspector: *S. Venman*
Contractor: *Fibertec Environmental Services*
Driller: *Ryan*
Equipment: *6620DT GeoProbe*

Casing Diameter: *2 in*
Casing Length: *18.7 ft*
Casing Type: *PVC*

Screen Diameter: *2 in*
Screen Length: *5 ft*
Screen Mesh: *0.010 in*
Screen Type: *PVC*

Protective Casing: *4"-dia. Steel*

Notes:

For details of subsurface strata, see Log of Geoprobes, HP-7-07.

Coordinates: *N 537053.6 E 13285895.4*

FIGURE NO.

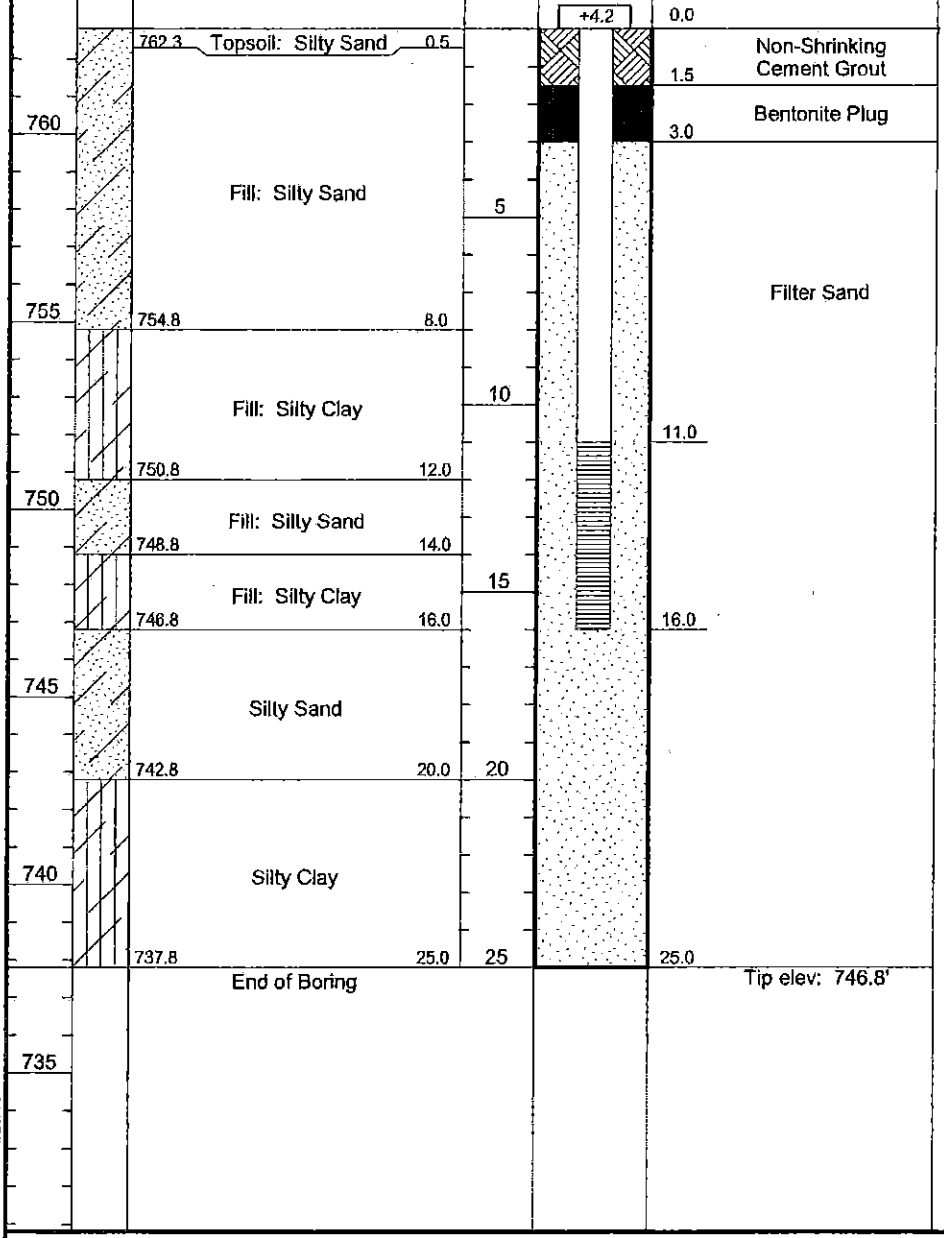
WELL LOG 62-100065-01.GPJ NTH CORPORATE.GDT 4/23/13

MONITORING WELL NO: MW-7-07

Project Name: *Flint Bishop Airport Landfill*

Project Location: *Flint, Michigan*

NTH Consultants, Ltd.
NTH Proj. No.: 62-100065-00
Checked By: ACE



Total Depth: *25.0 ft*
Drilling Date: *09-07-2011*
Inspector: *S. Venman*
Contractor: *Fibertec Environmental Services*
Driller: *Ryan*
Equipment: *6620DT GeoProbe*

Casing Diameter: *2 in*
Casing Length: *15.1 ft*
Casing Type: *PVC*

Screen Diameter: *2 in*
Screen Length: *5 ft*
Screen Mesh: *0.010 in*
Screen Type: *PVC*

Protective Casing: *4"-dia. Steel*

Notes:
For details of subsurface strata, see Log of Geoprobes, HP-8-07.

Coordinates: *N 536860.8 E 13286025.4*

FIGURE NO.

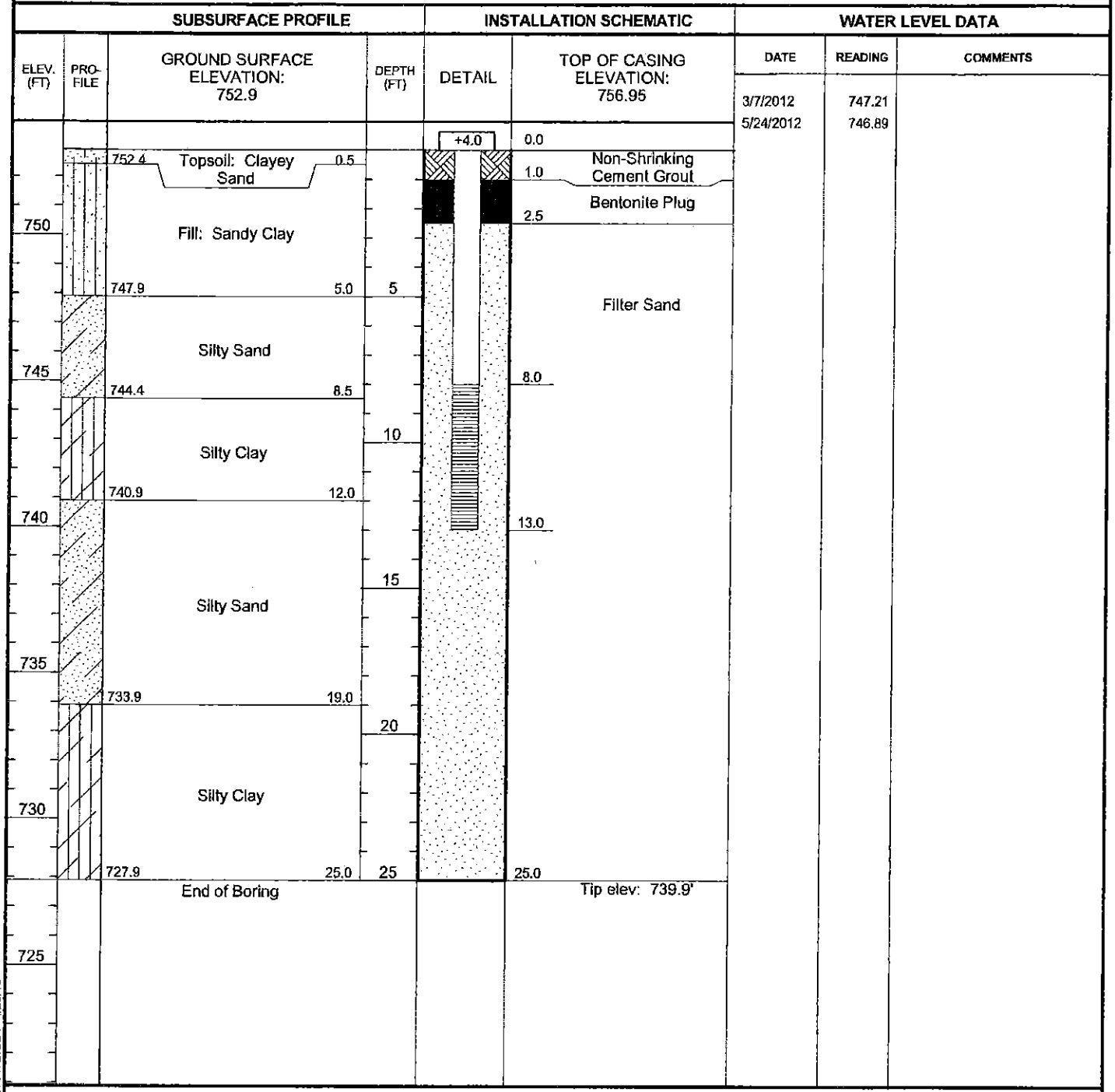
WELL LOG 62-100065-01.GPJ NTH_CORPORATE.GDT 4/23/13

MONITORING WELL NO: MW-8-07

Project Name: *Flint Bishop Airport Landfill*

Project Location: *Flint, Michigan*

NTH Consultants, Ltd.
NTH Proj. No.: 62-100065-00
Checked By: ACE



Total Depth: *25.0 ft*
Drilling Date: *09-07-2011*
Inspector: *S. Venman*
Contractor: *Fibertec Environmental Services*
Driller: *Ryan*
Equipment: *6620DT GeoProbe*

Casing Diameter: *2 in*
Casing Length: *12.1 ft*
Casing Type: *PVC*

Screen Diameter: *2 in*
Screen Length: *5 ft*
Screen Mesh: *0.010 in*
Screen Type: *PVC*

Protective Casing: *4"-dia, Steel*

Notes:

For details of subsurface strata, see Log of Geoprobes, HP-9-07.

Coordinates: *N 536618.9 E 13286100.2*

FIGURE NO.

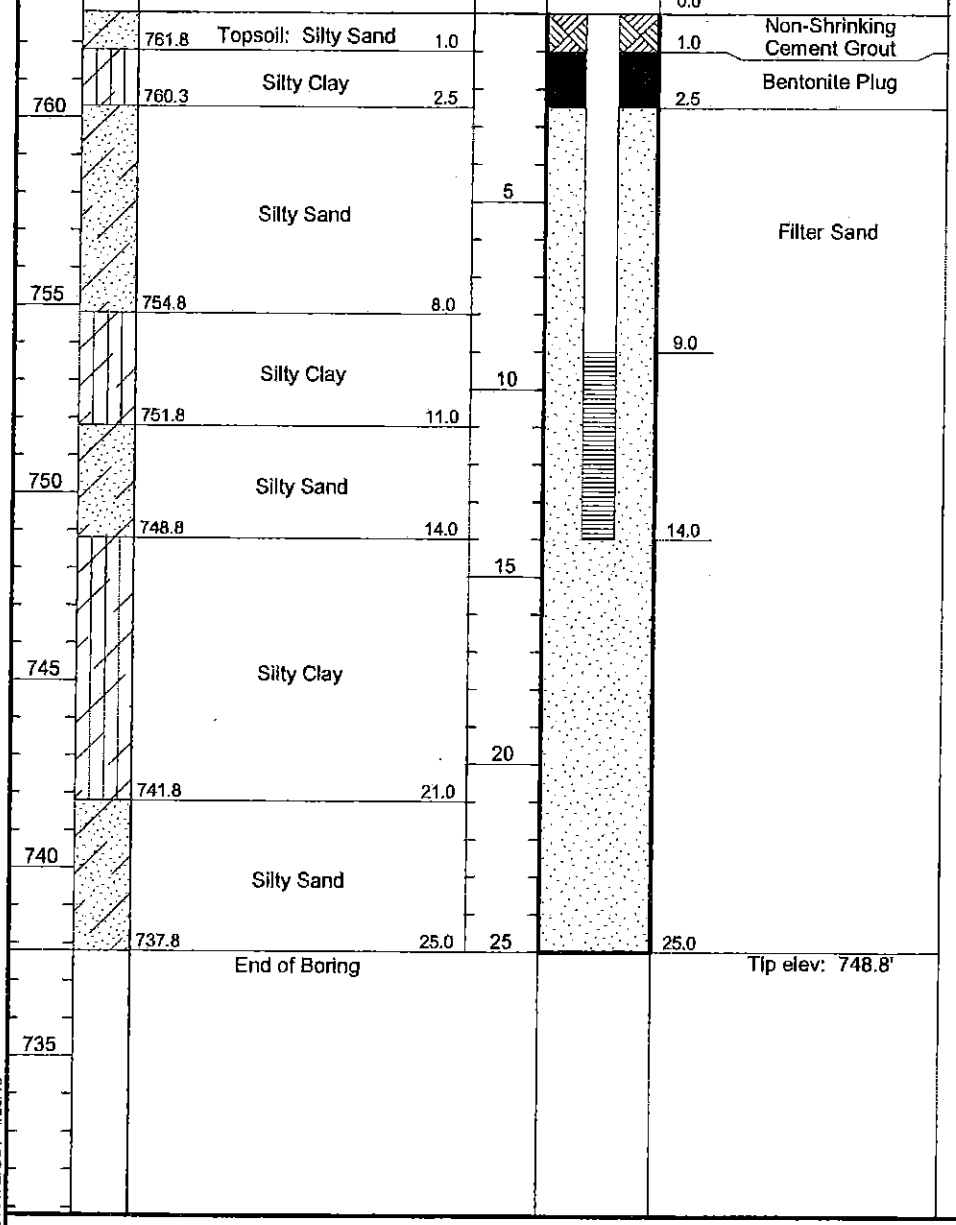
WELL LOG 62-100065-01.GPJ NTH_CORPORATE.GDT 4/23/13

MONITORING WELL NO: MW-9-07

Project Name: *Flint Bishop Airport Landfill*

Project Location: *Flint, Michigan*

NTH Consultants, Ltd.
NTH Proj. No.: 62-100065-00
Checked By: ACE



WATER LEVEL DATA		
DATE	READING	COMMENTS
3/7/2012	--	Ponded at surface
5/24/2012	760.52	

Total Depth: *25.0 ft*
Drilling Date: *09-06-2011*
Inspector: *S. Venman*
Contractor: *Fibertec Environmental Services*
Driller: *Ryan*
Equipment: *Hand Auger & 6620DT GeoProbe*

Casing Diameter: *2 in*
Casing Length: *9.0 ft*
Casing Type: *PVC*

Screen Diameter: *2 in*
Screen Length: *5 ft*
Screen Mesh: *0.010 in*
Screen Type: *PVC*

Protective Casing: *8"-dia. Steel*

Notes:

For details of subsurface strata, see Log of Geoprobes, HP-14-07. Localized ponded water was present at time well was surveyed, preventing opening of lid. Top of casing reference elevation taken as top of protective cover lid.

Coordinates: *N 535948.4 E 13284918.1*

FIGURE NO.

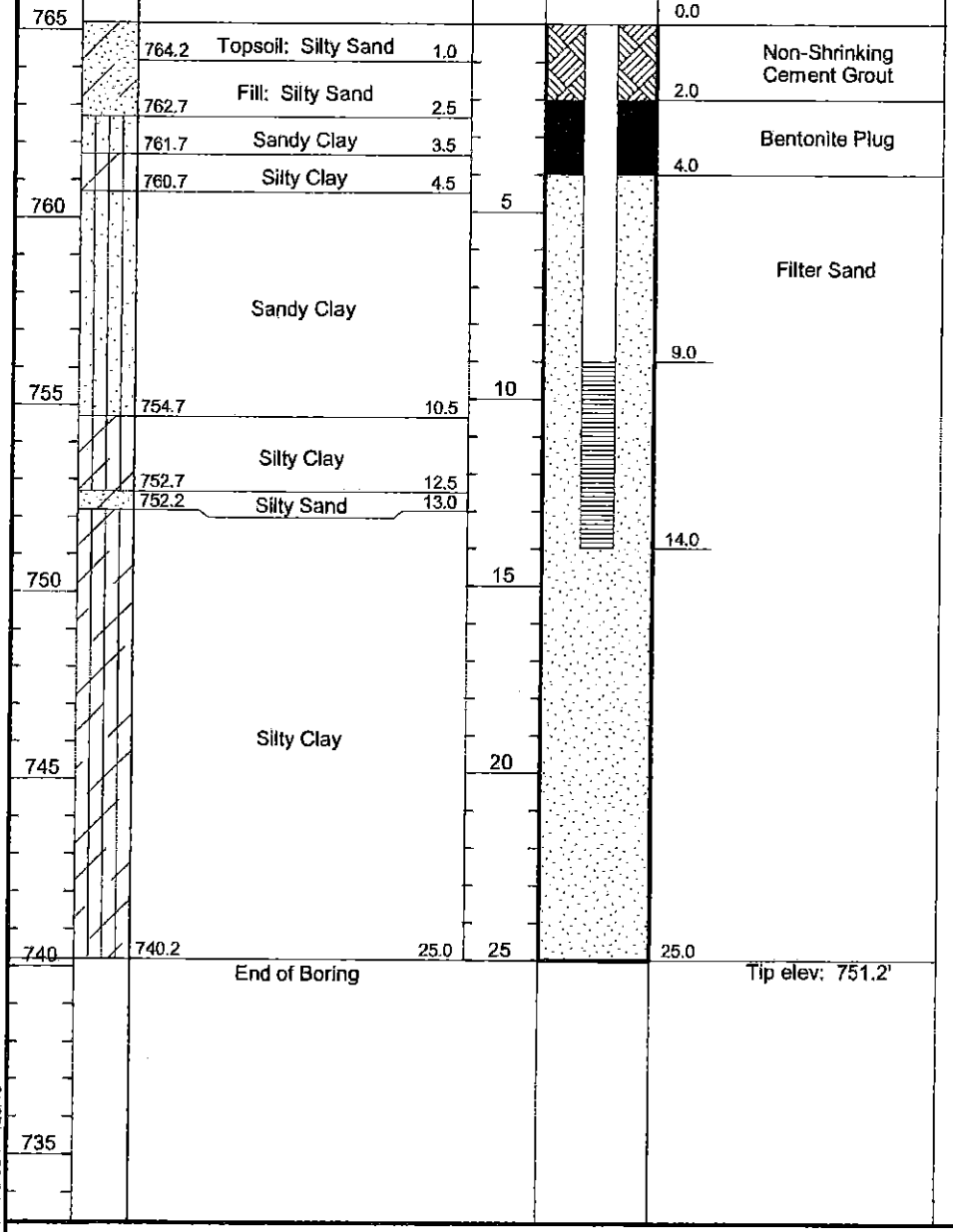
WELL LOG 62-100065-01.GPJ NTH CORPORATE.GDT 4/23/13

MONITORING WELL NO: MW-10-07

Project Name: *Flint Bishop Airport Landfill*

Project Location: *Flint, Michigan*

NTH Consultants, Ltd.
NTH Proj. No.: 62-100065-00
Checked By: ACE



WATER LEVEL DATA		
DATE	READING	COMMENTS
3/7/2012	762.93	
5/24/2012	762.03	

Total Depth: *25.0 ft*
Drilling Date: *09-06-2011*
Inspector: *S. Venman*
Contractor: *Fibertec Environmental Services*
Driller: *Ryan*
Equipment: *Hand Auger & 6620DT GeoProbe*

Casing Diameter: *2 in*
Casing Length: *8.9 ft*
Casing Type: *PVC*

Screen Diameter: *2 in*
Screen Length: *5 ft*
Screen Mesh: *0.010 in*
Screen Type: *PVC*

Protective Casing: *8"-dia. Steel*

Notes:
For details of subsurface strata, see Log of Geoprobes, HP-15-07.

Coordinates: *N 535938 E 13284492.5*

FIGURE NO.

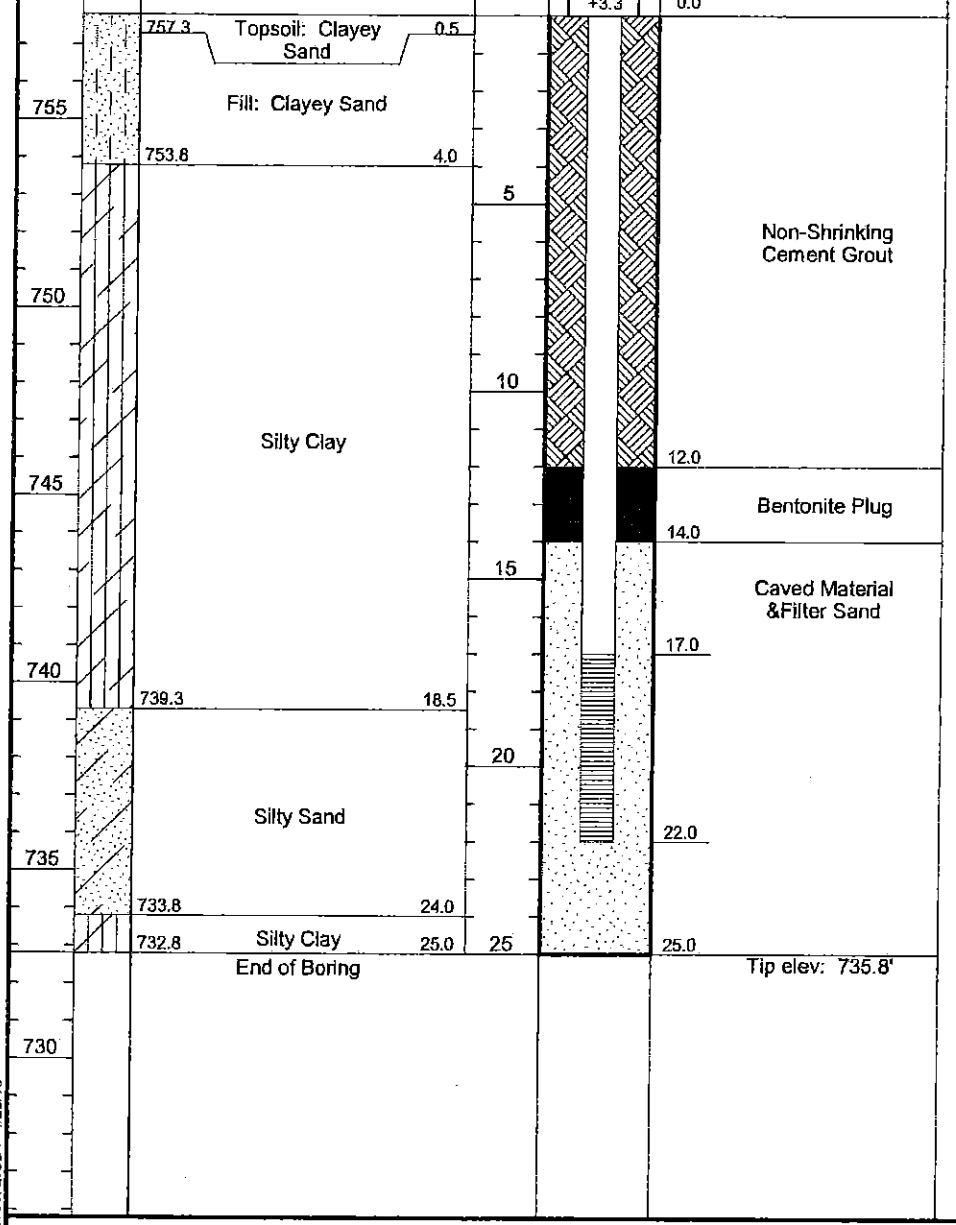
WELL LOG 62-100065-01.GPJ NTH CORPORATE.GDT 4/23/13

MONITORING WELL NO: MW-11-07

Project Name: *Flint Bishop Airport Landfill*

Project Location: *Flint, Michigan*

NTH Consultants, Ltd.
NTH Proj. No.: 62-100065-00
Checked By: ACE



WATER LEVEL DATA		
DATE	READING	COMMENTS
3/7/2012	746.35	
5/24/2012	745.29	

Total Depth: *25.0 ft*
Drilling Date: *09-07-2011*
Inspector: *S. Venman*
Contractor: *Fibertec Environmental Services*
Driller: *Ryan*
Equipment: *6620DT GeoProbe*

Casing Diameter: *2 in*
Casing Length: *20.3 ft*
Casing Type: *PVC*

Screen Diameter: *2 in*
Screen Length: *5 ft*
Screen Mesh: *0.010 in*
Screen Type: *PVC*

Protective Casing: *4"-dia. Steel*

Notes:

For details of subsurface strata, see Log of Geoprobes, HP-16-07.

Coordinates: *N 536730.5 E 13286190.2*

FIGURE NO.

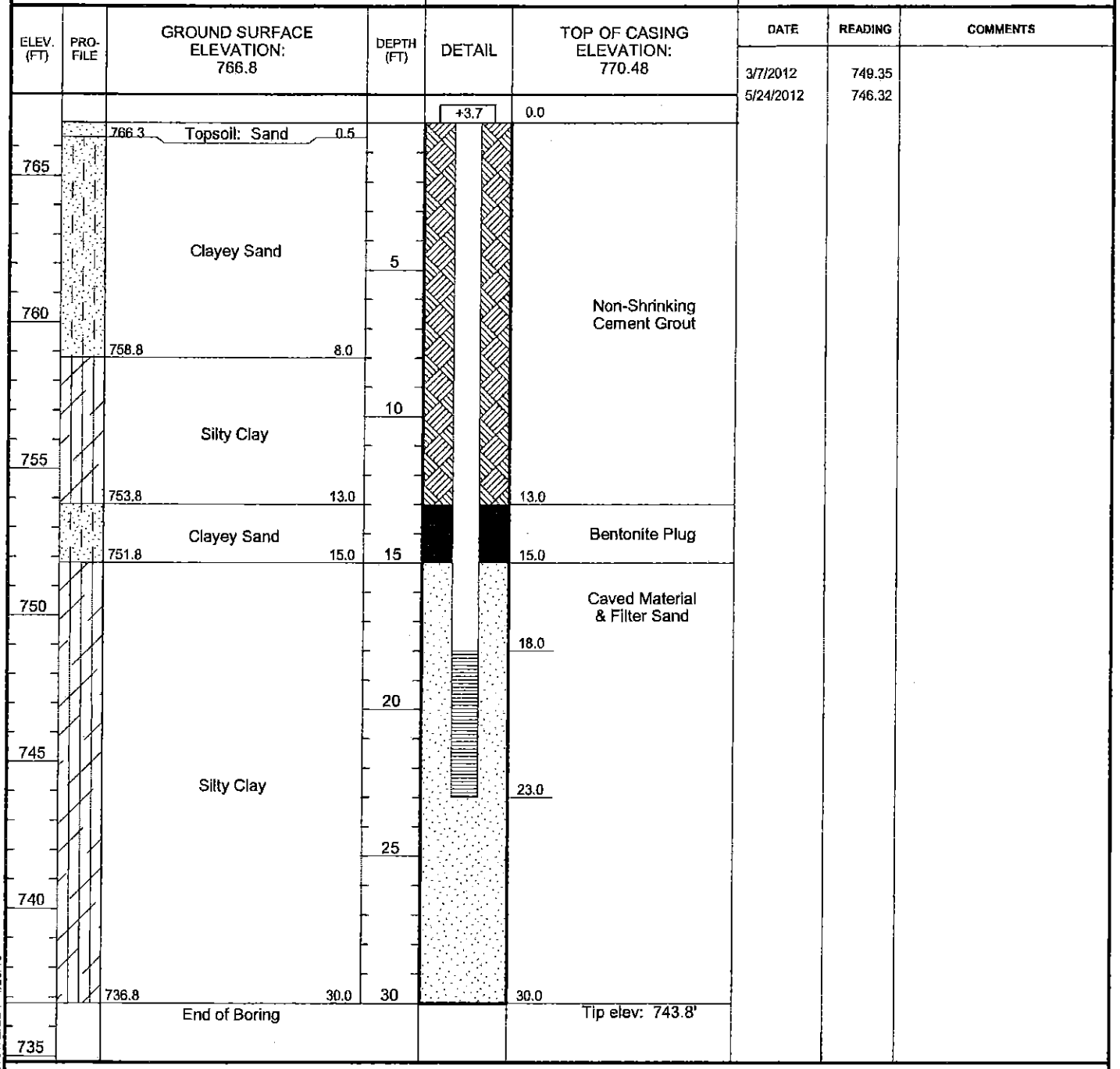
WELL LOG 62-100065-01.GPJ NTH_CORPORATE.GDT 4/23/13

MONITORING WELL NO: MW-12-07

Project Name: *Flint Bishop Airport Landfill*

Project Location: *Flint, Michigan*

NTH Consultants, Ltd.
NTH Proj. No.: 62-100065-00
Checked By: ACE



Total Depth: *30.0 ft*
Drilling Date: *09-07-2011*
Inspector: *S. Venman*
Contractor: *Fibertec Environmental Services*
Driller: *Ryan*
Equipment: *6620DT GeoProbe*

Casing Diameter: *2 in*
Casing Length: *21.7 ft*
Casing Type: *PVC*

Screen Diameter: *2 in*
Screen Length: *5 ft*
Screen Mesh: *0.010 in*
Screen Type: *PVC*

Protective Casing: *4"-dia. Steel*

Notes:

For details of subsurface strata, see Log of Geoprobes, HP-17-07.

Coordinates: *N 536961.8 E 13286180*

FIGURE NO.

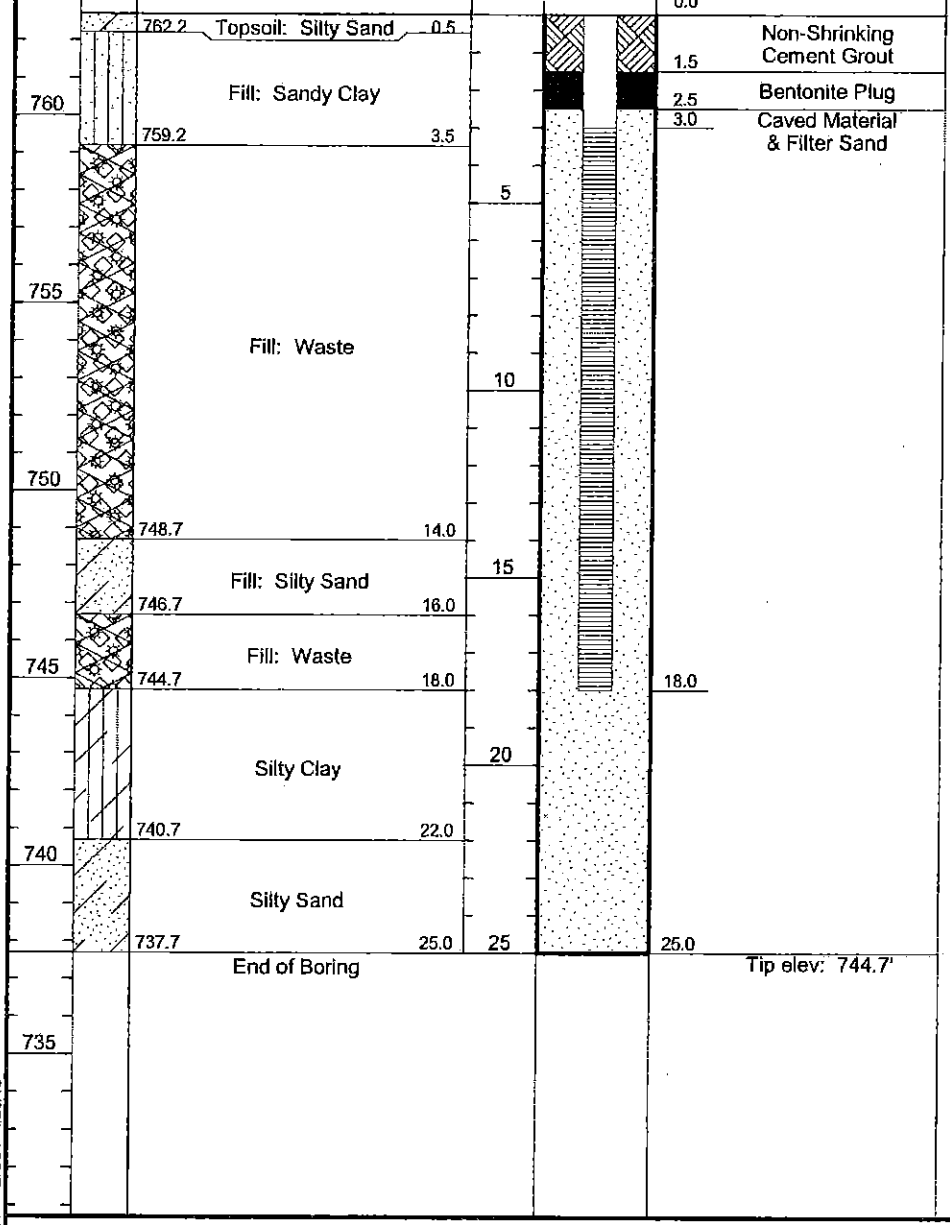
WELL LOG 62-100065-01.GPJ NTH CORPORATE.GDT 4/23/13

PIEZOMETER NO: PZ-1-07

Project Name: *Flint Bishop Airport Landfill*

Project Location: *Flint, Michigan*

NTH Consultants, Ltd.
NTH Proj. No.: 62-100065-00
Checked By: ACE



WATER LEVEL DATA

DATE	READING	COMMENTS
3/7/2012	758.91	
5/24/2012	757.87	

Total Depth: *25.0 ft*
Drilling Date: *09-08-2011*
Inspector: *S. Venman*
Contractor: *Fibertec Environmental Services*
Driller: *Ryan*
Equipment: *6620DT GeoProbe*

Casing Diameter: *2 in*
Casing Length: *2.6 ft*
Casing Type: *PVC*

Screen Diameter: *2 in*
Screen Length: *15 ft*
Screen Mesh: *0.010 in*
Screen Type: *PVC*

Protective Casing: *8"-dia. Steel*

Notes:

For details of subsurface strata, see Log of Geoprobes, HP-10-07.

Coordinates: *N 536844.9 E 13285584.6*

FIGURE NO.

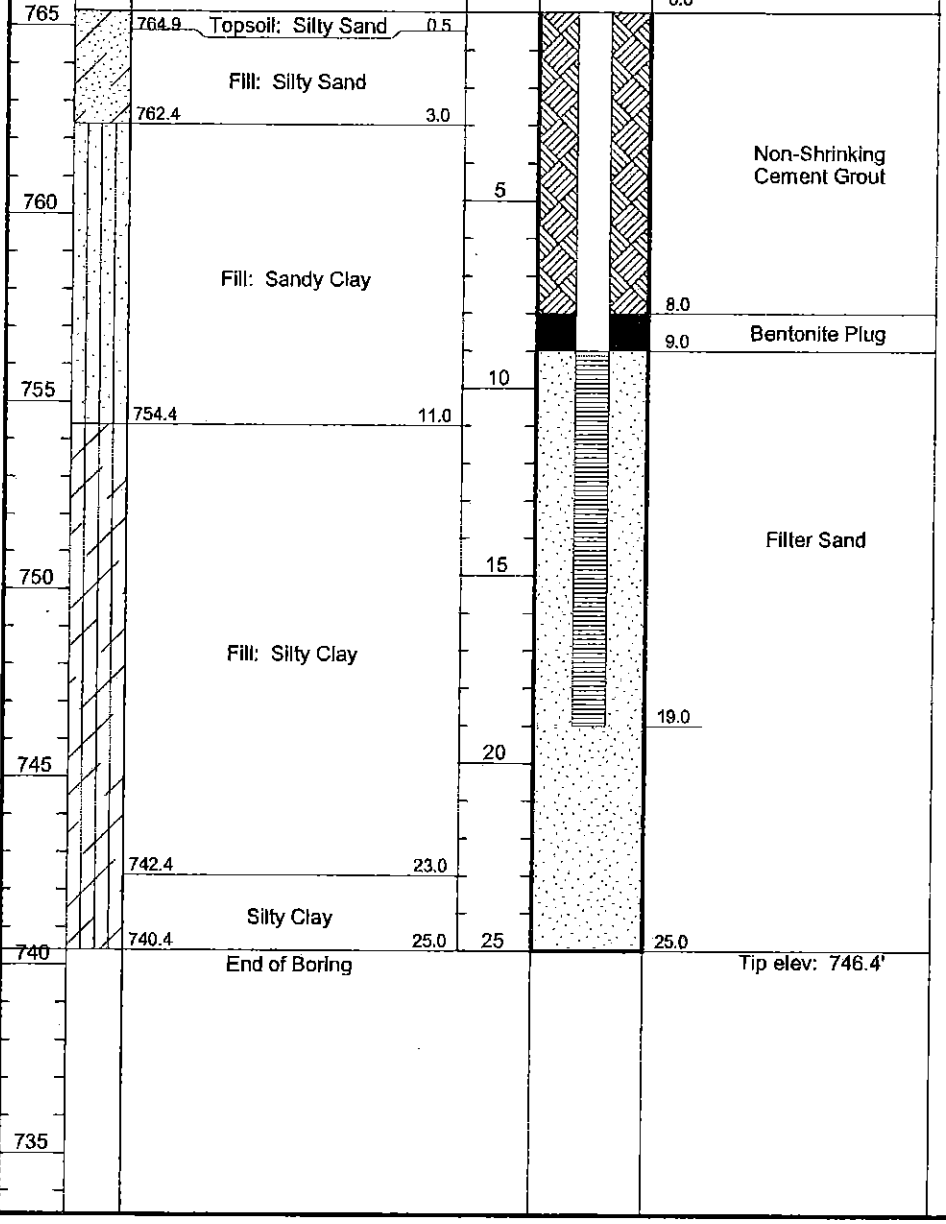
WELL LOG 62-100065-01.GPJ NTH_CORPORATE.GDT 4/23/13

PIEZOMETER NO: PZ-2-07

Project Name: *Flint Bishop Airport Landfill*

Project Location: *Flint, Michigan*

NTH Consultants, Ltd.
NTH Proj. No.: 62-100065-00
Checked By: ACE



WATER LEVEL DATA		
DATE	READING	COMMENTS
3/7/2012	755.84	
5/24/2012	755.98	

Total Depth: *25.0 ft*
Drilling Date: *09-06-2011*
Inspector: *S. Venman*
Contractor: *Fiberfec Environmental Services*
Driller: *Ryan*
Equipment: *6620DT GeoProbe*

Casing Diameter: *2 in*
Casing Length: *8.6 ft*
Casing Type: *PVC*

Screen Diameter: *2 in*
Screen Length: *10 ft*
Screen Mesh: *0.010 in*
Screen Type: *PVC*

Protective Casing: *8"-dia. Steel*

Notes:

For details of subsurface strata, see Log of Geoprobes, HP-11-07.

Coordinates: *N 536418.4 E 13285270.4*

FIGURE NO.

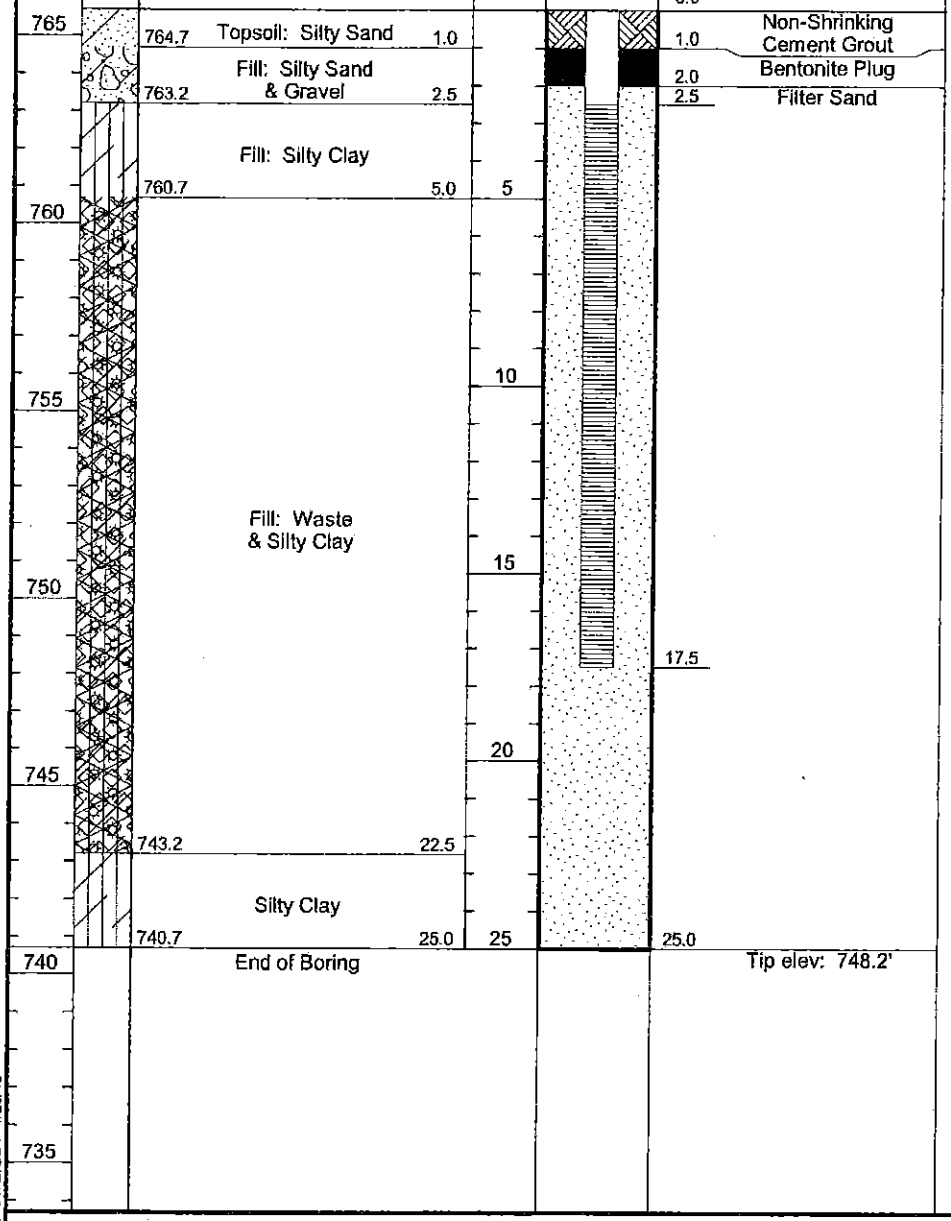
WELL LOG 62-100065-01.GPJ NTH CORPORATE.GDT 4/23/13

PIEZOMETER NO: PZ-3-07

Project Name: *Flint Bishop Airport Landfill*

Project Location: *Flint, Michigan*

NTH Consultants, Ltd.
NTH Proj. No.: 62-100065-00
Checked By: ACE



Total Depth: *25.0 ft*
Drilling Date: *09-06-2011*
Inspector: *S. Venman*
Contractor: *Fibertec Environmental Services*
Driller: *Ryan*
Equipment: *Hand Auger & 6620DT GeoProbe*

Casing Diameter: *2 in*
Casing Length: *2.2 ft*
Casing Type: *PVC*

Screen Diameter: *2 in*
Screen Length: *15 ft*
Screen Mesh: *0.010 in*
Screen Type: *PVC*

Protective Casing: *8"-dia. Steel*

Notes:

For details of subsurface strata, see Log of Geoprobes, HP-12-07.

Coordinates: *N 536377.6 E 13284761.2*

FIGURE NO.

WELL LOG 62-100065-01.GPJ NTH CORPORATE.GDT 4/23/13

PIEZOMETER NO: PZ-4-07

Project Name: *Flint Bishop Airport Landfill*

Project Location: *Flint, Michigan*

NTH Consultants, Ltd.
NTH Proj. No.: 62-100065-00
Checked By: ACE

SUBSURFACE PROFILE				INSTALLATION SCHEMATIC		WATER LEVEL DATA		
ELEV. (FT)	PRO-FILE	GROUND SURFACE ELEVATION: 766.8	DEPTH (FT)	DETAIL	TOP OF CASING ELEVATION: 766.40	DATE	READING	COMMENTS
					0.0	3/7/2012	764.44	
		766.3 Topsoil: Silty Sand 0.5			1.0 Non-Shrinking Cement Grout	5/24/2012	763.82	
765		Fill: Silty Sand			2.0 Bentonite Plug			
		762.8 4.0			3.0 Filter Sand			
		761.8 Fill: Silty Clay 5.0	5					
760			10					
755		Fill: Waste	15					
750		748.8 18.0	20		18.0			
745		Silty Clay						
		743.3 23.5						
		741.8 Silty Sand 25.0	25		25.0			
		End of Boring			Tip elev: 748.8'			
740								
735								

Total Depth: *25.0 ft*
Drilling Date: *09-09-2011*
Inspector: *S. Venman*
Contractor: *Fibertec Environmental Services*
Driller: *Ryan*
Equipment: *6620DT GeoProbe*

Casing Diameter: *2 in*
Casing Length: *2.6 ft*
Casing Type: *PVC*

Screen Diameter: *2 in*
Screen Length: *15 ft*
Screen Mesh: *0.010 in*
Screen Type: *PVC*

Protective Casing: *8"-dia, Steel*

Notes:

For details of subsurface strata, see Log of Geoprobes, HP-13-07.

Coordinates: *N 536179.4 E 13283856.6*

FIGURE NO.

WELL LOG 62-100065-01.GPJ NTH CORPORATE.GDT 4/23/13

ATTACHMENT III

TABLES

TABLE 1 (Page 1 of 2)
SOIL ANALYTICAL RESULTS - SUBSURFACE SOIL SAMPLES FROM BORINGS
Flint Bishop Airport Landfill
NTH Project No. 62-100065-00

PARAMETER	Units	(Boring No.) (Well No. - if installed) (Sample No.) (Sample Depth - ft) (Material Type) (Sampling Date)												PART 201 GENERIC NONRESIDENTIAL SOIL CLEANUP CRITERIA			
		HP-1-07 (MW-1-07) S-1 1.5' - 2.5' Cover Soil 9/9/2011	HP-2-07 -- S-1 0.5' - 2.5' Cover Soil 9/9/2011	HP-3-07 (MW-2-07) S-1 0.0' - 2.0' Cover Soil 9/8/2011	HP-4-07 (MW-3-07) S-1 0.5' - 2.5' Cover Soil 9/8/2011	DUPLICATE -- DUP-1 -- Cover Soil 9/8/2011	HP-5-07 (MW-4-07) S-1 2.5' - 4.5' Cover Soil 9/8/2011	HP-6-07 (MW-5-07) S-1 4.5' - 5.5' Cover Soil 9/8/2011	HP-6-07 (MW-5-07) S-2 8.0' - 8.5' Fill Soil - Dike 9/8/2011	HP-7-07 (MW-6-07) S-1 7.5' - 9.0' Cover Soil 9/8/2011	HP-7-07 (MW-6-07) S-2 14.0' - 15.5' Waste 9/8/2011	HP-8-07 (MW-7-07) S-1 7.0' - 7.5' Fill Soil - Dike 9/7/2011	HP-9-07 (MW-8-07) S-1 4.5' - 5.5' Fill Soil 9/7/2011	Default Background	DWP	GSIP	DC
METALS																	
Aluminum	mg/kg	7400	9100	11000	7200	7700	12000	4800	7900	7100	8800	6500	11000	6900	1	NA	370000
Antimony	mg/kg	ND	0.36	ND	ND	ND	0.5	0.57	0.47	0.37	0.82	1.3	ND	NA	4.3	94	670
Arsenic	mg/kg	10	7.2	5.9	4.2	4.4	7	10	6	6.2	8.8	8.9	11	5.8	4.6	4.6	37
Barium	mg/kg	130	80	40	42	45	66	33	52	37	63	94	86	75	1300	290[6]	130000
Beryllium	mg/kg	0.39	0.46	0.53	ND	ND	0.68	ND	ND	ND	ND	ND	ND	NA	51	30[6]	1600
Cadmium	mg/kg	0.46	0.14	0.12	0.12	0.15	0.24	0.22	0.22	0.21	0.83	1.4	0.22	1.2	6	2.6[6]	30
Calcium	mg/kg	6000	43000	46000	50000	47000	5900	45000	83000	36000	7200	49000	4300	NA	NA	NA	NA
Chromium	mg/kg	11	14	17	10	11	16	8.2	11	9.6	16	18	14	18	30	3.3	9200
Cobalt	mg/kg	11	7.9	9.7	5.7	5.9	7.6	3.6	5	5.1	5.7	5.4	7.7	6.8	2	2	9000
Copper	mg/kg	8.5	12	16	11	11	12	11	12	11	19	140	9.2	32	5800	52[6]	73000
Iron	mg/kg	22000	19000	17000	16000	16000	21000	8100	14000	13000	41000	13000	20000	12000	6	NA	580000
Lead	mg/kg	7.4	8	9.3	7.2	8.4	15	39	55	24	1500	73	13	21	700	3700[6]	900
Magnesium	mg/kg	2900	18000	24000	20000	19000	3900	9100	14000	13000	3700	15000	3200	NA	22000	NA	1000000
Manganese	mg/kg	2700	440	320	270	310	300	180	250	290	310	270	980	440	1	40[6]	90000
Mercury	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	0.074	0.62	0.68	ND	0.13	1.7	0.05	580
Nickel	mg/kg	16	18	22	15	16	15	16	14	12	14	16	15	20	100	54[6]	150000
Potassium	mg/kg	1200	1900	2000	1200	1300	1100	780	1200	1000	950	1100	1400	NA	NA	NA	NA
Selenium	mg/kg	0.35	0.26	0.29	0.34	0.26	0.48	0.66	0.28	0.36	0.23	0.27	0.42	0.41	4	0.4	9600
Silver	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.11	0.96	ND	1	13	0.1	9000
Sodium	mg/kg	52	160	250	170	160	87	160	320	140	220	760	99	NA	7000	NA	1000000
Thallium	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	2.3	4.2	130
Vanadium	mg/kg	18	23	25	16	18	25	75	19	15	14	17	23	NA	990	430	5500
Zinc	mg/kg	42	45	45	33	47	67	63	65	45	290	240	49	47	5000	120[6]	630000
VOCs		ALL ND	ALL ND	ELSE ND	ALL ND	ALL ND	ALL ND	ALL ND	ALL ND	ALL ND	ELSE ND	ELSE ND	ALL ND				
1,2,3-Trimethylbenzene	µg/kg	---	---	---	---	---	---	---	---	---	---	---	---	NA	NA	NA	NA
1,2,4-Trimethylbenzene	µg/kg	---	---	440	---	---	---	---	---	---	180	---	---	NA	2100	570	110000
1,3,5-Trimethylbenzene	µg/kg	---	---	140	---	---	---	---	---	---	---	---	---	NA	1800	1100	94000
1,4-Dichlorobenzene	µg/kg	---	---	380	---	---	---	---	---	---	160	920	---	NA	1700	360	1900000
2-Butanone	µg/kg	---	---	---	---	---	---	---	---	---	---	---	---	NA	760000	44000	27000000
2-Methylnaphthalene	µg/kg	---	---	---	---	---	---	---	---	---	---	---	---	NA	170000	4200	26000000
Chlorobenzene	µg/kg	---	---	150	---	---	---	---	---	---	130	500	---	NA	2000	500	260000
Ethylbenzene	µg/kg	---	---	---	---	---	---	---	---	---	---	---	---	NA	1500	360	140000
Styrene	µg/kg	---	---	---	---	---	---	---	---	---	---	---	---	NA	2700	2100	520000
Tetrachloroethene	µg/kg	---	---	---	---	---	---	---	---	---	---	---	---	NA	100	1200	88000
Toluene	µg/kg	---	---	---	---	---	---	---	---	---	---	---	---	NA	16000	5400	250000
Trichloroethene	µg/kg	---	---	---	---	---	---	---	---	---	---	---	---	NA	100	4000	500000
Xylenes	µg/kg	---	---	---	---	---	---	---	---	---	---	---	---	NA	5600	820	150000

NOTES:

1) **mg/kg** - milligrams per kilogram (equivalent to parts per million); **µg/kg** - micrograms per kilogram (equivalent to parts per billion)..
2) **ND** = Not Detected; **ALL ND** = All parameters included in this scan were ND; **ELSE ND** = All parameters included in this scan were ND except as noted; **NLL** = Not Likely to Leach; **ID** = Insufficient Data (no criteria developed); **NT** = Not Tested.
3) **SVOCs** = Semi-Volatile Organic Compounds.
4) **VOCs** = Volatile Organic Compounds.
5) **PCBs** = Polychlorinated Biphenyls.
6) GSI criteria for these parameters are dependent on hardness of receiving surface water. GSI protection criteria shown are calculated assuming hardness = 100 milligrams per liter
7) **Bold** indicates reported concentration is above the Part 201 Generic Nonresidential Drinking Water Protection Criteria and above the Part 201 Default Background Criteria.
8) Underline indicates reported concentration is above the Part 201 Generic GSI Protection Criteria and above the Part 201 Default Background Criteria.
9) Highlighted indicates reported concentration is above the Part 201 Generic Nonresidential Direct Contact Criteria and above the Part 201 Default Background Criteria.

QC by: ACE (2/11/2013)

TABLE 1 (Page 2 of 2)
SOIL ANALYTICAL RESULTS - SUBSURFACE SOIL SAMPLES FROM BORINGS
Flint Bishop Airport Landfill
NTH Project No. 62-100065-00

PARAMETER	Units	(Boring No.) (Well No. - if installed) (Sample No.) (Sample Depth - ft) (Material Type) (Sampling Date)												PART 201 GENERIC NONRESIDENTIAL SOIL CLEANUP CRITERIA			
		HP-10-07 (PZ-1-07) S-1 0.5' - 2.0' Cover Soil 9/8/2011	HP-10-07 (PZ-1-07) S-2 3.5' - 18.0' Waste 9/8/2011 *Composite*	HP-11-07 (PZ-2-07) S-1 2.0' - 3.0' Cover Soil 9/6/2011	HP-11-07 (PZ-2-07) S-2 11.0' - 23.0' Waste 9/6/2011 *Composite*	HP-12-07 (PZ-3-07) S-1 2.5' - 3.5' Cover Soil 9/6/2011	HP-12-07 (PZ-3-07) S-2 6.0' - 22.0' Waste 9/6/2011 *Composite*	HP-13-07 (PZ-4-07) S-1 2.0' - 4.0' Cover Soil 9/9/2011	HP-13-07 (PZ-4-07) S-2 5.0' - 18.0' Waste 9/9/2011 *Composite*	HP-14-07 (MW-9-07) S-1 2.5' - 3.5' Native Soil 9/6/2011	HP-15-07 (MW-10-07) S-1 1.0' - 2.0' Fill Soil 9/6/2011	HP-16-07 (MW-11-07) S-1 1.5' - 2.5' Fill Soil 9/7/2011	HP-17-07 (MW-12-07) S-1 1.0' - 2.0' Native Soil 9/7/2011	FIELD BLANK -- FB-1 (Water) -- 9/6/2011	Default Background	DWP	GSIP	DC
METALS																	
Aluminum	mg/kg	**7100**	4600	**7300**	6400	**11000**	**7000**	**9800**	**12000**	6700	3800	**7100**	13000	NT	6900	1	NA	370000
Antimony	mg/kg	0.39	**6.8**	0.35	0.86	ND	ND	0.39	1	ND	ND	0.49	ND	NT	NA	4.3	94	670
Arsenic	mg/kg	**6.8**	**13**	**7.2**	**6.8**	**6.9**	4.8	**14**	**7.6**	2.5	5.5	**9.1**	5.5	NT	5.8	4.6	4.6	37
Barium	mg/kg	38	54	43	68	58	43	62	150	36	21	42	48	NT	75	1300	290[6]	130000
Beryllium	mg/kg	ND	ND	ND	ND	ND	ND	0.43	0.37	ND	ND	ND	ND	NT	NA	51	30[6]	1600
Cadmium	mg/kg	0.19	1.2	0.096	0.54	0.12	0.2	0.13	2.3	0.11	0.1	0.22	0.13	NT	1.2	6	2.6[6]	30
Calcium	mg/kg	53000	54000	60000	41000	56000	45000	21000	44000	68000	900	63000	4000	NT	NA	NA	NA	NA
Chromium	mg/kg	12	**30**	11	10	16	12	14	**29**	10	6.4	12	16	NT	18	30	3.3	9200
Cobalt	mg/kg	5.8	6.3	5.6	6.3	**7.7**	5.4	**8.2**	6.6	4	5.3	5.6	6.1	NT	6.8	2	2	9000
Copper	mg/kg	13	**92**	11	19	22	10	15	39	7.8	4.2	15	11	NT	32	5800	52[6]	73000
Iron	mg/kg	**15000**	**47000**	**14000**	**17000**	**19000**	**17000**	**21000**	**53000**	11000	8300	**15000**	**17000**	NT	12000	6	NA	580000
Lead	mg/kg	15	83	6.2	340	7	7.7	9.3	140	4.6	5.2	23	12	NT	21	700	3700[6]	900
Magnesium	mg/kg	21000	8900	**23000**	14000	**25000**	18000	9800	14000	21000	1200	17000	3300	NT	NA	22000	NA	1000000
Manganese	mg/kg	230	**520**	280	330	350	320	320	440	110	190	300	220	NT	440	1	40[6]	90000
Mercury	mg/kg	ND	**0.56**	ND	0.099	ND	ND	ND	0.085	ND	ND	ND	ND	NT	0.13	1.7	0.05	580
Nickel	mg/kg	17	35	14	15	20	13	19	20	12	9.1	16	15	NT	20	100	54[6]	150000
Potassium	mg/kg	1200	870	1400	1300	2300	1600	1900	1800	810	430	1200	1200	NT	NA	NA	NA	NA
Selenium	mg/kg	0.37	0.39	0.33	0.29	0.28	0.24	ND	0.3	0.28	0.26	0.29	0.24	NT	0.41	4	0.4	9600
Silver	mg/kg	ND	0.26	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NT	I	13	0.1	9000
Sodium	mg/kg	150	420	270	330	360	430	110	500	160	81	180	100	NT	NA	7000	NA	1000000
Thallium	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NT	NA	2.3	4.2	130
Vanadium	mg/kg	17	9.8	17	15	25	17	23	15	17	11	22	25	NT	NA	990	430	5500
Zinc	mg/kg	49	**1800**	35	**250**	40	**290**	44	**380**	30	15	59	46	NT	47	5000	120[6]	630000
VOCs		ALL ND	ELSE ND	ALL ND	ELSE ND	ALL ND	ELSE ND	ALL ND	ELSE ND	ALL ND	ALL ND	ALL ND	ALL ND	ALL ND				
1,2,3-Trimethylbenzene	µg/kg	---	---	---	150	---	170	---	220	---	---	---	---	---	NA	NA	NA	NA
1,2,4-Trimethylbenzene	µg/kg	---	190	---	290	---	410	---	570	---	---	---	---	---	NA	2100	570	110000
1,3,5-Trimethylbenzene	µg/kg	---	---	---	---	---	120	---	---	---	---	---	---	---	NA	1800	1100	94000
1,4-Dichlorobenzene	µg/kg	---	---	---	170	---	220	---	250	---	---	---	---	---	NA	1700	360	1900000
2-Butanone	µg/kg	---	---	---	---	---	---	---	5300	---	---	---	---	---	NA	760000	44000	27000000
2-Methylnaphthalene	µg/kg	---	590	---	---	---	---	---	---	---	---	---	---	---	NA	170000	4200	26000000
Chlorobenzene	µg/kg	---	---	---	---	---	**1000**	---	---	---	---	---	---	---	NA	2000	500	260000
Ethylbenzene	µg/kg	---	170	---	---	---	280	---	**800**	---	---	---	---	---	NA	1500	360	140000
Styrene	µg/kg	---	---	---	---	---	---	---	150	---	---	---	---	---	NA	2700	2100	520000
Tetrachloroethene	µg/kg	---	---	---	---	---	77	---	---	---	---	---	---	---	NA	100	1200	88000
Toluene	µg/kg	---	210	---	---	---	500	---	1500	---	---	---	---	---	NA	16000	5400	250000
Trichloroethene	µg/kg	---	---	---	---	---	230	---	---	---	---	---	---	---	NA	100	4000	500000
Xylenes	µg/kg	---	380	---	---	---	670	---	**2100**	---	---	---	---	---	NA	5600	820	150000

NOTES:

1) **mg/kg** - milligrams per kilogram (equivalent to parts per million); **µg/kg** - micrograms per kilogram (equivalent to parts per billion)..
2) **ND** = Not Detected; **ALL ND** = All parameters included in this scan were ND; **ELSE ND** = All parameters included in this scan were ND except as noted; **NLL** = Not Likely to Leach; **ID** = Insufficient Data (no criteria developed); **NT** = Not Tested.
3) **SVOCs** = Semi-Volatile Organic Compounds.
4) **VOCs** = Volatile Organic Compounds.
5) **PCBs** = Polychlorinated Biphenyls.
6) GSI criteria for these parameters are dependent on hardness of receiving surface water. GSI protection criteria shown are calculated assuming hardness = 100 milligrams per liter
7) **Bold** indicates reported concentration is above the Part 201 Generic Nonresidential Drinking Water Protection Criteria and above the Part 201 Default Background Criteria.
8) Underline indicates reported concentration is above the Part 201 Generic GSI Protection Criteria and above the Part 201 Default Background Criteria.
9) Highlighted indicates reported concentration is above the Part 201 Generic Nonresidential Direct Contact Criteria and above the Part 201 Default Background Criteria.
10) Part 201 criteria established by the Michigan Department of Environmental Quality, as presented on Table 1, R299.5744, dated September 28, 2012.

QC by: ACE (2/11/2013)

TABLE 2
SOIL ANALYTICAL RESULTS - SURFICIAL SOIL SAMPLES FROM HAND AUGER BORINGS
Flint Bishop Airport Landfill
NTH Project No. 62-100065-00

PARAMETER	Units	(Boring No.) (Sample No.) (Sample Depth - ft) (Sampling Date) (Vent/Spring #)										PART 201 GENERIC NONRESIDENTIAL SOIL CLEANUP CRITERIA			
		HAB-1-07 SS-1 0.0' - 0.5' 9/9/2011 Spring #4	HAB-2-07 SS-2 0.0' - 0.5' 9/9/2011 Vent #3	HAB-3-07 SS-3 0.0' - 0.5' 9/9/2011 Vent #2	HAB-4-07 SS-4 0.0' - 0.5' 9/9/2011 Vent #1	HAB-5-07 SS-5 0.0' - 0.5' 9/9/2011 Spring #3	HAB-6-07 SS-6 0.0' - 0.5' 9/9/2011 Spring #2	DUPLICATE DUP-2 *(HAB-6-07)* 9/9/2011	HAB-7-07 SS-7 0.0' - 0.5' 9/9/2011 Spring #1	HAB-8-07 SS-8 0.0' - 0.5' 9/9/2011 N/A	EQUIPMENT BLANK (Water) 9/9/2011 *[mg/L]*	Default Background	DWP	GSIP	DC
METALS															
Aluminum	mg/kg	4900	**7500**	**7300**	**8100**	2500	5300	4500	**9100**	**7700**	ND	6900	1	NA	370000
Antimony	mg/kg	ND	0.63	0.55	0.35	ND	0.79	0.31	ND	ND	ND	NA	4.3	94	670
Arsenic	mg/kg	**230**	5	3.5	2.3	4.3	**50**	**51**	**21**	3.8	ND	5.8	4.6	4.6	37
Barium	mg/kg	110	44	40	86	17	45	39	61	63	ND	75	1300	290[6]	130000
Beryllium	mg/kg	0.29	0.38	0.37	0.34	ND	0.3	0.23	0.38	0.31	ND	NA	51	30[6]	1600
Cadmium	mg/kg	0.13	0.13	0.25	0.32	0.084	0.15	0.14	0.14	0.14	ND	1.2	6	2.6[6]	30
Calcium	mg/kg	18000	34000	42000	49000	36000	55000	78000	17000	21000	ND	NA	NA	NA	NA
Chromium	mg/kg	11	12	12	14	5.3	9.6	8.6	13	11	ND	18	30	3.3	9200
Cobalt	mg/kg	5	5.6	5	4.5	2.2	4.5	4.5	5.8	5.5	ND	6.8	2	2	9000
Copper	mg/kg	10	10	13	9.8	4.2	11	13	8.8	7.2	ND	32	5800	52[6]	73000
Iron	mg/kg	**32000**	**15000**	**29000**	**25000**	8100	**33000**	**30000**	**16000**	**13000**	0.16	12000	6	NA	580000
Lead	mg/kg	7.7	10	20	17	4.8	12	14	8.6	8.3	ND	21	700	3700[6]	900
Magnesium	mg/kg	8100	14000	16000	22000	12000	17000	20000	7900	9600	ND	NA	22000	NA	1000000
Manganese	mg/kg	240	310	320	190	130	220	220	190	140	ND	440	1	40[6]	90000
Mercury	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.13	1.7	0.05	580
Nickel	mg/kg	10	14	13	14	5.3	11	10	13	13	ND	20	100	54[6]	150000
Potassium	mg/kg	730	1300	1600	1800	550	990	890	1300	1300	ND	NA	NA	NA	NA
Selenium	mg/kg	0.6	ND	ND	ND	ND	ND	0 26	ND	0.31	ND	0.41	4	0.4	9600
Silver	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	13	0.1	9000
Sodium	mg/kg	160	120	270	200	120	230	250	100	170	ND	NA	7000	NA	1000000
Thallium	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	2.3	4.2	130
Vanadium	mg/kg	17	18	19	20	8.7	16	19	22	18	ND	NA	990	430	5500
Zinc	mg/kg	36	39	77	230	55	40	210	37	38	ND	47	5000	120[6]	630000
PCBs	µg/kg	All ND	All ND	All ND	All ND	All ND	All ND	All ND	All ND	All ND	All ND	NA	NLL	NLL	NLL
Organochlorine Pesticides	µg/kg	All ND	All ND	All ND	All ND	All ND	All ND	All ND	All ND	All ND	All ND	Various	Various	Various	Various
Organochlorine Herbicides	µg/kg	All ND	All ND	All ND	All ND	All ND	All ND	All ND	All ND	All ND	All ND	Various	Various	Various	Various
SVOCs		All ND	All ND	ELSE ND	All ND	All ND	ELSE ND	All ND	All ND	All ND	All ND				
Benzo(b)fluoranthene	µg/kg	---	---	---	---	---	400	---	---	---	---	NA	NLL	NLL	80000
Bis(2-ethylhexyl)phthalate	µg/kg	---	---	620	---	---	---	---	---	---	---	NA	NLL	NLL	10000000
VOCs		ALL ND	ELSE ND	ELSE ND	ALL ND	ALL ND	ALL ND	ALL ND	ALL ND	ALL ND	ALL ND				
1,2,3-Trimethylbenzene	µg/kg	---	---	160	---	---	---	---	---	---	---	NA	NA	NA	NA
1,2,4-Trimethylbenzene	µg/kg	---	210	320	---	---	---	---	---	---	---	NA	2100	570	110000
1,4-Dichlorobenzene	µg/kg	---	240	530	---	---	---	---	---	---	---	NA	1700	360	1900000
Chlorobenzene	µg/kg	---	100	210	---	---	---	---	---	---	---	NA	2000	500	260000
Xylenes	µg/kg	---	---	240	---	---	---	---	---	---	---	NA	5600	820	150000

NOTES:

1) **mg/kg** - milligrams per kilogram (equivalent to parts per million); **µg/kg** - micrograms per kilogram (equivalent to parts per billion)..
2) **ND** = Not Detected; **ALL ND** = All parameters included in this scan were ND; **ELSE ND** = All parameters included in this scan were ND except as noted; **NLL** = Not Likely to Leach; **ID** = Insufficient Data (no criteria developed); NT = Not Tested.
3) **SVOCs** = Semi-Volatile Organic Compounds.
4) **VOCs** = Volatile Organic Compounds.
5) **PCBs** = Polychlorinated Biphenyls.
6) GSI criteria for these parameters are dependent on hardness of receiving surface water. GSI protection criteria shown are calculated assuming hardness = 100 milligrams per liter (mg/L).
7) **Bold** indicates reported concentration is above the Part 201 Generic Nonresidential Drinking Water Protection Criteria and above the Part 201 Default Background Criteria.
8) Underline indicates reported concentration is above the Part 201 Generic GSI Protection Criteria and above the Part 201 Default Background Criteria.
9) Highlighted indicates reported concentration is above the Part 201 Generic Nonresidential Direct Contact Criteria and above the Part 201 Default Background Criteria.

QC by: ACE (2/8/2013)

TABLE 3 (Page 2 of 2)
WATER ANALYTICAL RESULTS - GROUNDWATER, LEACHATE, & SEEPS
Flint Bishop Airport Landfill
NTH Project No. 62-100065-00

PARAMETER	Units	(Sampling Location) (Sample No.) (Sampling Date)									PART 201 GENERIC NONRESIDENTIAL GROUNDWATER CLEANUP CRITERIA		
		PZ-1 W-1 3/6/2012	PZ-2 W-1 3/5/2012	PZ-3 W-1 3/5/2012	PZ-4 W-1 3/7/2012	VENT#1 W-1 3/6/2012	VENT#2 W-1 3/6/2012	VENT#3 W-1 3/7/2012	EQUIPMENT BLANK 1 EB-1 3/7/2012	FIELD BLANK 1 FB-1 3/7/2012	DW	GSI	GCC
METALS													
Aluminum	µg/L	<50	**1,400**	**140**	**190**	**79**	**180**	**87**	<50	NT	50 (V); *4,100*	NA	6.4E+7
Antimony	µg/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	NT	6	130	68,000
Arsenic	µg/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	NT	10	10	4,300
Barium	µg/L	430	290	<100	<100	810	<100	<100	<100	NT	2,000	440[6]	1.4E+7
Beryllium	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	NT	4	2.4[6]	2.9E+5
Boron	µg/L	500	**510**	<300	NT	**1,200**	**870**	NT	NT	NT	500 (F)	7,200[6]	6.2E+7
Cadmium	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	NT	5	2.2[6]	1.9E+5
Calcium	µg/L	170,000	160,000	210,000	130,000	160,000	73,000	93,000	<1,000	NT	NA	NA	NA
Chromium	µg/L	<10	<10	<10	<10	<10	<10	<10	<10	NT	100	11	4.6E+5
Cobalt	µg/L	<20	<20	<20	<20	<20	<20	<20	<20	NT	100	100	2.6E+6
Copper	µg/L	4.3	<4.0	<4.0	<4.0	<4.0	4.2	<4.0	<4.0	NT	1,000 (E); *4,000*	9[6]	7.4E+6
Iron	µg/L	**47,000**	**76,000**	**41,000**	**72,000**	**43,000**	**36,000**	260	<100	NT	300 (E); *5,600*	NA	5.8E+7
Lead	µg/L	<3.0	**7.1**	<3.0	3.4	**4.2**	**15**	<3.0	<3.0	NT	4.0 (L)	21[5]	ID
Magnesium	µg/L	37,000	77,000	120,000	50,000	55,000	79,000	17,000	<300	NT	4.0E+5	NA	1.0E+9
Manganese	µg/L	**430**	**850**	**400**	**230**	**180**	**110**	<50	<50	NT	50 (E); *2,500*	2,000[5]	9.1E+6
Mercury	µg/L	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	NT	2	0.0013	56
Nickel	µg/L	<20	45	<20	<20	<20	28	<20	<20	NT	100	52[6]	7.4E+7
Potassium	µg/L	17,000	83,000	36,000	42,000	38,000	130,000	4,700	<1,000	NT	NA	NA	NA
Selenium	µg/L	<5.0	<5.0	<5.0	<5.0	<5.0	6.9	<5.0	<5.0	NT	50	5	9.7E+5
Silver	µg/L	<0.20	<0.20	<0.20	<0.20	<0.20	0.29	<0.20	<0.20	NT	98	0.2	1.5E+6
Sodium	µg/L	20,000	87,000	74,000	35,000	66,000	240,000	30,000	<1,000	NT	3.5E+5	NA	1.0E+9
Thallium	µg/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	NT	2	3.7	13,000
Vanadium	µg/L	<4.0	8.6	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	NT	62	27	9.7E+5
Zinc	µg/L	<50	100	<50	<50	<50	<50	<50	<50	NT	5,000 (E)	120[6]	1.1E+8
Methane	µg/L	17,000**	18,000**	20,000**	11,000**	20,000**	15,000**	950**	2.7	<2.6	NA[9]	NA	NA
PCBs		All ND	All ND	All ND	All ND	All ND	All ND	All ND	All ND	NT			
Aroclor-1254	µg/L	---	---	---	---	---	---	---	---	NT	0.5 (J)	0.2	3.3
Organochlorine Pesticides		Else ND	Else ND	Else ND	Else ND	Else ND	Else ND	Else ND	Else ND	NT			
4-4'-DDD	µg/L	<0.020	0.075	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	NT	37	NA	44
4-4'-DDT	µg/L	0.022	0.028	0.020	0.025	0.025	0.040	<0.020	<0.020	NT	10	0.02	13
Endrin	µg/L	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	NT	2	ID	160
Organochlorine Herbicides	µg/L	All ND	NT	All ND	All ND	All ND	All ND	All ND	All ND	NT	Various	Various	Various
SVOCs													
bis(2-Ethylhexyl)phthalate	µg/L	<5.0	<5.0	<5.0	5.1	<5.0	5.7	<5.0	<5.0	NT	6	25	320
Naphthalene	µg/L	13	14	8.9	18	<5.0	19	<5.0	<5.0	NT	1,500	11	31,000
Phenanthrene	µg/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	NT	150	2	1,000
VOCs										All ND			
Benzene	µg/L	**5.5**	**10**	**9.6**	**13**	3.2	**8.3**	<1.0	<1.0	<1.0	5	200	11,000
n-Butylbenzene	µg/L	<1.0	1.1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	230	ID	5,900
Chlorobenzene	µg/L	28	25	14	24	<1.0	39	<1.0	<1.0	<1.0	100	25	86,000
1,4-Dichlorobenzene	µg/L	<1.0	8.9	<1.0	<1.0	<1.0	20	<1.0	<1.0	<1.0	75	17	6,400
Dichlorodifluoromethane	µg/L	<5.0	<5.0	<5.0	<5.0	8.3	<5.0	<5.0	<5.0	<5.0	4,800	ID	3.0E+5
Ethylbenzene	µg/L	1.0	<1.0	<1.0	23	<1.0	14	<1.0	<1.0	<1.0	74 (E); *700*	18	1.7E+5
n-Propylbenzene	µg/L	2.4	3.2	<1.0	3.0	1.5	3.1	<1.0	<1.0	<1.0	230	ID	15,000
Toluene	µg/L	<1.0	<1.0	<1.0	1.7	<1.0	<1.0	<1.0	<1.0	<1.0	790 (E); *1,000*	270	5.3E+5
Trichloroethene	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.2	<1.0	5	200	22,000
1,2,3-Trimethylbenzene	µg/L	2.3	19	2.1	9.1	<1.0	11	<1.0	<1.0	<1.0	NA	NA	NA
1,2,4-Trimethylbenzene	µg/L	7.4	27	1.4	17	<1.0	22	<1.0	<1.0	<1.0	63 (E); *2,900*	17	56,000
1,3,5-Trimethylbenzene	µg/L	1.0	4.6	1.2	6.0	<1.0	7.5	<1.0	<1.0	<1.0	72 (E); *2,900*	45	61,000
Xylenes	µg/L	8.9	11	8.8	220	<3.0	41	<3.0	<3.0	<3.0	280 (E); *10,000*	41	1.9E+5

NOTES:

1) µg/L - micrograms per liter (equivalent to parts per billion).
2) **ND** = Not Detected; **ALL ND** = All parameters included in this scan were ND; **ELSE ND** = All parameters included in this scan were ND except as noted; **NT** = Not Tested.
3) **SVOCs** = Semi-Volatile Organic Compounds.
4) **VOCs** = Volatile Organic Compounds.
5) **PCBs** = Polychlorinated Biphenyls.
6) GSI criteria for these parameters are dependent on hardness of receiving surface water. GSI criteria shown are calculated assuming hardness = 100 milligrams per liter (mg/L).
7) Notations taken from MDEQ Footnotes to Part 201 Criteria Tables: (E) - Aesthetic drinking water value; health-based value also listed. (F) - Criterion based on adverse impacts to plant life and phytotoxicity. (L) - Criterion for lead is linked to the concentration of lead in soil and allowable level may be up to 15 ug/L if soil lead concentration is less than 316 mg/kg. (V) - Aesthetic drinking water value; site specific concentrations up to 200 ug/L may be acceptable for drinking water use. (J) - PCB criteria is for total concentration of all isomers detected.
8) **NA** = Not Applicable (Non-toxic compound); **ID** = Insufficient Data (no criteria has been developed).
9) For methane the Part 201 Flammability and Explosivity Screening Level is 520 ug/L. Analytical values above this screening criterion are denoted with **.
10) Bold indicates reported concentration is above the Part 201 Generic Nonresidential Drinking Water Criteria.
11) Underline indicates reported concentration is above the Part 201 Generic GSI Criteria.
12) Highlighted indicates reported concentration is above the Part 201 Generic Groundwater Contact Criteria.
13) Part 201 criteria established by the Michigan Department of Environmental Quality, as presented on Table 1, R299.5744, dated September 28, 2012.

QC by: ACE (3/6/2013)

TABLE 3 (Page 1 of 2)
WATER ANALYTICAL RESULTS - GROUNDWATER, LEACHATE, & SEEPS
Flint Bishop Airport Landfill
NTH Project No. 62-100065-00

PARAMETER	Units	(Sampling Location) (Sample No.) (Sampling Date)												PART 201 GENERIC NONRESIDENTIAL GROUNDWATER CLEANUP CRITERIA		
		MW-1 W-1 3/7/2012	DUP-1 Duplicate 1 3/7/2012 (MW-1)	MW-2 W-1 5/24/2012	MW-3 W-1 3/6/2012	MW-4 W-1 3/6/2012	MW-5 W-1 3/6/2012	MW-6 W-1 3/6/2012	MW-7 W-1 3/5/2012	MW-8 W-1 3/5/2012	MW-9 W-1 5/24/2012	MW-10 W-1 3/5/2012	MW-11 W-1 3/7/2012	MW-12 W-1 3/7/2012	DW	GSI	GCC
METALS																	
Aluminum	µg/L	<50	<50	1,200	2,700	300	300	55	<50	<50	110	200	200	480	50 (V); *4,100*	NA	6.4E+7
Antimony	µg/L	<2.0	<2.0	13	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	6	130	68,000
Arsenic	µg/L	54	57	<5.0	5.4	11	65	<5.0	<5.0	140	6.4	13	51	<5.0	10	10	4,300
Barium	µg/L	220	230	170	110	830	150	1,000	1,100	190	<100	<100	240	130	2,000	440[6]	1.4E+7
Beryllium	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	4	2.3[6]	2.9E+5
Boron	µg/L	NT	NT	--	960	1,700	<300	860	820	<300	NT	<300	NT	NT	500 (F)	7,200[6]	6.2E+7
Cadmium	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	5	2.2[6]	1.9E+5
Calcium	µg/L	180,000	180,000	100,000	95,000	160,000	140,000	250,000	260,000	150,000	140,000	100,000	96,000	130,000	NA	NA	NA
Chromium	µg/L	<10	<10	<10	11	<10	<10	<10	<10	<10	<10	<10	<10	<10	100	11	4.6E+5
Cobalt	µg/L	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	100	100	2.6E+6
Copper	µg/L	<4.0	<4.0	<4.0	4.9	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	4.2	<4.0	5.7	1,000 (E): *4,000*	9[6]	7.4E+6
Iron	µg/L	21,000	22,000	83,000	37,000	38,000	41,000	26,000	33,000	24,000	2,700	1,400	5,700	960	300 (E); *5,600*	NA	5.8E+7
Lead	µg/L	<3.0	<3.0	19	13	12	6.6	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	4 (L)	21[6]	ID
Magnesium	µg/L	71,000	75,000	33,000	83,000	62,000	34,000	73,000	68,000	47,000	37,000	39,000	40,000	59,000	4.0E+5	NA	1.0E+9
Manganese	µg/L	1,000	1,000	330	280	140	480	640	450	1,200	520	110	150	200	50 (E); *2,500*	2,000[6]	9.1E+6
Mercury	µg/L	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	2	0.0013	56
Nickel	µg/L	<20	<20	<20	42	29	<20	<20	<20	<20	<20	<20	<20	<20	100	52[6]	7.4E+7
Potassium	µg/L	31,000	33,000	21,000	140,000	39,000	8,700	27,000	23,000	2,400	1,300	1,300	11,000	3,200	NA	NA	NA
Selenium	µg/L	<5.0	<5.0	<5.0	7.2	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	50	5	9.7E+5
Silver	µg/L	<0.20	0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	98	0.2	1.5E+6
Sodium	µg/L	<60,000	63,000	42,000	260,000	85,000	24,000	48,000	44,000	36,000	9,900	13,000	28,000	16,000	3.5E+5	NA	1.0E+9
Thallium	µg/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2	3.7	13,000
Vanadium	µg/L	<4.0	<4.0	<4.0	4.9	<4.0	<4.0	<4.0	7.4	4.8	<4.0	<4.0	<4.0	<4.0	62	27	9.7E+5
Zinc	µg/L	<50	<50	95	65	80	<50	<50	<50	<50	<50	<50	<50	<50	5,000 (E)	120[6]	1.1E+8
Methane	µg/L	3,600**	3,700**	11000**	9,700**	16,000**	13,000**	12,000**	12,000**	430	3	9.4	5,300**	5.5	NA[9]	NA	NA
PCBs		All ND	All ND	Else ND	All ND	All ND	All ND	All ND	All ND	All ND	All ND	All ND	All ND	All ND			
Aroclor-1254	µg/L	---	---	0.40	---	---	---	---	---	---	---	---	---	---	0.5 (J)	0.2	3.3
Organochlorine Pesticides		Else ND	Else ND	Else ND	Else ND	Else ND	Else ND	Else ND	Else ND	Else ND	Else ND	Else ND	Else ND	NT			
4-4'-DDD	µg/L	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	NT	37	NA	44
4-4'-DDT	µg/L	<0.020	0.020	0.030	0.030	0.026	<0.020	0.026	<0.020	<0.020	<0.020	<0.020	<0.020	NT	10	0.02	13
Endrin	µg/L	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.034	<0.020	<0.020	NT	2	ID	160
Organochlorine Herbicides	µg/L	All ND	All ND	All ND	All ND	All ND	All ND	All ND	All ND	All ND	ALL ND	All ND	All ND	NT	Various	Various	Various
SVOCs																	
bis(2-Ethylhexyl)phthalate	µg/L	<5.0	<5.0	5.3	6.9	8.2	<5.0	<5.0	<5.0	40	<5.0	<5.0	<5.0	290	6	25	320
Naphthalene	µg/L	<5.0	<5.0	11	10	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	1,500	11	31,000
Phenanthrene	µg/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	3.0	<2.0	<2.0	<2.0	<2.0	<2.0	150	2	1,000
VOCs																	
Benzene	µg/L	2.5	2.5	10	12	4.5	3.9	3.6	4.8	<1.0	<1.0	<1.0	<1.0	<1.0	5	200	11,000
n-Butylbenzene	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	1.1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	230	ID	5,900
Chlorobenzene	µg/L	11	<1.0	77	83	<1.0	<1.0	<1.0	10	<1.0	<1.0	<1.0	<1.0	<1.0	100	25	86,000
1,4-Dichlorobenzene	µg/L	<1.0	<1.0	13	18	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	75	17	6,400
Dichlorodifluoromethane	µg/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	4,800	ID	3.0E+5
Ethylbenzene	µg/L	<1.0	<1.0	<1.1	23	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	74 (E); *700*	18	1.7E+5
n-Propylbenzene	µg/L	<1.0	<1.0	2.9	1.9	<1.0	2.3	<1.0	1.1	<1.0	<1.0	<1.0	<1.0	<1.0	230	ID	15,000
Toluene	µg/L	<1.0	<1.0	<1.0	1.4	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	790 (E); *1,000*	270	5.3E+5
Trichloroethene	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.1	<1.0	<1.0	<1.0	<1.0	5	200	22,000
1,2,3-Trimethylbenzene	µg/L	<1.0	<1.0	3.1	6.2	<1.0	11	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	NA	NA	NA
1,2,4-Trimethylbenzene	µg/L	<1.0	1.0	22	11	<1.0	18	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	63 (E); *2,900*	17	56,000
1,3,5-Trimethylbenzene	µg/L	<1.0	<1.0	2.4	4.0	<1.0	2.8	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	72 (E): *2,900*	45	61,000
Xylenes	µg/L	<3.0	<3.0	14	38	<3.0	8.6	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	280 (E): *10,000*	41	1.9E+5

NOTES:
1) µg/L - micrograms per liter (equivalent to parts per billion).
2) **ND** = Not Detected; **ALL ND** = All parameters included in this scan were ND; **ELSE ND** = All parameters included in this scan were ND except as noted; NT = Not Tested.
3) **SVOCs** = Semi-Volatile Organic Compounds.
4) **VOCs** = Volatile Organic Compounds.
5) **PCBs** = Polychlorinated Biphenyls.
6) GSI criteria for these parameters are dependent on hardness of receiving surface water. GSI criteria shown are calculated assuming hardness = 100 milligrams per liter (mg/L).
7) Notations taken from MDEQ Footnotes to Part 201 Criteria Tables: (E) - Aesthetic drinking water value; health-based value also listed. (F) - Criterion based on adverse impacts to plant life and phytotoxicity. (L) - Criterion for lead is linked to the concentration of lead in soil and allowable level may be up to 15 ug/L if soil lead concentration is less than 316 mg/kg. (V) - Aesthetic drinking water value; site specific concentrations up to 200 ug/L may be acceptable for drinking water use. (J) - PCB criteria is for total concentration of all isomers detected.
8) NA = Not Applicable (Non-toxic compound); ID = Insufficient Data (no criteria has been developed).
9) For methane the Part 201 Flammability and Explosivity Screening Level is 520 ug/L. Analytical values above this screening criterion are denoted with **.
10) Bold indicates reported concentration is above the Part 201 Generic Nonresidential Drinking Water Criteria.
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12) Highlighted indicates reported concentration is above the Part 201 Generic Groundwater Contact Criteria.
13) Part 201 criteria established by the Michigan Department of Environmental Quality, as presented on Table 1, R299.5744, dated September 28, 2012.

QC by: ACE (3/6/2013)

Table 4
GROUNDWATER & SURFACE WATER ELEVATIONS
Flint Bishop Airport Landfill Environmental Site Assessment
Project No. 62-100065-01

Well Designation	Ground Surface Elev.	Top of Casing Elev.	Depth (feet bgs)	Tip El.	Water Level Measurement on Date (feet btoc)				Groundwater Elevation on Date			
					3/5/2012	3/6/2012	3/7/2012	5/24/2012	3/5/2012	3/6/2012	3/7/2012	5/24/2012
Monitoring Wells & Piezometers												
MW-1-07	751.99	755.58	7.5	744.5			6.81	7.03			748.77	748.55
MW-2-07	762.81	762.81[1]	12.0	750.8				0.99				761.82
MW-3-07	760.48	763.87	12.0	748.5		5.13	5.00	4.80		758.74	758.87	759.07
MW-4-07	760.02	763.66	20.0	740.0		14.83	8.26	10.00		748.83	755.40	753.66
MW-5-07	760.59	764.06	16.0	744.6		14.64	14.14	14.02		749.42	749.92	750.04
MW-6-07	762.81	766.46	20.0	742.8		18.62	18.64	18.78		747.84	747.82	747.68
MW-7-07	762.75	766.91	16.0	746.8	14.85		14.78	14.45	752.06		752.13	752.46
MW-8-07	752.93	756.95	13.0	739.9	10.06		9.74	10.06	746.89		747.21	746.89
MW-9-07	762.78	762.82[1]	14.0	748.8				2.30				760.52
MW-10-07	765.21	764.95	14.0	751.2	1.48		2.02	2.92	763.47		762.93	762.03
MW-11-07	757.82	761.07	22.0	735.8			14.72	15.78			746.35	745.29
MW-12-07	766.77	770.48	23.0	743.8			21.13	24.16			749.35	746.32
PZ-1	762.73	762.28	18.0	744.7		3.31	3.37	4.41		758.97	758.91	757.87
PZ-2	765.41	765.00	19.0	746.4	8.36		9.16	9.02	756.64		755.84	755.98
PZ-3	765.73	765.37	17.5	748.2	2.51		2.36	2.01	762.86		763.01	763.36
PZ-4	766.81	766.40	18.0	748.8			1.96	2.58			764.44	763.82
Staff Gauges												
Swartz Creek	---	753.71[2]	---	---			8.04	9.12			745.67	744.59
Hewett Drain	---	762.78[2]	---	---			15.14	15.40			747.64	747.38

Notes:

1) Top of protective cover lid elevation. Well set flush with ground surface. Localized ponded water around well prevented opening of lid at time of survey.

2) Reference elevation of measurement point for surface water level. For Hewett Drain reference point is top of concrete headwall on bridge. For Swartz Creek reference point is top of elliptical steel culvert.

3) **feet bgs** = feet below ground surface; **feet btoc** = feet below top of casing.

Table 5
MONITORING WELL METHANE MEASUREMENTS
Flint Bishop Airport Landfill Environmental Site Assessment
Project No. 62-100065-01

Well Designation	Headspace Gas Measurements		
	Methane [% LEL]	Oxygen [% VOL]	Carbon Monoxide (CO) [ppm]
MW-1-07	0	19.4	0
MW-2-07	>100% (12% VOL)	17.4	0
MW-3-07	>100% (54.5% VOL)	7.4	0
MW-4-07	28%	17.6	0
MW-5-07	0	20.8	0
MW-6-07	52%	17.4	0
MW-7-07	4%	20.4	0
MW-8-07	0	20.8	0
MW-9-07	0	18.4	0
MW-10-07	0	19.4	0
MW-11-07	0	20.9	0
MW-12-07	0	20.5	0
PZ-1	>100% (22.5% VOL)	11.5	0
PZ-2	>100% (36% VOL)	10.5	0
PZ-3	>100% (6% VOL)	17.4	0
PZ-4	>100% (42% VOL)	7.4	0

Notes:

1) Measurements obtained by NTH Consultants, Ltd. on May 24, 2012.
2) Gas components measured with RKI Eagle meter, with infrared detector.
3) **LEL** = Lower Explosive Limit.
4) **>100%** - Meter indicated concentration at or above the LEL. For reference, the LEL for methane is approximately 5% by volume in air.
5) **%VOL** = Percent by volume.
6) **ppm** = parts per million.

Work Plan
For
Bishop Airport Landfill Disposal Area

Property:
22-Acres
West of Bishop International Airport

Located at:

Near the intersection of
Bristol and Linden Roads
Flint, Michigan

Prepared for:

City of Flint
Mr. Robert Misekow
Utilities Director
Department of Utilities
1101 South Saginaw Street
Flint, Michigan 48502
Contract Number 07-024

August 15, 2007

Prepared by:

GEO-environmental Resources, Inc
2531 Jackson Road
Ann Arbor Michigan 48103
Voice and Fax 888-417-4440

Project Number: 07-358-104.05

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1.0 INTRODUCTION

The City of Flint engaged GEO-environmental Resources, Inc. (GEO) to research the Bishop Airport Landfill history and develop a work plan to investigate leachate discharge from the former solid waste disposal areas. The City of Flint operated two solid waste disposal areas licensed by the Michigan Department of Public Health. The solid waste disposal areas were operated west of the Bishop International Airport in Flint, Michigan. A summary of the location, history and existing site information for both Bishop Airport Landfills I and II is presented herein. A conceptual site model for Bishop Airport Landfill I was developed to prepare a work plan. This plan was designed to characterize the extent of impacts at the landfill boundary and evaluate groundwater to surface water pathways.

1.1 OBJECTIVES

The landfill assessment process involves examining the site history, characterizing the waste beneath the ground surface and evaluating potential pathways of contaminant migration. These objectives will be employed in a phased approach. As data are collected, new information builds on the data collected from the previous phase. The data will either support adequate site characterization of a relevant pathway or will be cause for collection of additional data. The project objectives for the first phase are to:

- Delineate the vertical and lateral landfill boundaries;
- Evaluate the subsurface hydrogeologic conditions, including depth to groundwater, groundwater flow direction, and groundwater impacts;
- Identify the locations of the nearest drinking water wells, irrigation wells, or other supply wells;
- Determine if there is a hydraulic connection between groundwater and surface water;
- Evaluate the surface soil near groundwater surface water impacts;
- Evaluate the known location(s) of groundwater surface water impacts; and
- Assess the Groundwater surface water interface (GSI) pathway(s).

1.2 LOCATION

The City of Flint operated two solid waste disposal areas in the northwest corner of Bishop International Airport, near the intersection of Bristol and Linden Roads in Flint. Bishop Airport Landfill I is located within an approximate 22-acre area. The landfill is generally bounded by a ditch along the northern property line, the South Branch of Swartz Creek to the east, an airport runway lighting system on the south, and the Hewitt Drain to the west. The land filling occurred on both the east and west banks of the South Branch of Swartz Creek.

The second solid waste disposal area was located south and west of Bishop Airport Landfill I. The Bishop Airport Landfill II is located in approximately a 30-acre area bounded by ditch along the northern property line, the Hewitt Drain to the east, Bishop Airport property boundary to the south, and Linden Road to the west.

The approximate locations of both Bishop Airport Landfill I and Bishop Airport Landfill II are presented in Figure 1, Site Vicinity Map, and Figure 2, Site Location Map.

1.3 OWNERSHIP

The Bishop Airport Landfills I and II are owned by the City of Flint. The City of Flint purchased the property along Swartz Creek from F. Szabo on April 29, 1958 (Liber & Page 1342-113). The City of Flint purchased the land south of the railroad, between Swartz Creek and Linden Road, from J. Boomer on June 20, 1958 (Liber and Page 1351-331). The fill placed in Bishop Airport Landfills are contained within the boundaries of these properties.

1.4 HISTORY

Information regarding the history of the site is limited, but documentation found in aerial photographs and files located at Genesee County Health Department, Bishop International Airport and the City of Flint indicate that two solid waste disposal areas were operated near the Bishop International Airport. The solid waste disposal areas are Bishop Airport Landfill I and Bishop Airport Landfill II.

The objective of consulting historical sources is to develop a history of the previous uses of the property. This information is summarized in the table below.

1.4.1 Bishop Airport Landfill I

Period/Date	Land Use	Source(s) of Information
1941	Farm Land/flood plain; Residential home. The oxbow locations along Swartz Creek and Hewitt Drain are important geomorphic features. Some of these locations are coincident with seeps and vents observed today. The oxbows are a potential preferred pathway to assess the groundwater surface water pathway.	Figure 3
1950	On the landfill area; Farm Land/flood plain, Residential home. East of the landfill area and Swartz Creek, an Airport Runway was constructed, and runway extension lighting was installed south of the landfill area.	Figure 4
1962	On the landfill area; Farm Land/flood plain, Residential home removed, a north–south road to airport runway lights was constructed. Runway was extended closer to Swartz Creek; the farm field reflects several ponds in the vicinity of the future landfill.	Figure 5

Period/Date	Land Use	Source(s) of Information
1964	Similar to 1962 photograph except that land is disturbed east of Swartz Creek. This is believed to be the early construction of the Bishop Airport Landfill.	Figure 6
1966–1971	Approved applications for solid waste disposal and site pictures of the landfill taken in 1971 were found among the records. A pond of water located adjacent to the soil berm and west of Swartz Creek was noted.	Appendix A, Figures 7 and 8
1972	The landfill area is disturbed; surface water is present west of Swartz Creek along the property boundary. The presence of a pond is consistent with observations and site photographs taken in 1971. The airport runway was expanded west of the original Swartz Creek. Swartz Creek was redirected around the runway.	Figure 9
1982	The landfill area has poor vegetation coverage on the west portion (fill in the 70s) compared to better vegetation cover near Swartz Creek (fill prior to the 70s). Construction along Swartz Creek intended to straighten out and install the creek in a large diameter culvert under the runway.	Figure 10
1992	Swartz Creek has been realigned (straightened) under the runway and the former creek channel west of the runway has been filled in. A trucking company is parking on the landfill portion located east of Swartz Creek.	Figure 11
1997	Little or no change from 1992	Figure 12
2003	The landfill area is generally unchanged. The runway was extended, a perimeter road and fence was constructed through the former landfill.	Figure 13

Period/Date	Land Use	Source(s) of Information
2006	In March, Michigan Department of Environmental Quality (MDEQ) staff observed landfill leachate flowing from an area referred to as Vent #1. Samples were collected which exceed applicable Part 201 cleanup criteria. In April, DEQ sent an information request letter. In May, preliminary water and soil sample results were submitted to the MDEQ. In June, the MDEQ sent a notice letter to the City of Flint indicating that Bishop Airport Landfill I is a facility and leachate discharge is unlawful pursuant to Part 31. City of Flint staff have closely monitored the seeps and vents documenting that waters venting to the boundary of the landfill have a potential to reach Swartz Creek and the seep and vent flow is intermittent.	Appendix B Figure 14 Appendix C

1.4.2 Bishop Airport Landfill II

Period/Date	Land Use	Source(s) of Information
1941	Farm Land	Figure 3
1950	Farm Land	Figure 4
March 1962	Farm Land	Figure 5
1964	Farm Land, filling disturbance on the property south of the landfill area.	Figure 6
1972	Farm Land, no land disturbance in the vicinity of the landfill area.	Figure 9
1973	City of Flint's new application for solid waste disposal area.	Appendix A
1973–1975	Area was operated as a landfill. The landfill was closed in June 1975.	Appendix A
1982	Former landfill area still undisturbed. A pistol range is constructed.	Figure 10
1992	The area of the former landfill has grown a vegetative cover and the pistol range has been built up.	Figure 11

Period/Date	Land Use	Source(s) of Information
1997–2007	Little or no change from 1992 aerial photograph.	Figure 12

1.4.3 Summary of History

The Bishop Airport Landfill I disposal area was licensed and operated by the City of Flint in 1966. During the first years of operation municipal trash was placed in areas adjacent to Swartz Creek. The disposal of municipal trash continued to occur as far west of Swartz Creek as Hewitt Drain. The Bishop Airport Landfill I disposal area was closed around 1973 or 1974. Bishop Airport Landfill II disposal area was approved to receive municipal trash in 1974 and operated until June 1975, when Bishop Airport Landfills I and II were closed.

In 2006, the MDEQ determined that Bishop Airport landfill I was discharging leachate to an unnamed ditch that ultimately discharges to the south branch of Swartz Creek. City of Flint staff has closely monitored the seeps and vents between April 2006 and March 2007. City staff documented that waters venting to the boundary of the landfill have a potential to reach Swartz Creek. City staff also demonstrated that seep and vent flow are intermittent.

2.0 SUMMARY OF EXISTING INFORMATION

The geology, hydrology, site security, land use, and results of previous investigations are presented in the following paragraphs.

2.1 GEOLOGY

The surface topography of Bishop Airport Landfill I disposal area is approximately 22 acres with elevations ranging between 760 and 765 feet above mean sea level (USGS Swartz Creek Quadrangle, 1975).

According to the Soil Survey of Genesee County Michigan, USDA 1993, the surface soils at the site generally consist of the Metamora Loamy Sand of the Conover-Brookston Association. These soils are level to gently sloping, somewhat poorly drained loams that have clay loam subsoil. The topsoil at the site is underlain by Pleistocene lacustrine clays and silts (Farrand, 1982, Quaternary Geology of Michigan, Michigan Geological Survey). According to the Bedrock Geology of Michigan (Wilson, 1987, Michigan Geological Survey), bedrock consists of Early Pennsylvanian Saginaw Formation. The Saginaw Formation is comprised of interbedded shale, sandstone, siltstone and limestone.

2.2 HYDROLOGY

Bishop Airport Landfill I is located within the Swartz Creek Subwatershed of the Flint River Watershed. Generally, regional groundwater flow is toward the Flint River and the major subwatershed creek system. The regional groundwater flow direction is anticipated to be north. Given that Swartz Creek and Hewitt Drain are located at the east and west boundary of the fill area, shallow groundwater flow may be influenced by either of these surface water bodies. It is possible that shallow groundwater may migrate in each direction.

The historic aerial photographs depicted several oxbow features near both Swartz Creek and Hewitt Drain. Given the dominant lacustrian clay, it is likely the oxbows consist of silt, sand and gravel which will serve as preferential pathways for groundwater to vent to Swartz Creek and Hewitt Drain. The oxbows near the solid waste disposal areas could be a natural pathway.

Portions of Bishop Airport Landfill I are constructed in the flood plain of the Swartz Creek. A flood insurance map is presented in Appendix B. Based on the flood plain map, nearly ¾ of the land filled area along the northern and eastern property boundary was part of the Swartz Creek flood plain. As part of the landfill construction, a clay soil mixed with pieces of concrete and other material was placed along the property line to establish a berm to separate water in contact with the municipal waste from the ditch to the north and from Swartz Creek to the east. The berm reduces flow of groundwater contained in the landfill "bath tub" from reaching Swartz Creek. Several vents, seeps and ponds located on the northern and eastern perimeter of Bishop Airport Landfill I was mapped by the City of Flint staff. These springs and vents appear to be located within the former flood plain. Figure 14 presents an apparent correlation between the location of observed seeps and vents with an approximate outline of the 100-year flood plain.

Several hydraulic studies have been completed on the portion of Swartz Creek that is located near Bristol Road. The hydraulic characteristics of Swartz Creek were reviewed and summarized. This reach of Swartz Creek drains an area of approximately 67 square miles. The flood flows of Swartz Creek are reported to range from a 10-year event of Q10 = 1400 Cubic Feet per Second (CFS) to a 50-year event of Q50 = 2200 CFS to a 100-year event of Q100 = 2600 CFS. It is reported that Swartz Creek always has flow. One investigator predicted that flow volume in Swartz Creek would likely increase over time due to "hard surface" developments in the area that is drained by Swartz Creek.

2.3 SITE SECURITY

Access to both landfills are restricted by fencing and posted no trespassing. The Airport Security patrols the perimeter fence areas regularly to enforce no trespassing and safe operation of the airport. The City of Flint Police Department manages a pistol range which is located over a portion of the Bishop Airport Landfill II. Access to the landfills is restricted and actively monitored by the Bishop International Airport (Bishop Airport Landfill I) and City of Flint Police Department (Bishop Airport Landfill II).

2.4 LAND USE

Both landfill areas are zoned "E" Heavy Commercial Limited Manufacturing District. The "E" Heavy Commercial Light Manufacturing District designation is intended to accommodate heavy commercial and certain light manufacturing uses which are generally incompatible with uses appropriate in retail business districts, but which do not warrant an exclusive industrial classification.

2.5 PREVIOUS INVESTIGATORS' RESULTS

Previous investigations completed on the Bishop Airport Landfill I are described below. No investigations have been conducted on the Bishop Airport Landfill II.

2.5.1 City of Flint Inspections

City of Flint staff has visited Bishop Airport Landfill I site 32 times between April 27, 2006, and March 6, 2007. City staff documented observations of the seeps, pooled water, and surface water vents. City of Flint staff observed landfill leachate flowing at approximately 570 gallons per day or approximately 0.0009 CFS from a location describe as Vent #1. Flowing conditions at Vent #1 discontinued in the summer and were not observed again until December 11, 2006. The flow appeared again in February 2007 and continued through March 2007. No observations were made between March 2007 and May 24, 2007. Leachate discharge was not observed from Vent # 1 on May 24, 2007. A copy of the Flint staff field reports are presented in Appendix C. The locations of features observed by City of Flint staff are presented in Figure 13.

2.5.2 Bishop International Airport

Bishop International Airport hired RC Associates, Inc. (RC) in 2000 to install soil borings in the areas of airport expansion. Copies of the soil boring logs B-1A and B-2A are provided in Appendix D. Generally, the soil boring logs describe a silty clay to a depth of approximately 7 feet below ground surface (bgs). The silty clay is underlain by saturated medium sand that varies in thickness from 0.5 feet to 6 feet. The sand is underlain by a stiff clay encountered approximately 8 to 13 feet bgs. No municipal trash or fill was identified in the borings.

In December 2002 and January 2003, RC installed several additional soil borings as part of a perimeter road construction. In general, these borings are similar to the previous borings; however, several of the soil borings identified indications of buried swamp materials, municipal trash, or fill-related refuse. Borings B-3, B-3A, B-5 (no B-4 was provided), and B-6 terminated in landfill refuse. Figure 14 presents the approximate location of the borings. Copies of all the soil borings are presented in Appendix D.

Bishop International Airport hired Wilcox Professional Services, LLC (Wilcox) to collect preliminary water and soil samples to assess the discharge of leachate from the Bishop Airport Landfill I.

Wilcox visited the site on April 20, 2006, and collected two water samples and two soil samples. The summary and results were presented in a letter dated May 10, 2006, and attached in Appendix E.

The water samples collected by Wilcox were analyzed for the following parameters:

- Volatile organic compounds (VOCs) by United States Environmental Protection Agency (USEPA) methods 5035/8260b;
- Semi-volatile organic compounds (SVOCs) by USEPA method 8270c;
- Herbicides by USEPA method 8151;
- Pesticides by USEPA methods 8081;
- Polychlorinated biphenyl compounds (PCBs) by USEPA method 8082;
- Target Analyte List (TAL) by USEPA methods 6020/7471 that include aluminum, antimony, arsenic, barium, beryllium, cadmium, calcium, chromium, cobalt, copper, iron, lead, magnesium, manganese, mercury, nickel, potassium, selenium, silver, sodium, thallium, vanadium, and zinc; and
- Several inorganic parameters by various USEPA methods including, biological oxygen demand (BOD), chemical oxygen demand (COD), nitrate, nitrite, Total Kjeldal Nitrogen (TKN), total phosphorus, chloride, sulfate, and carbonate/bicarbonate

The soil samples were analyzed for the same parameters, except carbonate/bicarbonate and COD were omitted.

The following parameters were detected in the water samples above the residential and commercial I drinking water criteria:

- iron,
- benzene, and
- diethyl ether.

The following parameters were detected in soil above generic cleanup criteria near the boundary of the landfill:

- arsenic,
- cobalt,
- iron,
- lead,
- mercury,
- selenium, and
- zinc.

The definition of a "Facility" includes any area, place, or property where a hazardous substance in excess of the cleanup criteria for unrestricted residential use has been released, deposited, disposed of, or otherwise comes to be located. The Bishop Airport Landfill I is a facility based on the analytical results and history of a former landfill that contains approximately 530,000-cubic yards of municipal waste.

3.0 CONCEPTUAL SITE MODEL DEVELOPMENT

Conceptual site groundwater, geology, and risk pathway models were developed only for Bishop Airport Landfill I. The existing information was used to establish a basis to select sample locations to further characterize the site. Given the landfill history and placement of approximately 530,000 cubic yards of municipal waste, a containment strategy is likely the most economical option.

As data are collected, these models may be modified or changed to reflect the findings as the project phases proceed. Groundwater and soil sampling will be conducted to verify assumptions and further refine areas not yet characterized. The models will be used to identify data gaps or areas necessary to conduct in-fill sampling to achieve the project objectives described in Section 1.1.

3.1 GROUNDWATER AND GEOLOGY MODEL

Review of the boring logs and regional drinking water well logs suggest the geology at solid waste disposal area is situated primarily in lacustrian clay. There are also indications that sand and shallow sand lenses in the clay were removed to make space for the landfill activities. Groundwater has been identified at approximately 7 to 10 feet bgs near the landfill area. Based on historic data, the landfill was excavated approximately 15 feet below the original ground surface and no deeper than Swartz Creek. The bottom of Swartz Creek is at an elevation of approximately 743.5 feet. The 100-year flood level of Swartz Creek is approximately 753.0 feet. Portions of the landfill were located in the 100-year flood plain.

The available information and observations suggest the landfill is partially isolated from Swartz Creek by a soil berm/dyke. The soil berm/dyke likely consists of clay, sand, and pieces of concrete. In some areas this soil berm/dyke appears highly effective to limit groundwater migration to Swartz Creek. Seasonal surface seeps or vents allow groundwater to be expressed at surface and released to the ditch, then ultimately to the creek. The soil berm/dyke and cohesive soil under and around the land filled area is establishing a "bath tub" that contains the waste and groundwater impacted by waste. The bottom of the solid waste disposal area is underlain by cohesive clay which likely limits vertical migration of groundwater. After a rainfall event, ponds appear on the landfill and the pond water is allowed to infiltrate into the waste until the groundwater in the landfill (bath tub) rises to a level that spills out along seeps or vents located at the edge of the landfill boundary.

Leachate constituents from the landfill that mix with surrounding groundwater and surface water infiltration can potentially move to the adjacent surface water features. Groundwater within the landfill is impeded by clay and on that basis groundwater movement both vertically and horizontally is assumed to be slow. Groundwater gradients will be further evaluated as part of the Work Plan scope to refine the groundwater and geology conceptual model.

3.2 RISK PATHWAY MODEL

The pathway model was completed to make an initial assessment what additional information is necessary for facility specific evaluation, determine if facility-specific or site-specific modification to generic criteria is warranted, and based on the data that are collected, determine whether a response is necessary.

3.2.1 Sources

The Bishop Airport Landfill I is a former landfill that contains approximately 530,000-cubic yards of waste. The aerial photographs present a chronology of land filling and a reasonable estimate of the extent of land fill operations. City of Flint staff observed indications of methane generation (bubbling in some pools of water located on the landfill).

Based on review of Genesee County and City of Flint records, it appears that only municipal wastes were disposed at the landfill. However, landfills operating in the 1960s and 1970s could also accept industrial waste. Hazardous wastes were typically included in landfill refuse disposed prior to 1981, when Resource Conservation and Recovery Act requirements changed that practice.

The physical boundaries of Bishop Airport Landfill I are well defined by the historic aerial photographs. The vertical extent of the landfill and lateral extent should be defined. The berm/dyke construction along the northern boundary and eastern boundaries will need to be assessed. Given the areal extent and volume of waste, containment (if necessary) may be the only source control alternative.

3.2.2 Risk Due to Groundwater Contamination

Groundwater in the vicinity of the Bishop Airport Landfill I is used for drinking water. The source of groundwater comes from bedrock wells. The landfill is likely set in a "bath tub". Shallow groundwater was encountered in the borings installed in the landfill and near the landfill. It is unlikely that shallow water is hydraulically connected to the bedrock aquifer; however data collection should include borings installed deep enough to assess the clay under the landfill and assess of the shallow groundwater to determine its regulatory status as groundwater not in an aquifer.

Landfill gas is generated by decomposing refuse. The landfill gas likely contains low concentrations of volatile organic contaminants that evaporate from the refuse. The contaminants can diffuse with the migrating landfill gas (which is largely methane and carbon dioxide). Subsequent diffusion into the underlying groundwater can result in groundwater contamination.

Leachate has a potential to seep from the landfill to Swartz Creek and Hewitt Drain. Leachate has also been observed at several locations near these surface water features.

3.2.2.1 Drinking Water Usage

Impacted groundwater that can be used for drinking water is a relevant pathway. The demonstration of groundwater not in an aquifer should be evaluated. If the demonstration can be made, the drinking water pathway is not complete and would not be applicable. This work plan will collect some data that is useful to demonstrate groundwater not in an aquifer. To make the demonstration, additional data described in MDEQ Operational Memorandum may need to be collected.

3.2.2.2 Volatilization to Indoor Air

Impacted groundwater volatilization to indoor air is a relevant pathway. However it is unlikely that the pathway will be complete. There are no buildings on the landfill or near the landfill to make this pathway complete. It is likely that due care for future construction will need to address fire and explosion due to methane accumulation. An engineered control to mitigate methane gas will also address volatilization to indoor air.

3.2.2.3 Venting to Surface Waters

Impacted groundwater venting to surface waters is relevant pathway. This work plan was developed to determine if the pathway is complete. This work plan proposes to collect site data which should prove or disprove this presumption. The landfill boundaries are adjacent to surface water features on three sides. The geology will need further evaluation. Sample location and collection should bias the seeps and vents. If a hydraulic connection between the landfill and surface water features exists, the additional data to characterize the landfill boundaries and determine groundwater and soil concentrations in the landfill and near the landfill boundary can be used to develop an application to request a mixing zone determination.

3.2.3 Risks Due to Soil Contamination

Soil exposed to leachate may become impacted to levels that exceed generic criteria. Generally the soil pathways are relevant; however, site security or vegetated soil cover may render the soil pathways incomplete.

3.2.3.1 Direct Contact (Ingestion, Dermal)

The direct contact to impacted soil (waste) is a relevant pathway. The site security (e.g., fencing and a vegetative soil cover) make this pathway incomplete and may not be applicable. An investigation to evaluate the landfill cap thickness and evaluate surface soil quality will be useful to determine applicability and need to add additional cover materials. Historically, MDEQ has applied a presumptive approach to build a cover compliant with Part 115 standards. This work plan did not evaluate the thickness of the cover materials. Based on observations, additional soil cover may be necessary to eliminate surface water ponds and mitigate surface water infiltration with grade improvements and ditches. The work plan did include hand auger soil samples near seeps to assess the soil direct contact criteria.

3.2.3.2 Inhalation of Subsurface to Ambient Air

Impacted soil in the subsurface may result in inhalation of subsurface to ambient air to be relevant pathway. However, it is not likely that the pathway will be complete. There are no buildings on the landfill or near the landfill and the landfill has vegetation cover.

3.2.3.3 Volatilization to Indoor Air

The volatilization to indoor air is a relevant pathway. However, it is not likely that the pathway will be complete. There are no buildings on the landfill or near the landfill.

3.2.3.4 Leaching to Drinking Water

The leaching to drinking water is a relevant pathway. Additional investigation of the vertical extent of impacts to soil and groundwater are necessary to determine if the pathway is complete. If a determination that groundwater not in an aquifer were made this pathway might not be applicable.

3.2.3.5 Leaching to Groundwater and Subsequent Direct Contact

The impacted soil leaching to groundwater is a relevant pathway. Additional investigation of the lateral extent of impacts and impacts found in the landfill are necessary to determine if the pathway is complete.

3.2.3.6 Leaching to Groundwater then Venting to Surface Water

The impacted soil leaching to groundwater then venting to surface water is a relevant pathway. Additional investigation of the lateral extent of soil impacts and impacts found in the landfill are necessary to determine if the pathway is complete.

3.2.3.7 Direct Transport to Surface Water

The direct transport of impacted soil to surface water is a relevant pathway. Additional investigation of soil near the seeps and vents should be conducted to determine the lateral extent of impacts is necessary to determine if the pathway is complete.

3.2.4 Risks Due to Surface Water Sediment Contamination

The risk due to surface water sediment is a relevant pathway. Additional investigation of soil/sediment near the seeps and vents to determine the lateral extent of impacts to soil/sediment is necessary to determine if the pathway is complete.

3.2.5 Other Risks

The other risks include fire and explosion and terrestrial flora/fauna/food chain hazards/ aesthetic conditions. Landfills generate methane that creates a potential for fire and explosion. In addition

leachate and methane can create aesthetic conditions (e.g. odors, red staining).

3.2.5.1 Fire and Explosion

The fire and explosion pathway are relevant. There has been an observation of landfill gas venting through surface water. Additional investigation of landfill gas in and near the landfill is necessary to evaluate a need for passive venting. Landfill gas may have an impact on the growth of vegetation (grass) by displacing oxygen. It may be necessary to mitigate landfill gas in order for vegetation to establish and control soil erosion. Several sparsely vegetated areas were noted during site visits.

3.2.5.2 Terrestrial Flora/Fauna/Food Chain Hazards/Aesthetic Conditions

The terrestrial flora/fauna/food chain hazards/aesthetic conditions are relevant pathways. Several sparsely vegetated areas were noted during site visits and leachate has an odor and color. The soil and groundwater sampling identified for assessment of other pathways can be used to assess these pathways.

3.3 SUMMARY OF CONCEPTUAL SITE MODEL

The geological setting of the landfill may limit the vertical and lateral migration of shallow impacted groundwater. The geologic setting may adequately protect drinking water and surface water exposure. Additional assessment of the geologic setting is necessary to assess the drinking water and surface water pathway. Direct contact and impacted soil transport to surface water may be applicable near the leachate seeps. Surface soil sample collection near the seeps and comparison with generic criteria would assess both direct contact and soil transport to surface water pathways. The following section describes a sample plan to assess drinking water protection, surface water exposure, direct contact and impacted soil transport to surface water.

4.0 WORK PLAN ORGANIZATION

The investigation of the Bishop Airport Landfill I will focus on characterization the potential for soil and groundwater to impact nearby surface water (Swartz Creek and Hewitt Drain). The investigation will include sampling groundwater and surface soils near seeps and vents. See Figures 15 and 16 for proposed groundwater and soil sample locations. Tables 1 and 2 present the purpose and intent of each groundwater and soil sample location. Following sample collection the data will be tabulated, compared to generic criteria, and likely used in preparation of a mixing zone application. An evaluation of the geology near the surface water features will aid in determining if the liquids in the refuse can reach either surface water feature.

4.1 SAMPLING PLAN

Procedures for installing soil borings, installing monitoring wells, measuring static ground-water and surface water-elevations, collecting groundwater samples, and installing staff gauges are described in the following sections. Included also is information pertaining to sampling procedures, sample

documentation, sample shipping, chain-of-custody (COC) procedures, and equipment decontamination procedures. The following tasks will be completed.

Soil borings will be advanced using sonic technologies to 25-feet bgs to evaluate the vertical subsurface conditions and install fourteen 2-inch monitoring wells. Soil samples will be classified in the field, and boring logs will be prepared describing soil characteristics and indicated water levels. During drilling activities a direct reading organic vapor monitoring instrument (photoionization detector [PID] or flame ionization detector [FID]) will be used to screen the borehole and the headspace of soil samples for volatile organic compounds (VOCs). The headspace readings will be used to evaluate soil samples for submission to the laboratory.

Collection of groundwater data will be used to characterize the extent of the groundwater impacts associated with the landfill. The analytical results will be compared to MDEQ cleanup criteria to evaluate if the groundwater is a risk to impact surface water.

Surface soil samples will be collected using a hand auger from areas outside the landfill cap at seepage faces along the edge of the landfill. Surface soil samples will be collected from along the edge of the landfill for chemical analysis to assess potential risks associated with exposure to possible leachate constituents in surface soil outside the landfill cap.

4.2 FIELD ACTIVITIES

During investigation of the Bishop Airport Landfill I, different types of field activities will be conducted. These activities include:

- Monitor well installation;
- Staff gauge installation;
- Groundwater sample collection; and
- Leachate seep or vent area soil sample collection.

Methodologies for the field activities are specified in the following subsections.

4.2.1 Monitor Well Installation

A sonic drilling method is the technically preferred drilling technique when drilling around landfills. The subsurface can include numerous buried items (wire, bed springs, and concrete debris) which can get twisted into conventional hollow auger drilling equipment or cause auger refusal. The sonic drilling method can sample through industrial fill that refuse split-spoon samplers. Full recovery of sample runs in dense till is routinely obtained while split-spoon samplers typically reached refusal.

The sonic drilling method provides 3- to 6-inch diameter continuous core samples of unconsolidated materials that are either 5 or 10 feet in length. The sampling method provides a much clearer, less disturbed view of geologic materials compared to conventional hollow auger 2-inch diameter split-spoon samples.

A total of sixteen monitoring wells and one soil boring will be installed using sonic drilling methods. Soil samples will be field-screened with a PID. All drilling, well installation, and subsurface sampling will be supervised by an experienced geologist. Detailed field logs of drilling and sampling activities, as well as a description and classification of materials encountered and recovered, will be prepared. The sample type, sample depth and amount of core recovery will be noted in the logs. Soil samples will be collected continuously. The soil will be described in accordance with the unified soil classification chart attached in Appendix F, Unified Soil Classification. The final depths of the monitor wells will be determined by the conditions encountered during drilling. The position of the groundwater surface will be presented in the soil boring logs. An example of a soil boring log is presented in Appendix G, Field Forms.

All monitor wells will be constructed of 2-inch ID, flush joint, schedule 40, PVC well casing. Coupled to each well casing will be a 5-foot length of schedule 40, flush joint, 0.010-inch slot size, PVC well screen. The monitor well assemblies will be installed through the inside of the augers to the desired depth. A minimum 2-foot thick bentonite slurry seal will be installed above the formation sand using the tremie method; a neat cement/bentonite grout will then be tremied into the remaining annular space. The riser pipe will be capped with a vented cap to allow equilibration of the water inside the well with atmospheric pressure. A flush mount steel casing with lockable lid will be placed over each well and seated into concrete. A well construction log will be prepared for each monitor well. An example of a well construction log is presented in Appendix G.

Following completion of the drilling phase, the monitoring well will be developed to improve efficiency. During development, a minimum of three to five casing volumes of water will be removed from the well by either bailing, pumping, of airlifting methods. Soil and water derived from drilling will be collected in 55-gallon drums or appropriate storage containers for characterization and appropriate disposal by the City of Flint. The location and top-of-casing elevation of the new well will be determined by a licensed surveyor.

4.2.2 Staff Gauge Installation

Two staff gauges will be installed at the site. Staff gauges SG-1-SC and SG-2-HD will be installed in Swartz Creek and Hewitt Drain at the locations indicated on Figure 15. The staff gauges are designed to monitor the surface-water elevations. Staff gauge readings will be collected when static water elevations in the monitor wells are collected. These data will be used to determine if a relationship between shallow groundwater and surface-water exists.

Staff gauges will be constructed of rust-resistant, porcelain-enameled iron to avoid discoloration. The staff gauges will be 2.5 inches wide, 5 feet in length, and graduated in tenths of feet (e.g., 0.1 feet). A 5-foot long staff gauge will accommodate seasonal fluctuations. The staff gauges will be placed in the center of the creek and drain. Additionally, the staff gauge will be located in a portion of the stream bed that provides data representative of average stream conditions (e.g., the gauge will not be located in a pool or a riffle).

The staff gauges will be mounted on a galvanized iron stake that will be driven at least 2 feet into the sediment underlying the surface water. The stake will be trued to vertical with a plumb line or carpenter's level prior to attaching the staff gauge. The staff gauge will be attached securely to the

stake with mounting bolts or brackets and placed so that the graduated portion of the staff gauge intersects the sediment surface. Following installation, the locations of the staff gauge and monitor wells will be surveyed, by a registered land surveyor, to the nearest 1 foot horizontally relative to the site benchmark and plotted on the scaled base map. The elevation of the top of the staff gauge will be determined to the nearest 0.01 foot and referenced to a United States Geological Survey benchmark. The datum referenced will be mean sea level.

4.2.3 Groundwater Sample Collection

Groundwater sampling will conducted following low flow (minimum drawdown) guidance described by Barcelona and Puls. A copy is provided in Appendix H, Low Flow Guidance. Prior to sampling groundwater, the static water level in the well and the total depth of the well will be measured and recorded. Monitoring wells will be purged using a QED bladder pump or equivalent with new, dedicated high density-polyethylene tubing. The pumping rate will be conducted at the lowest possible flow rate. The initial pumping rate will be adjusted to approximately 100 mL/min. The flow rate will be verified with the graduated cylinder (or equivalent) by collecting the water from the discharge line for one minute. While purging the monitor well, static water level will be monitored to verify that little or no drawdown is occurring in the well. If desired, the flow rate may be increased to up to 300 mL/min or higher in more permeable formations as long as minimal drawdown is observed in the well. The flow rate will be recorded and static water levels will be measured during groundwater purging. The flow from the discharge tube will be directed into a flow-through cell for collection of field parameters (i.e., pH, temperature, specific conductivity, dissolved oxygen (DO), and oxidation-reduction potential (ORP) using a multiparameter meter(s) and recorded at every purge volume. Purge water will be containerized and placed in a storage tank on site for characterization and appropriate disposal by the City of Flint.

After achieving equilibration of field parameters, groundwater samples will be collected into laboratory provided sample containers. Groundwater will be collected for individual analyses VOCs, SVOC, pesticide, herbicide, PCB, and metals and ammonia. Samples for VOC analyses will be collected first; all other parameters will be collected after VOCs. Samples will then be packed in an ice-filled cooler and submitted following a chain-of-custody (COC) procedure to an environmental laboratory for analysis.

4.2.4 Leachate Seep and Vent Areas Soil Sample Collection

A hand auger soil sampler will be used to collect shallow soil samples. The soil sample will be removed using a stainless-steel spatula and placed into appropriate containers. VOC samples will be collected first, mixed with methanol in tightly sealed containers, and then placed on ice immediately. After the VOCs have been collected, all other samples can be collected.

4.2 SAMPLE LOCATIONS

Groundwater samples will be collected from sixteen monitor wells or piezometers on or near the landfill. Table 1 lists the wells to be sampled, the parameters to be sampled, and the sampling

rationale for each. The location of each proposed monitor well and piezometer is shown on Figure 15.

Soil samples will be collected from eight locations near the landfill. Table 2 lists the sample locations, the parameters to be sampled, and the sampling rationale for each. The location of each sample is shown on Figure 16.

4.3 DECONTAMINATION PROCEDURE

To prevent the cross-contamination of samples and to prevent the transport of contaminants from one area of the facility to another, all non-disposable sampling equipment will be decontaminated. Non-disposable sampling equipment (i.e., ladles, sampling trowels, etc.) will be decontaminated prior to the collection of each sample. The equipment will be washed with a potable water and non-phosphate detergent solution and finally rinsed with potable water. Decontamination water will be collected in appropriate containers for characterization and appropriate disposal by the City of Flint. When using non-disposable sampling equipment, equipment rinsate blanks will be collected.

4.4 SAMPLE CONTAINERS AND PRESERVATION

All sample containers will be provided by the environmental laboratory. Solid and highly viscous samples will be placed in clean, properly-labeled, glass containers with PTFE-lined lids provided by the environmental laboratory. Each sample container will be of sufficient volume (vials, small bottles, and/or quart bottles) to contain an adequate quantity of sample for the completion of all proposed analyses. Liquid samples will be placed in containers constructed of materials appropriate for the analyses to be conducted and also will be equipped with a PTFE-lined lid. Chemical preservatives may be pre-measured and placed in the liquid sample bottles by the laboratory prior to the sampling event. Alternatively, the waste samples may be preserved by the laboratory upon receipt. The laboratory should be contacted prior to the scheduled sample event so that appropriate sample bottles of adequate volume for the analyses to be conducted may be provided.

After each sample is collected and labeled, the bottle will be placed in a plastic ziplock bag and sealed. Each sample will then be placed immediately into an ice chest and cooled to an approximate temperature of 4°C using ice and/or "blue ice".

4.5 ANALYTICAL PROCEEDURE AND METHODS

The environmental laboratory will be selected based on lowest qualified bid. Sample analysis will be conducted according to MDEQ Operation Memorandum 2, effective October 1, 2007.

The soil and groundwater will be analyzed for VOCs by USEPA methods 5035a(soil only)/8260b, SVOCs by USEPA method 8270c, herbicides by USEPA method 8151, pesticides by USEPA methods 8081, PCBs by USEPA method 8082, TAL by various USEPA methods 6020/7471 that include aluminum, antimony, arsenic, barium, beryllium, cadmium, calcium, chromium, cobalt,

copper, iron, lead, magnesium, manganese, mercury, nickel, potassium, selenium, silver, sodium, thallium, vanadium, and zinc. The groundwater sampling will also include total ammonia by USEPA method 350.1.

4.6 FIELD QUALITY CONTROL

During the investigation, specific quality assurance/quality control (QA/QC) procedures in accordance with MDEQ Operation Memorandum will be implemented to ensure that the data collected during the site investigation and from the laboratory analyses are an accurate representation of the existing conditions at the site. Detailed field and laboratory QA/QC procedures are discussed in the following subsections. If unusual or erratic data are reported regarding a particular sample, the data can be compared with the data reported for the QA/QC samples to determine if the sample may have been influenced by outside environmental factors not related to the actual quality of the source media.

Field equipment may include a photoionization detector and a multi-meter measuring pH, conductivity, DO, ORP, temperature. Field equipment will be calibrated at least daily when in use and operated in accordance with the manufacturer's instructions and manuals. Field personnel will document all field calibration activities in the bound field notebook.

Field blank samples will be collected during groundwater sampling activities to ensure that existing site conditions (i.e., airborne contaminants, etc.) do not adversely affect the quality of the samples collected and that sample containers provided by the laboratory are not contaminated. A set of field blank samples will be collected by filling the appropriate laboratory containers with deionized or distilled water. The field blanks will be collected in the proximity of the monitoring wells scheduled for sampling and immediately before or after collection of the groundwater samples. The field blank samples will be analyzed for VOC only. There will be no field blank samples collected for soil.

To ensure that sample collection and handling procedures are implemented consistently, one duplicate soil and one duplicate groundwater sample will be collected. For each sample type (i.e., water and soil) the duplicate sample will consist of a representative aliquot of the sample being collected. The duplicate sample will be placed in a second bottle set and analyzed for the same parameters as the initial sample. The resulting data can be compared to evaluate general laboratory data reproducibility.

4.7 LABORATORY QUALITY CONTROL

One matrix spike sample and matrix spike duplicate sample of groundwater will be provided to laboratory to allow the laboratory to spike field samples and evaluate sample matrix interference.

Trip blank samples will be provided to ensure that sample shipment procedures do not impact the quality of the samples collected. Deionized water will be placed in appropriate containers by the contract laboratory. One set of trip blanks will accompany each ice chest of sample containers shipped to the site. The trip blank samples will remain in the ice chests during the sample collection activities and will accompany the samples during shipment back to the contract laboratory. Each set of trip blanks will be analyzed for VOCs only.

Internal laboratory QA/QC samples including blanks, sample spikes, duplicates, and reference samples will be prepared and analyzed along with each batch of soil and groundwater samples submitted for analysis during the investigation. A brief description of the required laboratory QA/QC samples is provided below. Method-specific laboratory QA/QC samples may also be specified in each analytical method and should be prepared and analyzed at the frequencies specified by the method.

A method blank will be prepared and analyzed with each batch of samples. A washed sea sand sample will be utilized as the method blank when conducting soil analyses. Each method blank will be carried through the entire sample preparation and analytical process. The detection of contaminants in a method blank is indicative of analytical equipment or procedural contamination.

A laboratory matrix spike will be analyzed with every batch of samples to assess the ability of the method to recover a known quantity of a constituent from a typical sample matrix. Matrix spikes are prepared by "spiking" a customer's sample with a known quantity of the analyte for which the customer has requested analysis. A low matrix spike recovery indicates that sample matrix interferences may be inhibiting the ability of the analytical procedure to recover the constituent of concern.

A matrix spike duplicate will also be prepared and analyzed with each batch of samples. The analytical data reported for the matrix spike duplicate will be compared to the data reported for the matrix spike so that the precision of the analytical method may be evaluated.

Reference samples (also called laboratory control samples) composed of certified standard solutions or blank matrices spiked with the constituents of concern will also be analyzed with each batch of samples. The analytical results reported for the reference samples will be used to evaluate the ability of the method to produce data within an acceptable range of the known concentrations.

In addition to the aforementioned QA/QC samples, the contract laboratory will also spike each sample submitted for VOC analysis with surrogate chemicals similar to those for which the analyses are being conducted. Low surrogate spike recoveries are typically indicative of sample matrix interference or inadequate sample preparation. Acceptable surrogate spike recovery ranges are specified in the analytical method.

All samples will be analyzed within the allowable holding times specified by the analytical methods. Further, the laboratory will accommodate the possible need for reanalysis due to matrix interference by performing the initial analysis in a timely manner such that any reanalysis required may be performed within the applicable holding time.

4.8 DRINKING WATER WELL LOCATIONS

To document the drinking water pathway a search of the Michigan water well records will be completed. The search will determine all the water wells near the landfills. After this list is completed, the addresses closest to the landfill will be physically inspected to verify that a well is located on the property.

5.0 DOCUMENT AND RECORDING

A bound notebook will be maintained by field personnel to document all field activities conducted during implementation of the work plan. The notebook will provide documentation of the sampling procedures, events of significance to the sampling program (i.e., weather conditions), and other field observations. All entries will be completed with an indelible ink pen or indelible marker and will be signed and dated. The field notebook will document each step of the sampling procedures and, at a minimum, will include the following:

- Date of the sampling event;
- Sample locations and identification;
- Sample collection procedures;
- Sample descriptions and unique identification numbers;
- Names of sampling personnel;
- Time of sample collection;
- Weather conditions; and
- Field observations of sampling procedures that might affect the analytical results; and other appropriate comments and observations.

All sample labels will be completed in waterproof ink and/or covered with water-tight tape and attached to the appropriate sample containers. Each sample label will be completed with the facility name; the date and time of sample collection; a unique sample identification number; the requested analyses; and the name of the person collecting the sample.

Samples will be transported to the contract laboratory daily either through personal delivery by the field sampler or by overnight courier. The previously-bagged samples will be packed in an ice chest with a sufficient amount of ice (contained in plastic ziplock bags) or "blue ice" to ensure that the samples are maintained at an approximate temperature of 4°C while en route to the laboratory. Adequate quantities of packing material will be placed between the sample containers to protect them from breakage during shipment. Each ice chest will be accompanied by a COC form completed as described in the following section. The ice chest will be taped shut with packing tape, sealed with a dated custody seal, and hand delivered or delivered via overnight courier to the analytical laboratory.

Sample custody will be documented through the use of COC forms, custody seals, and courier air bills (if shipped). Implementation of detailed sample custody procedures will enable project personnel to document each phase of sample shipment from site departure to receipt by the laboratory.

Custody seals will be signed and dated by the field sampler when packaging samples for shipment to the contract laboratory. A custody seal will be placed on each ice chest in a location that will preclude opening the ice chest without breaking the seal. The custody seal should remain intact until the samples are received by the laboratory. Laboratory personnel will inspect each ice chest upon receipt. If the custody seal has been broken, the project manager will be notified immediately and appropriate measures will be implemented to investigate the potential impact to the associated samples.

Each time samples are prepared for shipment to the laboratory; a three-part COC form will be completed and will accompany the shipment. Whenever custody of the samples is transferred, the individuals relinquishing and receiving them will sign, date, and note the time on the form. Each person relinquishing sample custody will retain one carbon copy of the three-part form. The original record will accompany the shipment of samples to the laboratory and, upon laboratory receipt, will be returned to the project manager to document that the custody chain was unbroken.

The COC form accompanying each ice chest will be placed in a plastic ziplock bag and taped inside the ice chest lid after the sampling personnel have signed the document.

6.0 REPORTING

The data will be summarized in a technical memorandum that describes the sample collection and tabulates the laboratory data. All data will be compared to Part 201 Cleanup Criteria defined in Operation Memorandum Number 1 dated December 10, 2004.

And??

7.0 SCHEDULE

The duration of each task is presented as follows:

- Monitor well installation 5 to 6-days;
- Staff gauge installation 1/2-day;
- Surveying 1-day in the field and 2 weeks to deliver a map;
- Groundwater sample collection 5 to 6-days;
- Leachate seep or vent area soil sample collection 1-day
- Laboratory analytical work 4-weeks.
- Technical Memorandum 6-weeks

The total project duration is 12 to 15-weeks. The start of field work is dependent on City of Flint authorization. The MDEQ project manager will be notified of site activities one week prior to mobilization.

8.0 REFERENCES

Aerial Photographs 1941, 1950, 1964, 1972, 1982, 1992, 1997 Environmental Data Resources, 2007

Aerial Photographs 1962, Clark Aerial Survey Corporation

Aerial Photographs 2003, City of Flint

Farrand, W. R.,"Quaternary Geology of Michigan", 1982; 2 colored sheets, 1:500,000 map of Northern Peninsula and Southern Peninsula

Flood Insurance Map, FEMA

Operation Memorandum Number 1, MDEQ, December 10, 2004

Operation Memorandum Number 2, MDEQ, October 1, 2007

United States Geological Survey, Swartz Creek

Wilson, S. E, "Bedrock Geology of Michigan" 1987; 2 colored sheets, 1:500,000 colored map of the aerial extent of geologic formations including both peninsulas

TABLES

Table 1, Sample Locations to assess GSI pathway, Bishop Airport Landfill I, City of Flint, Michigan, August 2007.

Boring ID	Well ID MW/PZ	Depth	Comment
HP-1-07	MW-1-07	25	The purpose is to determine the subsurface geology as near as practical to the Spring and install a 2-inch well with a 5-foot screen in the water bearing unit likely to support the Spring. The Monitor well will be sampled and used to determine hydraulic conditions.
HP-2-07		25	The purpose is to determine the subsurface geology as near as practical to the berm/dyke located north of the surface water on the landfill. If initial boring is located in waste, move location north to assess geology at landfill boundary.
HP-3-07	MW-2-07	25	The purpose is to determine the subsurface geology as near as practical to the berm/dyke located along the boundary of the landfill. If initial boring is located in waste, move location north to assess geology at landfill boundary. Install a 2-inch well with a 5-foot screen in the water bearing unit likely to support Vent #3. The Monitor well will be sampled for Sample Analytical Group 1 parameters and used to assess hydraulic conditions.
HP-4-07	MW-3-07	25	The purpose is to determine the subsurface geology as near as practical to the berm/dyke located along the boundary of the landfill. If initial boring is located in waste, move location north to assess geology at landfill boundary. Install a 2-inch well with a 5-foot screen in the water bearing unit likely to support Vent #2. The Monitor well will be sampled for Sample Analytical Group 1 parameters and used to assess hydraulic conditions.
HP-5-07	MW-4-07	25	The purpose is to determine the subsurface geology as near as practical to the berm/dyke located along the boundary of the landfill. If initial boring is located in waste, move location north to assess geology at landfill boundary. Install a 2-inch well with a 5-foot screen in the water bearing unit likely to support Vent #1. The Monitor well will be sampled for Sample Analytical Group 1 parameters and used to assess hydraulic conditions.
HP-6-07	MW-5-07	25	The purpose is to determine the subsurface geology as near as practical to the berm/dyke located along the boundary of the landfill. If initial boring is located in waste, move location east to assess geology at landfill boundary. Install a 2-inch well with a 5-foot screen in the water bearing. The Monitor well will be sampled for Sample Analytical Group 1 parameters and used to assess hydraulic conditions.
HP-7-07	MW-6-07	25	The purpose is to determine the subsurface geology as near as practical to the berm/dyke located along the boundary of the landfill. If initial boring is located in waste, move location east to assess geology at landfill boundary. Install a 2-inch well with a 5-foot screen in the water bearing unit likely to support Spring #3. The Monitor well will be sampled for Sample Analytical Group 1 parameters and used to assess hydraulic conditions.
HP-8-07	MW-7-07	25	The purpose is to determine the subsurface geology as near as practical to the berm/dyke located along the boundary of the landfill. If initial boring is located in waste, move location east to assess geology at landfill boundary. Install a 2-inch well with a 5-foot screen in the water bearing unit likely to support Spring #2. The Monitor well will be sampled for Sample Analytical Group 1 parameters and used to assess hydraulic conditions.

Table 1, Sample Locations to assess GSI pathway, Bishop Airport Landfill I, City of Flint, Michigan, August 2007.

Boring ID	Well ID MW/PZ	Depth	Comment
HP-9-07	MW-8-07	25	The purpose is to determine the subsurface geology as near as practical to the berm/dyke located along the boundary of the landfill. If initial boring is located in waste, move location east to assess geology at landfill boundary. Install a 2-inch well with a 5-foot screen in the water bearing unit likely to support Spring #1. The Monitor well will be sampled for Sample Analytical Group 1 parameters and used to assess hydraulic conditions.
HP-10-07	PZ-1-07	25	Purpose is to establish the vertical extent of fill within the landfill. Install a 2-inch well with 15 or 20 foot screened through the waste with screen exposed above the water table. The Piezometer will primarily be used for gauging liquid levels in the landfill. The piezometer well will be sampled once for Sample Analytical Group 1 parameters to evaluate liquid conditions in waste. The Piezometers will be used primarily to assess hydraulic conditions.
HP-11-07	PZ-2-07	25	Purpose is to establish the vertical extent of fill within the landfill. Install a 2-inch well with 15 or 20 foot screened through the waste with screen exposed above the water table. The Piezometer will primarily be used for gauging liquid levels in the landfill. The piezometer well will be sampled once for Sample Analytical Group 1 parameters to evaluate liquid conditions in waste.
HP-12-07	PZ-3-07	25	Purpose is to establish the vertical extent of fill within the landfill. Install a 2-inch well with 15 or 20 foot screened through the waste with screen exposed above the water table. The Piezometer will primarily be used for gauging liquid levels in the landfill. The piezometer well will be sampled once for Sample Analytical Group 1 parameters to evaluate liquid conditions in waste.
HP-13-07	PZ-4-07	25	Purpose is to establish the vertical extent of fill within the landfill. Install a 2-inch well with 15 or 20 foot screened through the waste with screen exposed above the water table. The Piezometer will primarily be used for gauging liquid levels in the landfill. The piezometer well will be sampled once for Sample Analytical Group 1 parameters to evaluate liquid conditions in waste.
HP-14-07	MW-9-07	25	The purpose is to determine the subsurface geology south of the landfill boundary. Install a 2-inch well with a 5-foot screen in the water bearing unit. The Monitor well will be sampled for Sample Analytical Group 1 parameters and used to assess hydraulic conditions.
HP-15-07	MW-10-07	25	The purpose is to determine the subsurface geology south of the landfill boundary. Install a 2-inch well with a 5-foot screen in the water bearing unit. The Monitor well will be sampled for Sample Analytical Group 1 parameters and used to assess hydraulic conditions.
HP-16-07	MW-11-07	25	The purpose is to determine the subsurface geology as near as practical to the berm/dyke located along the eastern bank of the creek and the boundary of the landfill. If initial boring is located in waste, move location east to assess geology at landfill boundary. Install a 2-inch well with a 5-foot screen in the water bearing unit near the storm sewer. The Monitor well will be sampled for Sample Analytical Group 1 parameters and used to assess hydraulic conditions.

Table 2, Sample Locations to assess soil quality, Bishop Airport Landfill I, City of Flint, Michigan, August 2007.

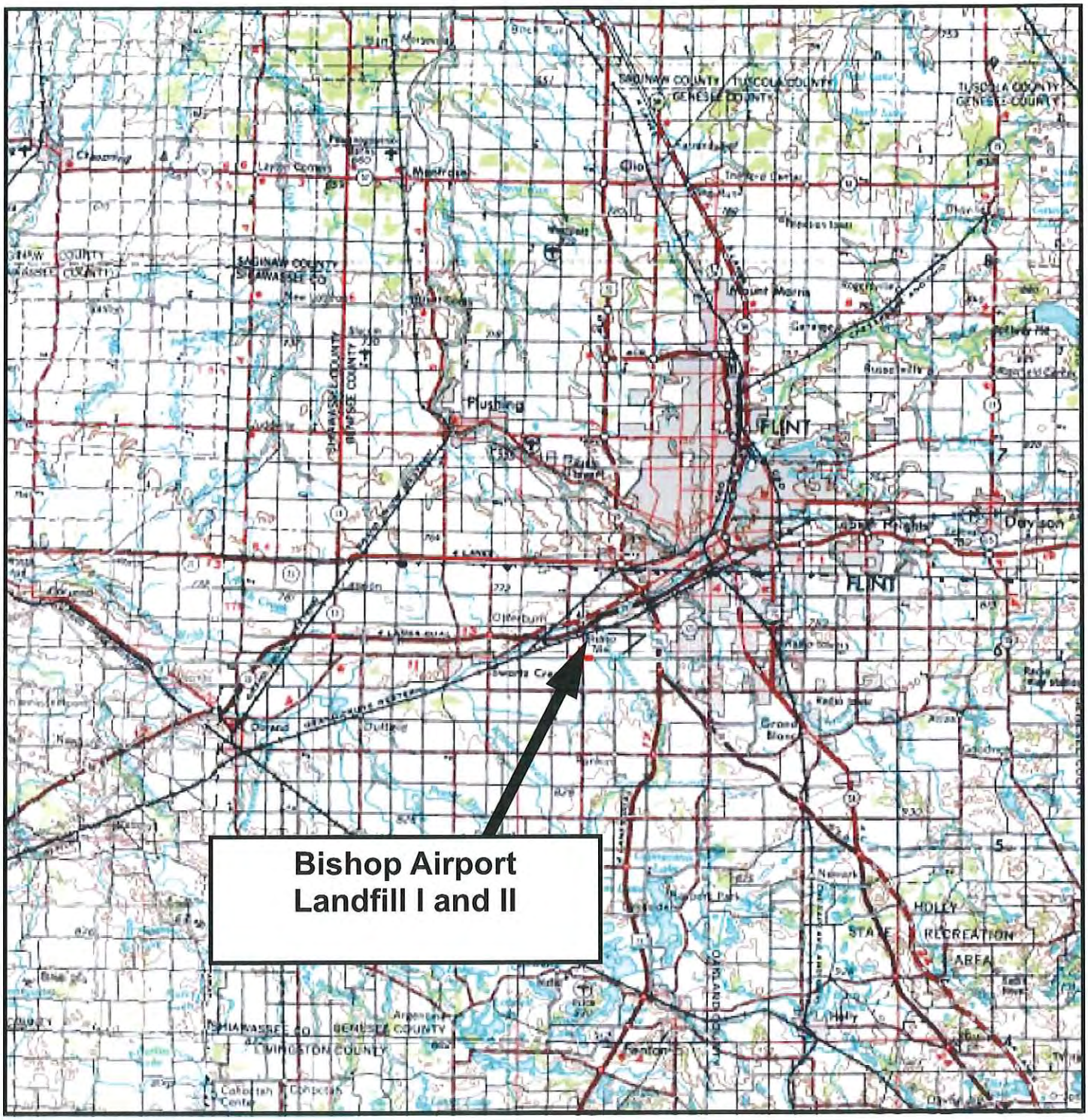
Boring ID	Depth	Comment
HAB-1-07	2	Bias sample collection to most visibly impacted soil at Spring #4 and analyze soil for parameters in sample analytical group 1.
HAB-2-07	2	Bias sample collection to most visibly impacted soil at Vent #3 and analyze soil for parameters in sample analytical group 1.
HAB-3-07	2	Bias sample collection to most visibly impacted soil at Vent #2 and analyze soil for parameters in sample analytical group 1.
HAB-4-07	2	Bias sample collection to most visibly impacted soil at Vent #1 and analyze soil for parameters in sample analytical group 1.
HAB-5-07	2	Bias sample collection to most visibly impacted soil at Spring #3 and analyze soil for parameters in sample analytical group 1.
HAB-6-07	2	Bias sample collection to most visibly impacted soil at Spring #2 and analyze soil for parameters in sample analytical group 1.
HAB-7-07	2	Bias sample collection to most visibly impacted soil at Spring #1 and analyze soil for parameters in sample analytical group 1.
HAB-8-07	2	Bias sample collection to most visibly impacted soil at storm sewer outfall east of Swartz Creek and analyze soil for parameters in sample analytical group 1.

Depending on soil sample results, additional soil samples may be collected to assess a hot spot or a new seep/vent location.

Sample Analytical Group 1	Volatile organic compounds (VOCs) by United States Environmental Protection Agency (USEPA) methods 5035/8260b, Semi- volatile organic compounds (SVOCs) by USEPA method 8270c, Herbicides by USEPA method 8151, Pesticides by USEPA methods 8081, polychlorinated biphenyl compounds (PCBs) by USEPA method 8082, TAL metals by USEPA methods 6020/7471 that include, aluminmum, antimony, arsenic, barium, beryllium, cadmium, calcium, chromium, cobalt, copper, iron, lead, magnesium, manganese, mercury, nickel, potassium, selenium, silver, sodium, thallium, vanadium and zinc.

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FIGURES



Site Vicinity Map

Bishop Airport Landfill I and II
West of Bishop International Airport
Flint, Michigan

Legend

N

Approximate Scale

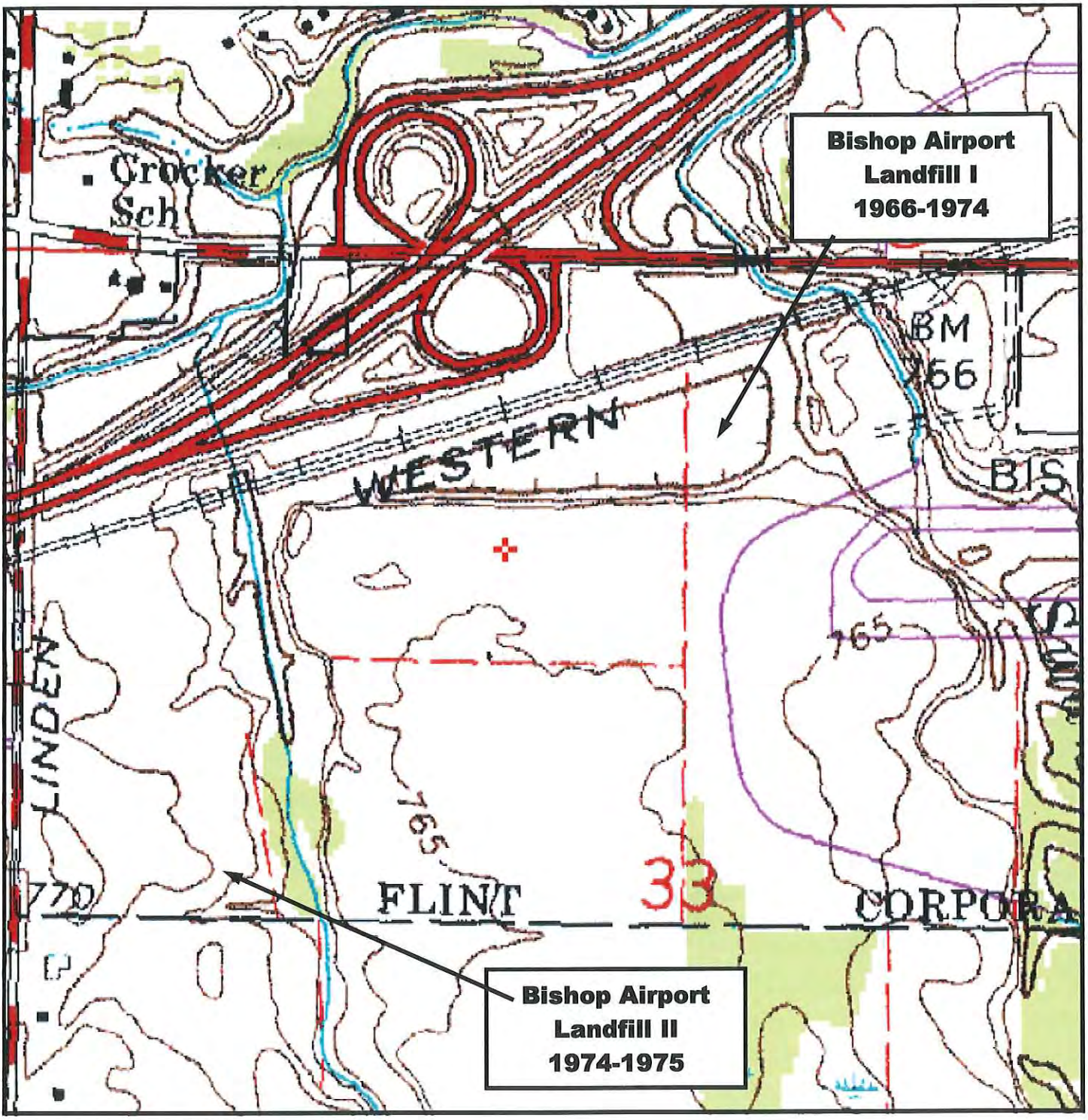
0 6 12 18 24 30 km

0 4 8 12 16 20 mi

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Ann Arbor, Michigan 48103
Voice and Fax (888) 417-4440

Source: **USGS Swartz Creek (MI) Quadrangle**

FIGURE 1



Site Location Map

Bishop Airport Landfill I and II
West of Bishop International Airport
Flint, Michigan

Legend

N

Approximate Scale

0 0.1 0.2 0.3 0.4 0.5 km

0 0.09 0.18 0.27 0.36 0.45 mi

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Source: **USGS Swartz Creek (MI) Quadrangle**

FIGURE 2



Legend

Approximate scale

0 0.1 0.2 0.3 0.4 0.5 km

0 0.09 0.18 0.27 0.36 0.45 mi

N

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Source: Environmental Data Resources, Inc. 440 Wheelers Farms Road, Milford CT.

1941 Aerial Photograph

Bishop Airport Landfill I and II
West of Bishop International Airport
Flint, Michigan

Figure 3



Legend

Approximate Scale

0 0.1 0.2 0.3 0.4 0.5 km

0 0.09 0.18 0.27 0.36 0.45 mi

N

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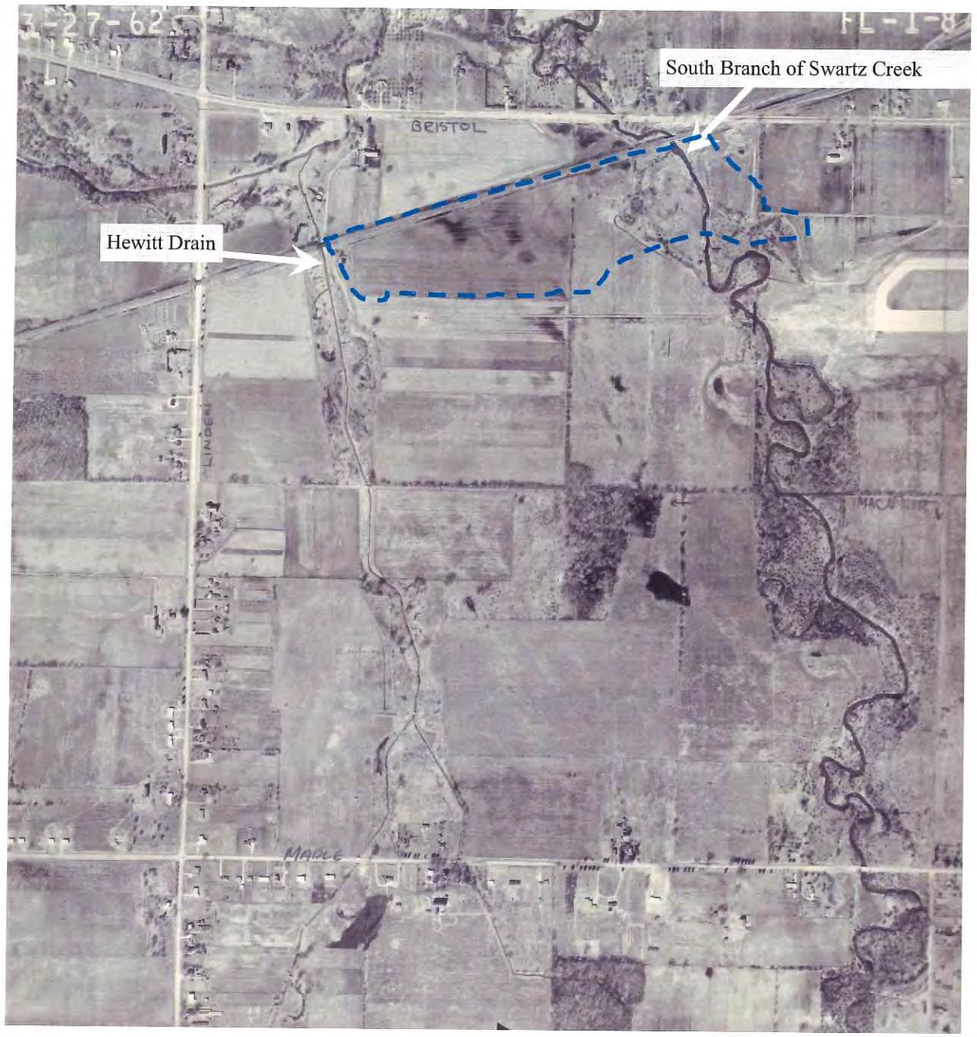
2531 Jackson Road, Suite 164
Ann Arbor, Michigan 48103
Voice and Fax (888) 417-4440

Source: Environmental Data Resources, Inc. 440 Wheelers Farms Road, Milford CT.

1950 Aerial Photograph

Bishop Airport Landfill I and II
West of Bishop International Airport
Flint, Michigan

Figure 4



Legend

Approximate boundary of Bishop Airport Landfill I

No scale

N

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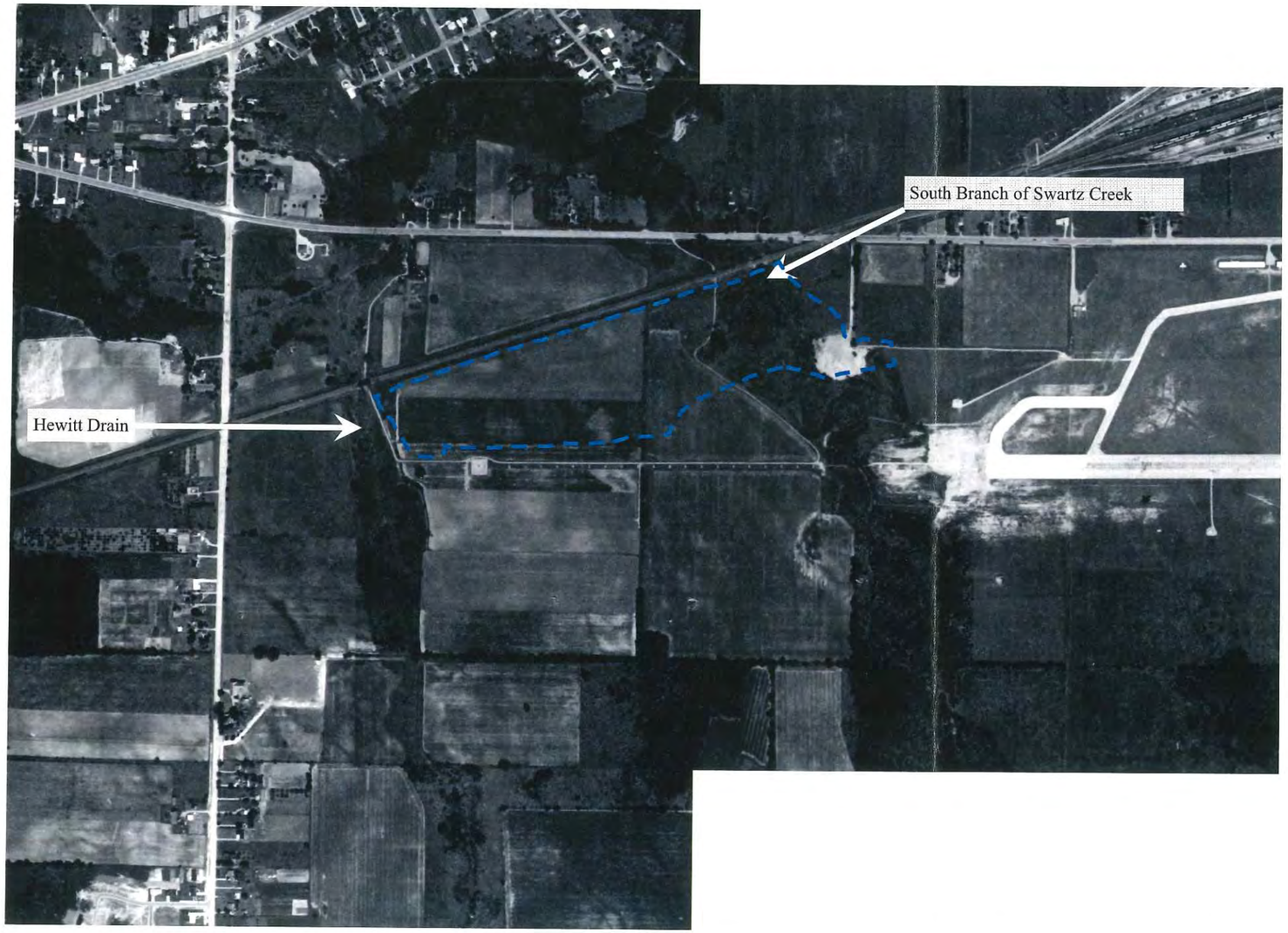
2531 Jackson Road, Suite 164
Ann Arbor, Michigan 48103
Voice and Fax (888) 417-4440

Source: Clark Aerial Survey Corporation, 1962

1962 Aerial Photograph

Bishop Airport Landfill I and II
West of Bishop International Airport
Flint, Michigan

Figure 5



Legend

Approximate Scale

0 0.1 0.2 0.3 0.4 0.5 km

0 0.09 0.18 0.27 0.36 0.45 mi

Approximate boundary of Bishop Airport Landfill I

N

GEO-environmental Resources, Inc.

2531 Jackson Road, Suite 164
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Voice and Fax (888) 417-4440

Source: Environmental Data Resources, Inc. 440 Wheelers Farms Road, Milford CT.

1964 Aerial Photograph

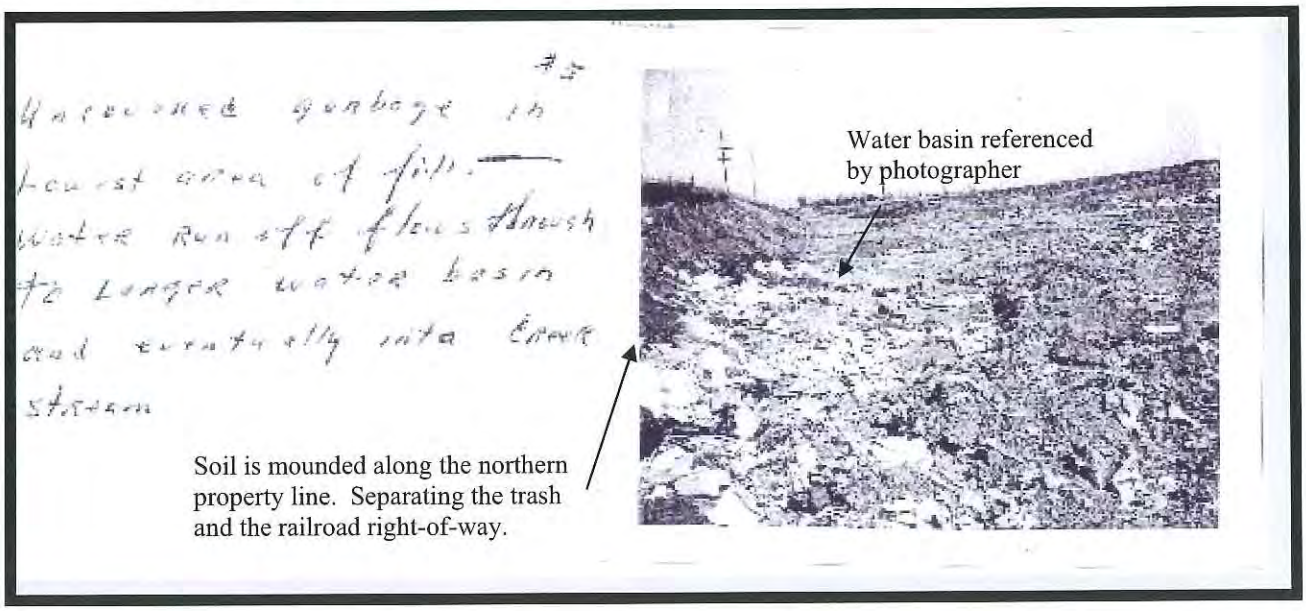
Bishop Airport Landfill I and II
West of Bishop International Airport
Flint, Michigan

Figure 6



Photograph 1: Viewing the landfill cover. Looking east along the northern boundary.

Photo Taken By: Kevin Lund Date Photo Taken: May 22, 2007



Photograph 2: Photograph copied from the Genesee County Health Department files. The photograph is taken from near the same vantage point as the photograph presented in Photograph 1. References by sanitarian that observed surface water comes in contact with trash and flows toward the Creek.

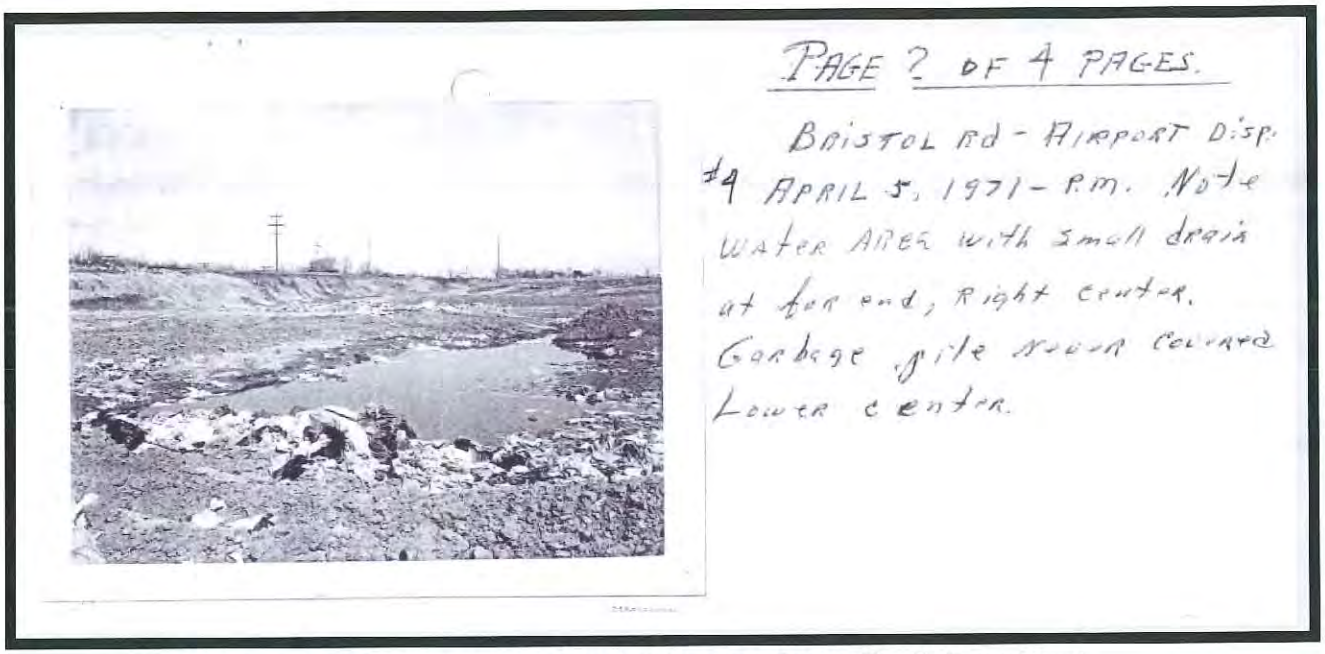
Photo Taken By: Genesee County Sanitarian Date Photo Taken: April 5, 1971

Site Photographs

Bishop Airport Landfill I and II
West of Bishop International Airport
Flint, Michigan

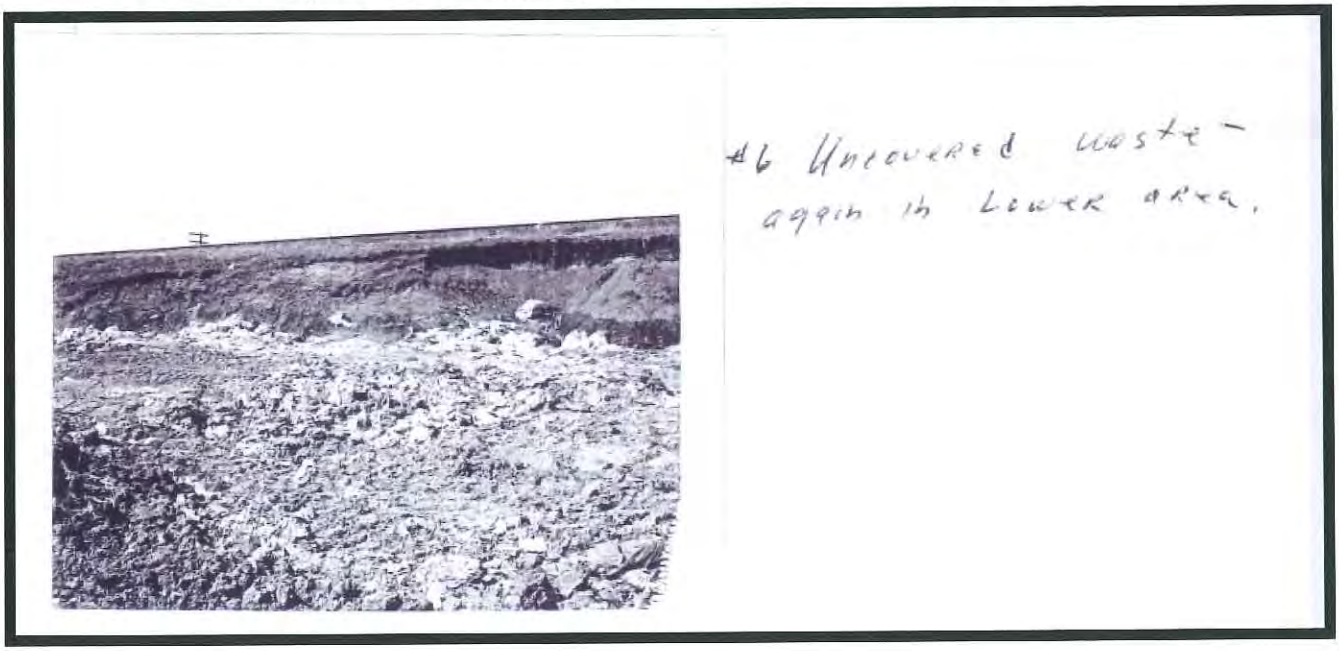
GEO-environmental Resources, Inc.
2531 Jackson Road, Suite 164
Ann Arbor, Michigan 48103
Voice and Fax (888) 417-4440

Figure 7



Photograph 3: Photograph copied from the Genesee County Health Department files. Possible looking east.

Photo Taken By: Genesee County Sanitarian Date Photo Taken: April 5, 1971



Photograph 4: Photograph copied from the Genesee County Health Department files. Possibly looking north, the lower area is located near Swartz Creek.

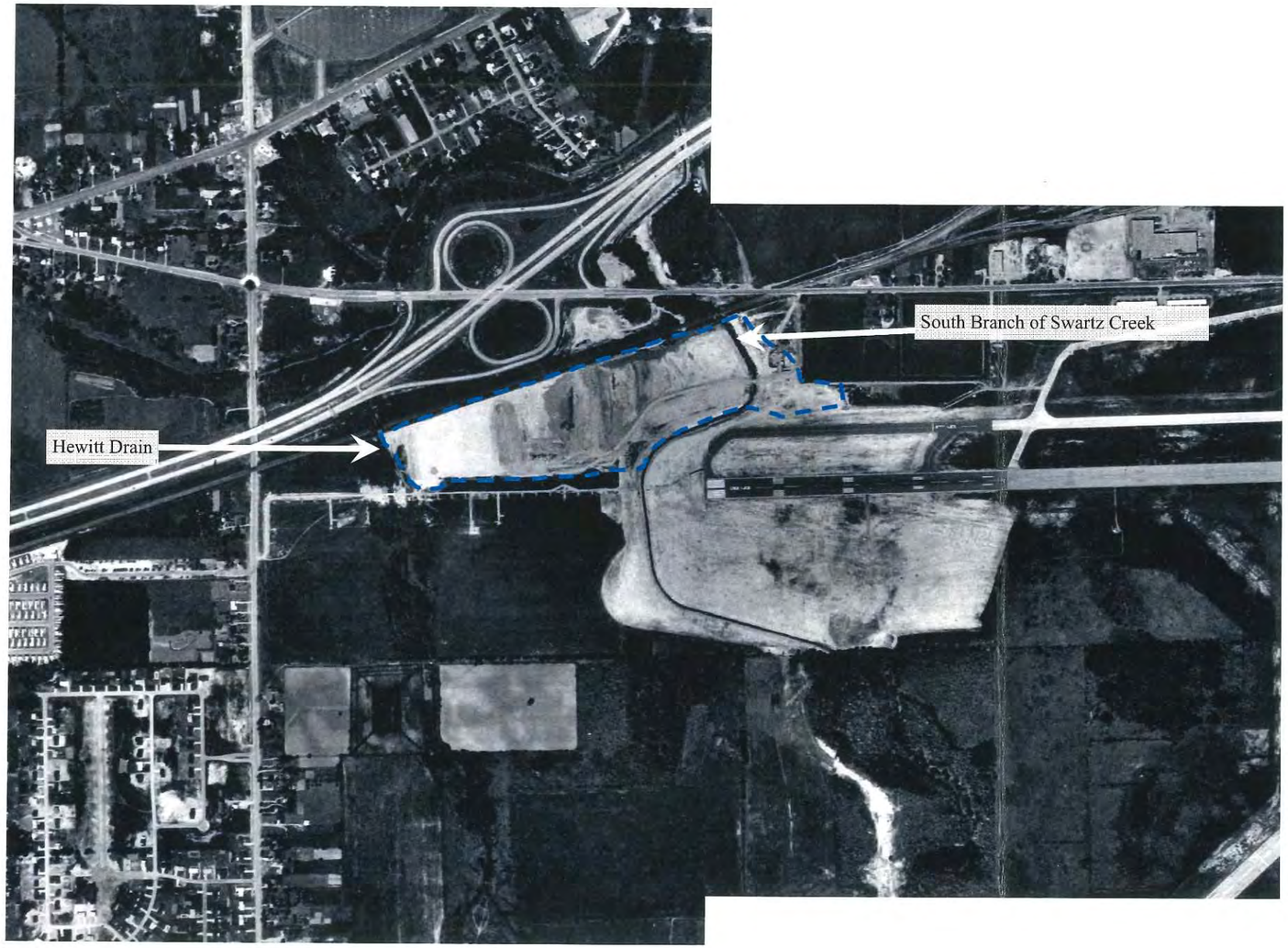
Photo Taken By: Genesee County Sanitarian Date Photo Taken: April 5, 1971

Site Photographs

Bishop Airport Landfill I and II
West of Bishop International Airport
Flint, Michigan

GEO-environmental Resources, Inc.
2531 Jackson Road, Suite 164
Ann Arbor, Michigan 48103
Voice and Fax (888) 417-4440

Figure 8



Legend

Approximate Scale

0 0.1 0.2 0.3 0.4 0.5 km

0 0.09 0.18 0.27 0.36 0.45 mi

Approximate boundary of
Bishop Airport
Landfill I

N

GEO-environmental Resources, Inc.

2531 Jackson Road, Suite 164
Ann Arbor, Michigan 48103
Voice and Fax (888) 417-4440

Source: Environmental Data Resources, Inc. 440 Wheelers Farms Road, Milford CT.

1972 Aerial Photograph

Bishop Airport Landfill I and II
West of Bishop International Airport
Flint, Michigan

Figure 9



Legend

Approximate Scale

0 0.1 0.2 0.3 0.4 0.5 km

0 0.09 0.18 0.27 0.36 0.45 mi

Approximate boundary of Bishop Airport Landfill I

N

GEO-environmental Resources, Inc.

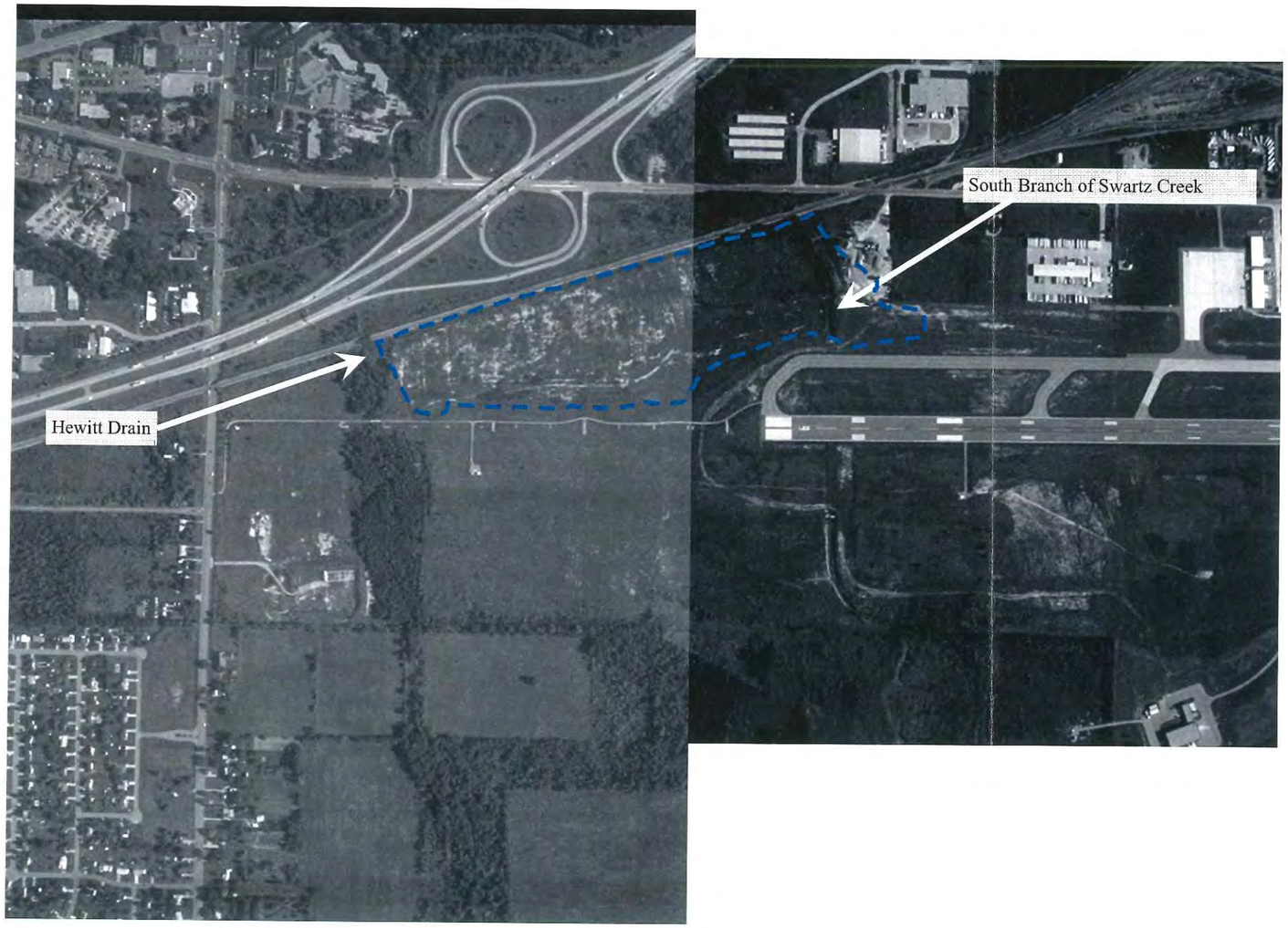
2531 Jackson Road, Suite 164
Ann Arbor, Michigan 48103
Voice and Fax (888) 417-4440

Source: Environmental Data Resources, Inc. 440 Wheelers Farms Road, Milford CT.

1982 Aerial Photograph

Bishop Airport Landfill I and II
West of Bishop International Airport
Flint, Michigan

Figure 10



Legend

Approximate Scale

0 0.1 0.2 0.3 0.4 0.5 km

0 0.09 0.18 0.27 0.36 0.45 mi

Approximate boundary of Bishop Airport Landfill I

N

GEO-environmental Resources, Inc.

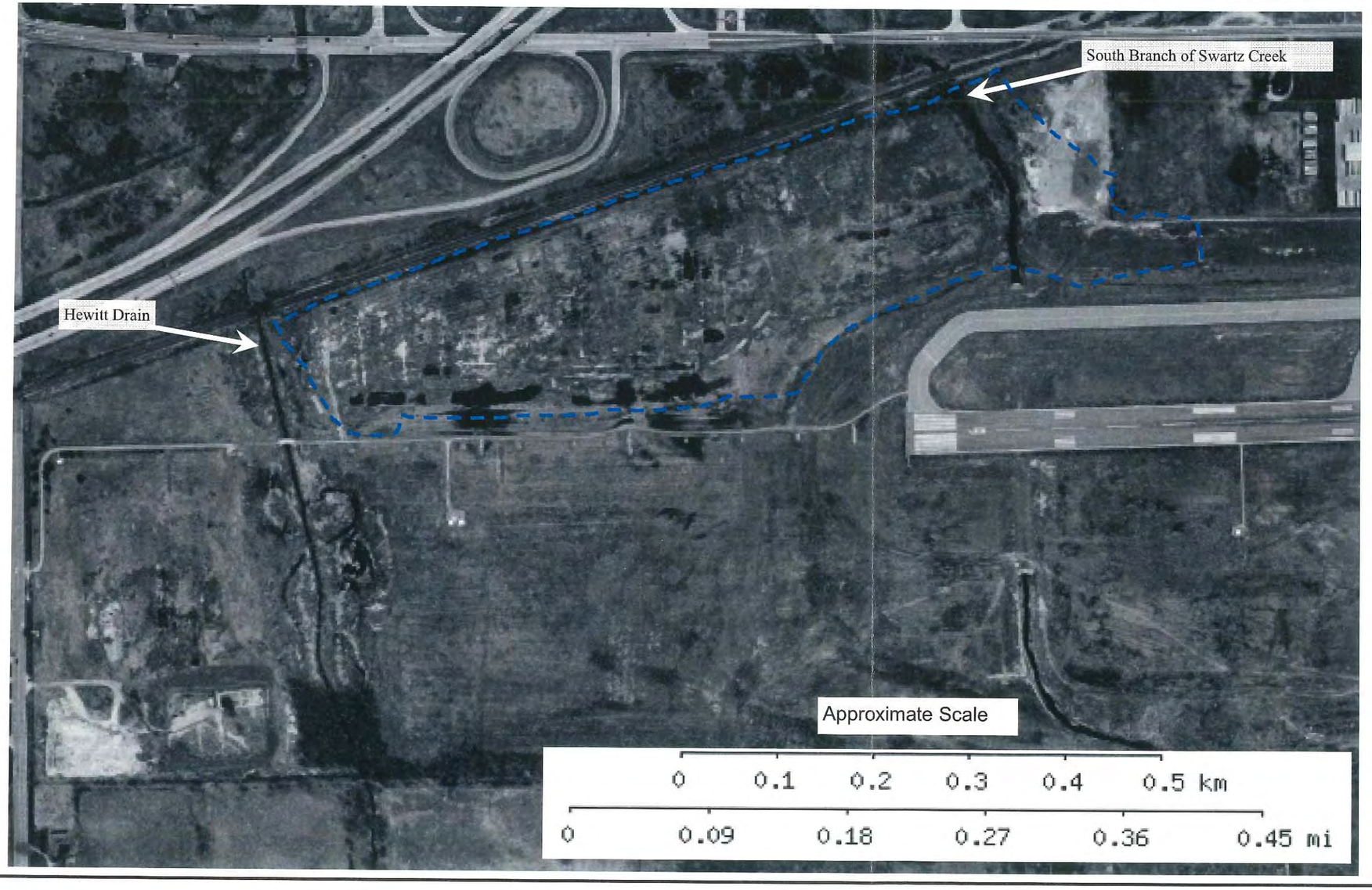
2531 Jackson Road, Suite 164
Ann Arbor, Michigan 48103
Voice and Fax (888) 417-4440

Source: Environmental Data Resources, Inc. 440 Wheelers Farms Road, Milford CT.

1992 Aerial Photograph

Bishop Airport Landfill I and II
West of Bishop International Airport
Flint, Michigan

Figure 11



Legend

Approximate boundary of Bishop Airport Landfill I

N

GEO-environmental Resources, Inc.

2531 Jackson Road, Suite 164
Ann Arbor, Michigan 48103
Voice and Fax (888) 417-4440

Source: Aerial Photograph dated 1997, Provided by City of Flint.

1997 Aerial Photograph

Bishop Airport Landfill I and II
West of Bishop International Airport
Flint, Michigan

Figure 12



Legend

Approximate Boundary
of the Bishop Airport Landfill I

Approximate Boundary
Of the 100-year flood plain

SITE	LATITUDE	LONGITUDE
VENT 1	42 °58'19.241"N	83 °45'38.457"W
VENT 2	42 °58'18.163"N	83 °45'42.422"W
VENT 3	42 °58'17.350"N	83 °45'44.085"W
SPRING 1	42 °58'15.195"N	83 °45'30.602"W
SPRING 2	42 °58'16.311"N	83 °45'30.435"W
SPRING 3	42 °58'17.519"N	83 °45'30.872"W
SPRING 4	42 °58'10.209"N	83 °46'05.635"W
SPRING 5	42 °58'06.033"N	83 °46'04.463"W
SPRING 6	42 °58'03.656"N	83 °46'03.843"W
SAMPLE LOCATION UP STREAM	42 °58'20.789"N	83 °45'33.541"W
SAMPLE LOCATION DOWN STREAM	42 °58'20.542"N	83 °45'34.055"W
SURFACE WATER	42 °58'15.303"N	83 °45'55.006"W

GEO-environmental Resources, Inc.

2531 Jackson Road, Suite 164
Ann Arbor, Michigan 48103
Voice and Fax (888) 417-4440

Source: Aerial Photograph dated 2003, Provided by City of Flint.
FEMA 100-year Flood Plain Map, Flint, Michigan

Locations of Seeps, Vents and Extent of 100-Year Flood Plain

Bishop Airport Landfill I and II
West of Bishop International Airport
Flint, Michigan

Figure 13



Legend

Approximate Boundary of the Bishop Airport Landfill I

Soil Borings Installed by RC Engineering, Inc. (December 2002-January 2003) B-2

GEO-environmental Resources, Inc.

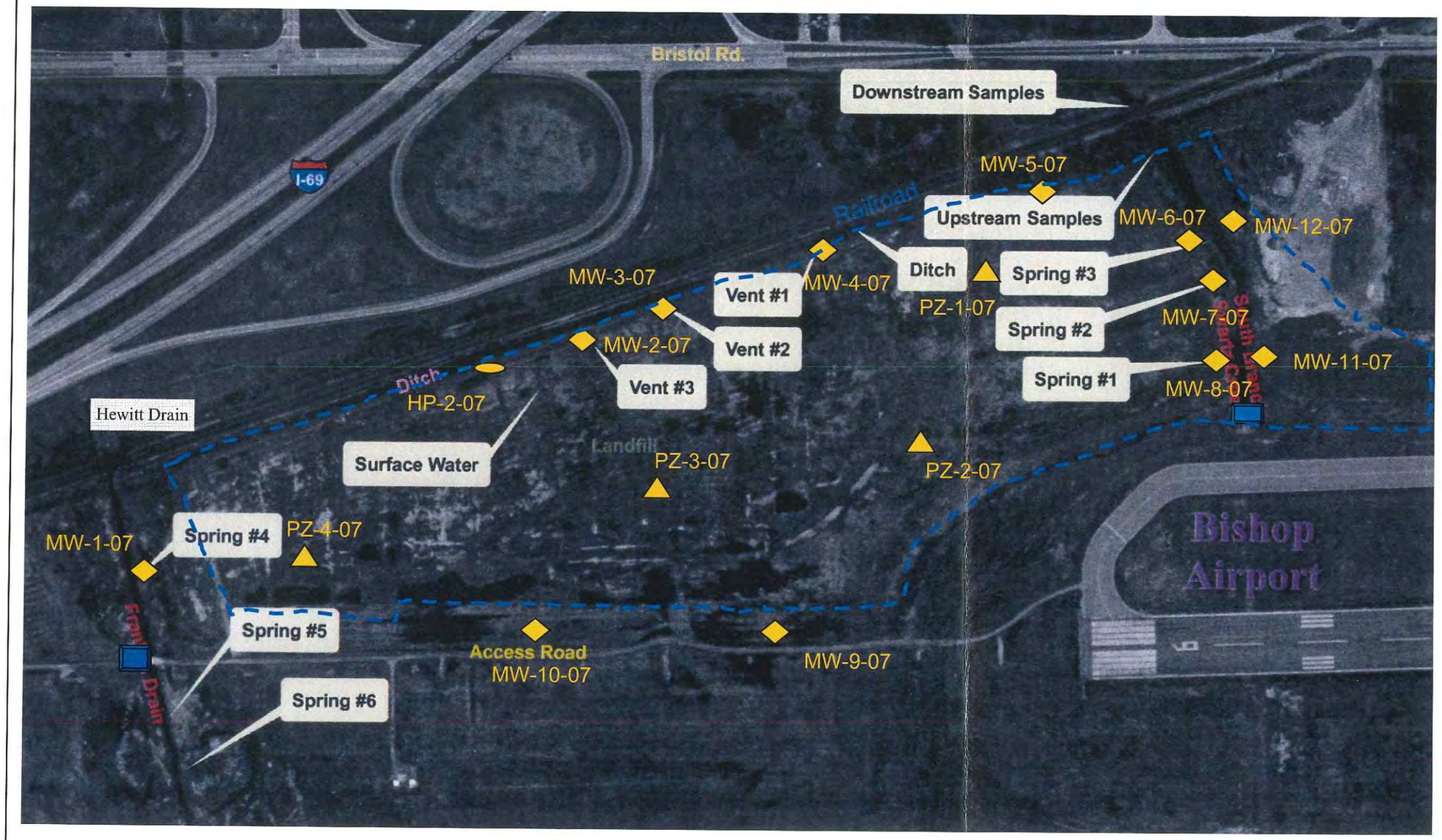
2531 Jackson Road, Suite 164
Ann Arbor, Michigan 48103
Voice and Fax (888) 417-4440

Source: Aerial Photograph dated 2003, Provided by City of Flint.

Location of Seeps, Vents and Soil Borings

Bishop Airport Landfill I and II
West of Bishop International Airport
Flint, Michigan

Figure 14



Legend

Approximate Boundary of the Bishop Airport Landfill I

Proposed Monitor Wells — MW-1-07

Proposed Piezometers — PZ-1-07

Proposed Soil Boring — HP-2-07

Proposed Stream Gauge

GEO-environmental Resources, Inc.

2531 Jackson Road, Suite 164
Ann Arbor, Michigan 48103
Voice and Fax (888) 417-4440

0 250 500 feet

Approximate scale

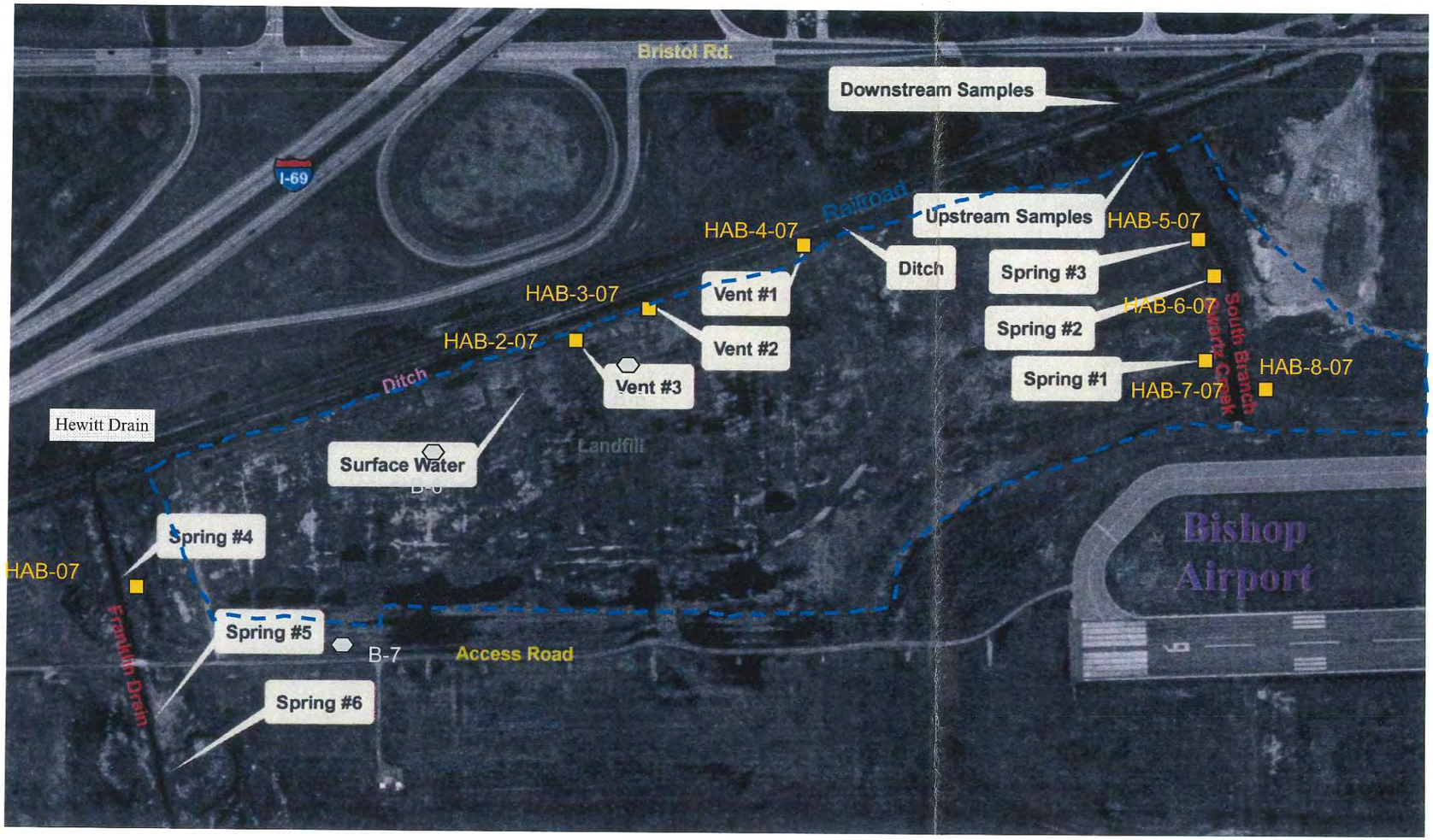
N

Source: Aerial Photograph dated 1997, Provided by City of Flint.

Proposed Monitor Wells and Piezometers

Bishop Airport Landfill I and II
West of Bishop International Airport
Flint, Michigan

Figure 15



Legend

Approximate Boundary of the Bishop Airport Landfill I

Proposed Hand Auger Boring Locations — HAB-1-07

GEO-environmental Resources, Inc.

2531 Jackson Road, Suite 164
Ann Arbor, Michigan 48103
Voice and Fax (888) 417-4440

0 250 500 feet

Approximate scale

N

Source: Aerial Photograph dated 1997, Provided by City of Flint.

Proposed Hand Auger Boring Locations

Bishop Airport Landfill I and II
West of Bishop International Airport
Flint, Michigan

Figure 16

APPENDIX

APPENDIX A Landfill Licenses

August 8, 1966

Mr. Anthony W. DeBlaise, Director
Public Works & Utilities
Department of Public Works Waste Division
1101 S. Saginaw St.
Flint, Michigan 48502

RE: Bishop Airport - Genesee County

Dear Sir:

Your application for a license of the above solid waste disposal facility has been approved by this department.

Enclosed is your current license. This license is issued with the following stipulations:
None.

We solicit your cooperation in operating your facility in a sanitary manner in compliance with Act 87, Public Acts of 1965.

Very truly yours,

LaRue L. Miller, Chief
Section of Environmental Health
Division of Engineering

R. L. Hadfield

By: R.L. Hadfield, Sanitarian
Environmental Health Planning Unit

jcd
Enc.

cc: Michigan Water Resources Commission
CC: Genesee County Health Department

MICHIGAN DEPARTMENT OF PUBLIC HEALTH
DIVISION OF ENGINEERING

TO:
Michigan Department of Public Health
Division of Engineering
3500 North Logan Street
Lansing, Michigan 48914

DO NOT WRITE IN THIS SPACE
Bonding Co. Continental Insurance Co.
Agent Nancy A. Meeks
Address Flint, Michigan
License No. 2021
Bond Value $5,000
Loc. Code

APPLICATION FOR SOLID WASTE DISPOSAL AREA LICENSE

(See back of last copy for instructions)

(Fill out in triplicate)

[X] new [ ] renewal [ ] addition

pplication is hereby made to the Director, Michigan Department of Public Health, for a license to operate a solid waste disposal rea under the provisions of Act 87, P.A. 1965.

ate March 21, 1966

NAME OF DISPOSAL AREA Bishop Airport Size 10 acres (acres)

LOCATION Genesee (county) Flint (city, village or township) Parts of Sec. 33 & 34, R6E, T7N (section)

(address or additional location description)

NAME OF PROPERTY OWNER City of Flint (individual, firm, township, city, etc.) Address 1101 S. Saginaw St., Flint, Mich., 48502 (include zip code)

NAME OF OPERATOR DPW Waste Division Address 1101 S. Saginaw St., Flint, Mich., 48502 (include zip code)

RESPONSIBLE PERSON TO CONTACT Anthony W. DeBlaise, Director of Public Works & Utilities (if other than operator)

Address 1101 S. SaginawSt., Flint, Michigan, 48502 (include zip code)

TYPE OF DISPOSAL OPERATION: (If more than one area involved file separate application for each)

[X] Sanitary Landfill [ ] Hog Feeding
[ ] Incineration [ ] Other _____ (specify)

TYPE OF MATERIAL HANDLED: (check one or more)

[X] General Refuse [ ] Garbage [ ] Industrial Waste [ ] Liquid Waste [ ] Rubbish [ ] Other _____ (specify)

FEE: The required annual license fee of $25.00 [ ] is [X] is not attached.
(governments and agencies thereof exempt.)

BOND: The power of attorney and bond in the amount of $5,000 is attached.
(bond of $500.00/acre, minimum bond $2500.00)

hereby certify that the foregoing information is accurate and complete

Anthony W. DeBlaise Director of Public Works & Utilities
(signature and title of applicant)

ny disposal operation possibly involving the use of the waters of the State also requires the submission of a new or increased use atement to the Water Resources Commission as provided by Act 245, P.A. 1929 as amended

Municipal Land Refill - No charge.

cknowledgment of receipt of annual $25.00 license fee received by me on

July 28 1966

gnature Louis E. Dunbar R.S.

itle Dir. Sanitation

Leave This Space Blank

JUL 1966

Director

55.2 - 2M - 1/66

WILLIAM G. MILLIKEN, Governor

MAURICE S. REIZEN, M.D., Director

STATE OF MICHIGAN
DEPARTMENT OF PUBLIC HEALTH
3500 N. LOGAN, LANSING, MICHIGAN 48914

September 1, 1970

Department of Public Works and Utilities
City of Flint
1101 South Saginaw Street
Flint, Michigan 48502

Attention: Mr. A. W. DeBlaise, Director

Subject: Bishop Airport Landfill
Genesee County

Dear Sir:

Your application for a license of the above solid waste disposal facility has been approved by this department.

Enclosed is your current license No. 70-002. This license is issued with the following stipulations:

1. For initial area at west end of fill as per engineering plan.

We solicit your cooperation in operating your facility in a sanitary manner in compliance with Act 87, Public Acts of 1965.

Very truly yours,

Fred B. Kellow, Chief
Section of Solid Waste Management
Division of Engineering

By: R. L. Hadfield
Sanitarian

RLH/BG

Enc.

cc: Michigan Water Resources Commission
Genesee County Health Department

MICHIGAN DEPARTMENT OF PUBLIC HEALTH
DIVISION OF ENGINEERING

TO:
Michigan Department of Public Health
Division of Engineering
3500 North Logan Street
Lansing, Michigan 48914

DO NOT WRITE IN THIS SPACE
Bonding Co. _____
Agent _____
Address _____
License No. 70-002
Bond Value Performance Bond
Loc. Code _____

APPLICATION FOR SOLID WASTE DISPOSAL AREA LICENSE

(See back of last copy for instructions)
(Fill out in triplicate)

☐ new ☒ renewal ☐ addition

Application is hereby made to the Director, Michigan Department of Public Health, for a license to operate a solid waste disposa area under the provisions of Act 87, P.A. 1965.

Date October 29, 1969

NAME OF DISPOSAL AREA Bishop Airport Landfill Size 10 (acres)

LOCATION Genesee (county) City of Flint (city, village or township) (section)
Bristol Road (address or additional location description)
Flint, Michigan 48507

NAME OF PROPERTY OWNER City of Flint (individual, firm, township, city, etc.) Address 1101 South Saginaw Street (include zip code)

NAME OF OPERATOR City of Flint Address 1101 South Saginaw Street (include zip code)

RESPONSIBLE PERSON TO CONTACT A. W. DeBlaise - Director of Public Works and Utilities (if other than operator)

Address 1101 South Saginaw Street, Flint, Michigan 48502 (include zip code)

TYPE OF DISPOSAL OPERATION: (If more than one area involved file separate application for each)
☒ Sanitary Landfill ☐ Hog Feeding
☐ Incineration ☐ Other _____ (specify)

TYPE OF MATERIAL HANDLED: (check one or more)
☐ General Refuse ☐ Garbage ☐ Industrial Waste ☐ Liquid Waste ☒ Rubbish ☐ Other _____ (specify)

FEE: The required annual license fee of $25.00 ☐ is ☐ is not attached.
(governments and agencies thereof exempt.)

BOND: The power of attorney and bond in the amount of _____ is attached.
(bond of $500.00/acre, minimum bond $2500.00)

hereby certify that the foregoing information is accurate and complete

A. W. DeBlaise Director, Public Works and Utilities
(signature and title of applicant)

ny disposal operation possibly involving the use of the waters of the State also requires the submission of a new or increased use atement to the Water Resources Commission as provided by Act 245, P.A. 1929 as amended

cknowledgment of receipt of annual $25.00 license fee received by me on

_____ 19__

gnature _____

itle _____

Leave This Space Blank
MICHIGAN DEPARTMENT OF PUBLIC HEALTH
ENGINEERING DIVISION
EXAMINED AND APPROVED
As Compliance with Act 87, P.A. 1965
SEP 1 1970

55.2 – 2M – 1/66

STATE OF MICHIGAN
DEPARTMENT OF PUBLIC HEALTH
3500 N. LOGAN, LANSING, MICHIGAN 48914

WILLIAM G. MILLIKEN, Governor

MAURICE S. REIZEN, M.D., Director

January 12, 1972

A. W. DeBlaise, Director
Public Works and Utilities
City of Flint
1101 South Saginaw Street
Flint, Michigan 48502

Subject: Bishop Airport Landfill - Genesee County

Dear Sir:

Your application for a license of the above solid waste disposal area has been approved by this department.

Enclosed is your current license carrying No. 1516. This license has been issued for a solid waste disposal area and therefore must not receive liquid wastes without special approval from the Health Department. The stipulations on this license are as follows:

1. All refuse must be covered at the end of the operating day with 6" of compacted earth.
2. Clay berms and seals must be installed as prescribed by plans and agreement to protect the ground and surface waters.
3. All filled and completed areas must have 2' final cover installed and the area seeded.

We solicit your cooperation in operating your facility in a sanitary manner in compliance with Act 87, Public Acts of 1965, as amended.

Very truly yours,

Fred B. Kellow, Chief
Division of Solid Waste Management
Bureau of Environmental Health

By: Rodney L. Mosier
Environmental Sanitarian

RLM/pc

Enc.
cc: Michigan Water Resources Commission
Genesee County Health Department

MICHIGAN THE GREAT LAKE STATE

MICHIGAN DEPARTMENT OF PUBLIC HEALTH
DIVISION OF ENGINEERING

TO:
Michigan Department of Public Health
Division of Engineering
3500 North Logan Street
Lansing, Michigan 48914

DO NOT WRITE IN THIS SPACE
PERFORMANCE BOND
Bonding Co. _____
Agent _____
Address _____
License No. 1516
Bond Value _____
Loc. Code _____

APPLICATION FOR SOLID WASTE DISPOSAL AREA LICENSE

(See back of last copy for instructions)
(Fill out in triplicate)

☐ new ☒ renewal ☐ addition

Application is hereby made to the Director, Michigan Department of Public Health, for a license to operate a solid waste disposal area under the provisions of Act 87, P.A. 1965.

Date **August 27, 1971**

NAME OF DISPOSAL AREA **Bishop Airport Landfill** Size **10** (acres)

LOCATION **Genesee** (county) **City of Flint** (city, village or township) (section)

Bristol Road (address or additional location description)

Flint, Michigan 48507

NAME OF PROPERTY OWNER **City of Flint** (individual, firm, township, city, etc.) Address **1101 South Saginaw Street 48502** (include zip code)

NAME OF OPERATOR **City of Flint** Address **1101 South Saginaw Street 48502** (include zip code)

RESPONSIBLE PERSON TO CONTACT **A. W. DeBlaise - Director of Public Works & Utilities** (if other than operator)

Address **1101 South Saginaw Street, Flint, Michigan 48502** (include zip code)

TYPE OF DISPOSAL OPERATION: (If more than one area involved file separate application for each)

☒ Sanitary Landfill ☐ Hog Feeding
☐ Incineration ☐ Other _____ (specify)

TYPE OF MATERIAL HANDLED: (check one or more)

☐ General Refuse ☐ Garbage ☐ Industrial Waste ☐ Liquid Waste ☐ Rubbish ☐ Other _____ (specify)

FEE: The required annual license fee of $25.00 ☐ is ☒ is not attached.
(governments and agencies thereof exempt.)

BOND: The power of attorney and bond in the amount of _____ is attached.
(bond of $500.00/acre, minimum bond $2500.00)

I hereby certify that the foregoing information is accurate and complete

A. W. DeBlaise **Director of Public Works & Utilities**
(signature and title of applicant)

Any disposal operation possibly involving the use of the waters of the State also requires the submission of a new or increased use statement to the Water Resources Commission as provided by Act 245, P.A. 1929 as amended

Acknowledgment of receipt of annual $25.00 license fee received by me on

December 1 – 1971

Signature _____

Title _____

Leave This Space Blank
MICHIGAN DEPARTMENT OF PUBLIC HEALTH
ENGINEERING DIVISION
EXAMINED AND APPROVED
For Compliance with Act 87, P.A. 1965
JAN 12 1972

DEQ 2 3M 1/66

MICHIGAN DEPARTMENT OF PUBLIC HEALTH
ureau of Environmental Health

Submit Th gh Your Local Health Department To:

Michigan Department of Public Health
Division of Solid Waste Management
3500 North Logan Street
Lansing, Michigan 48914

Do not write in this space
Bonding Co. PERFORMANCE
Agent
Address
License No. 2108
Bond Value
Loc. Code

APPLICATION FOR SOLID WASTE DISPOSAL AREA LICENSE

☑ new ☐ renewal ☒ addition

pplication is hereby made to the Director, Michigan Department of Public Health, for a license to operate a solid waste disposal ea under the provisions of Act 87, P.A. 1965, as amended.

NAME OF DISPOSAL AREA Bishop Airport Landfill II DATE Dec. 4, 1972

TYPE OF DISPOSAL OPERATION: (If more than one area involved file separate application for each)

- ☒ Sanitary Landfill (30 acres)
- ☐ Incineration (capacity)
- ☐ Other (specify)
- ☐ Refuse Transfer Facility
- ☐ Processing Plant

Construction Cost (except landfills)

LOCATION Genesee (county) Flint (township or municipality) 33-7-6 (section)

East side of Linden Road South of G.T.R.R. (address) (directions to site)

Number of acres available for landfilling, excluding licensed portion

NAME OF APPLICANT City of Flint (individual, firm, township, city, etc.)

Address 1101 S. Saginaw St. Flint, Michigan 48502 Zip Code

RESPONSIBLE PERSON TO CONTACT A.W. DeBlaise - Director of Public Works & Utilities (if other than applicant)

Address 1101 S. Saginaw St. Flint, Michigan Zip Code 48502

NAME OF PROPERTY OWNER City of Flint Address 1101 S. Saginaw St. Flint, Mich.

TYPE OF MATERIAL HANDLED: (check one or more)

- ☐ Industrial Waste
- ☐ Liquid Waste
- ☒ General Refuse
- ☐ Rubbish
- ☒ Garbage
- ☐ Other (specify)

FEE: The required annual license fee of $25.00 ☐ is attached. (governmental units exempt)
CHECKS MUST BE MADE PAYABLE TO THE LOCAL HEALTH DEPARTMENT.

BOND:

- ☐ Sanitary Landfill bond of $500/acre (minimum $2,500) and power of attorney are attached.
- ☐ Facility Bond of 1/4 of 1% of construction cost (minimum $2,500) and power of attorney are attached.
- ☐ Governmental unit performance bond is attached.

ereby certify that the foregoing information is accurate and complete.

A.W. DeBlaise (signature and title of applicant) Director of Public Works & Utilities

y disposal operation possibly involving the use of the waters of the State or the flood plain of any water course must be reviewed the Water Resources Commission under specific legislative authority.

cknowledgment of receipt of annual $25.00 license fee received by me on 19 .

gnature Title

5.2 - 2M - 1/72

STATE OF MICHIGAN

DEPARTMENT OF NATURAL RESOURCES

CITY OF FLINT BISHOP AIRPORT LANDFILL

SOLID WASTE DISPOSAL AREA LICENSE

This license is issued under the provisions of Act 87, Public Acts of 1965, as amended, to permit the operation of a solid waste disposal area in the State of Michigan. *This license does not obviate the necessity of obtaining other clearances and permits as may be required by state law or local ordinance. It is further made a condition of this license that the applicant give notice to public utilities in accordance with Act No. 53 of the Public Acts of 1974, being sections 460.701 to 460.718 of the Michigan Compiled Laws, and comply with each of the requirements of that Act.* This facility shall not receive liquid wastes without special approval from the health department having jurisdiction or this office.

GRANTED TO: City of Flint

COUNTY: GENESEE

ISSUE DATE: June 9, 1975 EXPIRATION DATE: September 1, 1975

This license is applicable to the facility located at and described as follows:

40 acres - 3900 W. Bristol Road, Section 33, East side of Linden Road south of G.T.R.R.

Stipulations:

None

A. W. DeBlaise, Director
Public Works & Utilities
City of Flint
1101 S. Saginaw Street
Flint, MI 48502

This license is subject to revocation by the Director of the Department of Natural Resources for any violation of the law under which it is issued or for any violation of the rules authorized thereunder, or any stipulations noted. This license shall be available through the licensee during the entire effective date and remains the property of the Director of the Department of Natural Resources. THIS LICENSE IS NOT TRANSFERABLE.

LICENSE NO. 3520

Deputy Director

85503 7/74

MICHIGAN DEPARTMENT OF NATURAL RESOURCES

Environmental Protection Branch
Solid Waste Management Division

Submit Through Your Local Health Department To:

Michigan Department of Natural Resources
Environmental Protection Branch
Solid Waste Management Division
Stevens T. Mason Building
Lansing, Michigan 48926

Do not write in this space

Bonding Co. _____
Agent _____
Address _____
License No. _____
Bond Value _____
Loc. Code _____

APPLICATION FOR SOLID WASTE DISPOSAL AREA LICENSE

☐ new ☒ renewal

Application is hereby made to the Director, Michigan Department of Natural Resources, for a license to operate a solid waste disposal area under the provisions of Act 87, P.A. 1965, as amended.

NAME OF DISPOSAL AREA: City of Flint Bishop Airport Landfill DATE: August 14, 1974

TYPE OF DISPOSAL OPERATION: (If more than one area involved file separate application for each)

☒ Sanitary Landfill (40 acres)
☐ Incineration (_____ capacity)
☐ Other _____ (specify)
☐ Refuse Transfer Facility
☐ Processing Plant
Construction Cost _____ (except landfills)

LOCATION: Genesee (county) 3900 W. Bristol Road (address) Flint (township or municipality) 33- (section)
East Side of Linden Road South of G.T.R.R. (directions to site)

Number of acres available for landfilling, excluding licensed portion _____

NAME OF APPLICANT: City of Flint (individual, firm, township, city, etc.)
Address 1101 S. Saginaw Street, Flint, Michigan Zip Code 48502

RESPONSIBLE PERSON TO CONTACT: Kenneth Hammermeister (if other than applicant)
Address 712 W. 12th Street, Flint, Michigan Zip Code 48503

NAME OF PROPERTY OWNER: City of Flint Address 1101 S. Saginaw Street

TYPE OF MATERIAL HANDLED: (check one or more)

☒ General Refuse ☒ Garbage
☐ Industrial Waste ☐ Liquid Waste ☐ Rubbish ☐ Other _____ (specify)

FEE: The required annual license fee of $25.00 ☐ is attached. (governmental units exempt)
CHECKS MUST BE MADE PAYABLE TO THE LOCAL HEALTH DEPARTMENT.

BOND:
☐ Sanitary Landfill bond of $500/acre (minimum $2,500) and power of attorney are attached.
☐ Facility Bond of 1/4 of 1% of construction cost (minimum $2,500) and power of attorney are attached.
☒ Governmental unit performance bond is attached.

I hereby certify that the foregoing information is accurate and complete.

A.W. DeBlaise Director of Public Works and Utilities
(signature and title of applicant)

DEPARTMENT OF NATURAL RESOURCES
SOLID WASTE MANAGEMENT DIVISION
JUN 09 1975
EXAMINED AND APPROVED
For Compliance with Act 87, P.A. 1965

Any disposal operation possibly involving the use of the waters of the State or the flood plain of any water course must be reviewed by the Water Resources Commission under specific legislative authority.

Acknowledgment of receipt of annual $25.00 license fee received by me on NA 19____.

Signature _____ Title _____

R 5501 4/73

New landfill 5/20/75

The City Council Monday decided to contract with William H. Leoni, Inc., to provide a landfill for city trash.

Anthony W. DeBlaise, Flint public works director, had said that with this action the city could stop using the landfill at Bishop Airport the first week in June.

The new landfill is on W. Grand Blanc Rd. just east of U.S. 23 in Mundy Twp.

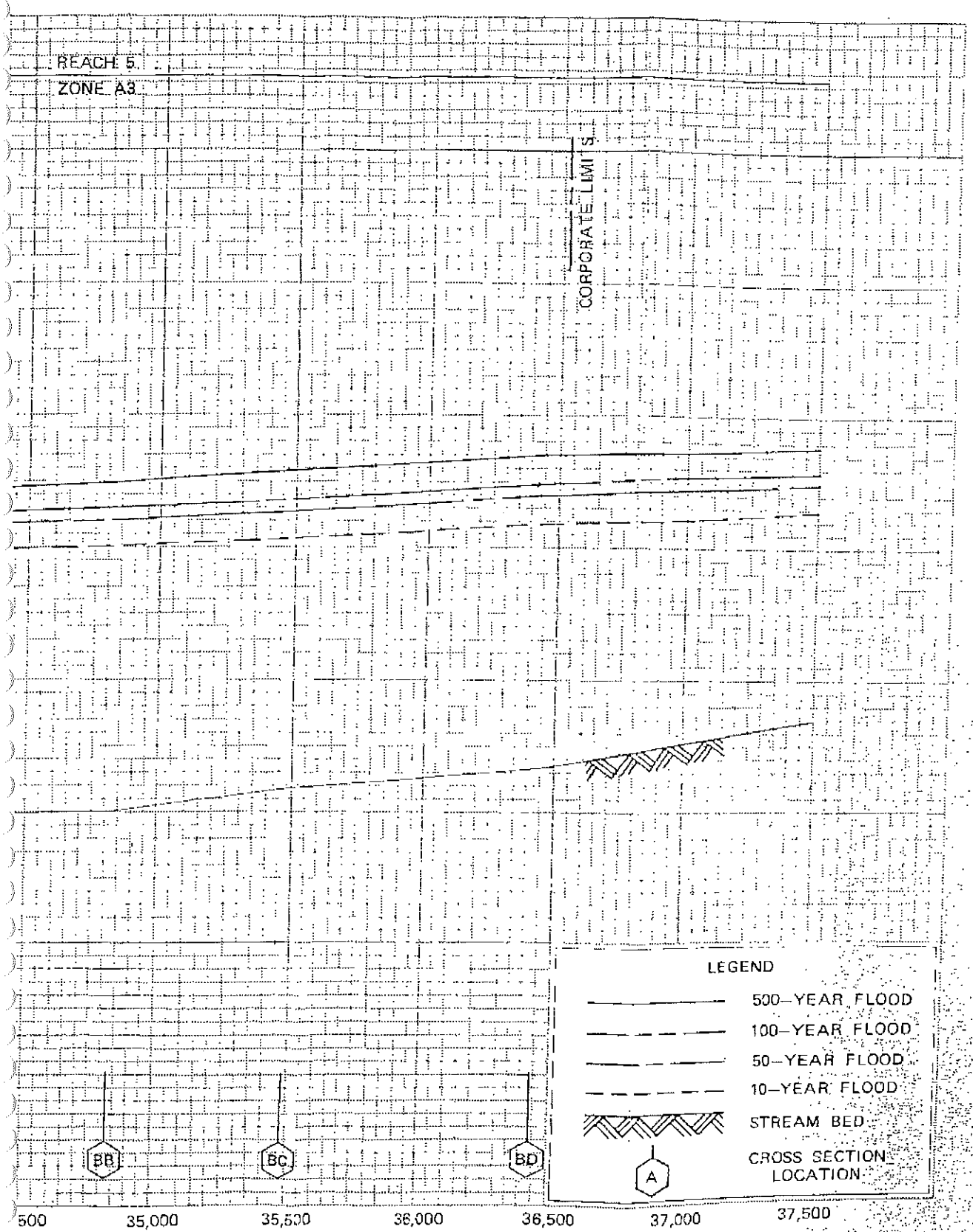
Leoni, general manager of C.J. Rogers Construction Co., will be guaranteed at least $150,000 a year. He will be paid $15 a load.

DeBlaise said the city will pay about $200,000 annually for the landfill, a saving of about $150,000 a year.

City residents will not be able to carry trash to the new landfill, Boggan said.

RM R.S.

APPENDIX B FEMA Flood Plain Map

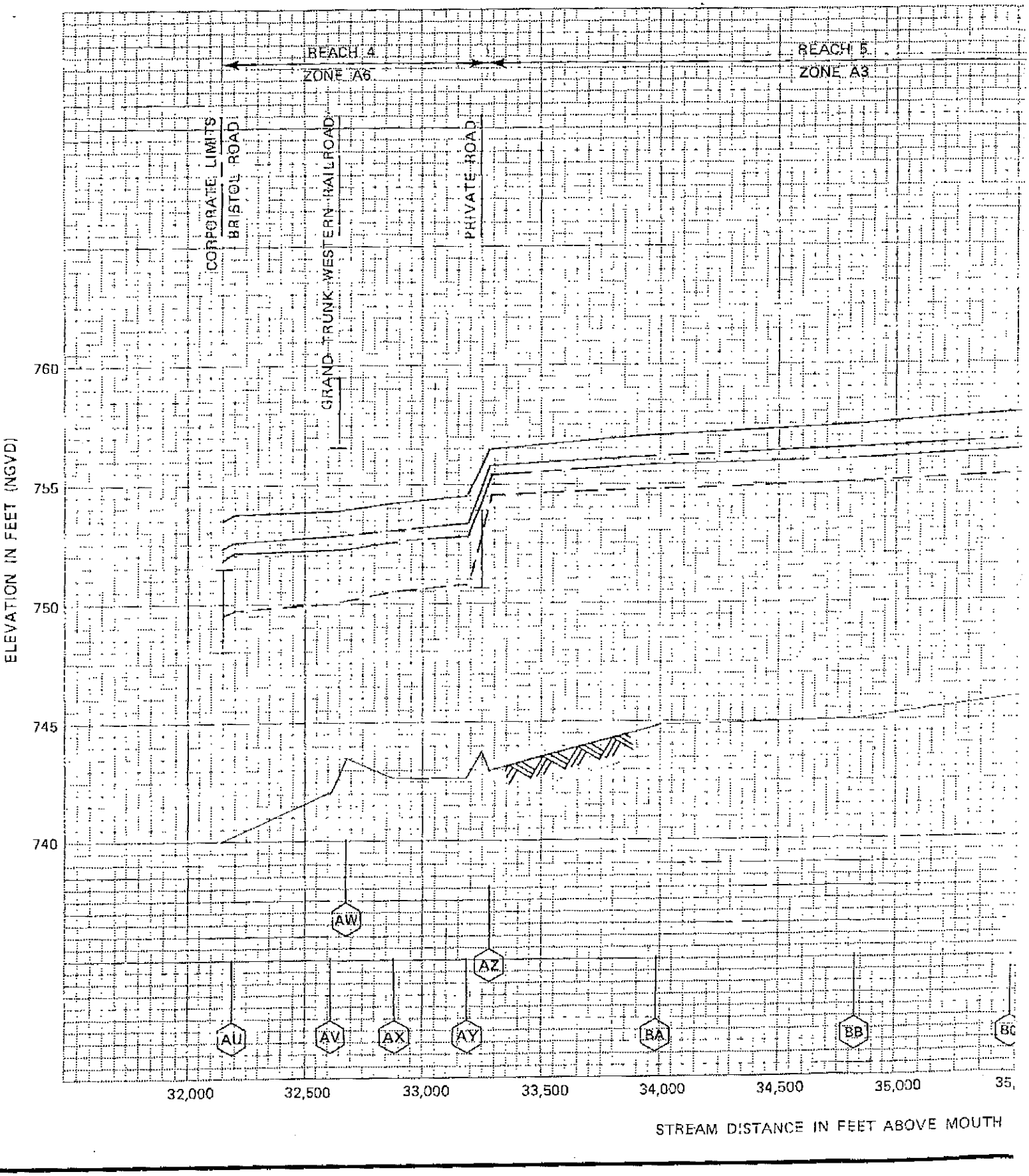


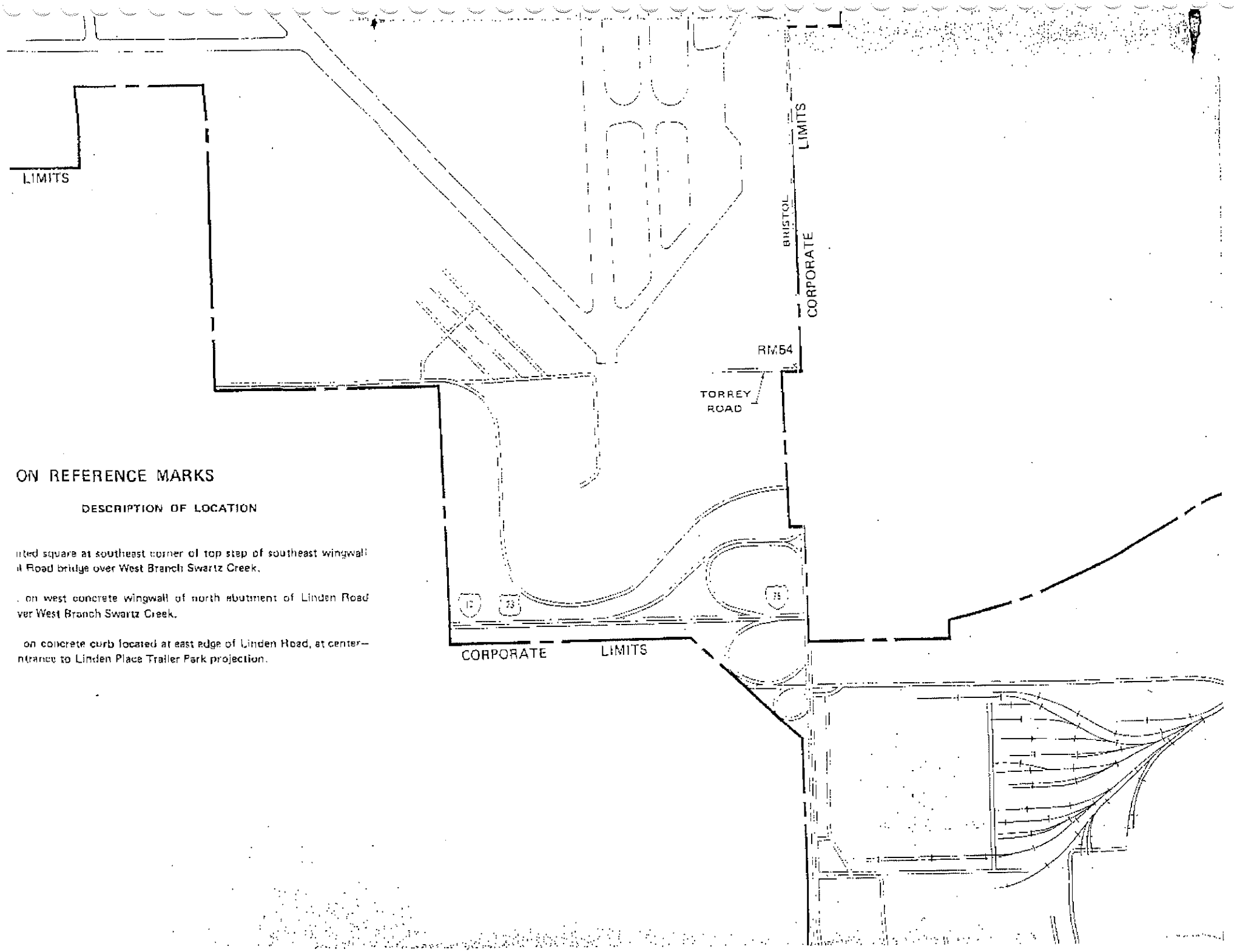
FLOOD PROFILES

SWARTZ CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY
Federal Insurance Administration
CITY OF FLINT, MI
(GENESEE CO.)

15P


REACH 4
ZONE A6
REACH 5
ZONE A3
CORPORATE LIMITS
BRISTOL ROAD
GRAND TRUNK WESTERN RAILROAD
PRIVATE ROAD
760
755
750
745
740
ELEVATION IN FEET (NGVD)
AU
AV
AW
AX
AY
AZ
BA
BB
BC
32,000
32,500
33,000
33,500
34,000
34,500
35,000
35,
STREAM DISTANCE IN FEET ABOVE MOUTH



ON REFERENCE MARKS

DESCRIPTION OF LOCATION

ited square at southeast corner of top step of southeast wingwall
d Road bridge over West Branch Swartz Creek.

. on west concrete wingwall of north abutment of Linden Road
ver West Branch Swartz Creek.

on concrete curb located at east edge of Linden Road, at center—
ntrance to Linden Place Trailer Park projection.

North
Swartz
Swartz Creek
RM46
RM47
RM48
RM49
RM24
RM23
PRIVATE ROAD
BRISTOL ROAD
MAPLE AVENUE
AIRPORT
BISHOP
CORPORATE LIMITS
AU
AW
AY
AX
AV
BA
BB
BC
BD

Basin Flint **Basin Number** 32B

Watercourse Swartz Cr

County Genesee **Drainage Area** 67 mi²

Township Flint **Description** @ Bristol Rd

Section 29/33

Town 7N

Range 6E

Discharge: 50 year frequency 2200 Hmc **100 year frequency** ~~2200~~ present 2600 Hmc

Method USGS FIS value (March 1978)

gage @ 67.3 mi² 148260

correlated with Flint #1485

Remarks additional values are : corel. co-f = .96

Q_{100}	d.a. (mi²)		sys. 14 yrs	extended 59 yr	round
6500	195	500	3210	3630	3600
4300	11.5	100	2450	2590	2600
		50	2130	2190	2200
		10	1390	1340	1400
		WRC shew	-.325	-.122	↑
		SYS shew	-.64	-.10	Use these HMC

1980 City of Flint FIS

TABLE 1 - SUMMARY OF DISCHARGES (continued)

FLOODING SOURCE AND LOCATION	DRAINAGE AREA SQ MILES	PEAK DISCHARGES (CFS) 10-YEAR	50-YEAR	100-YEAR	500-YEAR
SWARTZ CREEK					
At mouth	195	3,800	5,700	6,500	8,200
Above Thread Creek	130	2,500	3,800	4,300	5,400
Above Bristol Road	67.3	1,300	1,900	2,200	2,900

R.4501

File Number H-92175 9/9/92

OK to use 1 of 4/1/97

WATERCOURSE	COUNTY					
SWARTZ CREEK	GENESEE					
CITY/TWP	SEC	TWN	RNG	FIP	REMARK	
FLINT (T)	32/28	7N	6E	Yes		
FIELD	FDATE	INL	PRC	RECEIVED	STATUS	
		TLC	LAH	91-08-26	ACTIVE	
SDATE	OTHERNO	ACTION	ADATE			

CRITICAL BRIDGE? *YES/NO* ACTION ADATE

CHECK APPLICATION FOR COMPLETENESS ACTION ADATE

OTHER PROJECTS IN AREA?
1) Seven (7) Jobs on Swartz Creek in Sect 28
2)
3)

FIS? Yes

HAVE "Q"? Yes 22000 CFS

REQUEST"Q"? / / REC "Q" / /

SPECIAL INST: **check quad **reject proj **draft clearance
**OTHER... S-27-NE Windows w/s for crossing w/s via bridge o/s

STAFF FINDINGS: 10-2-92 TLC
MDOT's Hec-2 computer printout shows similar results for both options 1 & 2. Flood increases are minor enough that flood damage waivers could be obtained. Request damage waivers with submittal of formal app'l & plans. Also, note environmental concerns as to replacing bridge with culvert with shorter span.

10-26-92 TLC
Revised design submitted by Ayres Assoc with Hyd. Report. Hyd. Report Review by Bruce Weinberg and Results meet intent of ACT 167. Results Furnished by letter to Ayres Assoc. on 10-26-92 W/CC: MDOT

APPENDIX C City of Flint Documentation

City of Flint Utilities Department
Water Pollution Control Division

Investigation of Discharge from Bishop Airport Dump

Introduction

On April 21, 2006, the Law Department received a copy of a notice (attached), dated April 6, from the Michigan Department of Environmental Quality (MDEQ) about a discharge to a ditch leading to the South Branch of Swartz Creek. The discharge was flowing out of the abandoned City of Flint garbage dump at Bishop Airport. The notice was addressed to James L. Rice III, the Bishop Airport Director.

After the notice was forwarded to the City of Flint, the Water Pollution Control Division (WPCD) inspected the landfill to (1) measure the flow rate of the discharge, (2) determine the impact of the discharge on the receiving stream, and (3) look for other discharges from the dump to surface waters.

The Bishop Airport Authority responded to the notice by hiring an environmental consulting firm that specializes in environmental cleanups of sites like the abandoned dump to provide the information requested in the notice.

Inspection Findings

WPCD initially inspected the airport dump on April 27, 2006. Maps and photographs pertaining to the inspection are attached to this report.

Malodorous water was observed flowing at a rate of 570 gallons/day from a hole in the side of a bank about 10 feet above a ditch between the dump and a Grand Trunk Western railroad line. The ditch had impounded water in it. There was an orange colored substance, presumed to be iron bacterial slime, on the side of the ditch where the discharge flowed and in the ditch where there was water.

The South Branch of Swartz Creek was sampled and tested, both upstream and downstream, of the discharge from the ditch. Samples were tested for conventional water quality parameters. Grab samples were collected, and testing for dissolved oxygen, pH and conductivity were done on site. The discharge from the ditch had no impact on the water quality in the creek, as measured with the conventional parameters. The test results were as follows:

Swartz Creek South Branch Monitoring Data			
Parameter	**Units**	**Upstream**	**Downstream**
Ammonia Nitrogen	mg/L	<0.1	<0.1
Biochemical Oxygen Demand	mg/L	2.4	2.4
Color	Pt/Co Units	32	31
Conductivity	uS/cm	0.66	0.66
Dissolved Oxygen	mg/L	11	11
	% Saturation	107	107
pH	SU	8.4	8.4
Total Organic Carbon	mg/L	<0.1	<0.1
Total Phosphorus	mg/L	<0.1	<0.1
Total Suspended Solids	mg/L	5	5
Turbidity	NTU	6	6

The location and dimensions of the dump are unknown to WPCD. An area that appeared to be the dump (see the attached maps), based on the topography of the land was inspected to look for other sources of groundwater discharge to surface waters. The area surveyed was bordered by the ditch on the north side, the South Branch of Swartz Creek on the east side, an airport access road on the south side, and Franklin Drain on the west side. As shown on the attached map, groundwater was observed flowing out of this area into surface waters at several locations.

Vent # 1 was the source of groundwater discharge cited in the MDEQ notice. There was another vent (# 2) on top of the presumed dump that had groundwater flowing from it into the ditch, and there was what appeared to be another vent (# 3) on top of it that had no flow at the time. In addition, there was a depression on top of the presumed dump with standing water in it that seemed to be vernal wetland (labeled as "surface water" on the map).

Two springs (# 2 and 3) were observed flowing into the South Branch of Swartz Creek, and there was a dry spring (# 1) in a swale that drains into the creek. Three more springs (# 4, 5 and 6) were observed flowing into the Franklin Drain. The presumed iron bacterial slime was observed at the vents and all flowing springs.

A storm drain outfall with a heavy dry-weather discharge was observed on the other side of the South Branch of Swartz Creek from the presumed dump. The presumed iron bacterial slime was also observed at this outfall.

The location and flow of these watercourses were as follows:

Bishop Airport Dump Watercourses			
Site	Flow	Location	
		Latitude	Longitude
Vent # 1	570 gpd	42° 58' 19.241N	83° 45' 38.457W
Vent # 2	trickle	42° 58' 18.163N	83° 45' 42.422W
Vent # 3	dry	42° 58' 17.350N	83° 45' 44.085W
Spring # 1	dry	42° 58' 15.195N	83° 45' 30.602W
Spring # 2	trickle	42° 58' 16.311N	83° 45' 30.435W
Spring # 3	trickle	42° 58' 17.519N	83° 45' 30.872W
Spring # 4	trickle	42° 58' 10.209N	83° 46' 05.635W
Spring # 5	trickle	42° 58' 06.033N	83° 46' 04.463W
Spring # 6	trickle	42° 58' 03.656N	83° 46' 03.843W
Surface Water	trickle	42° 58' 15.303N	83° 45' 55.006W

Consultant Findings

Wilcox Professional Services issued a report (attached) summarizing the findings of its investigation of the groundwater discharge from the dump. It was determined that the levels of iron, benzene and diethyl ether in water samples and arsenic, cobalt, iron, mercury, selenium and zinc in soil samples exceeded the cleanup criteria in the Michigan Natural Resources and Environmental Protection Act Part 201 rules. Because of this finding, the dump is a "facility" (a site of environmental contamination) which may be required by the MDEQ to be remediated under these rules.

City of Flint Utilities Department
Water Pollution Control Division

Inspection of Bishop Airport Dump on July 6, 2006

On July 6, 2006, Bob Misekow, Utilities Director, and Brad Hill, Environmental Compliance Supervisor, briefly inspected the abandoned dump at Bishop Airport. The primary purpose of this visit was for introducing the Director to the dump site and the location of the groundwater discharge cited by the MDEQ in its April 6, 2006 notice to the Bishop International Airport Authority.

On this occasion, there appeared to be no discharge at the location cited by the MDEQ, where groundwater was previously found to be flowing at a rate of 570 gallons per day on April 27th by the Water Pollution Control Division.

Several other areas of the site where groundwater had been observed flowing into surface waters on April 27th were inspected. No groundwater flow was evident. Dense vegetation along the Franklin Drain hindered finding areas where groundwater flows had also been observed on April 27th, and this had to be postponed, as Mr. Hill's work shift was about to expire.

The Water Pollution Control Division inspected the site again on July 11, 2006 and located, positively identified (by GPS), marked and observed all locations inspected on April 27th. The report for this inspection is attached to this one.

City of Flint Utilities Department
Water Pollution Control Division

Inspection of Bishop Airport Dump on July 19, 2006

On July 19, 2006, Bob Misekow, Utilities Director, Trachelle Young, City Attorney, and Brad Hill, Environmental Compliance Supervisor, briefly inspected the abandoned dump at Bishop Airport. The primary purpose of this visit was for introducing the City Attorney to the dump site and the location of the groundwater discharge cited by the MDEQ in its April 6, 2006 notice to the Bishop International Airport Authority.

As depicted below, on this occasion, there appeared to be no discharge at the location cited by the MDEQ.



City of Flint Utilities Department
Water Pollution Control Division

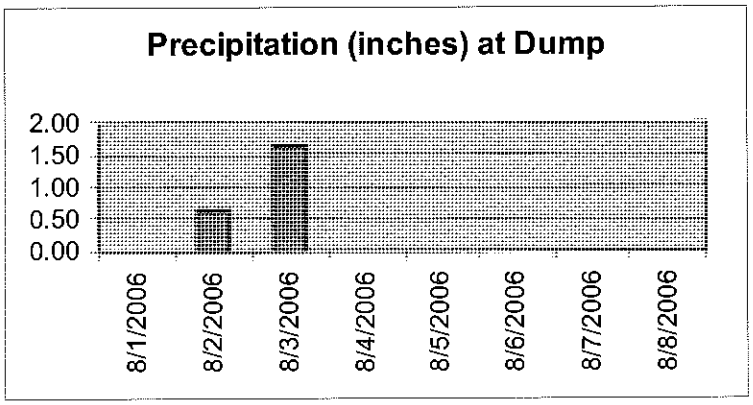
Inspection of Bishop Airport Dump on August 8, 2006

On August 8, 2006, Eric Brubaker, Environmental Compliance Inspector, and Tom Hutchings, Sr. Environmental Compliance Analyst, inspected the abandoned dump at Bishop Airport. The purpose of this visit was for introducing Eric to the dump site and to observe the location of the groundwater discharge cited by the MDEQ in its April 6, 2006 notice to the Bishop International Airport Authority.

As depicted below, there appeared to be no discharge at the location cited by the MDEQ.



The precipitation amounts during the week preceding the inspection at the dump were:



City of Flint Utilities Department
Water Pollution Control Division

Inspection of Bishop Airport Dump on August 15 and 16, 2006

On August 15, 2006, Tom Hutchings, Sr. Environmental Compliance Analyst, and Thad Domick, Environmental Compliance Analyst, inspected the abandoned dump at Bishop Airport. It was inspected again on the following day by Eric Brubaker, Environmental Compliance Inspector, and Mr. Hutchings.

On both days, there appeared to be no discharge at the location cited by the MDEQ, as indicated in the following photograph taken on August 15.



There was no precipitation at the dump during the week preceding the inspections.

City of Flint Utilities Department
Water Pollution Control Division

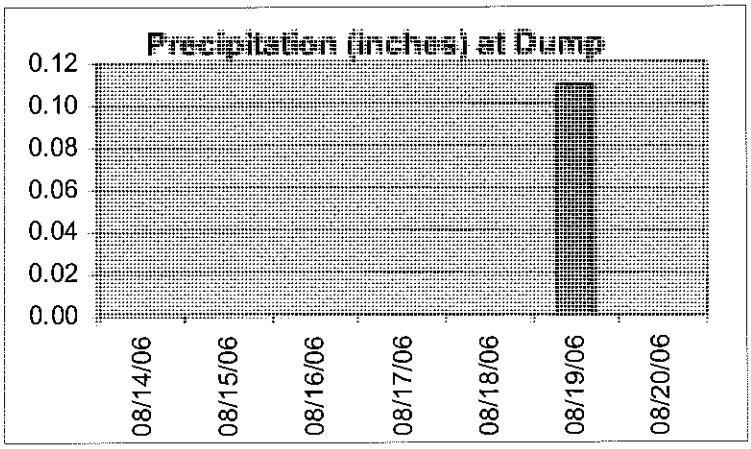
Inspection of Bishop Airport Dump on August 21, 2006

On August 21, 2006, Tom Hutchings, Sr. Environmental Compliance Analyst, inspected the abandoned dump at Bishop Airport.

There appeared to be no discharge at the location cited by the MDEQ, as indicated in the following photograph:



The amount of measurable precipitation at the dump during the week preceding the inspection was as follows:

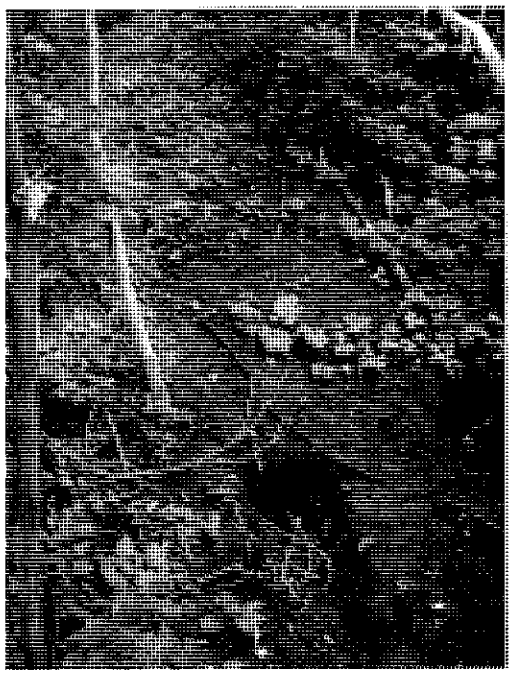


City of Flint Utilities Department
Water Pollution Control Division

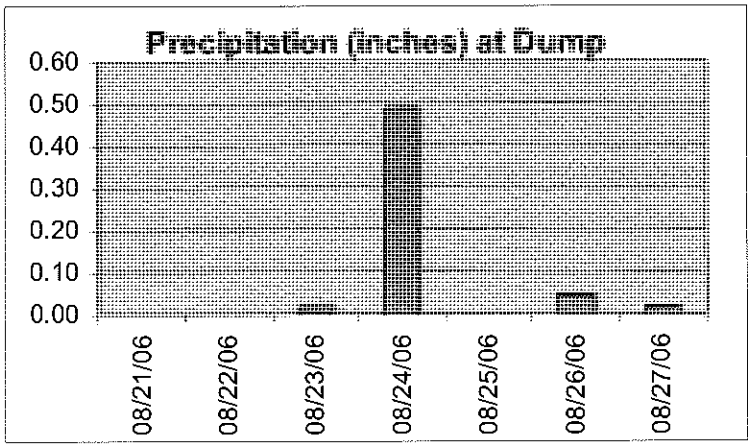
Inspection of Bishop Airport Dump on August 28, 2006

On August 28, 2006, Tom Hutchings, Sr. Environmental Compliance Analyst, inspected the abandoned dump at Bishop Airport.

There appeared to be no discharge at the location cited by the MDEQ, as indicated in the following photograph:



The amount of measurable precipitation at the dump during the week preceding the inspection was as follows:



City of Flint Utilities Department
Water Pollution Control Division

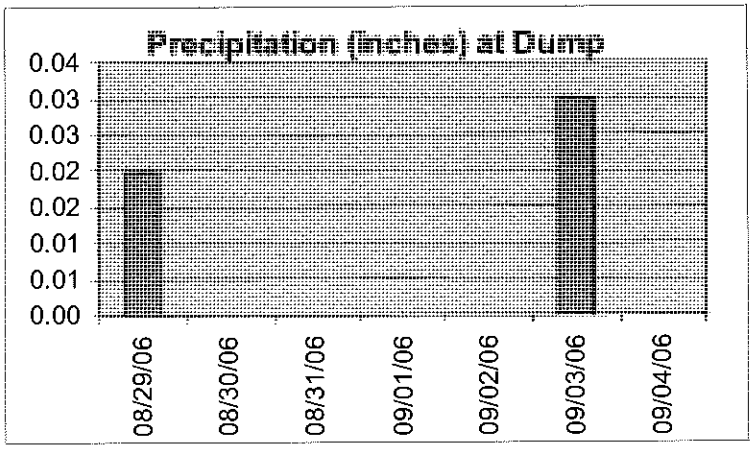
Inspection of Bishop Airport Dump on September 5, 2006

On September 5, 2006, Tom Hutchings, Sr. Environmental Compliance Analyst, Eric Brubaker, Environmental Compliance Inspector, and Brad Hill, Environmental Compliance Supervisor, inspected the abandoned dump at Bishop Airport.

There appeared to be no discharge at the location cited by the MDEQ, as indicated in the following photograph:



The amount of measurable precipitation at the dump during the week preceding the inspection was as follows:

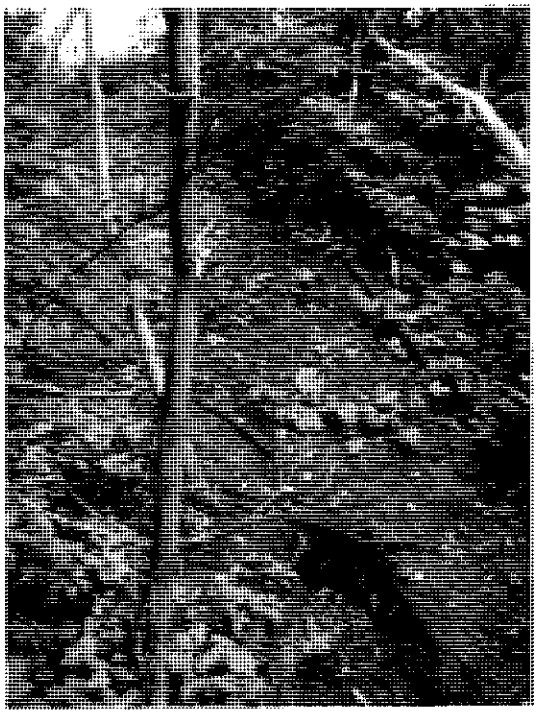


City of Flint Utilities Department
Water Pollution Control Division

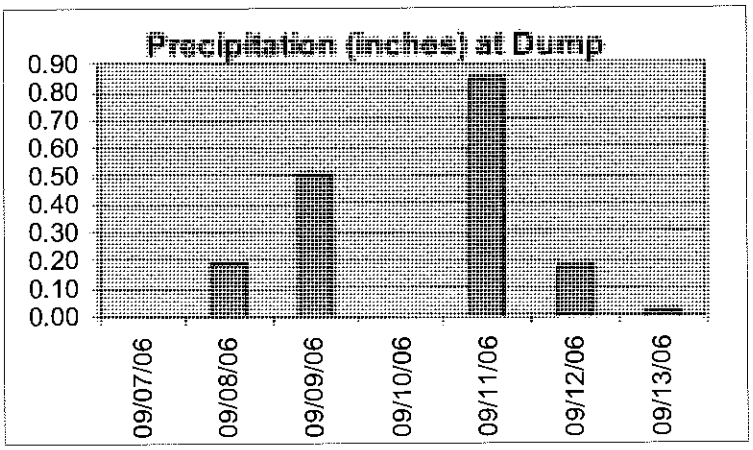
Inspection of Bishop Airport Dump on September 14, 2006

On September 14, 2006, Tom Hutchings, Sr. Environmental Compliance Analyst, inspected the abandoned dump at Bishop Airport.

There appeared to be no discharge at the location cited by the MDEQ, as indicated in the following photograph:



The amount of measurable precipitation at the dump during the week preceding the inspection was as follows:



City of Flint Utilities Department
Water Pollution Control Division

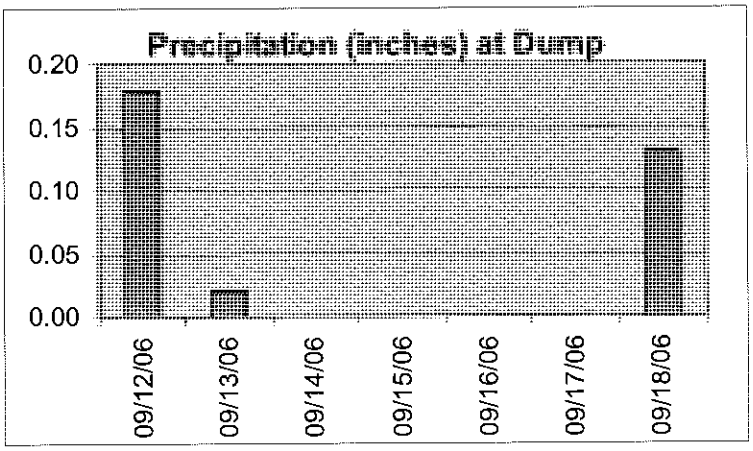
Inspection of Bishop Airport Dump on September 19, 2006

On September 19, 2006, Tom Hutchings, Sr. Environmental Compliance Analyst, inspected the abandoned dump at Bishop Airport.

There appeared to be no discharge at the location cited by the MDEQ, as indicated in the following photograph:



The amount of measurable precipitation at the dump during the week preceding the inspection was as follows:



City of Flint Utilities Department
Water Pollution Control Division

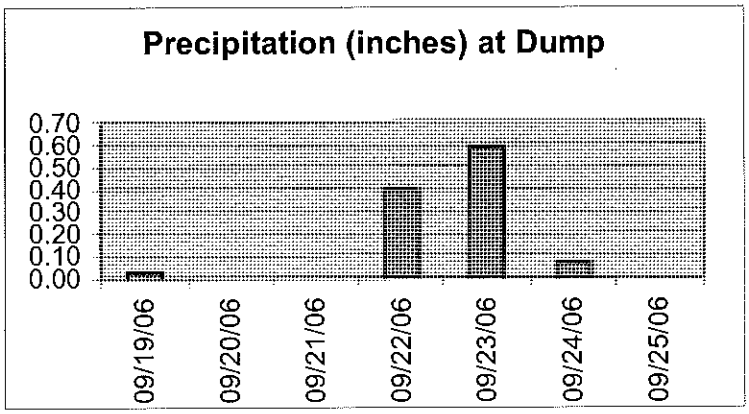
Inspection of Bishop Airport Dump on September 26, 2006

On September 26, 2006, Tom Hutchings, Sr. Environmental Compliance Analyst, inspected the abandoned dump at Bishop Airport.

There appeared to be no discharge at the location cited by the MDEQ, as indicated in the following photograph:



The amount of measurable precipitation at the dump during the week preceding the inspection was as follows:



City of Flint Utilities Department
Water Pollution Control Division

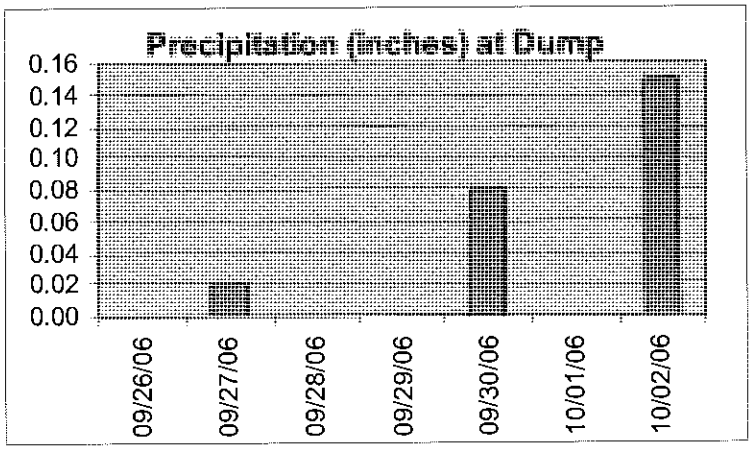
Inspection of Bishop Airport Dump on October 3, 2006

On October 3, 2006, Tom Hutchings, Sr. Environmental Compliance Analyst, and Dawn Welsh, Environmental Compliance Analyst, inspected the abandoned dump at Bishop Airport.

There appeared to be no discharge at the location cited by the MDEQ, as indicated in the following photograph:



The amount of measurable precipitation at the dump during the week preceding the inspection was as follows:



City of Flint Utilities Department
Water Pollution Control Division

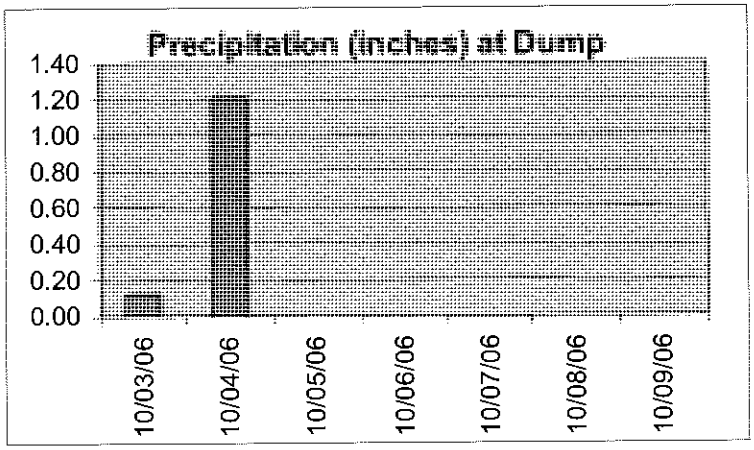
Inspection of Bishop Airport Dump on October 10, 2006

On October 10, 2006, Tom Hutchings, Sr. Environmental Compliance Analyst, inspected the abandoned dump at Bishop Airport.

There appeared to be no discharge at the location cited by the MDEQ, as indicated in the following photograph:



The amount of measurable precipitation at the dump during the week preceding the inspection was as follows:



City of Flint Utilities Department
Water Pollution Control Division

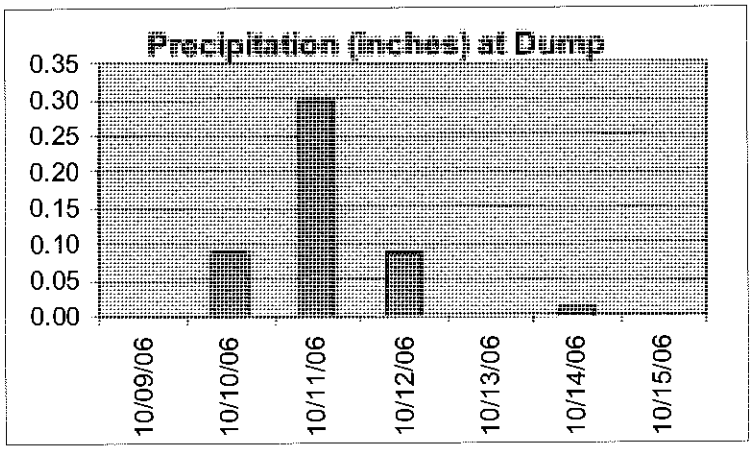
Inspection of Bishop Airport Dump on October 16, 2006

On October 16, 2006, Tom Hutchings, Sr. Environmental Compliance Analyst, inspected the abandoned dump at Bishop Airport.

There appeared to be no discharge at the location cited by the MDEQ, as indicated in the following photograph:



The amount of measurable precipitation at the dump during the week preceding the inspection was as follows:



City of Flint Utilities Department
Water Pollution Control Division

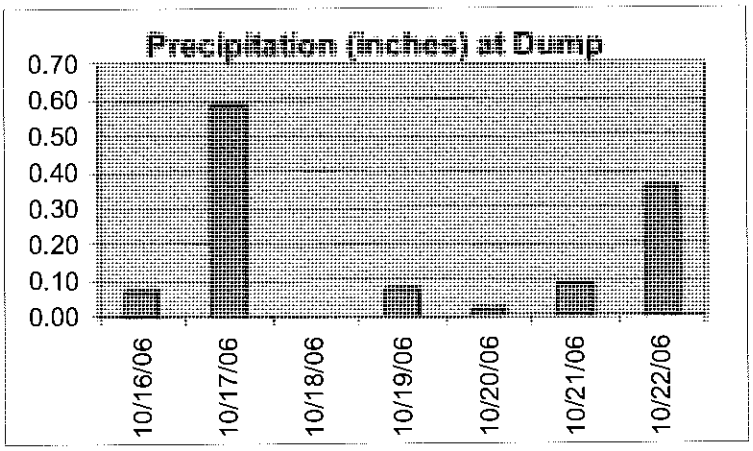
Inspection of Bishop Airport Dump on October 23, 2006

On October 23, 2006, Tom Hutchings, Sr. Environmental Compliance Analyst, inspected the abandoned dump at Bishop Airport.

There appeared to be no discharge at the location cited by the MDEQ, as indicated in the following photograph:



The amount of measurable precipitation at the dump during the week preceding the inspection was as follows:



City of Flint Utilities Department
Water Pollution Control Division

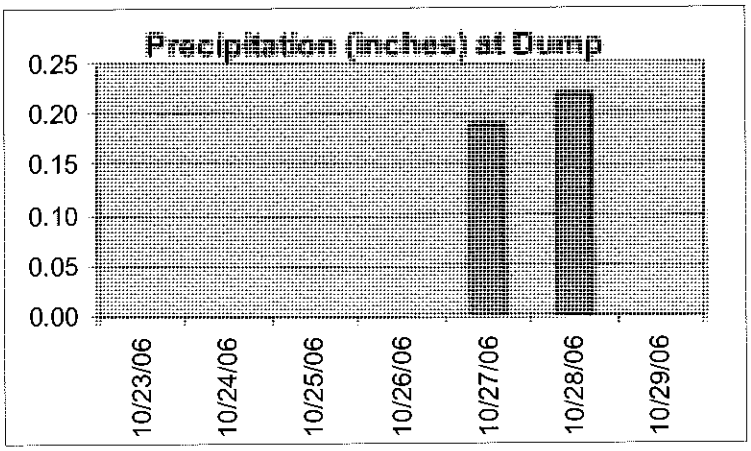
Inspection of Bishop Airport Dump on October 30, 2006

On October 30, 2006, Tom Hutchings, Sr. Environmental Compliance Analyst, inspected the abandoned dump at Bishop Airport.

There appeared to be no discharge at the location cited by the MDEQ, as indicated in the following photograph:



The amount of measurable precipitation at the dump during the week preceding the inspection was as follows:



City of Flint Utilities Department
Water Pollution Control Division

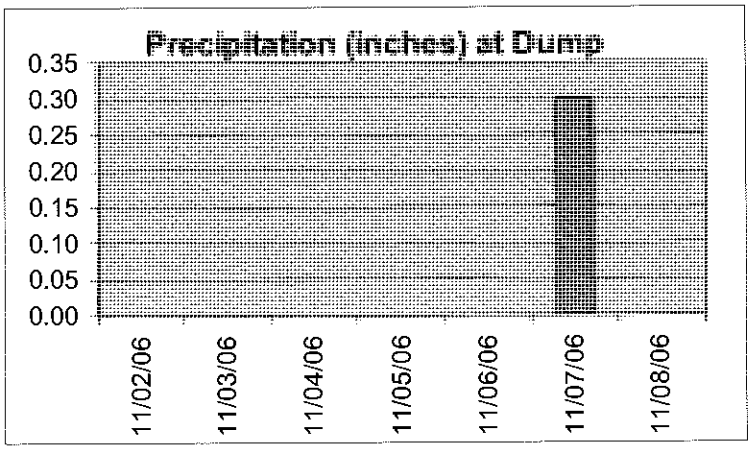
Inspection of Bishop Airport Dump on November 9, 2006

On November 9, 2006, Tom Hutchings, Sr. Environmental Compliance Analyst, inspected the abandoned dump at Bishop Airport.

There appeared to be no discharge at the location cited by the MDEQ, as indicated in the following photograph:



The amount of measurable precipitation at the dump during the week preceding the inspection was as follows:



City of Flint Utilities Department
Water Pollution Control Division

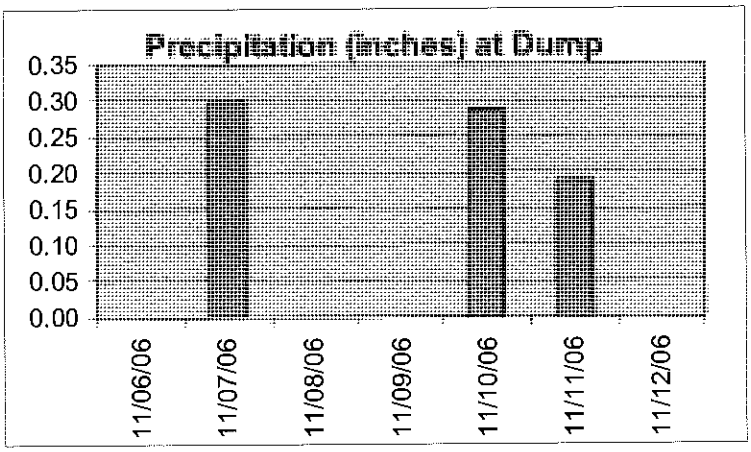
Inspection of Bishop Airport Dump on November 13, 2006

On November 13, 2006, Tom Hutchings, Sr. Environmental Compliance Analyst, inspected the abandoned dump at Bishop Airport.

There appeared to be no discharge at the location cited by the MDEQ, as indicated in the following photograph:



The amount of measurable precipitation at the dump during the week preceding the inspection was as follows:



City of Flint Utilities Department
Water Pollution Control Division

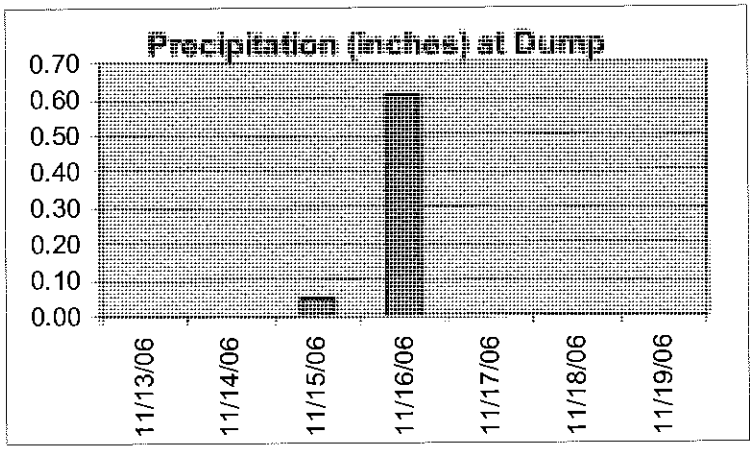
Inspection of Bishop Airport Dump on November 20, 2006

On November 20, 2006, Tom Hutchings, Sr. Environmental Compliance Analyst, inspected the abandoned dump at Bishop Airport.

There appeared to be no discharge at the location cited by the MDEQ, as indicated in the following photograph:



The amount of measurable precipitation at the dump during the week preceding the inspection was as follows:



City of Flint Utilities Department
Water Pollution Control Division

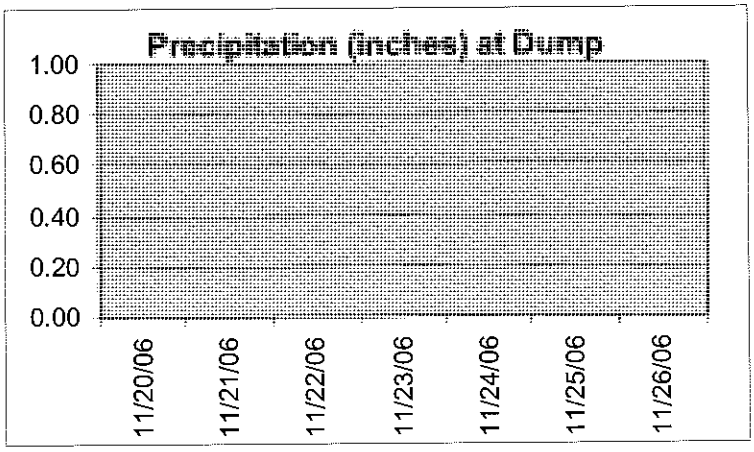
Inspection of Bishop Airport Dump on November 27, 2006

On November 27, 2006, Tom Hutchings, Sr. Environmental Compliance Analyst, inspected the abandoned dump at Bishop Airport.

There appeared to be no discharge at the location cited by the MDEQ, as indicated in the following photograph:



The amount of measurable precipitation at the dump during the week preceding the inspection was as follows:



City of Flint Utilities Department
Water Pollution Control Division

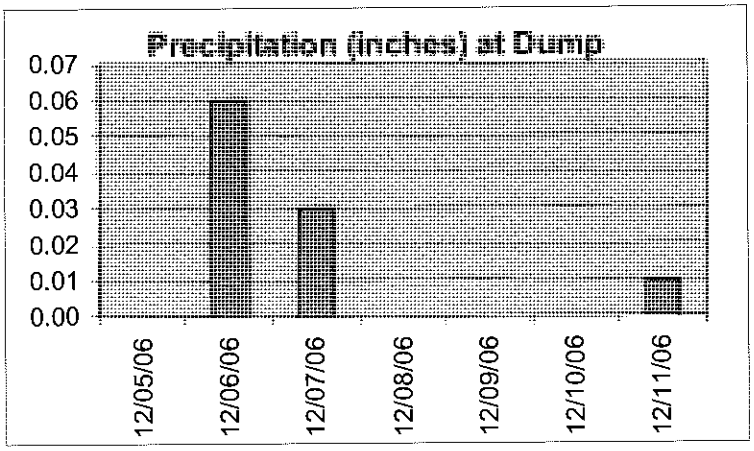
Inspection of Bishop Airport Dump on December 11, 2006

On December 11, 2006, Tom Hutchings, Sr. Environmental Compliance Analyst, inspected the abandoned dump at Bishop Airport. Mark Fulks, P.E., Water Pollution Control Coordinator, also visited the site.

There was a steady discharge at the location cited by the MDEQ, as indicated in the following photograph:



The amount of measurable precipitation at the dump during the week preceding the inspection was as follows:



City of Flint Utilities Department
Water Pollution Control Division

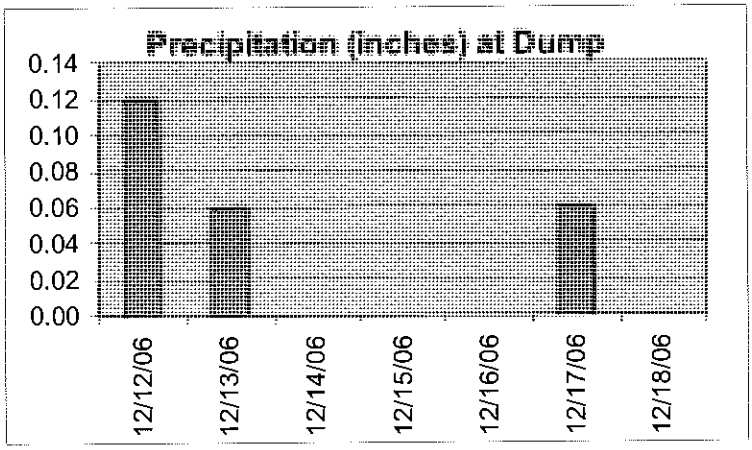
Inspection of Bishop Airport Dump on December 17, 2006

On December 17, 2006, Tom Hutchings, Sr. Environmental Compliance Analyst, inspected the abandoned dump at Bishop Airport. Mark Fulks, P.E., Water Pollution Control Coordinator, and Brad Hill, Environmental Compliance Supervisor, also visited the site.

There was a steady discharge at the location cited by the MDEQ, as indicated in the following photograph:



The amount of measurable precipitation at the dump during the week preceding the inspection was as follows:



City of Flint Utilities Department
Water Pollution Control Division

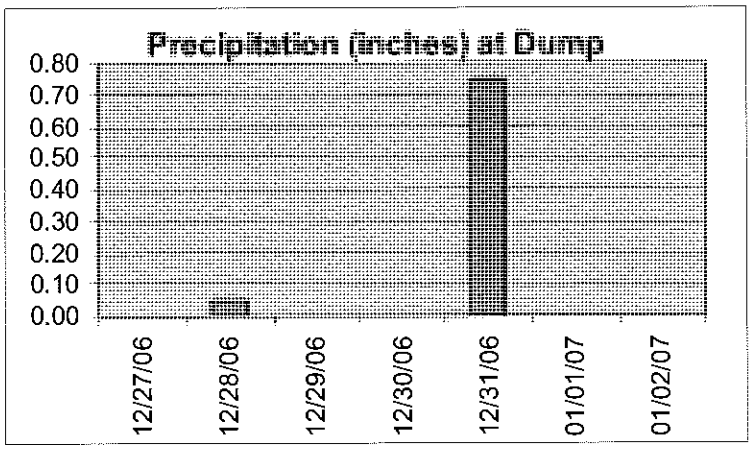
Inspection of Bishop Airport Dump on January 3, 2007

On January 3, 2007, Tom Hutchings, Sr. Environmental Compliance Analyst, inspected the abandoned dump at Bishop Airport.

There was a steady discharge at the location cited by the MDEQ, as indicated in the following photograph:



The amount of measurable precipitation at the dump during the week preceding the inspection was as follows:



City of Flint Utilities Department
Water Pollution Control Division

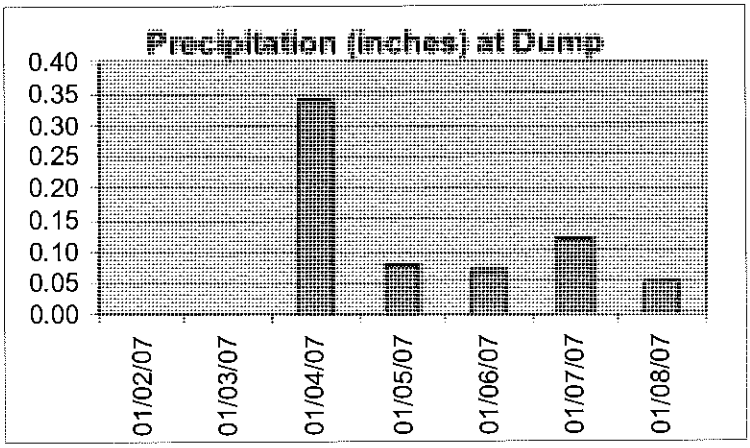
Inspection of Bishop Airport Dump on January 9, 2007

On January 9, 2007, Tom Hutchings, Sr. Environmental Compliance Analyst, and Dawn Welsh, Sr. Environmental Compliance Analyst, inspected the abandoned dump at Bishop Airport.

There was a steady discharge at the location cited by the MDEQ, as indicated in the following photograph:



The amount of measurable precipitation at the dump during the week preceding the inspection was as follows:



City of Flint Utilities Department
Water Pollution Control Division

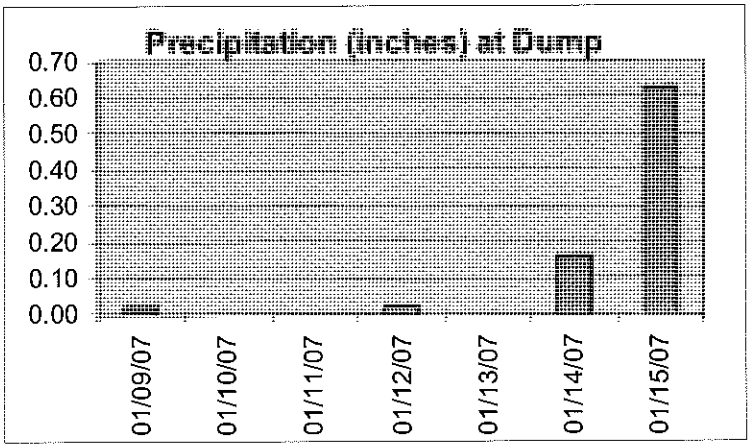
Inspection of Bishop Airport Dump on January 16, 2007

On January 16, 2007, Tom Hutchings, Sr. Environmental Compliance Analyst, and Dawn Welsh, Sr. Environmental Compliance Analyst, inspected the abandoned dump at Bishop Airport.

There was a steady discharge at the location cited by the MDEQ, as indicated in the following photograph:



The amount of measurable precipitation at the dump during the week preceding the inspection was as follows:



City of Flint Utilities Department
Water Pollution Control Division

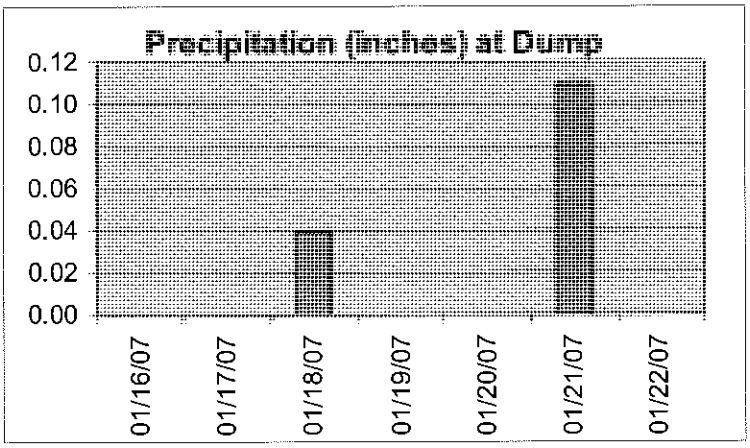
Inspection of Bishop Airport Dump on January 23, 2007

On January 23, 2007, Tom Hutchings, Sr. Environmental Compliance Analyst, inspected the abandoned dump at Bishop Airport.

There was a steady discharge at the location cited by the MDEQ, as indicated in the following photograph:



The amount of measurable precipitation at the dump during the week preceding the inspection was as follows:

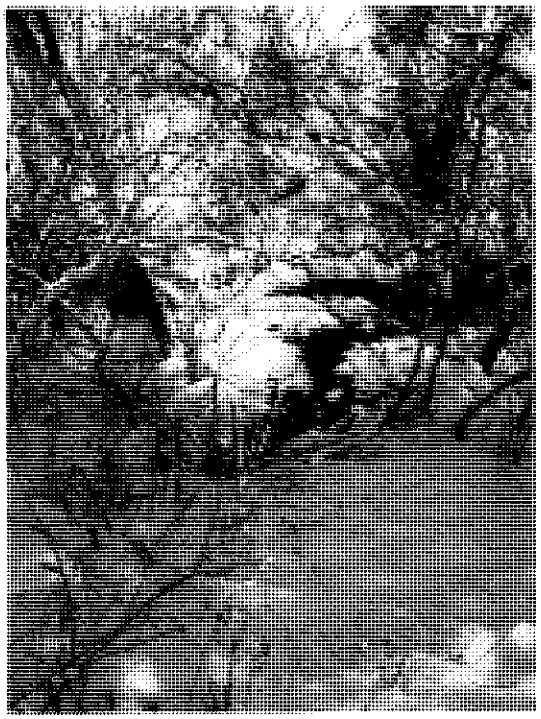


City of Flint Utilities Department
Water Pollution Control Division

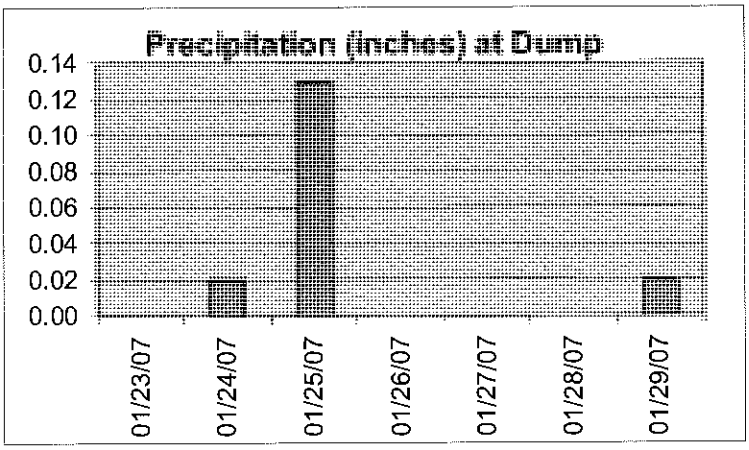
Inspection of Bishop Airport Dump on January 30, 2007

On January 30, 2007, Tom Hutchings, Sr. Environmental Compliance Analyst, inspected the abandoned dump at Bishop Airport.

There was a steady discharge at the location cited by the MDEQ, as indicated in the following photograph:



The amount of measurable precipitation at the dump during the week preceding the inspection was as follows:



City of Flint Utilities Department
Water Pollution Control Division

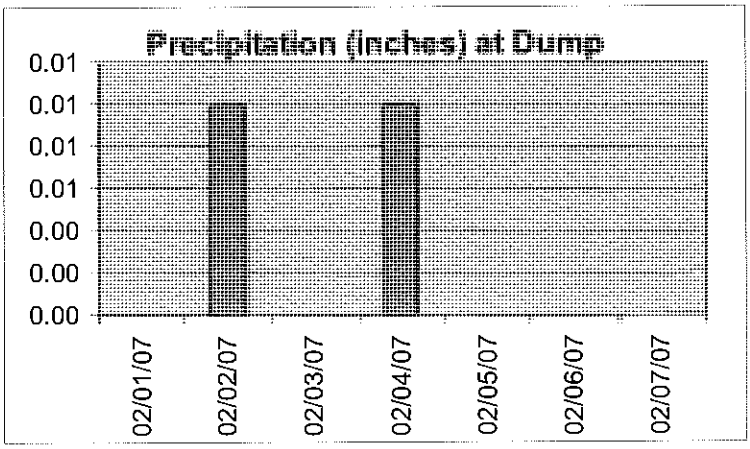
Inspection of Bishop Airport Dump on February 8, 2007

On February 8, 2007, Tom Hutchings, Sr. Environmental Compliance Analyst, inspected the abandoned dump at Bishop Airport.

There was a slow discharge at the location cited by the MDEQ, as indicated in the following photograph:



The amount of measurable precipitation at the dump during the week preceding the inspection was as follows:



City of Flint Utilities Department
Water Pollution Control Division

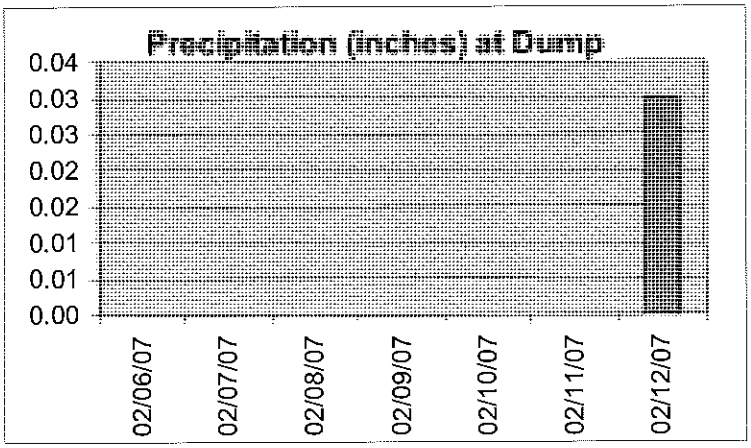
Inspection of Bishop Airport Dump on February 13, 2007

On February 13, 2007, Tom Hutchings, Sr. Environmental Compliance Analyst, inspected the abandoned dump at Bishop Airport.

There was no discharge at the location cited by the MDEQ, as indicated in the following photograph:



The amount of measurable precipitation at the dump during the week preceding the inspection was as follows:



City of Flint Utilities Department
Water Pollution Control Division

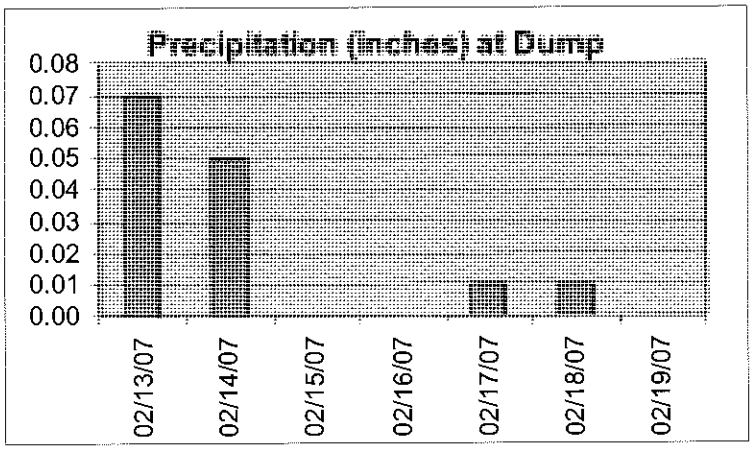
Inspection of Bishop Airport Dump on February 20, 2007

On February 20, 2007, Tom Hutchings, Sr. Environmental Compliance Analyst, inspected the abandoned dump at Bishop Airport.

There was a slight discharge at the location cited by the MDEQ, as indicated in the following photograph:



The amount of measurable precipitation at the dump during the week preceding the inspection was as follows:



City of Flint Utilities Department
Water Pollution Control Division

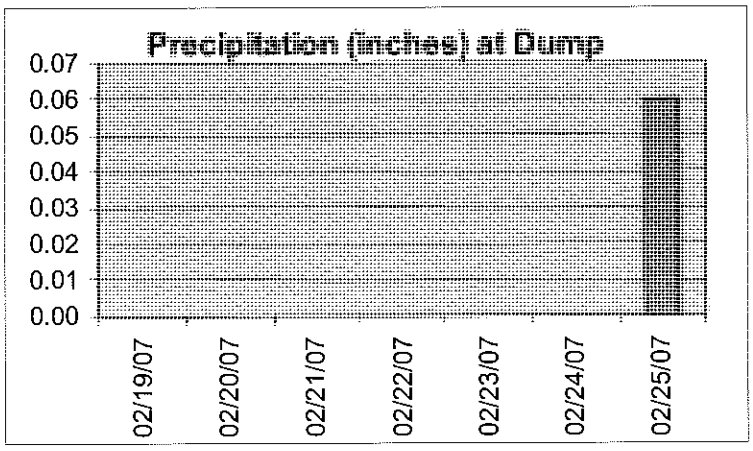
Inspection of Bishop Airport Dump on February 27, 2007

On February 27, 2007, Tom Hutchings, Sr. Environmental Compliance Analyst, inspected the abandoned dump at Bishop Airport.

There was no discharge at the location cited by the MDEQ, as indicated in the following photograph:



The amount of measurable precipitation at the dump during the week preceding the inspection was as follows:



City of Flint Utilities Department
Water Pollution Control Division

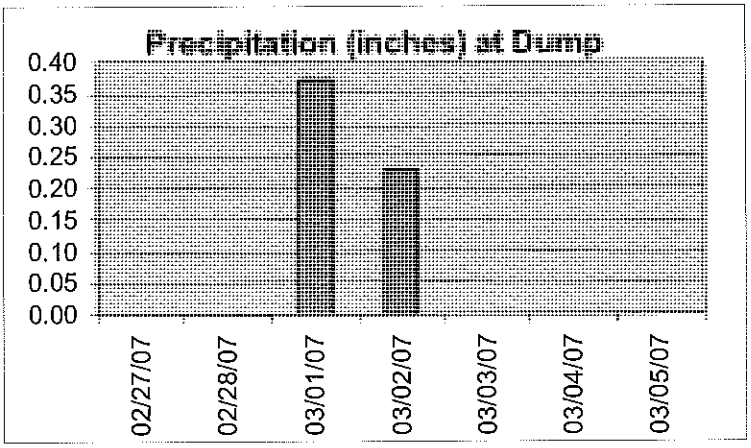
Inspection of Bishop Airport Dump on March 6, 2007

On March 6, 2007, Tom Hutchings, Sr. Environmental Compliance Analyst, inspected the abandoned dump at Bishop Airport.

There was no discharge at the location cited by the MDEQ, as indicated in the following photograph:



The amount of measurable precipitation at the dump during the week preceding the inspection was as follows:



APPENDIX D Data Provided by Bishop International Airport

Bishop International Airport Authority

MICHAEL F. MANLEY
Chairperson

WINFIELD L. COOPER, III
Vice-Chairperson

CLAUDIA F. SHELTON
Secretary

MICHAEL T. JOLIAT
Treasurer

GUY D. BRIGGS
BISHOP ODIS A. FLOYD
CHARLIE MARSHALL
MICHAEL McNAMARA
JERRY PRESTON

JAMES L. RICE II, A.A.E.
Airport Director

April 24, 2007

Mr. Kevin D. Lund, PE, CPG
GEO-Environmental Resources, Inc.
2521 Jackson Road
Ann Arbor, MI 48103

RE: FOIA Request

Dear Mr. Lund:

Enclosed please find the soil boring information related to your request. As shown on these documents it appears the landfill material was present at various locations, and not at others. This should help with your efforts to delineate the limits of the landfill. As I stated in our discussion, the FAA may have additional data for the southerly limits in association with their installation of the navigational aids.

Please let me know if you have any questions.

Sincerely,

Michael G. Trout, A.A.E.
Deputy Airport Director

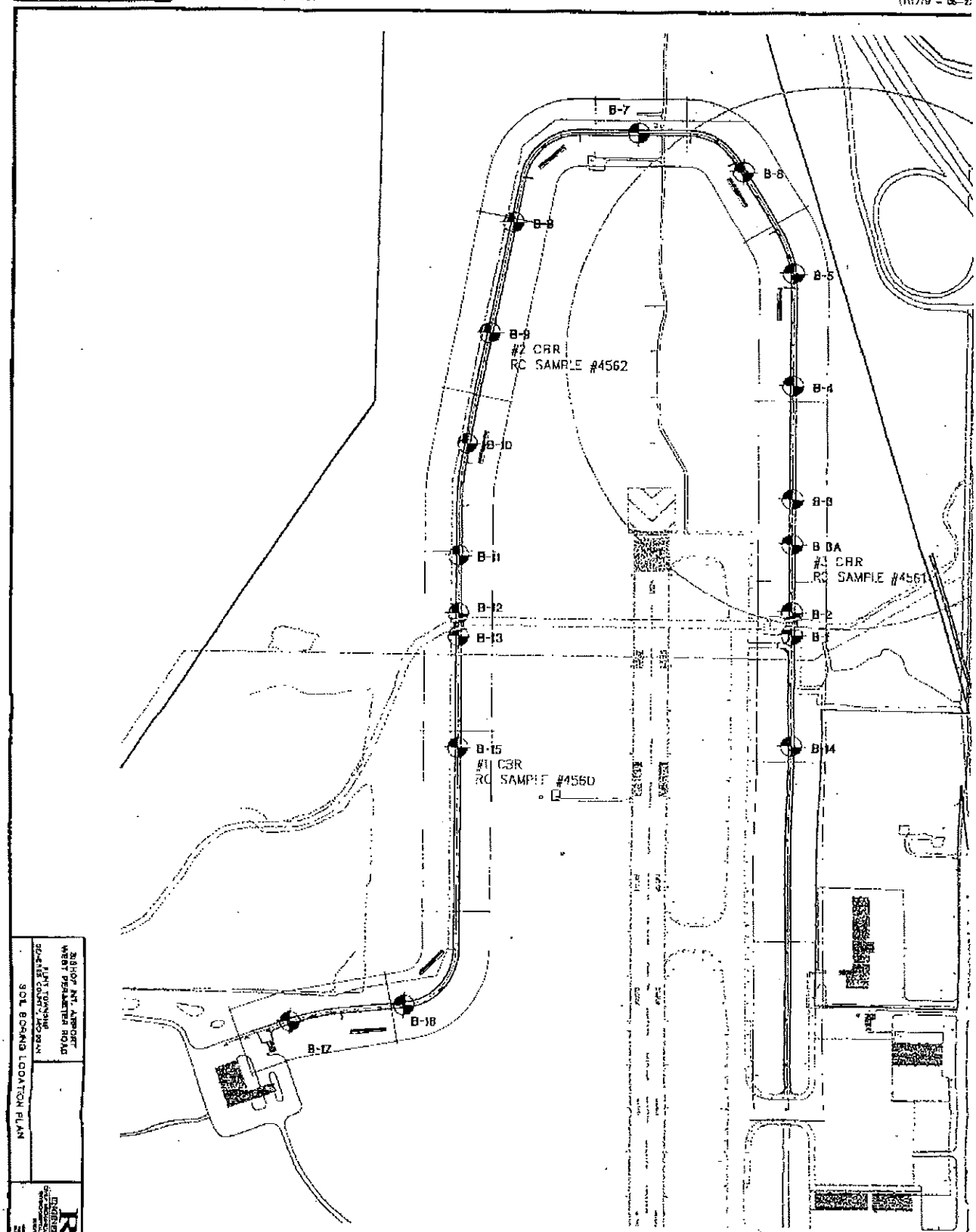
Enclosure

BISHOP INTERNATIONAL AIRPORT
WEST PERIMETER ROAD
FLINT, MICHIGAN

SUBSURFACE DISCLAIMER

THE FOLLOWING IS A SUBSURFACE INVESTIGATION REPORT PREPARED BY RC AND ASSOCIATES, INC. FOR THE OWNER. HOWEVER, SUCH REPORT IS SPECIFICALLY NOT MADE A PART OF THE CONTRACT DOCUMENTS. IT IS THE GENERAL REFERENCE PURPOSES ONLY, AND OWNER DOES NOT GUARANTEE THE ACCURACY, ADEQUACY, OR COMPLETENESS THEREOF. THIS REPORT IS MADE AVAILABE SOLELY FOR THE CONVENIENCE OF THE CONTRACTOR WHO IS ENCOURAGED TO PERFORM HIS OWN SUBSURFACE TESTING AND NOT TO RELY IN ANY MANNER UPON THIS REPORT IN FORMULATING HIS BID OR PERFORMING THE WORK. SUCH REPORT IS NOT INTENDED TO PROVIDE POSITIVE ASSERTIONS OF FACT. NO ASSERTIONS OR STATEMENTS CONTAINED IN SUCH REPORT SHOULD BE RELIED UPON BY CONTRACTOR AS POSITIVE STATEMENTS OF FACT, AND THE SPECIFICALLY DISCLAIMS ANY RESPONSIBILITY OR LIABILITY FOR THE SAME, IF ANY, THEREIN.

NOT PUBLISHED, ALL RIGHTS RESERVED



BISHOP INT. AIRPORT
WEST PERIMETER ROAD
SAGINAW COUNTY, MICHIGAN
SOIL BORING LOCATION PLAN

RC ENGINEERING, INC.

CSB

26814

SOIL BORING LO

Boring No: B-1

Project: West Perimeter Road - Bishop International Airport RC Project No: G-28914C

Location: Bishop International Airport - Flint, Michigan Client: Inland Seas Engineering

DESCRIPTION Ground Surface Elevation =	Depth (ft)	Sample No. & Type	N (Blows per ft.)	q_u (tsf)	q_p (tsf)	c_T (tsf)	γ (pcf)	w (%)	LL/PI (%)	PID (ppm)
Fine to coarse silty SAND; some clay, trace fine gravel and organics - brown - moist - medium dense (SM)		1-SS	20		4 1/2+			14		
	5	2-SS	22					9		
Sandy CLAY; trace to some silt, organics (roots, wood and buried swamp material), trace fine gravel - brown, turns gray @ about 13 feet - moist, turns wet @ about 10' 2" - hard to stiff (CL)		3-SS	12		4 1/2+		113.3	15		
	10	4-SS	16		1 1/2			35		
		5-SS	22		DS			21		
Boring Terminated @ 15 feet	15									

Changes in soil stratification indicated by the lines are approximate. The actual transition may vary between boring locations Unless otherwise noted, the boring was backfilled with natural soil.

WATER LEVEL OBSERVATIONS		BORING STARTED		12-24-02
+/- 13'	WHILE SAMPLING OR DRILLING	BORING COMPLETED		12-24-02
10' 2", WC @ 11'	IMMEDIATELY AFTER COMPLETION	RIG:	B-57	DRAWN BY: PKH
		OPERATOR:	BJB	APPROVED:
	AFTER COMPLETION	ASSISTANT:	PMH/RLS	SHEET: 1 of 1

SOIL BORING LOG

Boring No: B-2

Project: West Perimeter Road - Bishop International Airport RC Project No: G-28914C

Location: Bishop International Airport - Flint, Michigan Client: Inland Seas Engineering

DESCRIPTION Ground Surface Elevation =	Depth (ft)	Sample No. & Type	N (Blows per ft.)	q_u (tsf)	q_p (tsf)	ε_T (tsf)	γ (pcf)	w (%)	LL/PI (%)	PID (ppm)	LOI (%)
Driller reported 3 inches of Sandy clay TOPSOIL											
		1-SS	19		4-4 1/2			9			
Sandy CLAY; trace to some silt, trace fine gravel and organics - brown - moist - hard to stiff (CL)											
		2-SS	8		4-4 1/2			15			
	5										
		3-SS	13		1 1/2	0.76	135.8	17			
		4-SS	8		3 1/2		123.5	17			
Silty CLAY; trace fine gravel, fine sand and organics - mottled, gray & brown - moist - stiff to very stiff (CL)	10										
Fine SAND; trace silt - gray - wet - extremely dense (SP)		5-SS	103					27			
Boring Terminated @ 15 feet	15										

Changes in soil stratification indicated by the lines are approximate. The actual transition may vary between boring locations. Unless otherwise noted, the boring was backfilled with natural soil.

WATER LEVEL OBSERVATIONS		BORING STARTED		12-24-02
+/- 7' perched 13.5'	WHILE SAMPLING OR DRILLING	BORING COMPLETED		12-24-02
7' 5", WC @ 11' 2"	IMMEDIATELY AFTER COMPLETION	RIG:	B-57	DRAWN BY: PKH
		OPERATOR:	BJB	APPROVED:
	AFTER COMPLETION	ASSISTANT:	PMH/RLS	SHEET: 1 of 1

SOIL BORING LO(

Boring No: B-3

Project: West Perimeter Road - Bishop International Airport RC Project No: G-28914C

Location: Bishop International Airport - Flint, Michigan Client: Inland Seas Engineering

DESCRIPTION Ground Surface Elevation =	Depth (ft)	Sample No. & Type	N (Blows per ft.)	q_u (tsf)	q_p (tsf)	c_T (tsf)	γ (pcf)	w (%)	LL/PI (%)	PID (ppm)	LOI (%)
Driller reported 9 inches of TOPSOIL											
Clayey sand FILL; some glass, plastic, wood and debris (possible landfill cap) - medium dense (SC-FILL)		1-SS	18		3			12			
Landfill Materials: trace sand, clay, glass, plastic, fibers, rubber, steel and etc. - gray - wet - medium dense to loose	5	2-SS	13		DS			20			
		3-SS	4		DS			19			
Boring Terminated @ 7 1/2 feet											

Changes in soil stratification indicated by the lines are approximate. The actual transition may vary between boring locations. Unless otherwise noted, the boring was backfilled with natural soil.

WATER LEVEL OBSERVATIONS		BORING STARTED		1-3-03
None	WHILE SAMPLING OR DRILLING	BORING COMPLETED		1-3-03
DC @ 3' 6"	IMMEDIATELY AFTER COMPLETION	RIG:	B-57	DRAWN BY: PKH
		OPERATOR:	BJB	APPROVED:
	AFTER COMPLETION	ASSISTANT:	RLS/ROM	SHEET: 1 of 1

SOIL BORING LOG

Boring No: B-3A

Project: West Perimeter Road - Bishop International Airport RC Project No: G-28914C

Location: Bishop International Airport - Flint, Michigan Client: Inland Seas Engineering

DESCRIPTION Ground Surface Elevation =	Depth (ft)	Sample No. & Type	N (Blows per ft.)	q_u (tsf)	q_p (tsf)	c_T (tsf)	γ (pcf)	w (%)	LL/PI (%)	PID (ppm)	LOI (%)
Driller reported 6 inches of Sandy clay TOPSOIL											
Sandy CLAY; trace fine gravel and silt, frequent root structures and sand/silt partings - mottled browns with gray partings - moist - hard (CL)		1-SS	29		4 1/2+			12			
		2-SS	57		4 1/2+			10			
Sandy CLAY; trace fine gravel and silt - gray - moist - hard to very stiff (CL)	5	3-SS	28		4 1/2			17			
		4-SS	11		3 1/2			19			
Landfill Materials; trace sand, clay, glass, plastic, fibers, rubber, steel and etc. - gray - wet-medium dense	10	5-SS	14		1 3/4			49			15
Boring Terminated @ 15 feet	15										

Changes in soil stratification indicated by the lines are approximate. The actual transition may vary between boring locations. Unless otherwise noted, the boring was backfilled with natural soil.

WATER LEVEL OBSERVATIONS		BORING STARTED		1-3-03
11'	WHILE SAMPLING OR DRILLING	BORING COMPLETED		1-3-03
8' 6", WC @ 10' 6"	IMMEDIATELY AFTER COMPLETION	RIG:	B-57	DRAWN BY: PKH
		OPERATOR:	BJB	APPROVED:
	AFTER COMPLETION	ASSISTANT:	RLS/ROM	SHEET: 1 of 1

SOIL BORING LOG

Boring No: B-5

Project: West Perimeter Road - Bishop International Airport RC Project No: G-28914C

Location: Bishop International Airport - Flint, Michigan Client: Inland Seas Engineering

DESCRIPTION Ground Surface Elevation =	Depth (ft)	Sample No. & Type	N (Blows per ft.)	q_u (tsf)	q_p (tsf)	c_T (tsf)	γ (pcf)	w (%)	LL/PI (%)	PID (ppm)	LOI (%)
Driller reported 6 inches of Sandy clay TOPSOIL											
Sandy CLAY; some silt, trace fine gravel, frequent root structures and sand/silt partings - mottled browns with gray partings - moist - hard (CL)		1-SS	14		4			9			
Sandy CLAY; trace fine gravel and silt - gray - moist - hard (CL)											
		2-SS	6								
	5										
		3-SS	10								
Landfill Materials; trace sand, clay, glass, plastic, fibers, rubber, steel and etc. - gray - wet - loose to dense											
		4-SS	14								
	10										
		5-SS	32								
Boring Terminated @ 15 feet	15										

Changes in soil stratification indicated by the lines are approximate. The actual transition may vary between boring locations. Unless otherwise noted, the boring was backfilled with natural soil.

WATER LEVEL OBSERVATIONS		BORING STARTED	1-3-03		
Ground Surface	WHILE SAMPLING OR DRILLING	BORING COMPLETED	1-3-03		
WC @ 2' 6'	IMMEDIATELY AFTER COMPLETION	RIG:	B-57	DRAWN BY:	PKH
		OPERATOR:	BJB	APPROVED:	
	AFTER COMPLETION	ASSISTANT:	RLS/ROM	SHEET:	1 of 1

SOIL BORING LOG

Boring No: B-6

Project: West Perimeter Road - Bishop International Airport RC Project No: G-28914C

Location: Bishop International Airport - Flint, Michigan Client: Inland Seas Engineering

DESCRIPTION Ground Surface Elevation =	Depth (ft)	Sample No. & Type	N (Blows per ft.)	q_u (tsf)	q_p (tsf)	c_T (tsf)	γ (pcf)	w (%)	LL/PI (%)	PID (ppm)	LOI (%)
Driller reported 8 inches of Sandy clay TOPSOIL											
Sandy CLAY; trace fine gravel and silt, frequent root structures and sand/silt partings - mottled browns with gray partings - moist (CL)		1-SS	6		DS			12			
		2-SS	10		DS			23			
	5										
Landfill Materials; trace sand, clay, plastic, glass, fibers, rubber, steel and etc. - gray - wet - loose to medium dense to very loose to medium dense		3-SS	3		NR						
		4-SS	11					42			6
	10										
Landfill Materials; trace sand, clay, plastic, glass, fibrous insulation (possibly asbestos), rubber tire, steel and etc. - gray - wet - medium dense		5-SS	12					150			59
Boring Terminated @ 15 feet	15										

Changes in soil stratification indicated by the lines are approximate. The actual transition may vary between boring locations. Unless otherwise noted, the boring was backfilled with natural soil.

WATER LEVEL OBSERVATIONS		BORING STARTED	1-3-03
Ground Surface	WHILE SAMPLING OR DRILLING	BORING COMPLETED	1-3-03
WC @ 4' 6"	IMMEDIATELY AFTER COMPLETION	RIG: B-57	DRAWN BY: PKH
		OPERATOR: BJB	APPROVED:
	AFTER COMPLETION	ASSISTANT: RLS/ROM	SHEET: 1 of 1

SOIL BORING LOG

Boring No: B-7

Project: West Perimeter Road - Bishop International Airport RC Project No: G-28914C

Location: Bishop International Airport - Flint, Michigan Client: Inland Seas Engineering

DESCRIPTION Ground Surface Elevation =	Depth (ft)	Sample No. & Type	N (Blows per ft.)	q_u (tsf)	q_p (tsf)	c_T (tsf)	γ (pcf)	w (%)	LL/PI (%)	PID (ppm)	LOI (%)
Driller reported 4 inches of Sandy clay TOPSOIL											
Sandy CLAY; trace fine gravel, silt and organics - dark brown & brown - moist (CL)		1-SS	18		4 1/2+			14			
		2-SS	12		3 1/2			15			
Sandy CLAY; trace fine gravel and silt, frequent silt and sand partings - mottled, browns & gray - moist - hard to stiff (CL)	5										
		3-SS	26		1 1/2	0.65		14			
Sandy CLAY; trace to some silt - gray - moist - stiff (CL)		4-SS	17		1	0.60		15			
Clayey SAND; trace fine gravel and silt - gray - wet - medium dense (SC)	10										
Sandy SILT; trace fine gravel - gray - wet - stiff (ML)											
Fine to coarse SAND; trace fine gravel and silt - gray - wet - medium dense (SP)		5-SS	13					19			
Boring Terminated @ 15 feet	15										

Changes in soil stratification indicated by the lines are approximate. The actual transition may vary between boring locations. Unless otherwise noted, the boring was backfilled with natural soil.

WATER LEVEL OBSERVATIONS		BORING STARTED	1-3-03
+/- 9'	WHILE SAMPLING OR DRILLING	BORING COMPLETED	1-3-03
WC @ 8'	IMMEDIATELY AFTER COMPLETION	RIG: B-57	DRAWN BY: PKH
	AFTER COMPLETION	OPERATOR: BJB	APPROVED:
		ASSISTANT: RLS/ROM	SHEET: 1 of 1

SOIL BORING LOG

Boring No: B-8

Project: West Perimeter Road - Bishop International Airport RC Project No: G-28914C

Location: Bishop International Airport - Flint, Michigan Client: Inland Seas Engineering

DESCRIPTION Ground Surface Elevation =	Depth (ft)	Sample No. & Type	N (Blows per ft.)	q_u (tsf)	q_p (tsf)	c_T (tsf)	γ (pcf)	w (%)	LL/PI (%)	PID (ppm)	LOI (%)
Driller reported 6 inches of Sandy clay TOPSOIL											
Clayey SAND; frequent root structures - dark brown - moist - medium dense (SC)		1-SS	14		4 1/2+			12			
Sandy CLAY; trace to some silt, trace fine gravel, frequent root structures, silt and sand partings - mottled, browns w/ gray partings - moist - hard (CL)	5	2-SS	15		4 1/2+			13			
Sandy CLAY; trace fine gravel and silt, occasional silt/sand partings - mottled grays w/ gray partings - moist - hard (CL)		3-SS	19		4 1/2+		136.8	13			
Sandy CLAY; trace to some silt, trace fine gravel, frequent silt and sand partings - mottled, grays w/ gray partings - moist - firm (CL)	10	4-SS	15/DR		3/4	0.37		13			
Gravelly SAND; trace to some silt - gray - wet - dense (SP)	15	5-SS	30					15			
Boring Terminated @ 15 feet											

Changes in soil stratification indicated by the lines are approximate. The actual transition may vary between boring locations. Unless otherwise noted, the boring was backfilled with natural soil.

WATER LEVEL OBSERVATIONS		BORING STARTED	1-3-03
14' 6"	WHILE SAMPLING OR DRILLING	BORING COMPLETED	1-3-03
DC @ 12'	IMMEDIATELY AFTER COMPLETION	RIG: B-57	DRAWN BY: PKH
	AFTER COMPLETION	OPERATOR: BJB	APPROVED:
		ASSISTANT: RLS/ROM	SHEET: 1 of 1

SOIL BORING LOG

Boring No: B-9

Project: West Perimeter Road - Bishop International Airport RC Project No: G-28914C

Location: Bishop International Airport - Flint, Michigan Client: Inland Seas Engineering

DESCRIPTION Ground Surface Elevation =	Depth (ft)	Sample No. & Type	N (Blows per ft.)	q_u (tsf)	q_p (tsf)	c_T (tsf)	γ (pcf)	w (%)	LL/PI (%)	PID (ppm)	LOI (%)
Driller reported 3 inches of Sandy clay TOPSOIL											
Sandy CLAY; trace fine gravel and silt, frequent root structures, silt and sand partings - mottled, browns and tan - moist - hard to very stiff (CL)		1-SS	20		4 1/2+		128.2	10			
		2-SS	17		3 3/4		136.9	14			
Sandy CLAY; trace fine gravel and silt, frequent silt and sand partings - mottled, browns w/ gray partings - moist - very stiff (CL)	5										
Gravelly SAND; trace to some silt - gray - moist - medium dense to dense (SP)		3-SS	32		4 1/2+			10			
Sandy CLAY; trace fine gravel and silt, frequent fine to medium sand layers - mottled, browns - moist - hard (CL)											
Silty CLAY; trace fine gravel, fine sand, occasional silt partings - mottled, reddish brown & gray w/ gray partings - moist - hard (CL)		4-SS	41		4 1/2+			9			
Silty CLAY; trace to some fine sand, trace fine gravel - mottled grays - moist - hard (CL)	10										
Gravelly SAND; some silt, trace clay - gray - wet - dense (SP)		5-SS	34					15			
Boring Terminated @ 15 feet	15										

Changes in soil stratification indicated by the lines are approximate. The actual transition may vary between boring locations.
Unless otherwise noted, the boring was backfilled with natural soil.

WATER LEVEL OBSERVATIONS		BORING STARTED	1-3-03
11' 6"	WHILE SAMPLING OR DRILLING	BORING COMPLETED	1-3-03
DC @ 9.8'	IMMEDIATELY AFTER COMPLETION	RIG: B-57	DRAWN BY: PKH
	AFTER COMPLETION	OPERATOR: BJB	APPROVED:
		ASSISTANT: RLS/ROM	SHEET: 1 of 1

SOIL BORING LOG

Boring No: B-10

Project: West Perimeter Road - Bishop International Airport RC Project No: G-28914C

Location: Bishop International Airport - Flint, Michigan Client: Inland Seas Engineering

DESCRIPTION Ground Surface Elevation =	Depth (ft)	Sample No. & Type	N (Blows per ft.)	q_u (tsf)	q_p (tsf)	c_T (tsf)	γ (pcf)	w (%)	LL/PI (%)	PID (ppm)	LOI (%)
Fine to medium sandy CLAY; trace to some silt, trace fine gravel and organics (root structures to 7 inches) - mottled dark brown, gray and green - moist - hard (CL)		1-SS	17		4 1/2		127.9	14			
Fine to medium sandy CLAY; trace to some silt, trace fine gravel - brown - moist - hard (CL)	5	2-SS	25		4 1/2+		131.0	14			
Clayey SILT; - gray - moist - very stiff (ML)		3-SS	18		2			19			
Fine to medium sandy CLAY; trace fine gravel and organics - gray - moist - very stiff (CL)	10	4-SS	12		2		136.4	11			
Gravelly SAND; trace silt and clay - gray - moist - medium dense (SP)											
Fine to medium sandy CLAY; trace fine gravel, organics (roots, wood and buried swamp material) - gray - moist - very stiff (CL)		5-SS	23/DR		3-3 1/2			12			
Boring Terminated @ 15 feet	15										

Changes in soil stratification indicated by the lines are approximate. The actual transition may vary between boring locations. Unless otherwise noted, the boring was backfilled with natural soil.

WATER LEVEL OBSERVATIONS		BORING STARTED		12-26-02
None	WHILE SAMPLING OR DRILLING	BORING COMPLETED		12-26-02
None, DC @ 11'	IMMEDIATELY AFTER COMPLETION	RIG:	B-57	DRAWN BY: PKH
	AFTER COMPLETION	OPERATOR:	BJB	APPROVED:
		ASSISTANT:	PMH	SHEET: 1 of 1

SOIL BORING LOG

Boring No: B-11

Project: West Perimeter Road - Bishop International Airport RC Project No: G-28914C

Location: Bishop International Airport - Flint, Michigan Client: Inland Seas Engineering

DESCRIPTION Ground Surface Elevation =	Depth (ft)	Sample No. & Type	N (Blows per ft.)	q_u (tsf)	q_p (tsf)	c_T (tsf)	γ (pcf)	w (%)	LL/PI (%)	PID (ppm)	LOI (%)
Fine to medium sandy CLAY; trace coarse sand, silt and organics (root structures to 7 inches) - mottled, brown, dark brown and gray - moist - hard to very stiff (CL)		1-SS	20		4 1/2+			11			
Fine to medium sandy CLAY; trace to some organics - dark brown - moist - very stiff (CL)		2-SS	9		3 1/2		129.5	16			4
Fine to medium sandy CLAY, trace coarse sand and silt - mottled, brown, dark brown and gray, no mottles @ about 6 feet - moist - very stiff (CL)	5	3-SS	8		2 3/4		141.1	12			
Fine to medium sandy CLAY; trace coarse sand and silt - gray - moist - very stiff to firm (CL)		4-SS	7		3/4	0.45	137.4	12			
Fine SAND; trace silt, occasional sandy clay layers - gray - wet - loose (SP)	10	5-SS	9		1/2	0.28		12			
Boring Terminated @ 15 feet	15										

Changes in soil stratification indicated by the lines are approximate. The actual transition may vary between boring locations. Unless otherwise noted, the boring was backfilled with natural soil.

WATER LEVEL OBSERVATIONS		BORING STARTED		12-26-02
10' 3"	WHILE SAMPLING OR DRILLING	BORING COMPLETED		12-26-02
7' 10", WC @ 9' 3"	IMMEDIATELY AFTER COMPLETION	RIG:	B-57	DRAWN BY: PKH
		OPERATOR:	BJB	APPROVED:
	AFTER COMPLETION	ASSISTANT:	PMH	SHEET: 1 of 1

SOIL BORING LOG

Boring No: B-12

Project: West Perimeter Road - Bishop International Airport RC Project No: G-28914C

Location: Bishop International Airport - Flint, Michigan Client: Inland Seas Engineering

DESCRIPTION Ground Surface Elevation =	Depth (ft)	Sample No. & Type	N (Blows per ft.)	q_u (tsf)	q_p (tsf)	c_T (tsf)	γ (pcf)	w (%)	LL/PI (%)	PID (ppm)	LOI (%)
Driller reported 3 inches of Sandy clay TOPSOIL											
		1-SS	12		3 1/2		133.4	11			
Fine to coarse sandy CLAY; trace fine gravel, silt and organics - mottled, brown & gray - moist - very stiff to hard (CL)											
		2-SS	25		4 1/2+		132.3	9			
	5										
Silty SAND; trace fine gravel - brown - moist - very dense (CL)		3-SS	50					4			
		4-SS	22		4 1/2+		127.9	11			
	10										
Fine to coarse sandy CLAY; trace fine gravel and silt - gray - moist - hard to very stiff (CL)											
		5-SS	23		3 3/4		125.1	14			
	15										
Boring Terminated @ 15 feet											

Changes in soil stratification indicated by the lines are approximate. The actual transition may vary between boring locations. Unless otherwise noted, the boring was backfilled with natural soil.

WATER LEVEL OBSERVATIONS		BORING STARTED		12-24-02	
None	WHILE SAMPLING OR DRILLING	BORING COMPLETED		12-24-02	
DC @ 6' 5"	IMMEDIATELY AFTER COMPLETION	RIG:	B-57	DRAWN BY:	PKH
	AFTER COMPLETION	OPERATOR:	BJB	APPROVED:	
		ASSISTANT:	PMH/RLS	SHEET:	1 of 1

SOIL BORING LOG

Boring No: B-13

Project: West Perimeter Road - Bishop International Airport RC Project No: G-28914C

Location: Bishop International Airport - Flint, Michigan Client: Inland Seas Engineering

DESCRIPTION Ground Surface Elevation =	Depth (ft)	Sample No. & Type	N (Blows per ft.)	q_u (tsf)	q_p (tsf)	c_T (tsf)	γ (pcf)	w (%)	LL/PI (%)	PID (ppm)	LOI (%)
Fine to coarse sandy CLAY; trace fine to coarse gravel, silt and organics (roots) - mottled, brown & gray - moist (CL)											
Fine to coarse sandy CLAY; trace fine to coarse gravel, silt and organics (roots) - brown - moist - hard (CL)		1-SS	23		4 1/2+			8			
		2-SS	26		4 1/2+			8			
	5										
		3-SS	22		4 1/2+		140.7	15			
Fine to coarse sandy CLAY; trace fine to coarse gravel and silt - brown, turns gray @ about 3 3/4 feet - moist - hard to very stiff (CL)		4-SS	19		4		119.5	18			
	10										
		5-SS	26		3 1/2		123.5	17			
Boring Terminated @ 15 feet	15										

Changes in soil stratification indicated by the lines are approximate. The actual transition may vary between boring locations. Unless otherwise noted, the boring was backfilled with natural soil.

WATER LEVEL OBSERVATIONS		BORING STARTED		12-24-02
None	WHILE SAMPLING OR DRILLING	BORING COMPLETED		12-24-02
DC @ 9' 4"	IMMEDIATELY AFTER COMPLETION	RIG:	B-57	DRAWN BY: PKH
		OPERATOR:	BJB	APPROVED:
	AFTER COMPLETION	ASSISTANT:	PMH/RLS	SHEET: 1 of 1

SOIL BORING LOG

Boring No: B-14

Project: West Perimeter Road - Bishop International Airport RC Project No: G-28914C

Location: Bishop International Airport - Flint, Michigan Client: Inland Seas Engineering

DESCRIPTION Ground Surface Elevation =	Depth (ft)	Sample No. & Type	N (Blows per ft.)	q_u (tsf)	q_p (tsf)	c_T (tsf)	γ (pcf)	w (%)	LL/PI (%)	PID (ppm)	LOI (%)
Driller noted 7 inches of Recycled Asphalt Product (RAP)											
		1-SS	17		4 1/2+			13			
Sandy CLAY; trace fine gravel and silt, frequent silt/sand partings - mottled, browns w/ gray partings - moist - hard to stiff (CL)		2-SS	30		DS			11			
	5										
		3-SS	9		1 1/4	0.60	123.2	17			
		4-SS	6					134			
	10										
Landfill Materials: trace sand, clay, glass, fibers, rubber, steel and etc. - gray - wet - loose to medium dense (SP)											
		5-SS	12		3/4	0.35		33			
	15										
Boring Terminated @ 15 feet											

Changes in soil stratification indicated by the lines are approximate. The actual transition may vary between boring locations.
Unless otherwise noted, the boring was backfilled with natural soil.

WATER LEVEL OBSERVATIONS		BORING STARTED		1-3-03	
~ 12' WD	WHILE SAMPLING OR DRILLING	BORING COMPLETED		1-3-03	
10', WC 12' 6"	IMMEDIATELY AFTER COMPLETION	RIG:	B-57	DRAWN BY:	PKH
	AFTER COMPLETION	OPERATOR:	BJB	APPROVED:	
		ASSISTANT:	RLS/ROM	SHEET:	1 of 1

SOIL BORING LOG

Boring No: B-15

Project: West Perimeter Road - Bishop International Airport RC Project No: G-28914C

Location: Bishop International Airport - Flint, Michigan Client: Inland Seas Engineering

DESCRIPTION Ground Surface Elevation =	Depth (ft)	Sample No. & Type	N (Blows per ft.)	q_u (tsf)	q_p (tsf)	c_T (tsf)	γ (pcf)	w (%)	LL/PI (%)	PID (ppm)	LOI (%)
Driller reported 7 inches of Fine sandy CLAY; trace to some organics (root structures), trace silt - dark brown - moist (CL)											
Fine to coarse sandy CLAY; trace fine gravel, silt and organics (roots) - mottled, brown, gray, green & black - moist - hard to very stiff (CL)		1-SS	22		4 1/2+			11			
		2-SS	23		2 3/4		129.2	15			
Clayey SILT; trace fine sand and organics (decayed wood and roots) - dark brown & black - moist - very stiff to soft (ML)	5										
Silty CLAY; some fine sand, trace organics (roots) - olive & gray - very moist - soft (CL)		3-SS	10		1/2	0.27	112.3	22			
Fine to medium SAND; trace fine gravel, silt and organics - olive & gray - wet - medium dense (SP)											
Fine to coarse sandy CLAY; trace fine to coarse gravel, silt and organics (roots) - brown - moist - hard to very stiff (CL)	10	4-SS	23		4-4 1/2		132.4	16			
		5-SS	24		3 1/4			19			
Boring Terminated @ 15 feet	15										

Changes in soil stratification indicated by the lines are approximate. The actual transition may vary between boring locations. Unless otherwise noted, the boring was backfilled with natural soil.

WATER LEVEL OBSERVATIONS		BORING STARTED	12-26-02
7' 6"	WHILE SAMPLING OR DRILLING	BORING COMPLETED	12-26-02
7' 7", WC @ 11'	IMMEDIATELY AFTER COMPLETION	RIG: B-57	DRAWN BY: PKH
		OPERATOR: BJB	APPROVED:
	AFTER COMPLETION	ASSISTANT: PMH	SHEET: 1 of 1

SOIL BORING LOG

Boring No: B-16

Project: West Perimeter Road - Bishop International Airport RC Project No: G-28914C

Location: Bishop International Airport - Flint, Michigan Client: Inland Seas Engineering

DESCRIPTION Ground Surface Elevation =	Depth (ft)	Sample No. & Type	N (Blows per ft.)	q_u (tsf)	q_p (tsf)	c_T (tsf)	γ (pcf)	w (%)	LL/PI (%)	PID (ppm)	LOI (%)
Driller reported 8 inches of Fine sandy clay FILL; some organics (root structures), trace silt - mottled gray & brown - moist (CL-FILL)											
		1-SS	15		4 1/2+			11			
Fine to medium sandy CLAY; trace fine gravel, silt and organics (roots) - mottled, brown & gray - damp to moist - hard (CL)											
		2-SS	11		4 1/2+		115.0	21			
	5										
Fine to medium sandy CLAY; trace fine gravel and silt - mottled, brown & gray - damp to moist - very stiff (CL)											
		3-SS	25		2 1/4		137.6	26			
Clayey SILT; trace fine gravel, fine to medium sand - mottled, gray & brown - moist to very moist - very stiff (ML)											
		4-SS	16		3		123.5	9			
	10										
Fine to medium sandy CLAY; some silt, trace fine gravel, fine to medium sand - mottled, gray/brown, turns gray @ about 13 feet - moist - very stiff (CL)											
		5-SS	14		3-3 1/4		139.9	12			
	15										
Boring Terminated @ 15 feet											

Changes in soil stratification indicated by the lines are approximate. The actual transition may vary between boring locations. Unless otherwise noted, the boring was backfilled with natural soil.

WATER LEVEL OBSERVATIONS		BORING STARTED	12-26-02		
None	WHILE SAMPLING OR DRILLING	BORING COMPLETED	12-26-02		
None, DC 11' 6"	IMMEDIATELY AFTER COMPLETION	RIG:	B-57	DRAWN BY:	PKH
	AFTER COMPLETION	OPERATOR:	BJB	APPROVED:	
		ASSISTANT:	PMH	SHEET:	1 of 1

SOIL BORING LOG

Boring No: B-17

Project: West Perimeter Road - Bishop International Airport RC Project No: G-28914C

Location: Bishop International Airport - Flint, Michigan Client: Inland Seas Engineering

DESCRIPTION Ground Surface Elevation =	Depth (ft)	Sample No. & Type	N (Blows per ft.)	q_u (tsf)	q_p (tsf)	c_T (tsf)	γ (pcf)	w (%)	LL/PI (%)	PID (ppm)	LOI (%)
Driller reported 9 inches of Sandy clay FILL; - dark brown - moist (CL-FILL)											
Fine to coarse sandy CLAY; trace fine gravel, silt and organics (roots) - mottled, dark brown, brown & gray - moist - hard (CL)		1-SS	37		4 1/2+			12			
		2-SS	30		4 1/2+			11			
Fine to coarse sandy CLAY; trace fine gravel and silt - mottled, brown & gray - moist - hard to very stiff (CL)	5	3-SS	27		4 1/2+			13			
		4-SS	32		3 3/4		119.2	11			
Clayey fine to coarse SAND; some silt, trace fine to coarse gravel - gray - moist - very dense (SC)	10	5-SS	54		4 1/2+		137.4	10			
Boring Terminated @ 15 feet	15										

Changes in soil stratification indicated by the lines are approximate. The actual transition may vary between boring locations. Unless otherwise noted, the boring was backfilled with natural soil.

WATER LEVEL OBSERVATIONS		BORING STARTED	12-26-02
None	WHILE SAMPLING OR DRILLING	BORING COMPLETED	12-26-02
None, DC @ 8'	IMMEDIATELY AFTER COMPLETION	RIG: B-57	DRAWN BY: PKH
		OPERATOR: BJB	APPROVED:
	AFTER COMPLETION	ASSISTANT: PMH	SHEET: 1 of 1

RC ASSOCIATES, INC.

ENGINEERING ✧ ARCHITECTURE ✧ ENVIRONMENTAL ✧ SURVEYING ✧ GEOTECHNICAL
CONSTRUCTION SERVICES ✧ COMPUTER CONSULTING ✧ INTERIOR DESIGN

GENERAL NOTES

Soil Property Symbols

N: Standard Penetration Resistance (ASTM D-1586). Blows of a 140-lb hammer falling 30 inches required to drive a 2 inch O.D. split-spoon sampler (except where otherwise noted) 1 foot into the soil.

qu: Controlled strain unconfined compressive strength, tsf (ASTM D-2166)

qp: Calibrated hand penetrometer unconfined compressive strength, tsf

cs: Calibrated Torvane shear strength, tsf

w: Water Content, % (ASTM D-2216)

LL: Liquid Limit, % (ASTM D-4318)

PL: Plastic Limit, % (ASTM D-4318)

PI: Plasticity Index, % (ASTM D-4318)

PID: Photoionization detection values, ppm

ND: Non Detect

LOI: Loss on Ignition, %

Drilling and Sampling Symbols

SS: Split-spoon Sample - 1-3/8" I.D., 2" O.D., except where noted

ST: Shelby Tube Sample 0 3" O.D., except where noted

AS: Auger Sample

WS: Wash Sample - 3-1/8" rock bit except where noted

BS: Bag Sample

RC: Rock Core with Diamond Bit - NX size except where noted

NR: No Recovery

DS: Disturbed Sample

DR: Drove Rock

Water Level Observation Symbols

WS: While Sampling

WD: While Drilling

AB: After Boring (Augers or casing removed)

WC: Wet Cave-in

DC: Dry Cave-in

WL: Water Level (As measured in bore hole relative to the existing ground survey at the time indicated)

Sample Classification

All Samples are visually classified in general accordance with Standard Practice for Description and Identification of Soils [Visual-Manual Procedures] (ASTM Standard D-2488) and the Unified Soil Classification System.

Particle Size

Boulders: Greater than 12" (305 mm)
Cobbles: 3" to 12" (75 mm to 305 mm)
Coarse Gravel: 3/4" to 3" (19 mm to 76 mm)
Fine Gravel: #4 to 3/4" (4.75 mm to 19 mm)
Coarse Sand: #10 to #4 (2.00 mm to 4.75 mm)
Medium Sand: #40 to #10 (0.425 mm to 2.00 mm)
Fine Sand: #200 to #40 (0.074 mm to 0.425 mm)
Silt: 0.005 mm to 0.074 mm
Clay: Less than 0.005 mm

Constituent Terms

Few/Trace: Less than 10%
Occasional/Trace to Some: 10% to 20%
Frequent/Some: 20% to 35%
And: Greater than 35% for each type of soil identified

Note: Soil Constituents are based on visually estimated quantities.

Relative Density and Consistency

GRANULAR SOILS	STANDARD PENETRATION (N) VALUE, BLOWS/FOOT
Very Loose	Less than 4
Loose	4 - 9
Medium Dense	10 - 29
Dense	30 - 49
Very Dense	50 - 80
Extremely Dense	Greater than 80

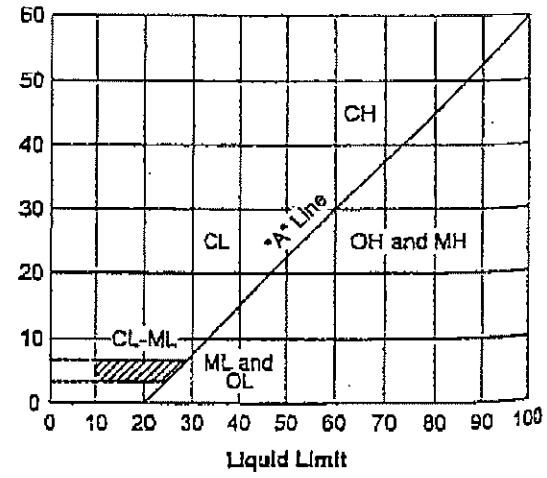
COHESIVE SOILS	UNCONFINED COMPRESSIVE STRENGTH (qu or qp), tsf
Very Soft	Less than 0.25
Soft	0.25 - 0.49
Firm	0.50 - 0.99
Stiff	1.00 - 1.99
Very Stiff	2.00 - 3.99
Hard	Greater than 4.00

RC ASSOCIATES, INC.

UNIFIED SOIL CLASSIFICATION SYSTEM (ASTM D-2487)

Major Divisions			Group Symbols	Typical Names	Laboratory Classification Criteria		
Coarse-grained soils (More than 50% is retained on No. 200 sieve)	Gravels (50% or more of coarse fraction is retained on No. 4 sieve)	Clean gravels (Little or no fines)	GW	Well-graded gravels, gravel-sand mixtures, little or no fines	Determine percentages of sand and gravel from grain-size curve. Depending on percentages of fines (fraction smaller than No. 200 sieve size), coarse-grained soils are classified as follows: Less than 5 percent fines: GW, GP, SW, SP. More than 12 percent fines: GM, GC, SM, SC. 5 to 12 percent fines: *Borderline* cases requiring dual symbols[b]	$C_u = \frac{D_{60}}{D_{10}}$ greater than 4; $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ between 1 and 3	
			GP	Poorly graded gravels, gravel-sand mixtures, little or no fines		Not meeting all gradation requirements for GW	
		Gravels with fines (Appreciable amount of fines)	GM[a] d	Silty gravels, gravel-sand-silt mixtures		Atterberg limits plot below "A" line or P.I. less than 4	Atterberg limits plot above "A" line with P.I. between 4 and 7 are *borderline* cases requiring use of dual symbols
			GM[a] u				
			GC	Clayey gravels, gravel-sand-clay mixtures		Atterberg limits plot above "A" line and P.I. greater than 7	
	Sands (More than 50% of coarse fraction passes No. 4 sieve)	Clean sands (Little or no fines)	SW	Well-graded sands, gravelly sands, little or no fines		$C_u = \frac{D_{60}}{D_{10}}$ greater than 6; $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ between 1 and 3	
			SP	Poorly graded sands, gravelly sands, little or no fines		Not meeting all gradation requirements for SW	
		Sands with fines (Appreciable amount of fines)	SM[a] d	Silty sands, sand-silt mixtures		Atterberg limits plot below "A" line or P.I. less than 4	Atterberg limits plot above "A" line with P.I. between 4 and 7 are *borderline* cases requiring use of dual symbols
			SM[a] u				
			SC	Clayey sands, sand-clay mixtures		Atterberg limits plot above "A" line and P.I. greater than 7	
Fine-grained soils (50% or more passes No. 200 sieve)	Silts and clays (Liquid limit 50 or less)		ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands, or clayey silts with slight plasticity			
			CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays			
			OL	Organic silts and organic silty clays of low plasticity			
	Silts and clays (Liquid limit greater than 50)		MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts			
			CH	Inorganic clays of high plasticity, fat clays			
			OH	Organic clays of medium to high plasticity, organic silts			
	Highly organic soils		Pt	Peat, muck and other highly organic soils			

Plasticity Chart



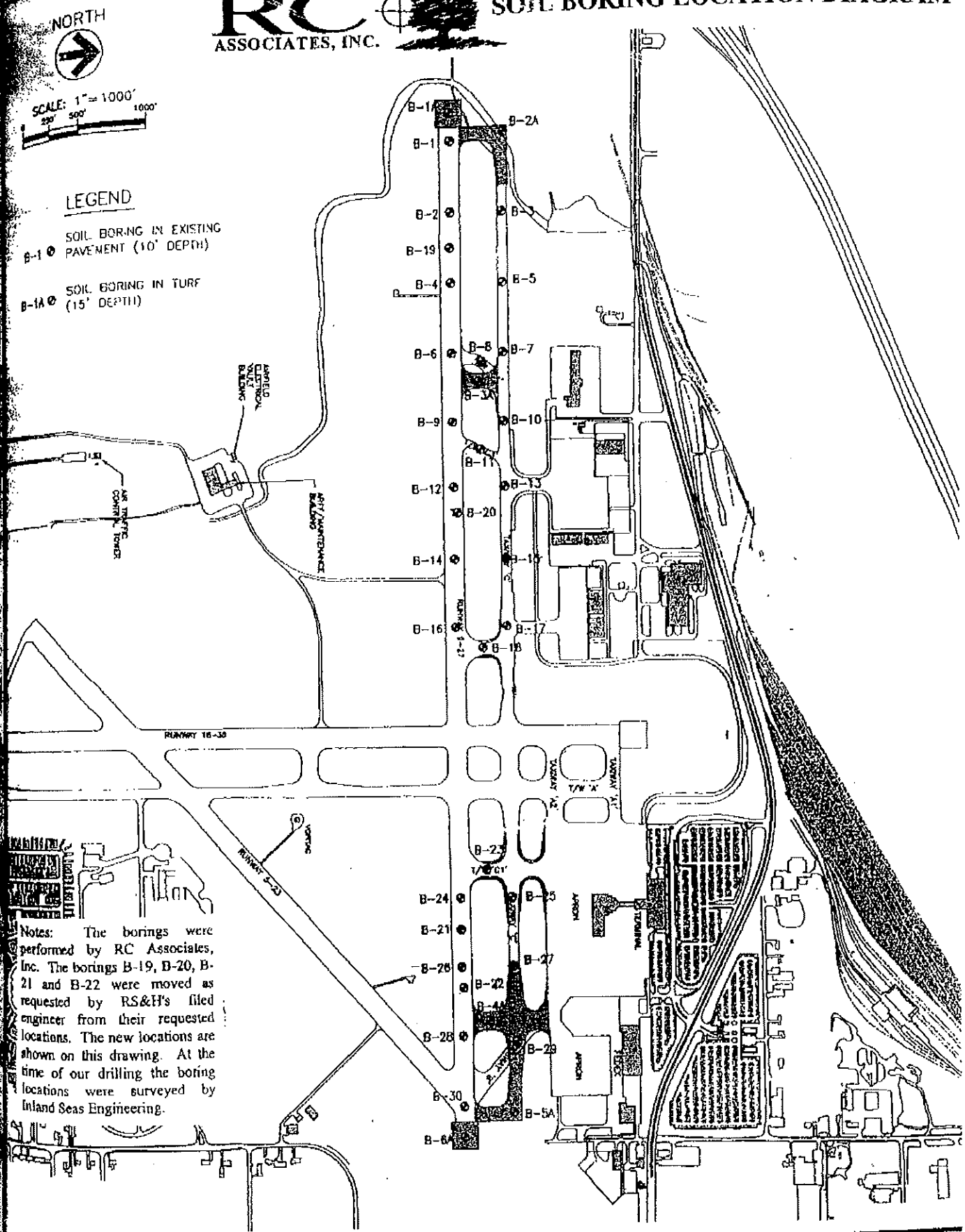
[a] Division of GM and SM groups into subdivisions of d and u are for roads and airfields only. Subdivision is based on Atterberg limits; suffix d used when L.L. is 28 or less and the P.I. is 6 or less; the suffix u used when L.L. is greater than 28.

[b] Borderline classifications, used for soils possessing characteristics of two groups, are designated by combinations of group symbols. For example: GW-GC, well-graded gravel-sand mixture with clay binder.

g:/clerical/projects/eoh/us

SOIL BORING LOCATION DIAGRAM

RC ASSOCIATES, INC.



Notes: The borings were performed by RC Associates, Inc. The borings B-19, B-20, B-21 and B-22 were moved as requested by RS&H's filed engineer from their requested locations. The new locations are shown on this drawing. At the time of our drilling the boring locations were surveyed by Inland Seas Engineering.

Bishop - International - Airport

RS&H

Reynolds, Smith and Hills Inc.

Architectural, Engineering, Planning and Environmental Services

Flint, Michigan

RUNWAY 9-27 AND TAXIWAY 'C' REHABILITATION

GEOTECHNICAL

REQUEST FOR PROPOSAL

RC ASSOCIATES, INC.
ARCHITECTURE + ENVIRONMENTAL + SURVEYING + GEOTECHNICAL
CONSTRUCTION SERVICES + COMPUTER CONSULTING + INTERIOR DESIGN
MECHANICAL/ELECTRICAL ENGINEERING

GENERAL NOTES

Property Symbols

Standard Penetration Resistance (ASTM D-1586). Blows of a 140-lb hammer falling 30 inches required to drive a 2 inch O.D. split-spoon sampler (except where otherwise noted) 1 foot into the soil.

Controlled strain unconfined compressive strength, tsf (ASTM D-2166)

Calibrated hand penetrometer unconfined compressive strength, tsf

Calibrated Torvane shear strength, tsf

Natural Unit Weight, pcf

w:	Water Content, % (ASTM D-2216)
LL:	Liquid Limit, % (ASTM D-4318)
PL:	Plastic Limit, % (ASTM D-4318)
PI:	Plasticity Index, % (ASTM D-4318)
PID:	Photoionization detection values, ppm
LOI:	Loss on Ignition, %

Soil and Sampling Symbols

Split-spoon Sample - 1-3/8" I.D., 2" O.D., except where noted

Shelby Tube Sample 0 3" O.D., except where noted

Auger Sample

Wash Sample - 3-1/8" rock bit except where noted

Bag Sample

Rock Core with Diamond Bit - NX size except where noted

No Recovery

Disturbed Sample

Remove Rock

Action Detect

Water Level Observation Symbols

WS:	While Sampling
WD:	While Drilling
AB:	After Boring (Augers or casing removed)
WC:	Wet Cave-in
DC:	Dry Cave-in
WL:	Water Level (As measured in bore hole relative to the existing ground surface at the time indicated)

Soil Classification

Soils are visually classified in general accordance with Standard Practice for Description and Identification of Soils [Visual Manual Procedures] (ASTM Standard D-2488) and the Unified Soil Classification System.

Particle Size

Boulders: Greater than 12" (305 mm)
Cobbles: 3" to 12" (75 mm to 305 mm)
Coarse Gravel: 3/4" to 3" (19 mm to 76 mm)
Fine Gravel: #4 to 3/4" (4.75 mm to 19 mm)
Coarse Sand: #10 to #4 (2.00 mm to 4.75 mm)
Medium Sand: #40 to #10 (0.425 mm to 2.00 mm)
Fine Sand: #200 to #40 (0.074 mm to 0.425 mm)
Silt: 0.005 mm to 0.074 mm
Clay: Less than 0.005 mm

Constituent Terms

Few/Trace: Less than 10%
Occasional/Trace to Some: 10% to 20%
Frequent/Some: 20% to 35%
And: Greater than 35% for each type of soil identified

Note: Soil Constituents are based on visually estimated quantities.

Density and Consistency

GRANULAR SOILS

	STANDARD PENETRATION (N) VALUE, BLOWS/FOOT
Very Loose	Less than 4
Loose	4 - 9
Medium Dense	10 - 29
Dense	30 - 49
Very Dense	50 - 80
Extremely Dense	Greater than 80

COHESIVE SOILS

	UNCONFINED COMPRESSIVE STRENGTH (qu or qp), tsf
Very Soft	Less than 0.25
Soft	0.25 - 0.49
Firm	0.50 - 0.99
Stiff	1.00 - 1.99
Very Stiff	2.00 - 3.99
Hard	Greater than 4.00

SOIL BORING LOG

Boring No: B-1A

Project: Proposed Runway "9-27" and Taxiway "C" Rehabilitation **RC Project No:** G-023910

Location: Bishop International Airport - Flint, Michigan **Client:** Inland Seas Engineering

DESCRIPTION Ground Surface Elevation =	Depth (ft)	Sample No. & Type	N (Blows per ft.)	q_u (tsf)	q_p (tsf)	c_T (tsf)	γ (pcf)	w (%)	LL/PI (%)	PID (ppm)	LOI (%)
Driller reported 2" of SOD overlying clayey TOPSOIL; some sand, trace gravel and silt - dark brown - moist (OL)		1-SS	16		4½+			11			
Sandy, Silty CLAY; trace gravel, few sand lenses - mottled, brown and gray, becoming brownish gray below about 6½' - moist - hard to very stiff to hard (CL)	5	2-SS	16		3			15	24/9		
		3-SS	28		4			14			
Fine to medium SAND; trace gravel, coarse sand and silt, few clay layers - brownish gray - wet - very dense (SP)	10	4-SS	55								
Sandy CLAY; some silt, trace gravel, few sand layers - gray - moist, few wet layers - very stiff (CL)	15	5-SS	30		2/DS			14			
Boring Terminated at 15'											
NOTE: A bag sample of the auger cuttings was also obtained from a depth of about 3 to 5 feet below the surface.											

Changes in soil stratification indicated by the lines are approximate. The actual transition may vary between boring locations. Unless otherwise noted, the boring was backfilled with natural soil.

WATER LEVEL OBSERVATIONS			
~7½'	WHILE SAMPLING OR DRILLING	BORING STARTED	7-12-00
WL @ 7.5'	IMMEDIATELY AFTER COMPLETION	BORING COMPLETED	7-12-00
WL @ 6.4' 10 Hours	AFTER COMPLETION	RIG: B-57	DRAWN BY: WAL
		OPERATOR: BJB	APPROVED: UKG
		ASSISTANT: PMH	SHEET: 1 of 1

SOIL BORING LOG

Boring No: B-2A

Project: Proposed Runway "9-27" and Taxiway "C" Rehabilitation **RC Project No:** G-023910

Location: Bishop International Airport - Flint, Michigan **Client:** Inland Seas Engineering

DESCRIPTION Ground Surface Elevation =	Depth (ft)	Sample No. & Type	N (Blows per ft.)	q_u (tsf)	q_p (tsf)	c_T (tsf)	γ (pcf)	w (%)	LL/PI (%)	PID (ppm)	LOI (%)
Driller reported 2" of SOD overlying Clayey TOPSOIL; some sand, trace gravel and silt - dark brown - moist (OL)											
		1-SS	20		4½+			16			
Sandy CLAY; some silt, trace gravel, few sand lenses and silt partings - mottled, brown and gray, becoming mostly brownish gray below about 4' - moist - hard (CL)											
		2-SS	30		4½+			15			
	5										
		3-SS	59								
Fine to medium SAND; trace gravel, coarse sand and silt - brownish gray - wet - very dense (SP)											
		4-SS	55		1¾			22			
	10										
Sandy CLAY; some silt, trace gravel, few sand lenses - gray - very moist - stiff to hard (CL)											
		5-SS	31		4½+			25			
	15										
Boring Terminated at 15'											

Changes in soil stratification indicated by the lines are approximate. The actual transition may vary between boring locations. Unless otherwise noted, the boring was backfilled with natural soil.

WATER LEVEL OBSERVATIONS		BORING STARTED	7-11-00
~ 7'	WHILE SAMPLING OR DRILLING	BORING COMPLETED	7-11-00
DC @ 12.0'	IMMEDIATELY AFTER COMPLETION	RIG: B-57	DRAWN BY: WAL
WL @ 7.3' 12¼ Hrs.	AFTER COMPLETION	OPERATOR: BJB	APPROVED: UKG
		ASSISTANT: MJR	SHEET: 1 of 1

APPENDIX E Wilcox Report May 10, 2006

Wilcox

An ISO 9001
Certified Company

5859 Sherman Road
Saginaw, MI 48604
989-752-6500
Fax: 989-752-6600

1-800-542-2756
wilcoxassociates.com

May 10, 2006

Mr. Erich Thiel
Reynolds, Smith and Hills, Inc.
G-3101 West Bristol Road, Suite 300
Flint, Michigan 48507

RE: PRELIMINARY WATER AND SOIL SAMPLING
FORMER CITY OF FLINT DUMP
BISHOP AIRPORT
GENESEE COUNTY, MICHIGAN
WILCOX PROJECT NO. 50129.00009

Dear Mr. Thiel:

Wilcox Professional Services, LLC (Wilcox) respectfully submits this report for the referenced project. The purpose of this report is to present the results of preliminary water and soil sampling performed to address a potential discharge of leachate from a former landfill, commonly referred to as the Former City of Flint Dump, as requested by the Michigan Department of Environmental Quality (MDEQ) in a letter dated April 6, 2006. The subject site is located near the northwest limits of the Bishop International Airport property in Flint, Michigan. The approximate location of the site is depicted on the attached Site Location Diagram.

To evaluate the potential discharge of leachate from the former landfill, Wilcox visited the site on April 20, 2006 and collected two water samples (WS-1 and WS-2) and two soil samples (S-1 and S-2) from the site. The approximate locations from which the samples were collected are depicted on the attached Site Diagram.

Sample WS-1 consisted of groundwater that was observed flowing from the side slope of the former landfill. Based on our conversation with Mr. James Innes of the MDEQ, this groundwater seep was the location of the potential discharge of leachate described in the MDEQ letter dated April 6, 2006. The water was relatively clear with no significant odor. Sample WS-2 consisted of surface water retained in an impounded portion of a drainage swale located near the northeast corner of the former landfill. Neither of the water samples was filtered. Sample S-1 consisted of soil from a visually stained area located approximately 20 feet down slope from groundwater seep noted above (WS-1). The soil was stained reddish brown and black with a mild odor characteristic of hydrogen sulfide (i.e., similar to rotten eggs). Sample S-2 consisted of sediment from the bottom of the impounded portion of the drainage swale where Sample WS-2 was collected. Photographs depicting the vicinity of the sample locations are attached.

Samples were placed in appropriate containers and subsequently into a cooler containing ice. The samples were then submitted to Merit Laboratories of Lansing, Michigan for confirmatory analyses. Samples WS-1 and WS-2 were analyzed for the following parameters; Volatile Organic Compounds (VOCs), Semi-VOCSs (SVOCs), Herbicides and Pesticides, Polynuclear Aromatic Compounds (PCBs), Total Concentrations of 18 metals, Biological Oxygen Demand (BOD), Chemical Oxygen Demand (COD), Nitrate, Nitrite, Total Kjeldal Nitrogen (TKN), Total Phosphorus, Chloride, Sulfate, Carbonate/Bicarbonate, Magnesium, Sodium, Calcium and Potassium. Samples S-1 and S-2 were analyzed for the same parameters except for Carbonate/Bicarbonate and COD.

Office Locations

Michigan
Alpena
Bad Axe
Brown City
Cadillac
Caledonia
Escanaba
Farmington Hills
Flint
Lansing
Saginaw

Indiana
Indianapolis

Arizona
Phoenix

Built on Quality - continuously improving our quality of service to meet and exceed our clients' expectations.

ZweigLetter
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Recognized Since 2000

CE NEWS
"Best Firm To Work For"
Recognized Since 2001

ENR
"Top Design Firm"
Recognized Since 2002

A Wilcox Associates, Inc. Company

Results of the laboratory analysis were compared to Michigan's Natural Resources Protection Act (NREPA), Part 201 Generic Cleanup Criteria and Screening Levels for residential sites. Some of the samples exhibited concentrations of VOCs and/or metals above analytical method detection limits, but below NREPA, Part 201 residential criteria. The results of contaminant substances with concentrations above NREPA, Part 201 residential criteria are included on the following summary tables. A complete copy of the analytical report is attached.

Table 1. Water Samples (WS-1 and WS-2)

Contaminant	Results		Residential & Commercial I Drinking Water Criteria	Groundwater Surface Water Interface Criteria
	WS-1	WS-2		
Iron	**49,700**	**1,010**		NA
Benzene	**8**	ND		200
Diethyl ether	**30**	ND		ID

Notes: All results reported in parts per billion (ppb)
Bold entries indicate concentration exceeds NREPA, Part 201 threshold limits for one or more criteria.
NA = Not Applicable
ND = contaminant not detected at concentrations above the analytical method detection limit (MDL)
Shaded text boxes indicate criterion has been exceeded.
ID = No specific criteria has been determined by the MDEQ

Results of the water sample analysis indicated that neither of the samples exhibited concentrations of contaminant substances above NREPA, Part 201 Generic Cleanup Criteria and Screening Levels for residential sites except for Iron, Benzene and Diethyl Ether, and neither exhibited concentrations of contaminant substances above NREPA, Part 201 Generic Cleanup Criteria and Screening Levels for the groundwater surface water interface (GSI).

Table 2. Soil Samples (S-1 and S-2)

Contaminant	Results		Statewide Default Background Levels	Drinking Water Protection Criteria	Groundwater Surface Water Interface Criteria	Direct Contact Criteria
	S-1	S-2				
Arsenic	1,200	**14,400**			70,000	
Cobalt	**3,150**	**2,540**	6,800			2,600,000
Iron	**286,000,000**	**18,400,000**			NA	
Lead	**49,900**	13,100		700,000	(G)	400,000
Mercury	**52**	ND	130	1,700		160,000
Selenium	330	**780**		4,000		2,600,000
Zinc	**278,000**	**75,700**		2,400,000	(G)	170,000,000

Notes: All results reported in parts per billion (ppb)
Bold entries indicate concentration exceeds NREPA, Part 201 threshold limits for one or more criteria.
ND = contaminant not detected at concentrations above the analytical method detection limit (MDL)
Shaded text boxes indicate criterion has been exceeded.
(G) = Criterion depends on the pH or the water hardness, or both, of the receiving water.

Results of the soil sample analysis indicated that neither of the samples exhibited concentrations of contaminant substances above NREPA, Part 201 Generic Cleanup Criteria and Screening Levels for residential sites except for Arsenic, Cobalt, Iron, Lead, Mercury, Selenium and Zinc. It is noted that some of the above metals, particularly lead and Zinc, have GSI criteria that varies depending on the characteristics of the receiving water. This is also true of some of the other metals that were detected in the samples. Evaluation of site-specific GSI criteria for various metals was not included in the scope of this preliminary sampling.

It is noted that some of the analytical parameters were selected to assist in future evaluations of the former landfill, as they may be useful in differentiating multiple groundwater sources and/or commingling plumes of contamination, if present. These parameters were as follows: BOD, COD, Nitrate, Nitrite, TKN, Total Phosphorus, Chloride, Sulfate, Carbonate/Bicarbonate, Magnesium, Sodium, Calcium and Potassium. The MDEQ has not established specific threshold or cleanup criteria under Part 201 for most of these parameters.

Based solely on the analytical data presented herein, the subject site is a "facility" as defined in Part 201 of the Natural Resources and Environmental Protection Act (NREPA). A facility is defined as any area, place or property where a hazardous substance in excess of MDEQ established, residential cleanup criteria has been released, deposited, disposed of or otherwise comes to be located.

Based on our past experience and the current and projected use of the properties located in the immediate vicinity of the site (i.e., commercial businesses and an airport), Wilcox is of the opinion that future evaluations of risk assessment and cleanup/mitigation options for the former landfill should utilize the Industrial (general airport operations/maintenance) or Commercial II (commercial warehouse/shipping businesses) category for comparison of contaminant concentrations to applicable criteria.

At this time, Wilcox offers no opinion for additional work to address the contamination identified in the above report. However, we would be pleased to discuss options for additional work should it be requested or required.

This report has been prepared for the sole use of RS&H, Inc. and Bishop International Airport. Use, reliance and distribution of this report by any other parties is prohibited without the written consent of Wilcox. We understand a copy of this report may be submitted to the MDEQ and the City of Flint. Wilcox authorizes use of this report by the MDEQ and City of Flint for general reference only, limited by the terms and conditions of our agreement with RS&H. This evaluation was conducted in accordance with accepted procedures in the field of environmental engineering and Wilcox's professional judgment. No warranties, implied or expressed, are made. It is expressly understood, we do not assume responsibility for reporting to any federal, state or local authority any conditions disclosed by this or any future phase of work which may be construed to present a potential danger to the health or safety of the general public or the environment. Please be advised that in certain circumstances, it may be the owner's responsibility to notify appropriate regulatory personnel in the event that such conditions are discovered.

Wilcox is pleased to be of continued service to RS&H. If you have questions or should you require additional information, please contact us at (989) 752-6500.

Respectfully,

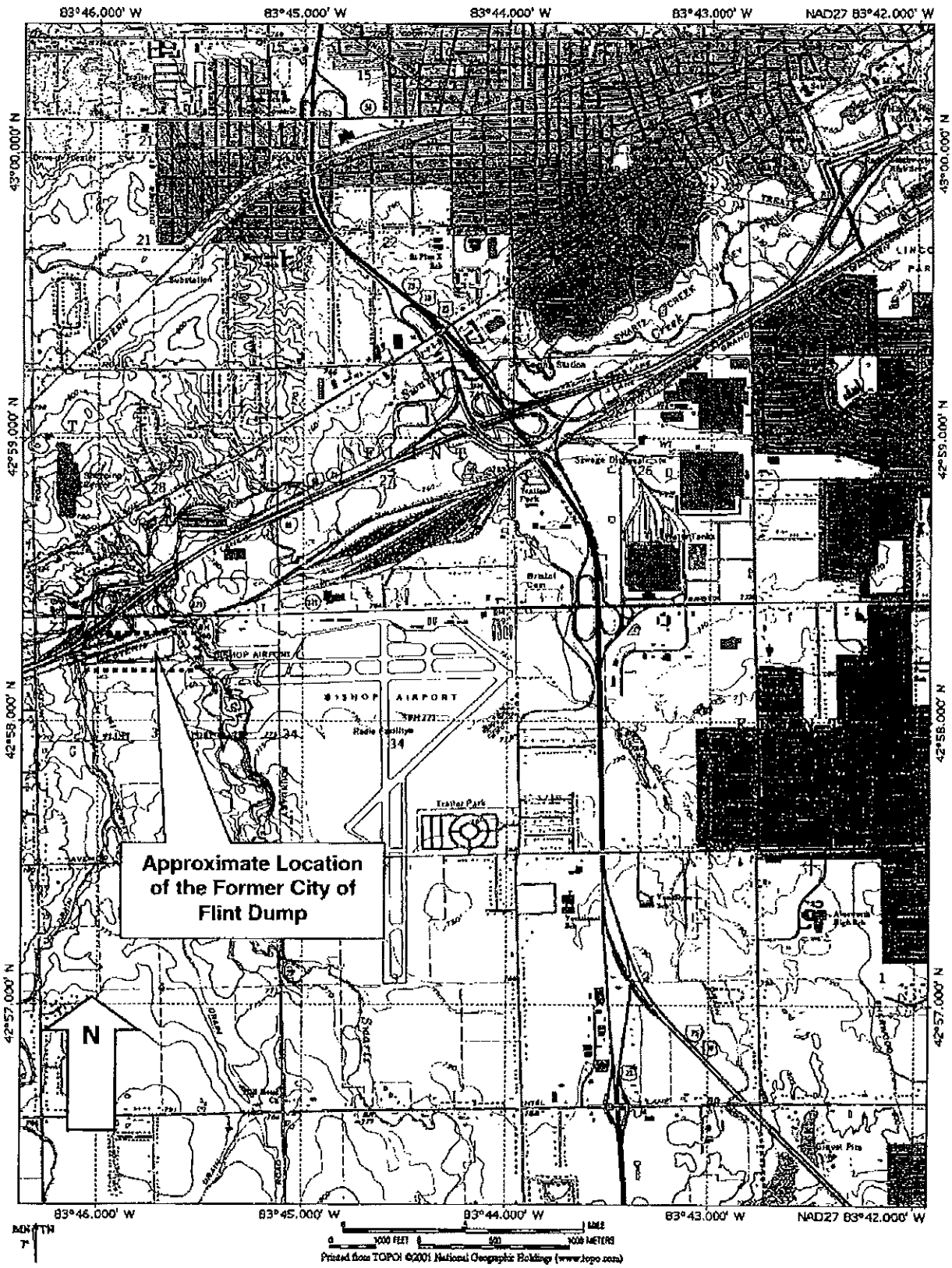
WILCOX PROFESSIONAL SERVICES, LLC

Brian J. Huebner
Project Professional

Wayne R. Bergstrom, Ph.D., P.E.
Project Director

Attachments: Site Location Diagram
Site Diagram
Site Photographs
Analytical Laboratory Report (21 Pages + Chain of Custody)

Cc: Mr. Mike Trout; Bishop International Airport



Wilcox

Phone: (989) 752-6500
Fax: (989) 752-6600
Website: http://www.wilcoxassociates.com

SITE LOCATION DIAGRAM
(USGS Topographic Map)
Former City of Flint Dump
Bishp International Airport
City of Flint, Michigan
Wilcox Project No. 50129.00009

DRAWN BY:	BJH
DATE:	05/08/06
APPROVED BY:	WRB
DATE:	05/10/06
UPDATED BY:	
DATE:	



Photo 1 – Photograph depicting the location of Water Sample WS-1.



Photo 2 – Photograph depicting the location of Soil Sample S-1.

Photographs depict the subject site at the time they were taken. Their material content has not been altered. Some formatting of size, brightness or contrast may have occurred to improve viewing of details.

Wilcox

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SITE PHOTOGRAPHS
Preliminary Water and Soil Sampling
Former City of Flint Dump
Bishop Airport
Genesee County, Michigan
Wilcox Project No. 50129.00009

DRAWN BY:	**BJH**
DATE:	**04/26/06**
APPROVED BY:	**WRB**
DATE:	**05/10/06**
UPDATED BY:	
DATE:	

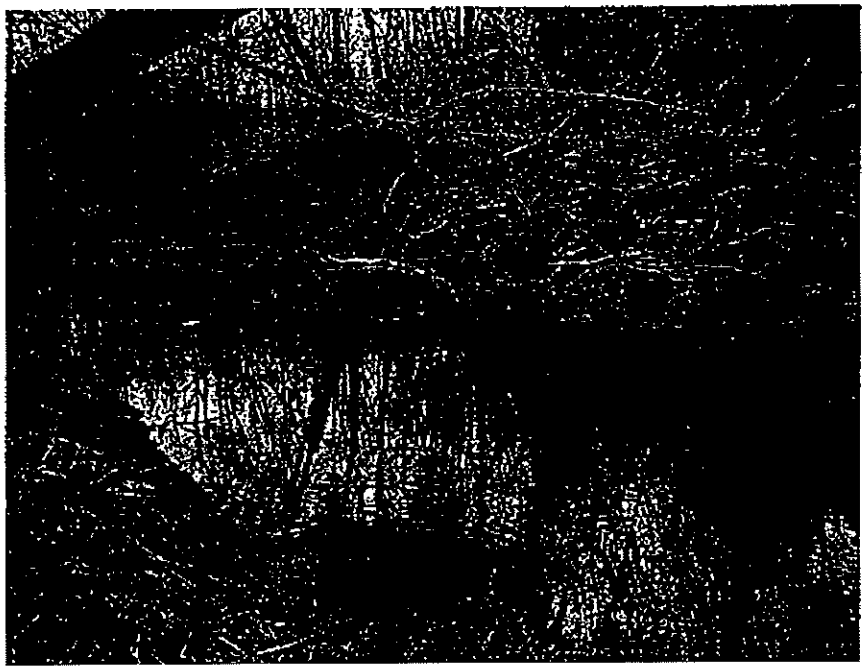


Photo 3 – Photograph depicting the area of impounded surface water near the northeast corner of the former landfill.

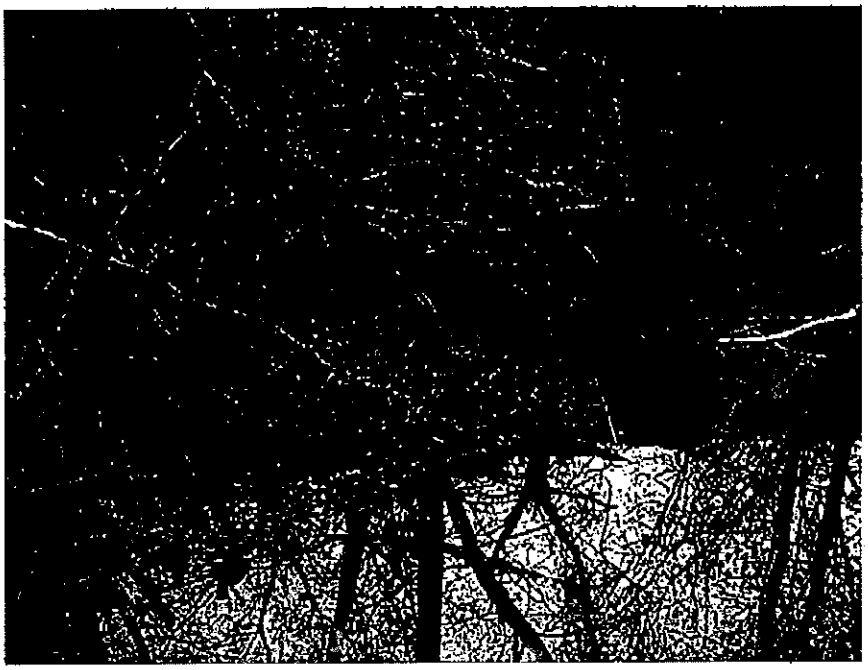


Photo 4 – Photograph depicting the location of Water Sample WS-2 and Soil Sample S-2.

Photographs depict the subject site at the time they were taken. Their material content has not been altered. Some formatting of size, brightness or contrast may have occurred to improve viewing of details.

Wilcox

Phone: (989) 752-6500
Fax: (989) 752-6600
Website:
http://www.wilcoxassociates.com

SITE PHOTOGRAPHS
Preliminary Water and Soil Sampling
Former City of Flint Dump
Bishop Airport
Genesee County, Michigan
Wilcox Project No. 50129.00009

DRAWN BY:	**BJH**
DATE:	**04/26/06**
APPROVED BY:	**WRB**
DATE:	**05/10/06**
UPDATED BY:	
DATE:	

Analytical Laboratory Report

Report ID: S26697.01(02)
Generated on 05/03/2006

Report to

Attention: Brian Huebner
WILCOX
5859 Sherman Road
Saginaw, MI 48604

Phone: 989-752-6500 FAX: 989-752-6600

Report produced by

Merit Laboratories
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Report Summary

Lab Sample ID(s): S26697.01-S26697.04
Project: 50129.00009
Submitted Date/Time: 04/20/2006 14:45
Sampled by: Brian Huebner
P.O. #: 14710

Report Notes

Results relate only to items tested as received by the laboratory.
Methods may be modified for improved performance.
Results reported on a dry weight basis where applicable.
""Not detected"" indicates that parameter was not found at a level equal to or greater than the RDL.
Report shall not be reproduced except in full, without the written approval of Merit Laboratories.

Violetta F. Murshak

Violetta F. Murshak
Laboratory Director

Analytical Laboratory Report

Lab Sample ID: S26697.01
Sample Tag: WS-1
Collected Date/Time: 04/20/2006 09:30
Matrix: Groundwater
COC Reference: 030876

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
4	1 L Amber	None	Yes	4.9	IR
1	L Plastic	None	Yes	4.9	IR
2	40 ml Glass	HCL	Yes	4.9	IR
1	125ml Plastic	HNO3	Yes	4.9	IR
1	250ml Plastic	H2SO4	Yes	4.9	IR

Analysis	Results	Units	RDL	Method	Run Date/Time	Analyst	CAS #	Flags
Extraction / Prep.								
BNA Extraction	Completed			3510C	04/25/06 10:44	EMR		
Extraction, PCB	Completed			3510C	04/24/06 10:56	TAS		
Mercury Digestion	Completed			7470A	04/21/06 10:00	JRT		
Metal Digestion	Completed			3015A	04/25/06 12:00	SLS		
Pesticides Extraction	Completed			3510C	04/24/06 10:57	TAS		
Inorganics								
Bicarbonate Alkalinity	937	mg/L	1	310.1	04/24/06 14:00	JKB		
Carbonate Alkalinity	Not detected	mg/L	2	310.1	04/24/06 14:00	JKB		
Chloride	85	mg/L	1	300.0	04/20/06 19:16	JDP	16887-00-6	
COD	123	mg/L	1	410.4	04/20/06 21:00	MJC		
Nitrate-N	Not detected	mg/L	0.2	300.0	04/20/06 19:16	JDP		
Nitrite-N	Not detected	mg/L	0.2	300.0	04/20/06 19:16	JDP		
Sulfate	Not detected	mg/L	2	300.0	04/20/06 19:16	JDP	14808-79-8	
TBOD5	255	mg/L	1	405.1	04/21/06 16:55-04/26/06	LBR		
Total Kjeldahl Nitrogen	82	mg/L	1	351.4	04/26/06 21:00	MJC		
Total Phosphorus	0.22	mg/L	0.01	365.2	04/25/06 16:00	MJC	7723-14-0	
Metals								
Antimony	Not detected	mg/L	0.002	200.8	04/27/06 14:25	SLS	7440-36-0	
Arsenic	0.001	mg/L	0.001	200.8	04/27/06 14:25	SLS	7440-38-2	
Barium	0.75	mg/L	0.01	200.8	04/27/06 14:25	SLS	7440-39-3	
Beryllium	Not detected	mg/L	0.001	200.8	04/27/06 14:25	SLS	7440-41-7	
Cadmium	Not detected	mg/L	0.0005	200.8	04/27/06 14:25	SLS	7440-43-9	
Calcium	172	mg/L	1.0	200.8	04/26/06 13:12	SLS	7440-70-2	
Chromium	0.022	mg/L	0.005	200.8	04/27/06 14:25	SLS	7440-47-3	
Cobalt	Not detected	mg/L	0.01	200.8	04/27/06 14:25	SLS	7440-48-4	
Copper	Not detected	mg/L	0.004	200.8	04/27/06 14:25	SLS	7440-50-8	
Iron	49.7	mg/L	0.10	200.8	04/26/06 15:42	SLS	7439-89-6	
Lead	0.007	mg/L	0.003	200.8	04/27/06 14:25	SLS	7439-92-1	
Magnesium	67.7	mg/L	1.0	200.8	04/26/06 13:12	SLS	7439-95-4	
Mercury	Not detected	mg/L	0.0002	245.1	04/21/06 13:34	JRT	7439-97-6	
Molybdenum	Not detected	mg/L	0.005	200.8	04/27/06 14:25	SLS	7439-98-7	
Nickel	0.008	mg/L	0.005	200.8	04/27/06 14:25	SLS	7440-02-0	
Potassium	44.7	mg/L	1.0	200.8	04/26/06 13:12	SLS	7440-09-7	
Selenium	Not detected	mg/L	0.005	200.8	04/27/06 14:25	SLS	7782-49-2	
Silver	Not detected	mg/L	0.0002	200.8	04/27/06 14:25	SLS	7440-22-4	
Sodium	65.8	mg/L	1.0	200.8	04/26/06 13:12	SLS	7440-23-5	
Thallium	Not detected	mg/L	0.001	200.8	04/27/06 14:25	SLS	7440-28-0	

Lab Sample ID: S26697.01 (continued)
Sample Tag: WS-1

Analysis	Results	Units	RDL	Method	Run Date/Time	Analyst	CAS #	Flags
Metals (continued)								
Vanadium	Not detected	mg/L	0.004	200.8	04/27/06 14:25	SLS	7440-62-2	
Zinc	0.05	mg/L	0.01	200.8	04/27/06 14:25	SLS	7440-66-6	
Organics - PCBs/Pesticides								
Organochlorine Pesticides								
Aldrin	Not detected	ug/L	0.02	608	04/24/06 15:01	JANB	309-00-2	
a-BHC	Not detected	ug/L	0.02	608	04/24/06 15:01	JANB	319-84-6	
b-BHC	Not detected	ug/L	0.02	608	04/24/06 15:01	JANB	319-85-7	
d-BHC	Not detected	ug/L	0.02	608	04/24/06 15:01	JANB	319-86-8	
g-BHC	Not detected	ug/L	0.02	608	04/24/06 15:01	JANB	58-89-9	
Chlordane	Not detected	ug/L	0.02	608	04/24/06 15:01	JANB	57-74-9	
4,4'-DDD	Not detected	ug/L	0.02	608	04/24/06 15:01	JANB	72-54-8	
4,4'-DDE	Not detected	ug/L	0.02	608	04/24/06 15:01	JANB	72-55-9	
4,4'-DDT	Not detected	ug/L	0.02	608	04/24/06 15:01	JANB	50-29-3	
Dieldrin	Not detected	ug/L	0.02	608	04/24/06 15:01	JANB	60-57-1	
Endosulfan I	Not detected	ug/L	0.02	608	04/24/06 15:01	JANB	959-98-8	
Endosulfan II	Not detected	ug/L	0.02	608	04/24/06 15:01	JANB	33213-65-9	
Endosulfan sulfate	Not detected	ug/L	0.02	608	04/24/06 15:01	JANB	1031-07-8	
Endrin	Not detected	ug/L	0.02	608	04/24/06 15:01	JANB	72-20-8	
Endrin aldehyde	Not detected	ug/L	0.02	608	04/24/06 15:01	JANB	7421-93-4	
Heptachlor	Not detected	ug/L	0.02	608	04/24/06 15:01	JANB	76-44-8	
Heptachlor epoxide	Not detected	ug/L	0.02	608	04/24/06 15:01	JANB	1024-57-3	
Toxaphene	Not detected	ug/L	1	608	04/24/06 15:01	JANB	8001-35-2	
Methoxychlor	Not detected	ug/L	0.5	608	04/24/06 15:01	JANB	72-43-5	
Endrin Ketone	Not detected	ug/L	0.02	608	04/24/06 15:01	JANB		
PCB								
PCB-1016	Not detected	ug/L	0.1	608	04/24/06 13:57	JANB	12674-11-2	
PCB-1221	Not detected	ug/L	0.1	608	04/24/06 13:57	JANB	11104-28-2	
PCB-1232	Not detected	ug/L	0.1	608	04/24/06 13:57	JANB	11141-16-5	
PCB-1242	Not detected	ug/L	0.1	608	04/24/06 13:57	JANB	53469-21-9	
PCB-1248	Not detected	ug/L	0.1	608	04/24/06 13:57	JANB	12672-29-6	
PCB-1254	Not detected	ug/L	0.1	608	04/24/06 13:57	JANB	11097-69-1	
PCB-1260	Not detected	ug/L	0.1	608	04/24/06 13:57	JANB	11096-82-5	
PCB, Total	Not detected	ug/L	0.1	608	04/24/06 13:57	JANB	1336-36-3	
Organics - Semi-Volatiles								
Semi-Volatile Organics - MDEQ								
Acenaphthene	Not detected	ug/L	5	8270C	04/26/06 14:36	ARH	83-32-9	
Acenaphthylene	Not detected	ug/L	5	8270C	04/26/06 14:36	ARH	208-96-8	
Anthracene	Not detected	ug/L	5	8270C	04/26/06 14:36	ARH	120-12-7	
Benzo(a)anthracene	Not detected	ug/L	1	8270C	04/26/06 14:36	ARH	56-55-3	
Benzo(b)fluoranthene	Not detected	ug/L	1	8270C	04/26/06 14:36	ARH	205-99-2	
Benzo(k)fluoranthene	Not detected	ug/L	1	8270C	04/26/06 14:36	ARH	207-08-9	
Benzo(ghi)perylene	Not detected	ug/L	1	8270C	04/26/06 14:36	ARH	191-24-2	
Benzo(a)pyrene	Not detected	ug/L	1	8270C	04/26/06 14:36	ARH	50-32-8	
bis(2-Chloroethoxy)methane	Not detected	ug/L	5	8270C	04/26/06 14:36	ARH	111-91-1	
bis(2-Chloroethyl)ether	Not detected	ug/L	5	8270C	04/26/06 14:36	ARH	111-44-4	
bis(2-Chloroisopropyl)ether	Not detected	ug/L	5	8270C	04/26/06 14:36	ARH	108-60-1	
bis(2-Ethylhexyl)phthalate	Not detected	ug/L	5	8270C	04/26/06 14:36	ARH	117-81-7	

Lab Sample ID: S26697.01 (continued)
Sample Tag: WS-1

Analysis	Results	Units	RDL	Method	Run Date/Time	Analyst	CAS #	Flags
Organics - Semi-Volatiles (continued)								
Semi-Volatile Organics - MDEQ (continued)								
4-Bromophenyl phenyl ether	Not detected	ug/L	5	8270C	04/26/06 14:36	ARH	101-55-3	
Butyl benzyl phthalate	Not detected	ug/L	5	8270C	04/26/06 14:36	ARH	85-68-7	
4-Chloroaniline	Not detected	ug/L	10	8270C	04/26/06 14:36	ARH	106-47-8	
2-Chloronaphthalene	Not detected	ug/L	5	8270C	04/26/06 14:36	ARH	91-58-7	
4-Chloro-3-methylphenol	Not detected	ug/L	5	8270C	04/26/06 14:36	ARH	59-50-7	
2-Chlorophenol	Not detected	ug/L	10	8270C	04/26/06 14:36	ARH	95-57-8	
4-Chlorophenyl phenyl ether	Not detected	ug/L	5	8270C	04/26/06 14:36	ARH	7005-72-3	
Chrysene	Not detected	ug/L	1	8270C	04/26/06 14:36	ARH	218-01-9	
p,m-Cresol	Not detected	ug/L	20	8270C	04/26/06 14:36	ARH	3/4-Cresol	
o-Cresol	Not detected	ug/L	10	8270C	04/26/06 14:36	ARH	95-48-7	
Dibenzo(ah)anthracene	Not detected	ug/L	2	8270C	04/26/06 14:36	ARH	53-70-3	
Dibenzofuran	Not detected	ug/L	4	8270C	04/26/06 14:36	ARH	132-64-9	
di-n-Butyl phthalate	Not detected	ug/L	5	8270C	04/26/06 14:36	ARH	84-74-2	
1,2-Dichlorobenzene	Not detected	ug/L	1	8270C	04/26/06 14:36	ARH	95-50-1	
1,3-Dichlorobenzene	Not detected	ug/L	1	8270C	04/26/06 14:36	ARH	541-73-1	
1,4-Dichlorobenzene	Not detected	ug/L	1	8270C	04/26/06 14:36	ARH	106-46-7	
3,3'-Dichlorobenzidine	Not detected	ug/L	5	8270C	04/26/06 14:36	ARH	91-94-1	
2,4-Dichlorophenol	Not detected	ug/L	10	8270C	04/26/06 14:36	ARH	120-83-2	
Diethyl phthalate	Not detected	ug/L	5	8270C	04/26/06 14:36	ARH	84-66-2	
2,4-Dimethylphenol	Not detected	ug/L	5	8270C	04/26/06 14:36	ARH	105-67-9	
Dimethyl phthalate	Not detected	ug/L	5	8270C	04/26/06 14:36	ARH	131-11-3	
4,6-Dinitro-2-methylphenol	Not detected	ug/L	20	8270C	04/26/06 14:36	ARH	534-52-1	
2,4-Dinitrophenol	Not detected	ug/L	30	8270C	04/26/06 14:36	ARH	51-28-5	
2,4-Dinitrotoluene	Not detected	ug/L	5	8270C	04/26/06 14:36	ARH	121-14-2	
2,6-Dinitrotoluene	Not detected	ug/L	5	8270C	04/26/06 14:36	ARH	606-20-2	
1,2-Diphenylhydrazine	Not detected	ug/L	5	8270C	04/26/06 14:36	ARH	122-66-7	
di-n-Octyl phthalate	Not detected	ug/L	5	8270C	04/26/06 14:36	ARH	117-84-0	
Fluoranthene	Not detected	ug/L	1	8270C	04/26/06 14:36	ARH	206-44-0	
Fluorene	Not detected	ug/L	5	8270C	04/26/06 14:36	ARH	86-73-7	
Hexachlorobenzene	Not detected	ug/L	5	8270C	04/26/06 14:36	ARH	118-74-1	
Hexachlorobutadiene	Not detected	ug/L	10	8270C	04/26/06 14:36	ARH	87-68-3	
Hexachlorocyclopentadiene	Not detected	ug/L	5	8270C	04/26/06 14:36	ARH	77-47-4	
Hexachloroethane	Not detected	ug/L	5	8270C	04/26/06 14:36	ARH	67-72-1	
Indeno(1,2,3-cd)pyrene	Not detected	ug/L	2	8270C	04/26/06 14:36	ARH	193-39-5	
Isophorone	Not detected	ug/L	5	8270C	04/26/06 14:36	ARH	78-59-1	
2-Methylnaphthalene	Not detected	ug/L	5	8270C	04/26/06 14:36	ARH	91-57-6	
Naphthalene	Not detected	ug/L	5	8270C	04/26/06 14:36	ARH	91-20-3	
2-Nitroaniline	Not detected	ug/L	30	8270C	04/26/06 14:36	ARH	88-74-4	
3-Nitroaniline	Not detected	ug/L	30	8270C	04/26/06 14:36	ARH	99-09-2	
4-Nitroaniline	Not detected	ug/L	30	8270C	04/26/06 14:36	ARH	100-01-6	
Nitrobenzene	Not detected	ug/L	5	8270C	04/26/06 14:36	ARH	98-95-3	
2-Nitrophenol	Not detected	ug/L	5	8270C	04/26/06 14:36	ARH	88-75-5	
4-Nitrophenol	Not detected	ug/L	30	8270C	04/26/06 14:36	ARH	100-02-7	
N-Nitrosodiphenylamine	Not detected	ug/L	5	8270C	04/26/06 14:36	ARH	86-30-6	
N-Nitrosodi-n-propylamine	Not detected	ug/L	5	8270C	04/26/06 14:36	ARH	621-64-7	
Pentachlorophenol	Not detected	ug/L	5	8270C	04/26/06 14:36	ARH	87-86-5	
Phenanthrene	Not detected	ug/L	2	8270C	04/26/06 14:36	ARH	85-01-8	
Phenol	Not detected	ug/L	5	8270C	04/26/06 14:36	ARH	108-95-2	
Pyrene	Not detected	ug/L	5	8270C	04/26/06 14:36	ARH	129-00-0	

Lab Sample ID: S26697.01 (continued)
Sample Tag: WS-1

Analysis	Results	Units	RDL	Method	Run Date/Time	Analyst	CAS #	Flags
Organics - Semi-Volatiles (continued)								
Semi-Volatile Organics - MDEQ (continued)								
1,2,4-Trichlorobenzene	Not detected	ug/L	5	8270C	04/26/06 14:36	ARH	120-82-1	
2,4,5-Trichlorophenol	Not detected	ug/L	5	8270C	04/26/06 14:36	ARH	95-95-4	
2,4,6-Trichlorophenol	Not detected	ug/L	4	8270C	04/26/06 14:36	ARH	88-06-2	
Organics - Volatiles								
Volatile Organics - DEQ List								
Benzene	8	ug/L	1	8260B	04/26/06 18:23	JGH	71-43-2	
Bromodichloromethane	Not detected	ug/L	1	8260B	04/26/06 18:23	JGH	75-27-4	
Bromoform	Not detected	ug/L	1	8260B	04/26/06 18:23	JGH	75-25-2	
Bromomethane	Not detected	ug/L	5	8260B	04/26/06 18:23	JGH	74-83-9	
n-Butylbenzene	Not detected	ug/L	1	8260B	04/26/06 18:23	JGH	104-51-8	
sec-Butylbenzene	Not detected	ug/L	1	8260B	04/26/06 18:23	JGH	135-98-8	
tert-Butylbenzene	Not detected	ug/L	1	8260B	04/26/06 18:23	JGH	98-06-6	
Carbon tetrachloride	Not detected	ug/L	1	8260B	04/26/06 18:23	JGH	56-23-5	
Chlorobenzene	5	ug/L	1	8260B	04/26/06 18:23	JGH	108-90-7	
Chloroethane	Not detected	ug/L	5	8260B	04/26/06 18:23	JGH	75-00-3	
Chloroform	Not detected	ug/L	1	8260B	04/26/06 18:23	JGH	67-66-3	
Chloromethane	Not detected	ug/L	5	8260B	04/26/06 18:23	JGH	74-87-3	
Dibromochloromethane	Not detected	ug/L	5	8260B	04/26/06 18:23	JGH	124-48-1	
1,2-Dichlorobenzene	Not detected	ug/L	1	8260B	04/26/06 18:23	JGH	95-50-1	
1,3-Dichlorobenzene	Not detected	ug/L	1	8260B	04/26/06 18:23	JGH	541-73-1	
1,4-Dichlorobenzene	2	ug/L	1	8260B	04/26/06 18:23	JGH	106-46-7	
1,1-Dichloroethane	Not detected	ug/L	1	8260B	04/26/06 18:23	JGH	75-34-3	
1,2-Dichloroethane	Not detected	ug/L	1	8260B	04/26/06 18:23	JGH	107-06-2	
1,1-Dichloroethene	Not detected	ug/L	1	8260B	04/26/06 18:23	JGH	75-35-4	
cis-1,2-Dichloroethene	Not detected	ug/L	1	8260B	04/26/06 18:23	JGH	156-59-2	
trans-1,2-Dichloroethene	Not detected	ug/L	1	8260B	04/26/06 18:23	JGH	156-60-5	
1,2-Dichloropropane	Not detected	ug/L	1	8260B	04/26/06 18:23	JGH	78-87-5	
cis-1,3-Dichloropropene	Not detected	ug/L	1	8260B	04/26/06 18:23	JGH	10061-01-5	
trans-1,3-Dichloropropene	Not detected	ug/L	1	8260B	04/26/06 18:23	JGH	10061-02-6	
Ethylbenzene	Not detected	ug/L	1	8260B	04/26/06 18:23	JGH	100-41-4	
Isopropylbenzene	Not detected	ug/L	5	8260B	04/26/06 18:23	JGH	98-82-8	
p-Isopropyltoluene	Not detected	ug/L	5	8260B	04/26/06 18:23	JGH	99-87-6	
Methylene chloride	Not detected	ug/L	5	8260B	04/26/06 18:23	JGH	75-09-2	
Naphthalene	Not detected	ug/L	5	8260B	04/26/06 18:23	JGH	91-20-3	
n-Propylbenzene	2	ug/L	1	8260B	04/26/06 18:23	JGH	103-65-1	
Styrene	Not detected	ug/L	1	8260B	04/26/06 18:23	JGH	100-42-5	
1,1,2,2-Tetrachloroethane	Not detected	ug/L	1	8260B	04/26/06 18:23	JGH	79-34-5	
Tetrachloroethene	Not detected	ug/L	1	8260B	04/26/06 18:23	JGH	127-18-4	
Toluene	Not detected	ug/L	1	8260B	04/26/06 18:23	JGH	108-88-3	
1,1,1-Trichloroethane	Not detected	ug/L	1	8260B	04/26/06 18:23	JGH	71-55-6	
1,1,2-Trichloroethane	Not detected	ug/L	1	8260B	04/26/06 18:23	JGH	79-00-5	
Trichloroethene	Not detected	ug/L	1	8260B	04/26/06 18:23	JGH	79-01-6	
1,2,4-Trimethylbenzene	Not detected	ug/L	1	8260B	04/26/06 18:23	JGH	95-63-6	
1,3,5-Trimethylbenzene	Not detected	ug/L	1	8260B	04/26/06 18:23	JGH	108-67-8	
Vinyl chloride	Not detected	ug/L	1	8260B	04/26/06 18:23	JGH	75-01-4	
o-Xylene	Not detected	ug/L	1	8260B	04/26/06 18:23	JGH	95-47-6	
p,m-Xylene	Not detected	ug/L	2	8260B	04/26/06 18:23	JGH		
Acetone	Not detected	ug/L	50	8260B	04/26/06 18:23	JGH	67-64-1	

Lab Sample ID: S26697.01 (continued)
Sample Tag: WS-1

Analysis	Results	Units	RDL	Method	Run Date/Time	Analyst	CAS #	Flags
Organics - Volatiles (continued)								
Volatile Organics - DEQ List (continued)								
2-Butanone (MEK)	Not detected	ug/L	30	8260B	04/26/06 18:23	JGH	78-93-3	
Carbon disulfide	Not detected	ug/L	5	8260B	04/26/06 18:23	JGH	75-15-0	
2-Hexanone	Not detected	ug/L	50	8260B	04/26/06 18:23	JGH	591-78-6	
4-Methyl-2-pentanone (MIBK)	Not detected	ug/L	50	8260B	04/26/06 18:23	JGH	108-10-1	
tert-Methyl butyl ether (MTBE)	Not detected	ug/L	5	8260B	04/26/06 18:23	JGH	1634-04-4	
1,1,1,2-Tetrachloroethane	Not detected	ug/L	1	8260B	04/26/06 18:23	JGH	630-20-6	
1,2,3-Trichlorobenzene	Not detected	ug/L	5	8260B	04/26/06 18:23	JGH	87-61-6	
1,2,3-Trichloropropane	Not detected	ug/L	1	8260B	04/26/06 18:23	JGH	96-18-4	
1,2,4-Trichlorobenzene	Not detected	ug/L	5	8260B	04/26/06 18:23	JGH	120-82-1	
1,2-Dibromo-3-chloropropane	Not detected	ug/L	5	8260B	04/26/06 18:23	JGH	96-12-8	
1,2-Dibromoethane	Not detected	ug/L	1	8260B	04/26/06 18:23	JGH	106-93-4	
2 Methylnaphthalene	Not detected	ug/L	5	8260B	04/26/06 18:23	JGH	91-57-6	
Acrylonitrile	Not detected	ug/L	2	8260B	04/26/06 18:23	JGH	107-13-1	
Bromobenzene	Not detected	ug/L	1	8260B	04/26/06 18:23	JGH	108-86-1	
Bromochloromethane	Not detected	ug/L	1	8260B	04/26/06 18:23	JGH	74-97-5	
Dibromomethane	Not detected	ug/L	5	8260B	04/26/06 18:23	JGH	74-95-3	
Dichlorodifluoromethane	Not detected	ug/L	5	8260B	04/26/06 18:23	JGH	75-71-8	
Diethyl ether	30	ug/L	10	8260B	04/26/06 18:23	JGH	60-29-7	
Hexachloroethane	Not detected	ug/L	5	8260B	04/26/06 18:23	JGH	67-72-1	
Methyl Iodide	Not detected	ug/L	1	8260B	04/26/06 18:23	JGH	74-88-4	
Tetrahydrofuran	Not detected	ug/L	90	8260B	04/26/06 18:23	JGH	109-99-9	
Trichlorofluoromethane	Not detected	ug/L	1	8260B	04/26/06 18:23	JGH	75-69-4	
1,2,3-Trimethylbenzene	Not detected	ug/L	1	8260B	04/26/06 18:23	JGH	526-73-8	
trans-1,4-Dichloro-2-butene	Not detected	ug/L	1	8260B	04/26/06 18:23	JGH	110-57-6	
Organics								
Chlorinated Herbicides								
Dicamba	Not detected	ug/L	2	8151	04/23/06 12:00	STL	1918-00-9	O
Dinoseb	Not detected	ug/L	0.6	8151	04/23/06 12:00	STL	88-85-7	O
2,4-D	Not detected	ug/L	4	8151	04/23/06 12:00	STL	94-75-7	O
2,4,5-TP (Silvex)	Not detected	ug/L	1	8151	04/23/06 12:00	STL	93-72-1	O
2,4,5-T	Not detected	ug/L	1	8151	04/23/06 12:00	STL	93-76-5	O

O-Analysis performed by outside laboratory

Analytical Laboratory Report

Lab Sample ID: S26697.02
Sample Tag: WS-2
Collected Date/Time: 04/20/2006 10:30
Matrix: Groundwater
COC Reference: 030876

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
4	1 L Amber	None	Yes	4.9	IR
1	L Plastic	None	Yes	4.9	IR
2	40 ml Glass	HCL	Yes	4.9	IR
1	125ml Plastic	HNO3	Yes	4.9	IR
1	250ml Plastic	H2SO4	Yes	4.9	IR

Analysis	Results	Units	RDL	Method	Run Date/Time	Analyst	CAS #	Flags
Extraction / Prep.								
BNA Extraction	Completed			3510C	04/25/06 10:44	EMR		
Extraction, PCB	Completed			3510C	04/24/06 10:56	TAS		
Mercury Digestion	Completed			7470A	04/21/06 10:00	JRT		
Metal Digestion	Completed			3015A	04/25/06 12:00	SLS		
Pesticides Extraction	Completed			3510C	04/24/06 10:57	TAS		
Inorganics								
Bicarbonate Alkalinity	602	mg/L	1	310.1	04/24/06 14:05	JKB		
Carbonate Alkalinity	Not detected	mg/L	2	310.1	04/24/06 14:05	JKB		
Chloride	57	mg/L	1	300.0	04/20/06 19:28	JDP	16887-00-6	
COD	58	mg/L	1	410.4	04/20/06 21:00	MJC		
Nitrate-N	2.0	mg/L	0.2	300.0	04/20/06 19:28	JDP		
Nitrite-N	Not detected	mg/L	0.2	300.0	04/20/06 19:28	JDP		
Sulfate	32	mg/L	2	300.0	04/20/06 19:28	JDP	14808-79-8	
TBOD5	17	mg/L	1	405.1	04/21/06 16:55-04/26/06	LBR		
Total Kjeldahl Nitrogen	25.0	mg/L	0.1	351.4	04/26/06 16:00	MJC		
Total Phosphorus	0.03	mg/L	0.01	365.2	04/25/06 16:00	MJC	7723-14-0	
Metals								
Antimony	Not detected	mg/L	0.002	200.8	04/27/06 14:28	SLS	7440-36-0	
Arsenic	0.001	mg/L	0.001	200.8	04/27/06 14:28	SLS	7440-38-2	
Barium	0.16	mg/L	0.01	200.8	04/27/06 14:28	SLS	7440-39-3	
Beryllium	Not detected	mg/L	0.001	200.8	04/27/06 14:28	SLS	7440-41-7	
Cadmium	Not detected	mg/L	0.0005	200.8	04/27/06 14:28	SLS	7440-43-9	
Calcium	144	mg/L	1.0	200.8	04/26/06 13:15	SLS	7440-70-2	
Chromium	Not detected	mg/L	0.005	200.8	04/27/06 14:28	SLS	7440-47-3	
Cobalt	Not detected	mg/L	0.01	200.8	04/27/06 14:28	SLS	7440-48-4	
Copper	0.004	mg/L	0.004	200.8	04/27/06 14:28	SLS	7440-50-8	
Iron	1.01	mg/L	0.10	200.8	04/26/06 15:45	SLS	7439-89-6	
Lead	Not detected	mg/L	0.003	200.8	04/27/06 14:28	SLS	7439-92-1	
Magnesium	44.4	mg/L	1.0	200.8	04/26/06 13:15	SLS	7439-95-4	
Mercury	Not detected	mg/L	0.0002	245.1	04/21/06 13:36	JRT	7439-97-6	
Molybdenum	Not detected	mg/L	0.005	200.8	04/27/06 14:28	SLS	7439-98-7	
Nickel	0.006	mg/L	0.005	200.8	04/27/06 14:28	SLS	7440-02-0	
Potassium	26.0	mg/L	1.0	200.8	04/26/06 13:15	SLS	7440-09-7	
Selenium	Not detected	mg/L	0.005	200.8	04/27/06 14:28	SLS	7782-49-2	
Silver	Not detected	mg/L	0.0002	200.8	04/27/06 14:28	SLS	7440-22-4	
Sodium	47.9	mg/L	1.0	200.8	04/26/06 13:15	SLS	7440-23-5	
Thallium	Not detected	mg/L	0.001	200.8	04/27/06 14:28	SLS	7440-28-0	

Lab Sample ID: S26697.02 (continued)
Sample Tag: WS-2

Analysis	Results	Units	RDL	Method	Run Date/Time	Analyst	CAS #	Flags
Metals (continued)								
Vanadium	Not detected	mg/L	0.004	200.8	04/27/06 14:28	SLS	7440-62-2	
Zinc	0.01	mg/L	0.01	200.8	04/27/06 14:28	SLS	7440-66-6	
Organics - PCBs/Pesticides								
Organochlorine Pesticides								
Aldrin	Not detected	ug/L	0.02	608	04/24/06 15:13	JANB	309-00-2	
a-BHC	Not detected	ug/L	0.02	608	04/24/06 15:13	JANB	319-84-6	
b-BHC	Not detected	ug/L	0.02	608	04/24/06 15:13	JANB	319-85-7	
d-BHC	Not detected	ug/L	0.02	608	04/24/06 15:13	JANB	319-86-8	
g-BHC	Not detected	ug/L	0.02	608	04/24/06 15:13	JANB	58-89-9	
Chlordane	Not detected	ug/L	0.02	608	04/24/06 15:13	JANB	57-74-9	
4,4'-DDD	Not detected	ug/L	0.02	608	04/24/06 15:13	JANB	72-54-8	
4,4'-DDE	Not detected	ug/L	0.02	608	04/24/06 15:13	JANB	72-55-9	
4,4'-DDT	Not detected	ug/L	0.02	608	04/24/06 15:13	JANB	50-29-3	
Dieldrin	Not detected	ug/L	0.02	608	04/24/06 15:13	JANB	60-57-1	
Endosulfan I	Not detected	ug/L	0.02	608	04/24/06 15:13	JANB	959-98-8	
Endosulfan II	Not detected	ug/L	0.02	608	04/24/06 15:13	JANB	33213-65-9	
Endosulfan sulfate	Not detected	ug/L	0.02	608	04/24/06 15:13	JANB	1031-07-8	
Endrin	Not detected	ug/L	0.02	608	04/24/06 15:13	JANB	72-20-8	
Endrin aldehyde	Not detected	ug/L	0.02	608	04/24/06 15:13	JANB	7421-93-4	
Heptachlor	Not detected	ug/L	0.02	608	04/24/06 15:13	JANB	76-44-8	
Heptachlor epoxide	Not detected	ug/L	0.02	608	04/24/06 15:13	JANB	1024-57-3	
Toxaphene	Not detected	ug/L	1	608	04/24/06 15:13	JANB	8001-35-2	
Methoxychlor	Not detected	ug/L	0.5	608	04/24/06 15:13	JANB	72-43-5	
Endrin Ketone	Not detected	ug/L	0.02	608	04/24/06 15:13	JANB		
PCB								
PCB-1016	Not detected	ug/L	0.1	608	04/24/06 14:09	JANB	12674-11-2	
PCB-1221	Not detected	ug/L	0.1	608	04/24/06 14:09	JANB	11104-28-2	
PCB-1232	Not detected	ug/L	0.1	608	04/24/06 14:09	JANB	11141-16-5	
PCB-1242	Not detected	ug/L	0.1	608	04/24/06 14:09	JANB	53469-21-9	
PCB-1248	Not detected	ug/L	0.1	608	04/24/06 14:09	JANB	12672-29-6	
PCB-1254	Not detected	ug/L	0.1	608	04/24/06 14:09	JANB	11097-69-1	
PCB-1260	Not detected	ug/L	0.1	608	04/24/06 14:09	JANB	11096-82-5	
PCB, Total	Not detected	ug/L	0.1	608	04/24/06 14:09	JANB	1336-36-3	
Organics - Semi-Volatiles								
Semi-Volatile Organics - MDEQ								
Acenaphthene	Not detected	ug/L	5	8270C	04/26/06 15:12	ARH	83-32-9	
Acenaphthylene	Not detected	ug/L	5	8270C	04/26/06 15:12	ARH	208-96-8	
Anthracene	Not detected	ug/L	5	8270C	04/26/06 15:12	ARH	120-12-7	
Benzo(a)anthracene	Not detected	ug/L	1	8270C	04/26/06 15:12	ARH	56-55-3	
Benzo(b)fluoranthene	Not detected	ug/L	1	8270C	04/26/06 15:12	ARH	205-99-2	
Benzo(k)fluoranthene	Not detected	ug/L	1	8270C	04/26/06 15:12	ARH	207-08-9	
Benzo(ghi)perylene	Not detected	ug/L	1	8270C	04/26/06 15:12	ARH	191-24-2	
Benzo(a)pyrene	Not detected	ug/L	1	8270C	04/26/06 15:12	ARH	50-32-8	
bis(2-Chloroethoxy)methane	Not detected	ug/L	5	8270C	04/26/06 15:12	ARH	111-91-1	
bis(2-Chloroethyl)ether	Not detected	ug/L	5	8270C	04/26/06 15:12	ARH	111-44-4	
bis(2-Chloroisopropyl)ether	Not detected	ug/L	5	8270C	04/26/06 15:12	ARH	108-60-1	
bis(2-Ethylhexyl)phthalate	Not detected	ug/L	5	8270C	04/26/06 15:12	ARH	117-81-7	

Lab Sample ID: S26697.02 (continued)
Sample Tag: WS-2

Analysis	Results	Units	RDL	Method	Run Date/Time	Analyst	CAS #	Flags
Organics - Semi-Volatiles (continued)								
Semi-Volatile Organics - MDEQ (continued)								
4-Bromophenyl phenyl ether	Not detected	ug/L	5	8270C	04/26/06 15:12	ARH	101-55-3	
Butyl benzyl phthalate	Not detected	ug/L	5	8270C	04/26/06 15:12	ARH	85-68-7	
4-Chloroaniline	Not detected	ug/L	10	8270C	04/26/06 15:12	ARH	106-47-8	
2-Chloronaphthalene	Not detected	ug/L	5	8270C	04/26/06 15:12	ARH	91-58-7	
4-Chloro-3-methylphenol	Not detected	ug/L	5	8270C	04/26/06 15:12	ARH	59-50-7	
2-Chlorophenol	Not detected	ug/L	10	8270C	04/26/06 15:12	ARH	95-57-8	
4-Chlorophenyl phenyl ether	Not detected	ug/L	5	8270C	04/26/06 15:12	ARH	7005-72-3	
Chrysene	Not detected	ug/L	1	8270C	04/26/06 15:12	ARH	218-01-9	
p,m-Cresol	Not detected	ug/L	20	8270C	04/26/06 15:12	ARH	3/4-Cresol	
o-Cresol	Not detected	ug/L	10	8270C	04/26/06 15:12	ARH	95-48-7	
Dibenzo(ah)anthracene	Not detected	ug/L	2	8270C	04/26/06 15:12	ARH	53-70-3	
Dibenzofuran	Not detected	ug/L	4	8270C	04/26/06 15:12	ARH	132-64-9	
di-n-Butyl phthalate	Not detected	ug/L	5	8270C	04/26/06 15:12	ARH	84-74-2	
1,2-Dichlorobenzene	Not detected	ug/L	1	8270C	04/26/06 15:12	ARH	95-50-1	
1,3-Dichlorobenzene	Not detected	ug/L	1	8270C	04/26/06 15:12	ARH	541-73-1	
1,4-Dichlorobenzene	Not detected	ug/L	1	8270C	04/26/06 15:12	ARH	106-46-7	
3,3'-Dichlorobenzidine	Not detected	ug/L	5	8270C	04/26/06 15:12	ARH	91-94-1	
2,4-Dichlorophenol	Not detected	ug/L	10	8270C	04/26/06 15:12	ARH	120-83-2	
Diethyl phthalate	Not detected	ug/L	5	8270C	04/26/06 15:12	ARH	84-66-2	
2,4-Dimethylphenol	Not detected	ug/L	5	8270C	04/26/06 15:12	ARH	105-67-9	
Dimethyl phthalate	Not detected	ug/L	5	8270C	04/26/06 15:12	ARH	131-11-3	
4,6-Dinitro-2-methylphenol	Not detected	ug/L	20	8270C	04/26/06 15:12	ARH	534-52-1	
2,4-Dinitrophenol	Not detected	ug/L	30	8270C	04/26/06 15:12	ARH	51-28-5	
2,4-Dinitrotoluene	Not detected	ug/L	5	8270C	04/26/06 15:12	ARH	121-14-2	
2,6-Dinitrotoluene	Not detected	ug/L	5	8270C	04/26/06 15:12	ARH	606-20-2	
1,2-Diphenylhydrazine	Not detected	ug/L	5	8270C	04/26/06 15:12	ARH	122-66-7	
di-n-Octyl phthalate	Not detected	ug/L	5	8270C	04/26/06 15:12	ARH	117-84-0	
Fluoranthene	Not detected	ug/L	1	8270C	04/26/06 15:12	ARH	206-44-0	
Fluorene	Not detected	ug/L	5	8270C	04/26/06 15:12	ARH	86-73-7	
Hexachlorobenzene	Not detected	ug/L	5	8270C	04/26/06 15:12	ARH	118-74-1	
Hexachlorobutadiene	Not detected	ug/L	10	8270C	04/26/06 15:12	ARH	87-68-3	
Hexachlorocyclopentadiene	Not detected	ug/L	5	8270C	04/26/06 15:12	ARH	77-47-4	
Hexachloroethane	Not detected	ug/L	5	8270C	04/26/06 15:12	ARH	67-72-1	
Indeno(1,2,3-cd)pyrene	Not detected	ug/L	2	8270C	04/26/06 15:12	ARH	193-39-5	
Isophorone	Not detected	ug/L	5	8270C	04/26/06 15:12	ARH	78-59-1	
2-Methylnaphthalene	Not detected	ug/L	5	8270C	04/26/06 15:12	ARH	91-57-6	
Naphthalene	Not detected	ug/L	5	8270C	04/26/06 15:12	ARH	91-20-3	
2-Nitroaniline	Not detected	ug/L	30	8270C	04/26/06 15:12	ARH	88-74-4	
3-Nitroaniline	Not detected	ug/L	30	8270C	04/26/06 15:12	ARH	99-09-2	
4-Nitroaniline	Not detected	ug/L	30	8270C	04/26/06 15:12	ARH	100-01-6	
Nitrobenzene	Not detected	ug/L	5	8270C	04/26/06 15:12	ARH	98-95-3	
2-Nitrophenol	Not detected	ug/L	5	8270C	04/26/06 15:12	ARH	88-75-5	
4-Nitrophenol	Not detected	ug/L	30	8270C	04/26/06 15:12	ARH	100-02-7	
N-Nitrosodiphenylamine	Not detected	ug/L	5	8270C	04/26/06 15:12	ARH	86-30-6	
N-Nitrosodi-n-propylamine	Not detected	ug/L	5	8270C	04/26/06 15:12	ARH	621-64-7	
Pentachlorophenol	Not detected	ug/L	5	8270C	04/26/06 15:12	ARH	87-86-5	
Phenanthrene	Not detected	ug/L	2	8270C	04/26/06 15:12	ARH	85-01-8	
Phenol	Not detected	ug/L	5	8270C	04/26/06 15:12	ARH	108-95-2	
Pyrene	Not detected	ug/L	5	8270C	04/26/06 15:12	ARH	129-00-0	

Lab Sample ID: S26697.02 (continued)
Sample Tag: WS-2

Analysis	Results	Units	RDL	Method	Run Date/Time	Analyst	CAS #	Flags
Organics - Semi-Volatiles (continued)								
Semi-Volatile Organics - MDEQ (continued)								
1,2,4-Trichlorobenzene	Not detected	ug/L	5	8270C	04/26/06 15:12	ARH	120-82-1	
2,4,5-Trichlorophenol	Not detected	ug/L	5	8270C	04/26/06 15:12	ARH	95-95-4	
2,4,6-Trichlorophenol	Not detected	ug/L	4	8270C	04/26/06 15:12	ARH	88-06-2	
Organics - Volatiles								
Volatile Organics - DEQ List								
Benzene	Not detected	ug/L	1	8260B	04/25/06 17:36	DMA	71-43-2	
Bromodichloromethane	Not detected	ug/L	1	8260B	04/25/06 17:36	DMA	75-27-4	
Bromoform	Not detected	ug/L	1	8260B	04/25/06 17:36	DMA	75-25-2	
Bromomethane	Not detected	ug/L	5	8260B	04/25/06 17:36	DMA	74-83-9	
n-Butylbenzene	Not detected	ug/L	1	8260B	04/25/06 17:36	DMA	104-51-8	
sec-Butylbenzene	Not detected	ug/L	1	8260B	04/25/06 17:36	DMA	135-98-8	
tert-Butylbenzene	Not detected	ug/L	1	8260B	04/25/06 17:36	DMA	98-06-6	
Carbon tetrachloride	Not detected	ug/L	1	8260B	04/25/06 17:36	DMA	56-23-5	
Chlorobenzene	Not detected	ug/L	1	8260B	04/25/06 17:36	DMA	108-90-7	
Chloroethane	Not detected	ug/L	5	8260B	04/25/06 17:36	DMA	75-00-3	
Chloroform	Not detected	ug/L	1	8260B	04/25/06 17:36	DMA	67-66-3	
Chloromethane	Not detected	ug/L	5	8260B	04/25/06 17:36	DMA	74-87-3	
Dibromochloromethane	Not detected	ug/L	5	8260B	04/25/06 17:36	DMA	124-48-1	
1,2-Dichlorobenzene	Not detected	ug/L	1	8260B	04/25/06 17:36	DMA	95-50-1	
1,3-Dichlorobenzene	Not detected	ug/L	1	8260B	04/25/06 17:36	DMA	541-73-1	
1,4-Dichlorobenzene	Not detected	ug/L	1	8260B	04/25/06 17:36	DMA	106-46-7	
1,1-Dichloroethane	Not detected	ug/L	1	8260B	04/25/06 17:36	DMA	75-34-3	
1,2-Dichloroethane	Not detected	ug/L	1	8260B	04/25/06 17:36	DMA	107-06-2	
1,1-Dichloroethene	Not detected	ug/L	1	8260B	04/25/06 17:36	DMA	75-35-4	
cis-1,2-Dichloroethene	Not detected	ug/L	1	8260B	04/25/06 17:36	DMA	156-59-2	
trans-1,2-Dichloroethene	Not detected	ug/L	1	8260B	04/25/06 17:36	DMA	156-60-5	
1,2-Dichloropropane	Not detected	ug/L	1	8260B	04/25/06 17:36	DMA	78-87-5	
cis-1,3-Dichloropropene	Not detected	ug/L	1	8260B	04/25/06 17:36	DMA	10061-01-5	
trans-1,3-Dichloropropene	Not detected	ug/L	1	8260B	04/25/06 17:36	DMA	10061-02-6	
Ethylbenzene	Not detected	ug/L	1	8260B	04/25/06 17:36	DMA	100-41-4	
Isopropylbenzene	Not detected	ug/L	5	8260B	04/25/06 17:36	DMA	98-82-8	
p-Isopropyltoluene	Not detected	ug/L	5	8260B	04/25/06 17:36	DMA	99-87-6	
Methylene chloride	Not detected	ug/L	5	8260B	04/25/06 17:36	DMA	75-09-2	
Naphthalene	Not detected	ug/L	5	8260B	04/25/06 17:36	DMA	91-20-3	
n-Propylbenzene	Not detected	ug/L	1	8260B	04/25/06 17:36	DMA	103-65-1	
Styrene	Not detected	ug/L	1	8260B	04/25/06 17:36	DMA	100-42-5	
1,1,2,2-Tetrachloroethane	Not detected	ug/L	1	8260B	04/25/06 17:36	DMA	79-34-5	
Tetrachloroethene	Not detected	ug/L	1	8260B	04/25/06 17:36	DMA	127-18-4	
Toluene	Not detected	ug/L	1	8260B	04/25/06 17:36	DMA	108-88-3	
1,1,1-Trichloroethane	Not detected	ug/L	1	8260B	04/25/06 17:36	DMA	71-55-6	
1,1,2-Trichloroethane	Not detected	ug/L	1	8260B	04/25/06 17:36	DMA	79-00-5	
Trichloroethene	Not detected	ug/L	1	8260B	04/25/06 17:36	DMA	79-01-6	
1,2,4-Trimethylbenzene	Not detected	ug/L	1	8260B	04/25/06 17:36	DMA	95-63-6	
1,3,5-Trimethylbenzene	Not detected	ug/L	1	8260B	04/25/06 17:36	DMA	108-67-8	
Vinyl chloride	Not detected	ug/L	1	8260B	04/25/06 17:36	DMA	75-01-4	
o-Xylene	Not detected	ug/L	1	8260B	04/25/06 17:36	DMA	95-47-6	
p,m-Xylene	Not detected	ug/L	2	8260B	04/25/06 17:36	DMA		
Acetone	Not detected	ug/L	50	8260B	04/25/06 17:36	DMA	67-64-1	

Lab Sample ID: S26697.02 (continued)
Sample Tag: WS-2

Analysis	Results	Units	RDL	Method	Run Date/Time	Analyst	CAS #	Flags
Organics - Volatiles (continued)								
Volatile Organics - DEQ List (continued)								
2-Butanone (MEK)	Not detected	ug/L	30	8260B	04/25/06 17:36	DMA	78-93-3	
Carbon disulfide	Not detected	ug/L	5	8260B	04/25/06 17:36	DMA	75-15-0	
2-Hexanone	Not detected	ug/L	50	8260B	04/25/06 17:36	DMA	591-78-6	
4-Methyl-2-pentanone (MIBK)	Not detected	ug/L	50	8260B	04/25/06 17:36	DMA	108-10-1	
tert-Methyl butyl ether (MTBE)	Not detected	ug/L	5	8260B	04/25/06 17:36	DMA	1634-04-4	
1,1,1,2-Tetrachloroethane	Not detected	ug/L	1	8260B	04/25/06 17:36	DMA	630-20-6	
1,2,3-Trichlorobenzene	Not detected	ug/L	5	8260B	04/25/06 17:36	DMA	87-61-6	
1,2,3-Trichloropropane	Not detected	ug/L	1	8260B	04/25/06 17:36	DMA	96-18-4	
1,2,4-Trichlorobenzene	Not detected	ug/L	5	8260B	04/25/06 17:36	DMA	120-82-1	
1,2-Dibromo-3-chloropropane	Not detected	ug/L	5	8260B	04/25/06 17:36	DMA	96-12-8	
1,2-Dibromoethane	Not detected	ug/L	1	8260B	04/25/06 17:36	DMA	106-93-4	
2-Methylnaphthalene	Not detected	ug/L	5	8260B	04/25/06 17:36	DMA	91-57-6	
Acrylonitrile	Not detected	ug/L	2	8260B	04/25/06 17:36	DMA	107-13-1	
Bromobenzene	Not detected	ug/L	1	8260B	04/25/06 17:36	DMA	108-86-1	
Bromochloromethane	Not detected	ug/L	1	8260B	04/25/06 17:36	DMA	74-97-5	
Dibromomethane	Not detected	ug/L	5	8260B	04/25/06 17:36	DMA	74-95-3	
Dichlorodifluoromethane	Not detected	ug/L	5	8260B	04/25/06 17:36	DMA	75-71-8	
Diethyl ether	Not detected	ug/L	10	8260B	04/25/06 17:36	DMA	60-29-7	
Hexachloroethane	Not detected	ug/L	5	8260B	04/25/06 17:36	DMA	67-72-1	
Methyl iodide	Not detected	ug/L	1	8260B	04/25/06 17:36	DMA	74-88-4	
Tetrahydrofuran	Not detected	ug/L	90	8260B	04/25/06 17:36	DMA	109-99-9	
Trichlorofluoromethane	Not detected	ug/L	1	8260B	04/25/06 17:36	DMA	75-69-4	
1,2,3-Trimethylbenzene	Not detected	ug/L	1	8260B	04/25/06 17:36	DMA	526-73-8	
trans-1,4-Dichloro-2-butene	Not detected	ug/L	1	8260B	04/25/06 17:36	DMA	110-57-6	
Organics								
Chlorinated Herbicides								
Dicamba	Not detected	ug/L	2	8151	04/23/06 12:00	STL	1918-00-9	O
Dinoseb	Not detected	ug/L	0.6	8151	04/23/06 12:00	STL	88-85-7	O
2,4-D	Not detected	ug/L	4	8151	04/23/06 12:00	STL	94-75-7	O
2,4,5-TP (Silvex)	Not detected	ug/L	1	8151	04/23/06 12:00	STL	93-72-1	O
2,4,5-T	Not detected	ug/L	1	8151	04/23/06 12:00	STL	93-76-5	O

O-Analysis performed by outside laboratory

Analytical Laboratory Report

Lab Sample ID: S26697.03
Sample Tag: S-1
Collected Date/Time: 04/20/2006 10:00
Matrix: Sludge
COC Reference: 030876

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	1 L Amber	None	Yes	4.9	IR
1	40 ml Glass	HCL	Yes	4.9	IR

Analysis	Results	Units	RDL	Method	Run Date/Time	Analyst	CAS #	Flags
Extraction / Prep.								
BNA Extraction	Completed			3550B	04/24/06 13:13	EMR		
Extraction, PCB	Completed			3550B	04/21/06 16:32	TAS		
Lead, Coarse Digestion	Completed			3050B	04/27/06 10:00	PER		
Lead, Fine and Coarse Prep	Completed			3050B	04/26/06 10:30	JRT		
Lead, Fine Digestion	Completed			3050B	04/27/06 10:00	PER		
Mercury Digestion	Completed			7471A	04/25/06 11:30	JRT		
Metal Digestion	Completed			3050B	04/25/06 12:00	SLS		
Pesticides Extraction	Completed			3550B	04/21/06 16:31	TAS		
Inorganics								
BOD - Soil	191	mg/kg	10	405.1 M	04/28/06 11:38-05/03/06	LBR		
Chloride	Not detected	mg/kg	220	300.0	04/26/06 10:19	JDP	16887-00-6	
Nitrate-N	Not detected	mg/kg	25	300.0	04/26/06 10:19	JDP		
Nitrite-N	Not detected	mg/kg	25	300.0	04/26/06 10:19	JDP		
Sulfate	Not detected	mg/kg	220	300.0	04/26/06 10:19	JDP	14808-79-8	
Total Kjeldahl Nitrogen	5,510	mg/kg	10	351.4	04/26/06 16:00	MJC		
Total Phosphorus	499	mg/kg	1	365.2	04/27/06 17:00	MJC	7723-14-0	
Total Solids	37.4	%	1	160.3	04/24/06 13:21	LBR		
Metals								
% Coarse by Weight	39.9	%			04/26/06 10:30	JRT		
% Fine by Weight	60.1	%			04/26/06 10:30	JRT		
Total Solids	41	%	1	160.3	04/26/06 10:30	JRT		
Antimony	Not detected	mg/kg	0.30	6020	04/27/06 15:20	SLS	7440-36-0	
Arsenic	1.20	mg/kg	0.10	6020	04/27/06 15:20	SLS	7440-38-2	
Barium	2,380	mg/kg	1.0	6020	04/27/06 15:20	SLS	7440-39-3	
Beryllium	Not detected	mg/kg	0.50	6020	04/27/06 15:20	SLS	7440-41-7	
Cadmium	1.08	mg/kg	0.20	6020	04/27/06 15:20	SLS	7440-43-9	
Calcium	67,300	mg/kg	2.0	6020	04/26/06 14:21	SLS	7440-70-2	
Chromium	15.9	mg/kg	2.0	6020	04/27/06 15:20	SLS	7440-47-3	
Cobalt	3.15	mg/kg	0.50	6020	04/27/06 15:20	SLS	7440-48-4	
Copper	5.5	mg/kg	1.0	6020	04/27/06 15:20	SLS	7440-50-8	
Iron	286,000	mg/kg	1.0	6020	04/27/06 12:57	SLS	7439-89-6	
Lead, Coarse	43.1	mg/kg	1.0	6020	04/27/06 12:26	PER		
Lead, Fine	64.6	mg/kg	1.0	6020	04/27/06 12:31	PER		
Lead, Total Calculated	56.0	mg/kg	1.0	6020	04/27/06 13:00	PER	7439-92-1C	
Lead	49.9	mg/kg	1.0	6020	04/27/06 15:20	SLS	7439-92-1	
Magnesium	3,680	mg/kg	4.0	6020	04/26/06 14:21	SLS	7439-95-4	
Mercury	0.052	mg/kg	0.050	7471	04/25/06 14:03	JRT	7439-97-6	
Molybdenum	Not detected	mg/kg	0.50	6020	04/27/06 15:20	SLS	7439-98-7	
Nickel	11.2	mg/kg	1.0	6020	04/27/06 15:20	SLS	7440-02-0	
Potassium	319	mg/kg	5.0	6020	04/26/06 14:21	SLS	7440-09-7	

Lab Sample ID: S26697.03 (continued)
Sample Tag: S-1

Analysis	Results	Units	RDL	Method	Run Date/Time	Analyst	CAS #	Flags
Metals (continued)								
Selenium	0.33	mg/kg	0.20	6020	04/27/06 15:20	SLS	7782-49-2	
Silver	Not detected	mg/kg	0.10	6020	04/27/06 15:20	SLS	7440-22-4	
Sodium	185	mg/kg	10.0	6020	04/26/06 14:21	SLS	7440-23-5	
Thallium	Not detected	mg/kg	0.50	6020	04/27/06 15:20	SLS	7440-28-0	
Vanadium	Not detected	mg/kg	1.0	6020	04/27/06 15:20	SLS	7440-62-2	
Zinc	278	mg/kg	1.0	6020	04/27/06 15:20	SLS	7440-66-6	
Organics - PCBs/Pesticides								
Organochlorine Pesticides								
Aldrin	Not detected	ug/kg	20	8081	04/24/06 12:45	JANB	309-00-2	
a-BHC	Not detected	ug/kg	20	8081	04/24/06 12:45	JANB	319-84-6	
b-BHC	Not detected	ug/kg	20	8081	04/24/06 12:45	JANB	319-85-7	
d-BHC	Not detected	ug/kg	20	8081	04/24/06 12:45	JANB	319-86-8	
Lindane	Not detected	ug/kg	20	8081	04/24/06 12:45	JANB	58-89-9	
Chlordane	Not detected	ug/kg	20	8081	04/24/06 12:45	JANB	57-74-9	
4,4'-DDD	Not detected	ug/kg	20	8081	04/24/06 12:45	JANB	72-54-8	
4,4'-DDE	Not detected	ug/kg	20	8081	04/24/06 12:45	JANB	72-55-9	
4,4'-DDT	Not detected	ug/kg	20	8081	04/24/06 12:45	JANB	50-29-3	
Dieldrin	Not detected	ug/kg	20	8081	04/24/06 12:45	JANB	60-57-1	
Endosulfan I	Not detected	ug/kg	20	8081	04/24/06 12:45	JANB	959-98-8	
Endosulfan II	Not detected	ug/kg	20	8081	04/24/06 12:45	JANB	33213-65-9	
Endosulfan sulfate	Not detected	ug/kg	20	8081	04/24/06 12:45	JANB	1031-07-8	
Endrin	Not detected	ug/kg	20	8081	04/24/06 12:45	JANB	72-20-8	
Endrin aldehyde	Not detected	ug/kg	20	8081	04/24/06 12:45	JANB	7421-93-4	
Heptachlor	Not detected	ug/kg	20	8081	04/24/06 12:45	JANB	76-44-8	
Heptachlor epoxide	Not detected	ug/kg	20	8081	04/24/06 12:45	JANB	1024-57-3	
Methoxychlor	Not detected	ug/kg	50	8081	04/24/06 12:45	JANB	72-43-5	
Toxaphene	Not detected	ug/kg	170	8081	04/24/06 12:45	JANB	8001-35-2	
Endrin Ketone	Not detected	ug/kg	20	8081	04/24/06 12:45	JANB		
PCB List								
PCB-1016	Not detected	ug/kg	1,000	8082	04/24/06 14:21	JANB	12674-11-2	
PCB-1242	Not detected	ug/kg	1,000	8082	04/24/06 14:21	JANB	53469-21-9	
PCB-1221	Not detected	ug/kg	1,000	8082	04/24/06 14:21	JANB	11104-28-2	
PCB-1232	Not detected	ug/kg	1,000	8082	04/24/06 14:21	JANB	11141-16-5	
PCB-1248	Not detected	ug/kg	1,000	8082	04/24/06 14:21	JANB	12672-29-6	
PCB-1254	Not detected	ug/kg	1,000	8082	04/24/06 14:21	JANB	11097-69-1	
PCB-1260	Not detected	ug/kg	1,000	8082	04/24/06 14:21	JANB	11096-82-5	
Organics - Semi-Volatiles								
Semi-Volatile Organics - MDEQ								
Acenaphthene	Not detected	ug/kg	300	8270C	04/25/06 19:58	ARH	83-32-9	
Acenaphthylene	Not detected	ug/kg	300	8270C	04/25/06 19:58	ARH	208-96-8	
Anthracene	Not detected	ug/kg	300	8270C	04/25/06 19:58	ARH	120-12-7	
Benzo(a)anthracene	Not detected	ug/kg	300	8270C	04/25/06 19:58	ARH	56-55-3	
Benzo(b)fluoranthene	Not detected	ug/kg	300	8270C	04/25/06 19:58	ARH	205-99-2	
Benzo(k)fluoranthene	Not detected	ug/kg	300	8270C	04/25/06 19:58	ARH	207-08-9	
Benzo(ghi)perylene	Not detected	ug/kg	300	8270C	04/25/06 19:58	ARH	191-24-2	
Benzo(a)pyrene	Not detected	ug/kg	300	8270C	04/25/06 19:58	ARH	50-32-8	
bis(2-Chloroethoxy)methane	Not detected	ug/kg	300	8270C	04/25/06 19:58	ARH	111-91-1	

Lab Sample ID: S26697.03 (continued)
Sample Tag: S-1

Analysis	Results	Units	RDL	Method	Run Date/Time	Analyst	CAS #	Flags
Organics - Semi-Volatiles (continued)								
Semi-Volatile Organics - MDEQ (continued)								
bis(2-Chloroethyl)ether	Not detected	ug/kg	300	8270C	04/25/06 19:58	ARH	111-44-4	
bis(2-Chloroisopropyl)ether	Not detected	ug/kg	300	8270C	04/25/06 19:58	ARH	108-60-1	
bis(2-Ethylhexyl)phthalate	Not detected	ug/kg	300	8270C	04/25/06 19:58	ARH	117-81-7	
4-Bromophenyl phenyl ether	Not detected	ug/kg	300	8270C	04/25/06 19:58	ARH	101-55-3	
Butyl benzyl phthalate	Not detected	ug/kg	300	8270C	04/25/06 19:58	ARH	85-68-7	
4-Chloroaniline	Not detected	ug/kg	300	8270C	04/25/06 19:58	ARH	106-47-8	
2-Chloronaphthalene	Not detected	ug/kg	300	8270C	04/25/06 19:58	ARH	91-58-7	
4-Chloro-3-methylphenol	Not detected	ug/kg	300	8270C	04/25/06 19:58	ARH	59-50-7	
2-Chlorophenol	Not detected	ug/kg	300	8270C	04/25/06 19:58	ARH	95-57-8	
4-Chlorophenyl phenyl ether	Not detected	ug/kg	300	8270C	04/25/06 19:58	ARH	7005-72-3	
Chrysene	Not detected	ug/kg	300	8270C	04/25/06 19:58	ARH	218-01-9	
p,m-Cresol	Not detected	ug/kg	300	8270C	04/25/06 19:58	ARH	3/4-Cresol	
o-Cresol	Not detected	ug/kg	300	8270C	04/25/06 19:58	ARH	95-48-7	
Dibenzo(ah)anthracene	Not detected	ug/kg	300	8270C	04/25/06 19:58	ARH	53-70-3	
Dibenzofuran	Not detected	ug/kg	300	8270C	04/25/06 19:58	ARH	132-64-9	
di-n-Butyl phthalate	Not detected	ug/kg	300	8270C	04/25/06 19:58	ARH	84-74-2	
1,2-Dichlorobenzene	Not detected	ug/kg	300	8270C	04/25/06 19:58	ARH	95-50-1	
1,3-Dichlorobenzene	Not detected	ug/kg	300	8270C	04/25/06 19:58	ARH	541-73-1	
1,4-Dichlorobenzene	Not detected	ug/kg	300	8270C	04/25/06 19:58	ARH	106-46-7	
3,3'-Dichlorobenzidine	Not detected	ug/kg	2,000	8270C	04/25/06 19:58	ARH	91-94-1	
2,4-Dichlorophenol	Not detected	ug/kg	300	8270C	04/25/06 19:58	ARH	120-83-2	
Diethyl phthalate	Not detected	ug/kg	300	8270C	04/25/06 19:58	ARH	84-66-2	
2,4-Dimethylphenol	Not detected	ug/kg	300	8270C	04/25/06 19:58	ARH	105-67-9	
Dimethyl phthalate	Not detected	ug/kg	300	8270C	04/25/06 19:58	ARH	131-11-3	
4,6-Dinitro-2-methylphenol	Not detected	ug/kg	800	8270C	04/25/06 19:58	ARH	534-52-1	
2,4-Dinitrophenol	Not detected	ug/kg	800	8270C	04/25/06 19:58	ARH	51-28-5	
2,4-Dinitrotoluene	Not detected	ug/kg	300	8270C	04/25/06 19:58	ARH	121-14-2	
2,6-Dinitrotoluene	Not detected	ug/kg	300	8270C	04/25/06 19:58	ARH	606-20-2	
1,2-Diphenylhydrazine	Not detected	ug/kg	300	8270C	04/25/06 19:58	ARH	122-66-7	
di-n-Octyl phthalate	Not detected	ug/kg	300	8270C	04/25/06 19:58	ARH	117-84-0	
Fluoranthene	Not detected	ug/kg	300	8270C	04/25/06 19:58	ARH	206-44-0	
Fluorene	Not detected	ug/kg	300	8270C	04/25/06 19:58	ARH	86-73-7	
Hexachlorobenzene	Not detected	ug/kg	300	8270C	04/25/06 19:58	ARH	118-74-1	
Hexachlorobutadiene	Not detected	ug/kg	300	8270C	04/25/06 19:58	ARH	87-68-3	
Hexachlorocyclopentadiene	Not detected	ug/kg	300	8270C	04/25/06 19:58	ARH	77-47-4	
Hexachloroethane	Not detected	ug/kg	300	8270C	04/25/06 19:58	ARH	67-72-1	
Indeno(1,2,3-cd)pyrene	Not detected	ug/kg	300	8270C	04/25/06 19:58	ARH	193-39-5	
Isophorone	Not detected	ug/kg	300	8270C	04/25/06 19:58	ARH	78-59-1	
2-Methylnaphthalene	Not detected	ug/kg	300	8270C	04/25/06 19:58	ARH	91-57-6	
Naphthalene	Not detected	ug/kg	300	8270C	04/25/06 19:58	ARH	91-20-3	
2-Nitroaniline	Not detected	ug/kg	800	8270C	04/25/06 19:58	ARH	88-74-4	
3-Nitroaniline	Not detected	ug/kg	800	8270C	04/25/06 19:58	ARH	99-09-2	
4-Nitroaniline	Not detected	ug/kg	800	8270C	04/25/06 19:58	ARH	100-01-6	
Nitrobenzene	Not detected	ug/kg	300	8270C	04/25/06 19:58	ARH	98-95-3	
2-Nitrophenol	Not detected	ug/kg	300	8270C	04/25/06 19:58	ARH	88-75-5	
4-Nitrophenol	Not detected	ug/kg	800	8270C	04/25/06 19:58	ARH	100-02-7	
N-Nitrosodiphenylamine	Not detected	ug/kg	300	8270C	04/25/06 19:58	ARH	86-30-6	
N-Nitrosodi-n-propylamine	Not detected	ug/kg	300	8270C	04/25/06 19:58	ARH	621-64-7	
Pentachlorophenol	Not detected	ug/kg	300	8270C	04/25/06 19:58	ARH	87-86-5	

Lab Sample ID: S26697.03 (continued)
Sample Tag: S-1

Analysis	Results	Units	RDL	Method	Run Date/Time	Analyst	CAS #	Flags
Organics - Semi-Volatiles (continued)								
Semi-Volatile Organics - MDEQ (continued)								
Phenanthrene	Not detected	ug/kg	300	8270C	04/25/06 19:58	ARH	85-01-8	
Phenol	Not detected	ug/kg	300	8270C	04/25/06 19:58	ARH	108-95-2	
Pyrene	Not detected	ug/kg	300	8270C	04/25/06 19:58	ARH	129-00-0	
1,2,4-Trichlorobenzene	Not detected	ug/kg	300	8270C	04/25/06 19:58	ARH	120-82-1	
2,4,5-Trichlorophenol	Not detected	ug/kg	300	8270C	04/25/06 19:58	ARH	95-95-4	
2,4,6-Trichlorophenol	Not detected	ug/kg	300	8270C	04/25/06 19:58	ARH	88-06-2	
Organics - Volatiles								
Volatile Organics DEQ - 5035								
Benzene	Not detected	ug/kg	100	8260B/5035	04/26/06 16:43	JGH	71-43-2	X
Bromodichloromethane	Not detected	ug/kg	300	8260B/5035	04/26/06 16:43	JGH	75-27-4	X
Bromoform	Not detected	ug/kg	300	8260B/5035	04/26/06 16:43	JGH	75-25-2	X
Bromomethane	Not detected	ug/kg	500	8260B/5035	04/26/06 16:43	JGH	74-83-9	X
n-Butylbenzene	Not detected	ug/kg	100	8260B/5035	04/26/06 16:43	JGH	104-51-8	X
sec-Butylbenzene	Not detected	ug/kg	100	8260B/5035	04/26/06 16:43	JGH	135-98-8	X
tert-Butylbenzene	Not detected	ug/kg	100	8260B/5035	04/26/06 16:43	JGH	98-06-6	X
Carbon tetrachloride	Not detected	ug/kg	100	8260B/5035	04/26/06 16:43	JGH	56-23-5	X
Chlorobenzene	Not detected	ug/kg	100	8260B/5035	04/26/06 16:43	JGH	108-90-7	X
Chloroethane	Not detected	ug/kg	600	8260B/5035	04/26/06 16:43	JGH	75-00-3	X
Chloroform	Not detected	ug/kg	100	8260B/5035	04/26/06 16:43	JGH	67-66-3	X
Chloromethane	Not detected	ug/kg	600	8260B/5035	04/26/06 16:43	JGH	74-87-3	X
Dibromochloromethane	Not detected	ug/kg	300	8260B/5035	04/26/06 16:43	JGH	124-48-1	X
1,2-Dichlorobenzene	Not detected	ug/kg	300	8260B/5035	04/26/06 16:43	JGH	95-50-1	X
1,3-Dichlorobenzene	Not detected	ug/kg	300	8260B/5035	04/26/06 16:43	JGH	541-73-1	X
1,4-Dichlorobenzene	Not detected	ug/kg	300	8260B/5035	04/26/06 16:43	JGH	106-46-7	X
1,1-Dichloroethane	Not detected	ug/kg	100	8260B/5035	04/26/06 16:43	JGH	75-34-3	X
1,2-Dichloroethane	Not detected	ug/kg	100	8260B/5035	04/26/06 16:43	JGH	107-06-2	X
1,1-Dichloroethene	Not detected	ug/kg	100	8260B/5035	04/26/06 16:43	JGH	75-35-4	X
cis-1,2-Dichloroethene	Not detected	ug/kg	100	8260B/5035	04/26/06 16:43	JGH	156-59-2	X
trans-1,2-Dichloroethene	Not detected	ug/kg	100	8260B/5035	04/26/06 16:43	JGH	156-60-5	X
1,2-Dichloropropane	Not detected	ug/kg	100	8260B/5035	04/26/06 16:43	JGH	78-87-5	X
cis-1,3-Dichloropropene	Not detected	ug/kg	100	8260B/5035	04/26/06 16:43	JGH	10061-01-5	X
trans-1,3-Dichloropropene	Not detected	ug/kg	100	8260B/5035	04/26/06 16:43	JGH	10061-02-6	X
Ethylbenzene	Not detected	ug/kg	100	8260B/5035	04/26/06 16:43	JGH	100-41-4	X
Isopropylbenzene	Not detected	ug/kg	600	8260B/5035	04/26/06 16:43	JGH	98-82-8	X
p-Isopropyltoluene	Not detected	ug/kg	300	8260B/5035	04/26/06 16:43	JGH	99-87-6	X
Methylene chloride	Not detected	ug/kg	300	8260B/5035	04/26/06 16:43	JGH	75-09-2	X
Naphthalene	Not detected	ug/kg	800	8260B/5035	04/26/06 16:43	JGH	91-20-3	X
n-Propylbenzene	Not detected	ug/kg	300	8260B/5035	04/26/06 16:43	JGH	103-65-1	X
Styrene	Not detected	ug/kg	100	8260B/5035	04/26/06 16:43	JGH	100-42-5	X
1,1,2,2-Tetrachloroethane	Not detected	ug/kg	300	8260B/5035	04/26/06 16:43	JGH	79-34-5	X
Tetrachloroethene	Not detected	ug/kg	100	8260B/5035	04/26/06 16:43	JGH	127-18-4	X
Toluene	Not detected	ug/kg	300	8260B/5035	04/26/06 16:43	JGH	108-88-3	X
1,1,1-Trichloroethane	Not detected	ug/kg	100	8260B/5035	04/26/06 16:43	JGH	71-55-6	X
1,1,2-Trichloroethane	Not detected	ug/kg	100	8260B/5035	04/26/06 16:43	JGH	79-00-5	X
Trichloroethene	Not detected	ug/kg	100	8260B/5035	04/26/06 16:43	JGH	79-01-6	X
1,2,4-Trimethylbenzene	Not detected	ug/kg	300	8260B/5035	04/26/06 16:43	JGH	95-63-6	X
1,3,5-Trimethylbenzene	Not detected	ug/kg	300	8260B/5035	04/26/06 16:43	JGH	108-67-8	X

X-Elevated reporting limit due to matrix interference

Lab Sample ID: S26697.03 (continued)
Sample Tag: S-1

Analysis	Results	Units	RDL	Method	Run Date/Time	Analyst	CAS #	Flags
Organics - Volatiles (continued)								
Volatile Organics DEQ - 5035 (continued)								
Vinyl chloride	Not detected	ug/kg	100	8260B/5035	04/26/06 16:43	JGH	75-01-4	X
o-Xylene	Not detected	ug/kg	100	8260B/5035	04/26/06 16:43	JGH	95-47-6	X
p,m-Xylene	Not detected	ug/kg	300	8260B/5035	04/26/06 16:43	JGH		X
Acetone	Not detected	ug/kg	3,000	8260B/5035	04/26/06 16:43	JGH	67-64-1	X
2-Butanone (MEK)	Not detected	ug/kg	2,000	8260B/5035	04/26/06 16:43	JGH	78-93-3	X
Carbon disulfide	Not detected	ug/kg	600	8260B/5035	04/26/06 16:43	JGH	75-15-0	X
2-Hexanone	Not detected	ug/kg	6,000	8260B/5035	04/26/06 16:43	JGH	591-78-6	X
4-Methyl-2-pentanone (MIBK)	Not detected	ug/kg	6,000	8260B/5035	04/26/06 16:43	JGH	108-10-1	X
tert-Methyl butyl ether (MTBE)	Not detected	ug/kg	600	8260B/5035	04/26/06 16:43	JGH	1634-04-4	X
1,1,1,2-Tetrachloroethane	Not detected	ug/kg	300	8260B/5035	04/26/06 16:43	JGH	630-20-6	X
1,2,3-Trichlorobenzene	Not detected	ug/kg	800	8260B/5035	04/26/06 16:43	JGH	87-61-6	X
1,2,3-Trichloropropane	Not detected	ug/kg	300	8260B/5035	04/26/06 16:43	JGH	96-18-4	X
1,2,4-Trichlorobenzene	Not detected	ug/kg	800	8260B/5035	04/26/06 16:43	JGH	120-82-1	X
1,2-Dibromo-3-chloropropane	Not detected	ug/kg	600	8260B/5035	04/26/06 16:43	JGH	96-12-8	X
1,2-Dibromoethane	Not detected	ug/kg	50	8260B/5035	04/26/06 16:43	JGH	106-93-4	MX
2-Methylnaphthalene	Not detected	ug/kg	800	8260B/5035	04/26/06 16:43	JGH	91-57-6	X
Acrylonitrile	Not detected	ug/kg	300	8260B/5035	04/26/06 16:43	JGH	107-13-1	X
Bromobenzene	Not detected	ug/kg	300	8260B/5035	04/26/06 16:43	JGH	108-86-1	X
Bromochloromethane	Not detected	ug/kg	300	8260B/5035	04/26/06 16:43	JGH	74-97-5	X
Dibromomethane	Not detected	ug/kg	600	8260B/5035	04/26/06 16:43	JGH	74-95-3	X
Dichlorodifluoromethane	Not detected	ug/kg	600	8260B/5035	04/26/06 16:43	JGH	75-71-8	X
Diethyl ether	Not detected	ug/kg	500	8260B/5035	04/26/06 16:43	JGH	60-29-7	X
Hexachloroethane	Not detected	ug/kg	800	8260B/5035	04/26/06 16:43	JGH	67-72-1	X
Methyl iodide	Not detected	ug/kg	300	8260B/5035	04/26/06 16:43	JGH	74-88-4	X
Tetrahydrofuran	Not detected	ug/kg	3,000	8260B/5035	04/26/06 16:43	JGH	109-99-9	X
Trichlorofluoromethane	Not detected	ug/kg	300	8260B/5035	04/26/06 16:43	JGH	75-69-4	X
1,2,3-Trimethylbenzene	Not detected	ug/kg	300	8260B/5035	04/26/06 16:43	JGH	526-73-8	X
trans-1,4-Dichloro-2-butene	Not detected	ug/kg	100	8260B/5035	04/26/06 16:43	JGH	110-57-6	X
Organics								
Chlorinated Herbicides								
Dicamba	Not detected	ug/kg	96	8150	04/24/06 12:00	STL	1918-00-9	O
Dinoseb	Not detected	ug/kg	29	8150	04/24/06 12:00	STL	88-85-7	O
2,4-D	Not detected	ug/kg	190	8150	04/24/06 12:00	STL	94-75-7	O
2,4,5-TP (Silvex)	Not detected	ug/kg	48	8150	04/24/06 12:00	STL	93-72-1	O
2,4,5-T (and salts and esters)	Not detected	ug/kg	48	8150	04/24/06 12:00	STL		O

X-Elevated reporting limit due to matrix interference
M-Result reported to MDL not RDL
O-Analysis performed by outside laboratory

Analytical Laboratory Report

Lab Sample ID: S26697.04
Sample Tag: S-2
Collected Date/Time: 04/20/2006 11:00
Matrix: Sludge
COC Reference: 030876

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	1 L Amber	None	Yes	4.9	IR
1	40 ml Glass	HCL	Yes	4.9	IR

Analysis	Results	Units	RDL	Method	Run Date/Time	Analyst	CAS #	Flags
Extraction / Prep.								
BNA Extraction	Completed			3550B	04/24/06 13:13	EMR		
Extraction, PCB	Completed			3550B	04/21/06 16:32	TAS		
Lead, Coarse Digestion	Completed			3050B	04/27/06 10:00	PER		
Lead, Fine and Coarse Prep	Completed			3050B	04/26/06 10:30	JRT		
Lead, Fine Digestion	Completed			3050B	04/27/06 10:00	PER		
Mercury Digestion	Completed			7471A	04/25/06 11:30	JRT		
Metal Digestion	Completed			3050B	04/25/06 12:00	SLS		
Pesticides Extraction	Completed			3550B	04/21/06 16:31	TAS		
Inorganics								
BOD - Soil	39	mg/kg	10	405.1 M	04/28/06 11:38-05/03/06	LBR		
Chloride	Not detected	mg/kg	160	300.0	04/26/06 10:42	JDP	16887-00-6	
Nitrate-N	Not detected	mg/kg	20	300.0	04/26/06 10:42	JDP		
Nitrite-N	Not detected	mg/kg	20	300.0	04/26/06 10:42	JDP		
Sulfate	Not detected	mg/kg	160	300.0	04/26/06 10:42	JDP	14808-79-8	
Total Kjeldahl Nitrogen	4,300	mg/kg	10	351.4	04/26/06 16:00	MJC		
Total Phosphorus	362	mg/kg	1	365.2	04/27/06 17:00	MJC	7723-14-0	
Total Solids	50	%	1	160.3	04/24/06 13:21	LBR		
Metals								
% Coarse by Weight	75.0	%			04/26/06 10:30	JRT		
% Fine by Weight	25.0	%			04/26/06 10:30	JRT		
Total Solids	52	%	1	160.3	04/26/06 10:30	JRT		
Antimony	Not detected	mg/kg	0.30	6020	04/27/06 15:43	SLS	7440-36-0	
Arsenic	14.4	mg/kg	0.10	6020	04/27/06 15:43	SLS	7440-38-2	
Barium	71.1	mg/kg	1.0	6020	04/27/06 15:43	SLS	7440-39-3	
Beryllium	Not detected	mg/kg	0.50	6020	04/27/06 15:43	SLS	7440-41-7	
Cadmium	0.38	mg/kg	0.20	6020	04/27/06 15:43	SLS	7440-43-9	
Calcium	41,500	mg/kg	2.0	6020	04/26/06 14:23	SLS	7440-70-2	
Chromium	7.4	mg/kg	2.0	6020	04/27/06 15:43	SLS	7440-47-3	
Cobalt	2.54	mg/kg	0.50	6020	04/27/06 15:43	SLS	7440-48-4	
Copper	15.6	mg/kg	1.0	6020	04/27/06 15:43	SLS	7440-50-8	
Iron	18,400	mg/kg	1.0	6020	04/27/06 13:11	SLS	7439-89-6	
Lead, Coarse	15.5	mg/kg	1.0	6020	04/27/06 12:27	PER		
Lead, Fine	17.0	mg/kg	1.0	6020	04/27/06 12:32	PER		
Lead, Total Calculated	15.8	mg/kg	1.0	6020	04/27/06 13:00	PER	7439-92-1C	
Lead	13.1	mg/kg	1.0	6020	04/27/06 15:43	SLS	7439-92-1	
Magnesium	7,510	mg/kg	4.0	6020	04/26/06 14:23	SLS	7439-95-4	
Mercury	Not detected	mg/kg	0.050	7471	04/25/06 13:54	JRT	7439-97-6	
Molybdenum	Not detected	mg/kg	0.50	6020	04/27/06 15:43	SLS	7439-98-7	
Nickel	7.3	mg/kg	1.0	6020	04/27/06 15:43	SLS	7440-02-0	
Potassium	440	mg/kg	5.0	6020	04/26/06 14:23	SLS	7440-09-7	

Lab Sample ID: S26697.04 (continued)
Sample Tag: S-2

Analysis	Results	Units	RDL	Method	Run Date/Time	Analyst	CAS #	Flags
Metals (continued)								
Selenium	0.78	mg/kg	0.20	6020	04/27/06 15:43	SLS	7782-49-2	
Silver	Not detected	mg/kg	0.10	6020	04/27/06 15:43	SLS	7440-22-4	
Sodium	97.6	mg/kg	10.0	6020	04/26/06 14:23	SLS	7440-23-5	
Thallium	Not detected	mg/kg	0.50	6020	04/27/06 15:43	SLS	7440-28-0	
Vanadium	5.9	mg/kg	1.0	6020	04/27/06 15:43	SLS	7440-62-2	
Zinc	75.7	mg/kg	1.0	6020	04/27/06 15:43	SLS	7440-66-6	
Organics - PCBs/Pesticides								
Organochlorine Pesticides								
Aldrin	Not detected	ug/kg	20	8081	04/24/06 13:01	JANB	309-00-2	
a-BHC	Not detected	ug/kg	20	8081	04/24/06 13:01	JANB	319-84-6	
b-BHC	Not detected	ug/kg	20	8081	04/24/06 13:01	JANB	319-85-7	
d-BHC	Not detected	ug/kg	20	8081	04/24/06 13:01	JANB	319-86-8	
Lindane	Not detected	ug/kg	20	8081	04/24/06 13:01	JANB	58-89-9	
Chlordane	Not detected	ug/kg	20	8081	04/24/06 13:01	JANB	57-74-9	
4,4'-DDD	Not detected	ug/kg	20	8081	04/24/06 13:01	JANB	72-54-8	
4,4'-DDE	Not detected	ug/kg	20	8081	04/24/06 13:01	JANB	72-55-9	
4,4'-DDT	Not detected	ug/kg	20	8081	04/24/06 13:01	JANB	50-29-3	
Dieldrin	Not detected	ug/kg	20	8081	04/24/06 13:01	JANB	60-57-1	
Endosulfan I	Not detected	ug/kg	20	8081	04/24/06 13:01	JANB	959-98-8	
Endosulfan II	Not detected	ug/kg	20	8081	04/24/06 13:01	JANB	33213-65-9	
Endosulfan sulfate	Not detected	ug/kg	20	8081	04/24/06 13:01	JANB	1031-07-8	
Endrin	Not detected	ug/kg	20	8081	04/24/06 13:01	JANB	72-20-8	
Endrin aldehyde	Not detected	ug/kg	20	8081	04/24/06 13:01	JANB	7421-93-4	
Heptachlor	Not detected	ug/kg	20	8081	04/24/06 13:01	JANB	76-44-8	
Heptachlor epoxide	Not detected	ug/kg	20	8081	04/24/06 13:01	JANB	1024-57-3	
Methoxychlor	Not detected	ug/kg	50	8081	04/24/06 13:01	JANB	72-43-5	
Toxaphene	Not detected	ug/kg	170	8081	04/24/06 13:01	JANB	8001-35-2	
Endrin Ketone	Not detected	ug/kg	20	8081	04/24/06 13:01	JANB		
PCB List								
PCB-1016	Not detected	ug/kg	1,000	8082	04/24/06 14:33	JANB	12674-11-2	
PCB-1242	Not detected	ug/kg	1,000	8082	04/24/06 14:33	JANB	53469-21-9	
PCB-1221	Not detected	ug/kg	1,000	8082	04/24/06 14:33	JANB	11104-28-2	
PCB-1232	Not detected	ug/kg	1,000	8082	04/24/06 14:33	JANB	11141-16-5	
PCB-1248	Not detected	ug/kg	1,000	8082	04/24/06 14:33	JANB	12672-29-6	
PCB-1254	Not detected	ug/kg	1,000	8082	04/24/06 14:33	JANB	11097-69-1	
PCB-1260	Not detected	ug/kg	1,000	8082	04/24/06 14:33	JANB	11096-82-5	
Organics - Semi-Volatiles								
Semi-Volatile Organics - MDEQ								
Acenaphthene	Not detected	ug/kg	300	8270C	04/25/06 20:33	ARH	83-32-9	
Acenaphthylene	Not detected	ug/kg	300	8270C	04/25/06 20:33	ARH	208-96-8	
Anthracene	Not detected	ug/kg	300	8270C	04/25/06 20:33	ARH	120-12-7	
Benzo(a)anthracene	Not detected	ug/kg	300	8270C	04/25/06 20:33	ARH	56-55-3	
Benzo(b)fluoranthene	Not detected	ug/kg	300	8270C	04/25/06 20:33	ARH	205-99-2	
Benzo(k)fluoranthene	Not detected	ug/kg	300	8270C	04/25/06 20:33	ARH	207-08-9	
Benzo(ghi)perylene	Not detected	ug/kg	300	8270C	04/25/06 20:33	ARH	191-24-2	
Benzo(a)pyrene	Not detected	ug/kg	300	8270C	04/25/06 20:33	ARH	50-32-8	
bis(2-Chloroethoxy)methane	Not detected	ug/kg	300	8270C	04/25/06 20:33	ARH	111-91-1	

Lab Sample ID: S26697.04 (continued)
Sample Tag: S-2

Analysis	Results	Units	RDL	Method	Run Date/Time	Analyst	CAS #	Flags
Organics - Semi-Volatiles (continued)								
Semi-Volatile Organics - MDEQ (continued)								
bis(2-Chloroethyl)ether	Not detected	ug/kg	300	8270C	04/25/06 20:33	ARH	111-44-4	
bis(2-Chloroisopropyl)ether	Not detected	ug/kg	300	8270C	04/25/06 20:33	ARH	108-60-1	
bis(2-Ethylhexyl)phthalate	Not detected	ug/kg	300	8270C	04/25/06 20:33	ARH	117-81-7	
4-Bromophenyl phenyl ether	Not detected	ug/kg	300	8270C	04/25/06 20:33	ARH	101-55-3	
Butyl benzyl phthalate	Not detected	ug/kg	300	8270C	04/25/06 20:33	ARH	85-68-7	
4-Chloroaniline	Not detected	ug/kg	300	8270C	04/25/06 20:33	ARH	106-47-8	
2-Chloronaphthalene	Not detected	ug/kg	300	8270C	04/25/06 20:33	ARH	91-58-7	
4-Chloro-3-methylphenol	Not detected	ug/kg	300	8270C	04/25/06 20:33	ARH	59-50-7	
2-Chlorophenol	Not detected	ug/kg	300	8270C	04/25/06 20:33	ARH	95-57-8	
4-Chlorophenyl phenyl ether	Not detected	ug/kg	300	8270C	04/25/06 20:33	ARH	7005-72-3	
Chrysene	Not detected	ug/kg	300	8270C	04/25/06 20:33	ARH	218-01-9	
p,m-Cresol	Not detected	ug/kg	300	8270C	04/25/06 20:33	ARH	3/4-Cresol	
o-Cresol	Not detected	ug/kg	300	8270C	04/25/06 20:33	ARH	95-48-7	
Dibenzo(ah)anthracene	Not detected	ug/kg	300	8270C	04/25/06 20:33	ARH	53-70-3	
Dibenzofuran	Not detected	ug/kg	300	8270C	04/25/06 20:33	ARH	132-64-9	
di-n-Butyl phthalate	Not detected	ug/kg	300	8270C	04/25/06 20:33	ARH	84-74-2	
1,2-Dichlorobenzene	Not detected	ug/kg	300	8270C	04/25/06 20:33	ARH	95-50-1	
1,3-Dichlorobenzene	Not detected	ug/kg	300	8270C	04/25/06 20:33	ARH	541-73-1	
1,4-Dichlorobenzene	Not detected	ug/kg	300	8270C	04/25/06 20:33	ARH	106-46-7	
3,3'-Dichlorobenzidine	Not detected	ug/kg	2,000	8270C	04/25/06 20:33	ARH	91-94-1	
2,4-Dichlorophenol	Not detected	ug/kg	300	8270C	04/25/06 20:33	ARH	120-83-2	
Diethyl phthalate	Not detected	ug/kg	300	8270C	04/25/06 20:33	ARH	84-66-2	
2,4 Dimethylphenol	Not detected	ug/kg	300	8270C	04/25/06 20:33	ARH	105-67-9	
Dimethyl phthalate	Not detected	ug/kg	300	8270C	04/25/06 20:33	ARH	131-11-3	
4,6-Dinitro-2-methylphenol	Not detected	ug/kg	800	8270C	04/25/06 20:33	ARH	534-52-1	
2,4-Dinitrophenol	Not detected	ug/kg	800	8270C	04/25/06 20:33	ARH	51-28-5	
2,4-Dinitrotoluene	Not detected	ug/kg	300	8270C	04/25/06 20:33	ARH	121-14-2	
2,6-Dinitrotoluene	Not detected	ug/kg	300	8270C	04/25/06 20:33	ARH	606-20-2	
1,2 Diphenylhydrazine	Not detected	ug/kg	300	8270C	04/25/06 20:33	ARH	122-66-7	
di-n-Octyl phthalate	Not detected	ug/kg	300	8270C	04/25/06 20:33	ARH	117-84-0	
Fluoranthene	Not detected	ug/kg	300	8270C	04/25/06 20:33	ARH	206-44-0	
Fluorene	Not detected	ug/kg	300	8270C	04/25/06 20:33	ARH	86-73-7	
Hexachlorobenzene	Not detected	ug/kg	300	8270C	04/25/06 20:33	ARH	118-74-1	
Hexachlorobutadiene	Not detected	ug/kg	300	8270C	04/25/06 20:33	ARH	87-68-3	
Hexachlorocyclopentadiene	Not detected	ug/kg	300	8270C	04/25/06 20:33	ARH	77-47-4	
Hexachloroethane	Not detected	ug/kg	300	8270C	04/25/06 20:33	ARH	67-72-1	
Indeno(1,2,3-cd)pyrene	Not detected	ug/kg	300	8270C	04/25/06 20:33	ARH	193-39-5	
Isophorone	Not detected	ug/kg	300	8270C	04/25/06 20:33	ARH	78-59-1	
2-Methylnaphthalene	Not detected	ug/kg	300	8270C	04/25/06 20:33	ARH	91-57-6	
Naphthalene	Not detected	ug/kg	300	8270C	04/25/06 20:33	ARH	91-20-3	
2-Nitroaniline	Not detected	ug/kg	800	8270C	04/25/06 20:33	ARH	88-74-4	
3-Nitroaniline	Not detected	ug/kg	800	8270C	04/25/06 20:33	ARH	99-09-2	
4-Nitroaniline	Not detected	ug/kg	800	8270C	04/25/06 20:33	ARH	100-01-6	
Nitrobenzene	Not detected	ug/kg	300	8270C	04/25/06 20:33	ARH	98-95-3	
2-Nitrophenol	Not detected	ug/kg	300	8270C	04/25/06 20:33	ARH	88-75-5	
4-Nitrophenol	Not detected	ug/kg	800	8270C	04/25/06 20:33	ARH	100-02-7	
N-Nitrosodiphenylamine	Not detected	ug/kg	300	8270C	04/25/06 20:33	ARH	86-30-6	
N-Nitrosodi-n-propylamine	Not detected	ug/kg	300	8270C	04/25/06 20:33	ARH	621-64-7	
Pentachlorophenol	Not detected	ug/kg	300	8270C	04/25/06 20:33	ARH	87-86-5	

Lab Sample ID: S26697.04 (continued)
Sample Tag: S-2

Analysis	Results	Units	RDL	Method	Run Date/Time	Analyst	CAS #	Flags
Organics - Semi-Volatiles (continued)								
Semi-Volatile Organics - MDEQ (continued)								
Phenanthrene	Not detected	ug/kg	300	8270C	04/25/06 20:33	ARH	85-01-8	
Phenol	Not detected	ug/kg	300	8270C	04/25/06 20:33	ARH	108-95-2	
Pyrene	Not detected	ug/kg	300	8270C	04/25/06 20:33	ARH	129-00-0	
1,2,4-Trichlorobenzene	Not detected	ug/kg	300	8270C	04/25/06 20:33	ARH	120-82-1	
2,4,5-Trichlorophenol	Not detected	ug/kg	300	8270C	04/25/06 20:33	ARH	95-95-4	
2,4,6-Trichlorophenol	Not detected	ug/kg	300	8270C	04/25/06 20:33	ARH	88-06-2	
Organics - Volatiles								
Volatile Organics DEQ - 5035								
Benzene	Not detected	ug/kg	100	8260B/5035	04/26/06 17:01	JGH	71-43-2	X
Bromodichloromethane	Not detected	ug/kg	200	8260B/5035	04/26/06 17:01	JGH	75-27-4	X
Bromoform	Not detected	ug/kg	200	8260B/5035	04/26/06 17:01	JGH	75-25-2	X
Bromomethane	Not detected	ug/kg	400	8260B/5035	04/26/06 17:01	JGH	74-83-9	X
n-Butylbenzene	Not detected	ug/kg	100	8260B/5035	04/26/06 17:01	JGH	104-51-8	X
sec-Butylbenzene	Not detected	ug/kg	100	8260B/5035	04/26/06 17:01	JGH	135-98-8	X
tert-Butylbenzene	Not detected	ug/kg	100	8260B/5035	04/26/06 17:01	JGH	98-06-6	X
Carbon tetrachloride	Not detected	ug/kg	100	8260B/5035	04/26/06 17:01	JGH	56-23-5	X
Chlorobenzene	Not detected	ug/kg	100	8260B/5035	04/26/06 17:01	JGH	108-90-7	X
Chloroethane	Not detected	ug/kg	500	8260B/5035	04/26/06 17:01	JGH	75-00-3	X
Chloroform	Not detected	ug/kg	100	8260B/5035	04/26/06 17:01	JGH	67-66-3	X
Chloromethane	Not detected	ug/kg	500	8260B/5035	04/26/06 17:01	JGH	74-87-3	X
Dibromochloromethane	Not detected	ug/kg	200	8260B/5035	04/26/06 17:01	JGH	124-48-1	X
1,2-Dichlorobenzene	Not detected	ug/kg	200	8260B/5035	04/26/06 17:01	JGH	95-50-1	X
1,3-Dichlorobenzene	Not detected	ug/kg	200	8260B/5035	04/26/06 17:01	JGH	541-73-1	X
1,4-Dichlorobenzene	Not detected	ug/kg	200	8260B/5035	04/26/06 17:01	JGH	106-46-7	X
1,1-Dichloroethane	Not detected	ug/kg	100	8260B/5035	04/26/06 17:01	JGH	75-34-3	X
1,2-Dichloroethane	Not detected	ug/kg	100	8260B/5035	04/26/06 17:01	JGH	107-06-2	X
1,1-Dichloroethene	Not detected	ug/kg	100	8260B/5035	04/26/06 17:01	JGH	75-35-4	X
cis-1,2-Dichloroethene	Not detected	ug/kg	100	8260B/5035	04/26/06 17:01	JGH	156-59-2	X
trans-1,2-Dichloroethene	Not detected	ug/kg	100	8260B/5035	04/26/06 17:01	JGH	156-60-5	X
1,2-Dichloropropane	Not detected	ug/kg	100	8260B/5035	04/26/06 17:01	JGH	78-87-5	X
cis-1,3-Dichloropropene	Not detected	ug/kg	100	8260B/5035	04/26/06 17:01	JGH	10061-01-5	X
trans-1,3-Dichloropropene	Not detected	ug/kg	100	8260B/5035	04/26/06 17:01	JGH	10061-02-6	X
Ethylbenzene	Not detected	ug/kg	100	8260B/5035	04/26/06 17:01	JGH	100-41-4	X
Isopropylbenzene	Not detected	ug/kg	500	8260B/5035	04/26/06 17:01	JGH	98-82-8	X
p-Isopropyltoluene	Not detected	ug/kg	200	8260B/5035	04/26/06 17:01	JGH	99-87-6	X
Methylene chloride	Not detected	ug/kg	200	8260B/5035	04/26/06 17:01	JGH	75-09-2	X
Naphthalene	Not detected	ug/kg	700	8260B/5035	04/26/06 17:01	JGH	91-20-3	X
n-Propylbenzene	Not detected	ug/kg	200	8260B/5035	04/26/06 17:01	JGH	103-65-1	X
Styrene	Not detected	ug/kg	100	8260B/5035	04/26/06 17:01	JGH	100-42-5	X
1,1,2,2-Tetrachloroethane	Not detected	ug/kg	200	8260B/5035	04/26/06 17:01	JGH	79-34-5	X
Tetrachloroethene	Not detected	ug/kg	100	8260B/5035	04/26/06 17:01	JGH	127-18-4	X
Toluene	Not detected	ug/kg	200	8260B/5035	04/26/06 17:01	JGH	108-88-3	X
1,1,1-Trichloroethane	Not detected	ug/kg	100	8260B/5035	04/26/06 17:01	JGH	71-55-6	X
1,1,2-Trichloroethane	Not detected	ug/kg	100	8260B/5035	04/26/06 17:01	JGH	79-00-5	X
Trichloroethene	Not detected	ug/kg	100	8260B/5035	04/26/06 17:01	JGH	79-01-6	X
1,2,4-Trimethylbenzene	Not detected	ug/kg	200	8260B/5035	04/26/06 17:01	JGH	95-63-6	X
1,3,5-Trimethylbenzene	Not detected	ug/kg	200	8260B/5035	04/26/06 17:01	JGH	108-67-8	X

X-Elevated reporting limit due to matrix interference

Lab Sample ID: S26697.04 (continued)
Sample Tag: S-2

Analysis	Results	Units	RDL	Method	Run Date/Time	Analyst	CAS #	Flags
Organics - Volatiles (continued)								
Volatile Organics DEQ - 5035 (continued)								
Vinyl chloride	Not detected	ug/kg	100	8260B/5035	04/26/06 17:01	JGH	75-01-4	X
o-Xylene	Not detected	ug/kg	100	8260B/5035	04/26/06 17:01	JGH	95-47-6	X
p,m-Xylene	Not detected	ug/kg	200	8260B/5035	04/26/06 17:01	JGH		X
Acetone	Not detected	ug/kg	2,000	8260B/5035	04/26/06 17:01	JGH	67-64-1	X
2-Butanone (MEK)	Not detected	ug/kg	2,000	8260B/5035	04/26/06 17:01	JGH	78-93-3	X
Carbon disulfide	Not detected	ug/kg	500	8260B/5035	04/26/06 17:01	JGH	75-15-0	X
2-Hexanone	Not detected	ug/kg	5,000	8260B/5035	04/26/06 17:01	JGH	591-78-6	X
4-Methyl-2-pentanone (MIBK)	Not detected	ug/kg	5,000	8260B/5035	04/26/06 17:01	JGH	108-10-1	X
tert-Methyl butyl ether (MTBE)	Not detected	ug/kg	500	8260B/5035	04/26/06 17:01	JGH	1634-04-4	X
1,1,1,2-Tetrachloroethane	Not detected	ug/kg	200	8260B/5035	04/26/06 17:01	JGH	630-20-6	X
1,2,3-Trichlorobenzene	Not detected	ug/kg	700	8260B/5035	04/26/06 17:01	JGH	87-61-6	X
1,2,3-Trichloropropane	Not detected	ug/kg	200	8260B/5035	04/26/06 17:01	JGH	96-18-4	X
1,2,4-Trichlorobenzene	Not detected	ug/kg	700	8260B/5035	04/26/06 17:01	JGH	120-82-1	X
1,2-Dibromo-3-chloropropane	Not detected	ug/kg	500	8260B/5035	04/26/06 17:01	JGH	96-12-8	X
1,2-Dibromoethane	Not detected	ug/kg	40	8260B/5035	04/26/06 17:01	JGH	106-93-4	XM
2-Methylnaphthalene	Not detected	ug/kg	700	8260B/5035	04/26/06 17:01	JGH	91-57-6	X
Acrylonitrile	Not detected	ug/kg	200	8260B/5035	04/26/06 17:01	JGH	107-13-1	X
Bromobenzene	Not detected	ug/kg	200	8260B/5035	04/26/06 17:01	JGH	108-86-1	X
Bromochloromethane	Not detected	ug/kg	200	8260B/5035	04/26/06 17:01	JGH	74-97-5	X
Dibromomethane	Not detected	ug/kg	500	8260B/5035	04/26/06 17:01	JGH	74-95-3	X
Dichlorodifluoromethane	Not detected	ug/kg	500	8260B/5035	04/26/06 17:01	JGH	75-71-8	X
Diethyl ether	Not detected	ug/kg	400	8260B/5035	04/26/06 17:01	JGH	60-29-7	X
Hexachloroethane	Not detected	ug/kg	600	8260B/5035	04/26/06 17:01	JGH	67-72-1	X
Methyl Iodide	Not detected	ug/kg	200	8260B/5035	04/26/06 17:01	JGH	74-88-4	X
Tetrahydrofuran	Not detected	ug/kg	2,000	8260B/5035	04/26/06 17:01	JGH	109-99-9	X
Trichlorofluoromethane	Not detected	ug/kg	200	8260B/5035	04/26/06 17:01	JGH	75-69-4	X
1,2,3-Trimethylbenzene	Not detected	ug/kg	200	8260B/5035	04/26/06 17:01	JGH	526-73-8	X
trans-1,4-Dichloro-2-butene	Not detected	ug/kg	100	8260B/5035	04/26/06 17:01	JGH	110-57-6	X
Organics								
Chlorinated Herbicides								
Dicamba	Not detected	ug/kg	84	8150	04/24/06 12:00	STL	1918-00-9	O
Dinoseb	Not detected	ug/kg	25	8150	04/24/06 12:00	STL	88-85-7	O
2,4-D	Not detected	ug/kg	170	8150	04/24/06 12:00	STL	94-75-7	O
2,4,5-TP (Silvex)	Not detected	ug/kg	42	8150	04/24/06 12:00	STL	93-72-1	O
2,4,5-T (and salts and esters)	Not detected	ug/kg	42	8150	04/24/06 12:00	STL		O

X-Elevated reporting limit due to matrix interference
M-Result reported to MDL not RDL
O-Analysis performed by outside laboratory

Merit Laboratories, Inc.

2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-8333
www.meritlabs.com

C.O.C. PAGE # _____ OF ___

030876

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Brian Huebner
COMPANY: Wilcox
ADDRESS: 5859 Sherman Rd.
CITY: Saginaw STATE: MI ZIP CODE: 48604
PHONE NO: (989) 752-6500 FAX NO: (989) 752-6500 P.O. NO: 14710
E-MAIL ADDRESS: bhuebner@wilcoxassociates.com QUOTE NO.:
PROJECT NO./NAME: 50129 00009 Former City of Flint Dump
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Brian Huebner / Brian Huebner

INVOICE TO

CONTACT NAME: Accounts Payable
COMPANY: Wilcox
ADDRESS: One Madison Ave.
CITY: Cadillac STATE: MI ZIP CODE: 49601
PHONE NO: (231) 775-7755 FAX NO: (231) 775-5735 P.O. NO: 14710
☐ SAME

TURNAROUND TIME REQUIRED: ☐ 24 HR ☐ 48 HR ☐ 72 HR ☒ STANDARD ☐ OTHER
DELIVERABLES REQUIRED: ☒ STANDARD ☐ LEVEL II ☐ LEVEL III ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE O=OIL A=AIR W=WASTE M=MISC

ANALYSIS (ATTACH LIST IF MORE SPACE REQUIRED)

MERIT LAB NO.	YEAR DATE	TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	VOCs	SVOCs	Herb/Pests	PCBs	Metals (18)	BOD/COD/NO_3/MBAS	TKN/TP/Cl/Sulfate	Carbonate/Bicarbonate	Mg/Na/Ca/K	SPECIAL INSTRUCTIONS/NOTES
26971.01	4/24/06	9:30 AM	WS-1	GW	9	5	2	1	1				X	X	X	X	X	X				See attached for parameters
.02	4/24/06	10:30 AM	WS-2	GW	9	5	2	1	1				X	X	X	X	X	X				
.03	4/24/06	10:00 AM	S-1	S	4						1	3 Encore	X	X	X	X	X	X				
.04	4/24/06	11:00 AM	S-2	S	4						1	3 Encore	X	X	X	X	X	X				
			Collected by: BSH																			

RELINQUISHED BY: SIGNATURE/ORGANIZATION	DATE	TIME
Brian Huebner	4/24/06	1:25 PM
RECEIVED BY: SIGNATURE/ORGANIZATION	DATE	TIME
[signature]	4-25-06	1330
RELINQUISHED BY: SIGNATURE/ORGANIZATION	DATE	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION	DATE	TIME

RELINQUISHED BY: SIGNATURE/ORGANIZATION	DATE	TIME
[signature]	4-25-06	1445
RECEIVED BY: SIGNATURE/ORGANIZATION	DATE	TIME
[signature]	4-26-06	1445

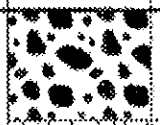
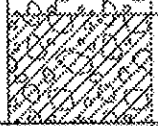
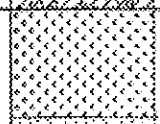
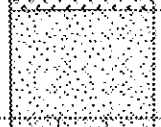
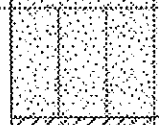
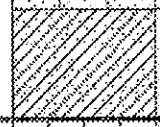
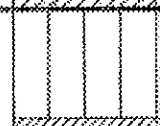
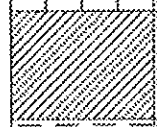
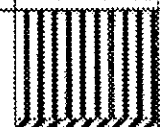
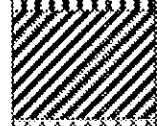
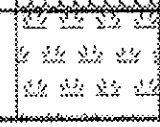
SEAL NO.	SEAL INTACT YES ☐ NO ☐	INITIALS
SEAL NO.	SEAL INTACT YES ☐ NO ☐	INITIALS

NOTES: TEMP. ON ARRIVAL 4.9

PLEASE NOTE: SIGNING ACKNOWLEDGES ACCEPTANCE OF TERMS & CONDITIONS ON REVERSE SIDE

APPENDIX F Unified Soil Classification

UNIFIED SOIL CLASSIFICATION SYSTEM CHART

MAJOR DIVISION			SYMBOL GRAPH	SYMBOL LETTER	GROUP NAME[A] AND TYPICAL DESCRIPTION
COARSE GRAINED SOILS	GRAVEL AND GRAVELLY SOILS	CLEAN GRAVELS		GW[B]	WELL-GRADED GRAVEL[C]; GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
		(LESS THAN 5% FINES)		GP[B]	POORLY-GRADED GRAVEL[C]; GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
	MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	GRAVELS WITH FINES		GM[B]	SILTY GRAVEL[C]; GRAVEL - SAND - SILT MIXTURES
		(MORE THAN 15% FINES)		GC[B]	CLAYEY GRAVEL[C]; GRAVEL - SAND - CLAY MIXTURES
MORE THAN 50% OF MATERIAL RETAINED ON NO. 200 SIEVE	SAND AND SANDY SOILS	CLEAN SANDS		SW	WELL-GRADED SAND[D]; GRAVELLY SANDS, LITTLE OR NO FINES
		(LESS THAN 5% FINES)		SP	POORLY-GRADED SAND[D]; GRAVELLY SANDS, LITTLE OR NO FINES
	MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE	SANDS WITH FINES		SM	SILTY SAND[D]; SAND - SILT MIXTURES
		(MORE THAN 15% FINES)		SC	CLAYEY SAND[D]; SAND - CLAY MIXTURES
FINE GRAINED SOILS	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		ML	SILT[E]; INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
				CL	LEAN CLAY[F]; INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				OL	ORGANIC CLAY/ORGANIC SILT[G]; ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
MORE THAN 50% OF MATERIAL PASSES THE NO. 200 SIEVE	SILTS AND CLAYS	LIQUID LIMIT 50 OR GREATER		MH	ELASTIC SILT[E]; INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
				CH	FAT CLAY[F]; INORGANIC CLAYS OF HIGH PLASTICITY
				OH	ORGANIC CLAY/ORGANIC SILT[G]; ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS				PT	PEAT; HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

NOTES: A) IF FIELD SAMPLE CONTAINS COBBLES OR BOULDERS, ADD "WITH COBBLES" AND/OR "WITH BOULDERS" TO GROUP NAME.
B) DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS WITH 5-15% FINES. ADD "WITH SILT" OR "WITH CLAY" TO GROUP NAME.
C) IF SOIL CONTAINS 15% OR MORE SAND, ADD "WITH SAND" TO GROUP NAME.
D) IF SOIL CONTAINS 15% OR MORE GRAVEL, ADD "WITH GRAVEL" TO GROUP NAME.
E) IF SOIL CONTAINS 30% OR MORE PLUS NO. 200, ADD "SANDY" OR "GRAVELLY" TO GROUP NAME. IF 15-25%, ADD "WITH SAND" OR "WITH GRAVEL", WHICHEVER IS PREDOMINANT.

APPENDIX G Field Forms

GEO-environmental Resources, Inc.
(888) 417-4440

SOIL SAMPLE COLLECTION FIELD SHEET

GENERAL INFORMATION

SITE NAME: _____ PROJECT NO. _____

SAMPLE NO. _____ BORING NO. _____

DATE/TIME COLLECTED: _____ PERSONNEL: _____

SAMPLE METHOD / DEPTH: _____ _____

SAMPLE MEDIA:	SOIL	SEDIMENT	SLUDGE	
SAMPLE QA SPLIT:	YES	NO		SPLIT SAMPLE NO. _____
SAMPLE QC DUPLICATE:	YES	NO		DUPLICATE SAMPLE NO. _____
MS/MSD REQUESTED:	YES	NO		

SAMPLE CONTAINERS, PRESERVATIVES, ANALYSIS

Sample Container	Preservative	Analysis Requested

OVA MEASUREMENTS

Background _____

Breathing zone _____

Boring _____

Headspace _____

SAMPLE DESCRIPTION

DEPTH: _____ DESCRIPTION: _____

_____ _____

_____ _____

_____ _____

_____ _____

GENERAL COMMENTS

_____

_____

_____

GEO-Environmental Resources, Inc.
(888) 417-4440

WATER SAMPLE COLLECTION FIELD SHEET

GENERAL INFORMATION

SITE NAME _____ PROJECT NO. _____

SAMPLE NO. _____ WELL NO. _____

DATE/TIME COLLECTED _____ PERSONNEL _____

SAMPLE METHOD _____ _____

SAMPLE MEDIA:	Groundwater	Surface Water	
SAMPLE QA SPLIT:	YES	NO	SPLIT SAMPLE NO. _____
SAMPLE QC DUPLICATE:	YES	NO	DUPLICATE SAMPLE NO. _____
MS/MSD REQUESTED	YES	NO	

SAMPLE CONTAINERS, PRESERVATIVES, ANALYSIS

Sample Container	Preservative	Analysis Requested

WELL PURGING DATA

Date _____

Time Started _____

Time Completed _____

Hnu Measurements

Background _____

Breathing Zone _____

Well Head _____

Well Depth (ft. BTOC) _____

Depth to Water (ft BTOC) _____

Water Column Length _____

Volume of Water in Well (gal) _____

Casing Volumes to Purge _____

Minimum to Purge (gal) _____

Actual Purge (gal) _____

FIELD MEASUREMENTS

Time	Amount Purged (gal)	pH	Temperature (°C)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	ORP (mV)	Turbidity (NTU's)

FIELD EQUIPMENT AND CALIBRATION

	Model	Calibration
Water Level Probe		
Water Quality Meter		

GENERAL COMMENTS

_____

_____

_____

WATER LEVEL DATA SHEET

Project Number: _____

Project Name: _____

Location: _____

Collected by: _____

Well Number	Date	Time	Method	MP Elevation	Well Depth	Depth To Water	Water Level Elevation	Comments

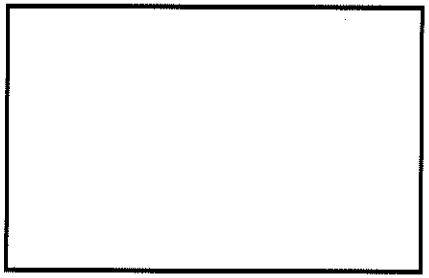
MP = Measuring Point

GEO-environmental Resources, Inc.
(888) 417-4440

GEO-environmental Resources, Inc.
(888) 417-4440

UNCONSOLIDATED BORING LOG

Boring/Well
Project Number
Client Name
Site Location
Date
Prepared by
Start Time and Date
Finish Time and Date
PID or FID with Lamp Size
Calibration Gas/Time/Results



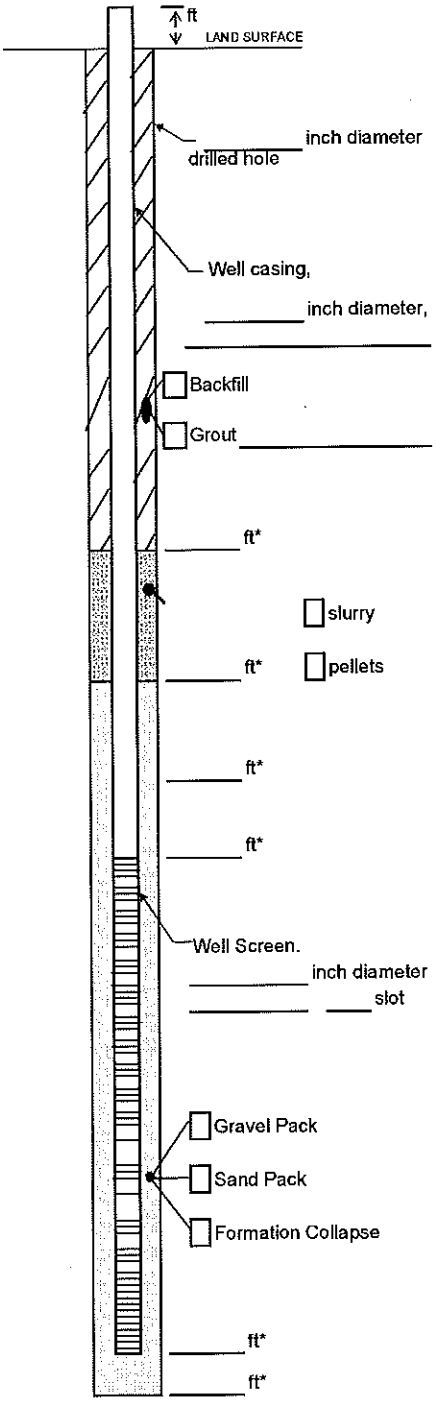
Drilling Contractor
Driller & Helper
Drilling Method
Sampling Interval
Hammer Weight
Drop Height
Total Depth Drilled
Borehole Diameter
Drilling Fluid Used
Sample Device
Dimensions

Sample Time	Sample ID & Type	Sample Interval (ft bls)	Sample Core Recovery (ft)	Standard Blow Counts	Density/ Consistency	Soil Color	Grain Size Modifier	Grain Size	Secondary Characteristics	Moisture Content	Remarks and Other Characteristics

GEO-environmental Resources, Inc.
(888) 417-4440

Well Construction Log

(Unconsolidated)



Measuring Point is
Top of Well Casing
Unless Otherwise Noted.

* Depth Below Land Surface

Project _____ Well _____

Town/City _____

County _____ State _____

Permit No. _____

Land-Surface Elevation and Datum:

_____ feet ☐ Surveyed ☐ Estimated

Installation Date(s) _____

Drilling Method _____

Drilling Contractor _____

Drilling Fluid _____

_____

Development Technique(s) and Date(s)

_____

_____

_____

Fluid Loss During Drilling _____ gallons

Water Removed During Development _____ gallons

Static Depth to Water _____ feet below M.P.

Pumping Depth to Water _____ feet below M.P.

Pumping Duration _____ hours

Yield _____ gpm Date _____

Specific Capacity _____ gpm/ft

Well Purpose _____

_____

_____

Remarks _____

_____

_____

_____

_____

Prepared by _____

APPENDIX H Low Flow Guidance

APPENDIX VI
RECENT SAMPLING RESULTS

MICHIGAN DEPARTMENT OF
ENVIRONMENT, GREAT LAKES, AND ENERGY
ENVIRONMENTAL LABORATORY

P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-9800
FAX: (517) 335-9600

04 December 2025

Work Order: 2511055

Brian Kuberski
EGLE-RRD-LANSING
525 W. Allegan Street
Lansing, MI 48909

RE: FLINT BISHOP AIRPORT LANDFILL

This is the official environmental laboratory report for testing conducted by the Michigan Department of Environment, Great Lakes, and Energy. Analyses performed by the laboratory were conducted using methods published by the U.S. Environmental Protection Agency, Standard Methods for the Examination of Water and Wastewater, ASTM, or other published or approved reference methods.

Kirby Shane
Laboratory Director

Total Charges for Reported Analyses: **$1,683.00**

MICHIGAN DEPARTMENT OF
ENVIRONMENT, GREAT LAKES, AND ENERGY

**MICHIGAN DEPARTMENT OF
ENVIRONMENT, GREAT LAKES, AND ENERGY
ENVIRONMENTAL LABORATORY**

P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-9800
FAX: (517) 335-9600

EGLE-RRD-LANSING
525 W. Allegan Street
Lansing MI, 48909

Project: FLINT BISHOP AIRPORT LANDFILL
Location ID: 25000453
Project Manager: Brian Kuberski

Reported:
12/04/2025

Analytical Report for Samples

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received	Qualifier
MW-8-07	2511055-01	Water	11/04/2025	11/05/2025	
MW-3-07	2511055-02	Water	11/04/2025	11/05/2025	
MW-4-07	2511055-03	Water	11/04/2025	11/05/2025	
MW-7-07	2511055-04	Water	11/04/2025	11/05/2025	
MW-6-07	2511055-05	Water	11/04/2025	11/05/2025	

Qualifiers and Definitions

Y17	Probable petroleum product(s) present.
A11	Result is estimated due to high initial verification standard criteria failure.
A08	Result(s) and reporting limit(s) are estimated due to low recovery of batch QC.
A07	Result(s) and reporting limit(s) are estimated due to poor precision.
100	Result is estimated due to method blank contamination of greater than 10% of result.
ND	Indicates the analyte was not detected at or above the method reporting limit (RL)
RL	Reporting Limit
NA	Not Applicable

Case Narrative

Samples were received **11/5/2025 2:15:00PM** for client **EGLE-RRD-LANSING** as a part of project **FLINT BISHOP AIRPORT LANDFILL**.

Temperature of samples upon receipt was recorded at 2.70º C and samples were received on ice

Samples were logged and designated as Work Order # **2511055** on **11/5/2025 4:02:00PM**.

This Report was created **12/4/2025 8:51:15AM**.

Additional Notes/Narrative (if applicable):

MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY

MICHIGAN DEPARTMENT OF
ENVIRONMENT, GREAT LAKES, AND ENERGY
ENVIRONMENTAL LABORATORY

P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-9800
FAX: (517) 335-9600

Client ID: MW-8-07

Lab ID: 2511055-01

CAS #	Analyte	Result	RL	Units	Dilution	Analyzed Date	QC Batch	Method	Analyst	Qualifier
Organics-Volatiles										
630-20-6	1,1,1,2-Tetrachloroethane	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
71-55-6	1,1,1-Trichloroethane	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
79-00-5	1,1,2-Trichloroethane	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
76-13-1	1,1,2-Trichlorotrifluoroethane	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
75-34-3	1,1-Dichloroethane	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
75-35-4	1,1-Dichloroethylene	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
87-61-6	1,2,3-Trichlorobenzene	ND	5.0	ug/L	1	11/08/25	B5K0702	8260	JT	
96-18-4	1,2,3-Trichloropropane	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
526-73-8	1,2,3-Trimethylbenzene	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
120-82-1	1,2,4-Trichlorobenzene	ND	5.0	ug/L	1	11/08/25	B5K0702	8260	JT	
95-63-6	1,2,4-Trimethylbenzene	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
96-12-8	1,2-Dibromo-3-chloropropane	ND	5.0	ug/L	1	11/08/25	B5K0702	8260	JT	
106-93-4	1,2-Dibromoethane	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
95-50-1	1,2-Dichlorobenzene	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
107-06-2	1,2-Dichloroethane	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
78-87-5	1,2-Dichloropropane	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
108-67-8	1,3,5-Trimethylbenzene	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
541-73-1	1,3-Dichlorobenzene	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
106-46-7	1,4-Dichlorobenzene	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
540-84-1	2,2,4-Trimethylpentane	ND	5.0	ug/L	1	11/08/25	B5K0702	8260	JT	
78-93-3	2-Butanone (MEK)	ND	5.0	ug/L	1	11/08/25	B5K0702	8260	JT	
91-57-6	2-Methylnaphthalene	ND	5.0	ug/L	1	11/08/25	B5K0702	8260	JT	
67-64-1	2-Propanone (acetone)	ND	20	ug/L	1	11/08/25	B5K0702	8260	JT	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	5.0	ug/L	1	11/08/25	B5K0702	8260	JT	
107-13-1	Acrylonitrile	ND	5.0	ug/L	1	11/08/25	B5K0702	8260	JT	
71-43-2	Benzene	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
74-97-5	Bromochloromethane	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
75-27-4	Bromodichloromethane	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
75-25-2	Bromoform	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
74-83-9	Bromomethane	ND	5.0	ug/L	1	11/08/25	B5K0702	8260	JT	
75-15-0	Carbon disulfide	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
56-23-5	Carbon tetrachloride	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
108-90-7	Chlorobenzene	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
75-00-3	Chloroethane	ND	5.0	ug/L	1	11/08/25	B5K0702	8260	JT	
67-66-3	Chloroform	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
74-87-3	Chloromethane	ND	5.0	ug/L	1	11/08/25	B5K0702	8260	JT	
156-59-2	cis-1,2-Dichloroethylene	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
10061-01-5	cis-1,3-Dichloropropylene	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
110-82-7	Cyclohexane	ND	5.0	ug/L	1	11/08/25	B5K0702	8260	JT	
124-48-1	Dibromochloromethane	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
74-95-3	Dibromomethane	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	

MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY

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ENVIRONMENTAL LABORATORY

P.O. Box 30270
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TEL: (517) 335-9800
FAX: (517) 335-9600

Client ID: MW-8-07

Lab ID: 2511055-01

CAS #	Analyte	Result	RL	Units	Dilution	Analyzed Date	QC Batch	Method	Analyst	Qualifier
Organics-Volatiles										
75-71-8	Dichlorodifluoromethane	ND	5.0	ug/L	1	11/08/25	B5K0702	8260	JT	
60-29-7	**Diethyl ether**	**6.2**	5.0	ug/L	1	11/08/25	B5K0702	8260	JT	
108-20-3	Diisopropyl Ether	ND	5.0	ug/L	1	11/08/25	B5K0702	8260	JT	
100-41-4	Ethylbenzene	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
637-92-3	Ethyltertiarybutylether	ND	5.0	ug/L	1	11/08/25	B5K0702	8260	JT	
67-72-1	Hexachloroethane	ND	5.0	ug/L	1	11/08/25	B5K0702	8260	JT	
110-54-3	Hexane	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
98-82-8	Isopropylbenzene	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
1330-20-7	m & p - Xylene	ND	2.0	ug/L	1	11/08/25	B5K0702	8260	JT	
96-37-7	Methylcyclopentane	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
75-09-2	Methylene chloride	ND	5.0	ug/L	1	11/08/25	B5K0702	8260	JT	
1634-04-4	Methyltertiarybutylether	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
91-20-3	Naphthalene	ND	5.0	ug/L	1	11/08/25	B5K0702	8260	JT	
104-51-8	n-Butylbenzene	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
142-82-5	n-Heptane	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
103-65-1	n-Propylbenzene	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
95-47-6	o-Xylene	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
109-66-0	Pentane	ND	5.0	ug/L	1	11/08/25	B5K0702	8260	JT	
135-98-8	sec-Butylbenzene	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
100-42-5	Styrene	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
98-06-6	tert-Butylbenzene	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
75-65-0	tertiary Butyl Alcohol	ND	50	ug/L	1	11/08/25	B5K0702	8260	JT	
994-05-8	tertiaryAmylmethylether	ND	5.0	ug/L	1	11/08/25	B5K0702	8260	JT	
127-18-4	Tetrachloroethylene	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
109-99-9	Tetrahydrofuran	ND	5.0	ug/L	1	11/08/25	B5K0702	8260	JT	
108-88-3	Toluene	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
156-60-5	trans-1,2-Dichloroethylene	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
10061-02-6	trans-1,3-Dichloropropylene	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
79-01-6	Trichloroethylene	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
75-69-4	Trichlorofluoromethane	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
75-01-4	Vinyl chloride	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
Surrogate: Bromofluorobenzene			*99.7 %*	*85-115*		*11/08/25*	B5K0702	*8260*	*JT*	
Surrogate: Dibromofluoromethane			*107 %*	*83-115*		*11/08/25*	B5K0702	*8260*	*JT*	
Surrogate: Toluene-d8			*98.1 %*	*85-115*		*11/08/25*	B5K0702	*8260*	*JT*	

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Client ID: MW-8-07

Lab ID: 2511055-01

CAS #	Analyte	Result	RL	Units	Dilution	Analyzed Date	QC Batch	Method	Analyst	Qualifier
Organics-Semivolatiles										
91-57-6	2-Methylnaphthalene	ND	5.7	ug/L	1	11/11/25	B5K1030	8270	MF	
83-32-9	Acenaphthene	ND	1.1	ug/L	1	11/11/25	B5K1030	8270	MF	
208-96-8	Acenaphthylene	ND	1.1	ug/L	1	11/11/25	B5K1030	8270	MF	
120-12-7	Anthracene	ND	1.1	ug/L	1	11/11/25	B5K1030	8270	MF	
56-55-3	Benz[a]anthracene	ND	1.1	ug/L	1	11/11/25	B5K1030	8270	MF	
50-32-8	Benzo[a]pyrene	ND	1.1	ug/L	1	11/11/25	B5K1030	8270	MF	
205-99-2	Benzo[b]fluoranthene	ND	1.1	ug/L	1	11/11/25	B5K1030	8270	MF	
191-24-2	Benzo[g,h,i]perylene	ND	1.1	ug/L	1	11/11/25	B5K1030	8270	MF	
207-08-9	Benzo[k]fluoranthene	ND	1.1	ug/L	1	11/11/25	B5K1030	8270	MF	
218-01-9	Chrysene	ND	1.1	ug/L	1	11/11/25	B5K1030	8270	MF	
53-70-3	Dibenz[a,h]anthracene	ND	2.3	ug/L	1	11/11/25	B5K1030	8270	MF	
206-44-0	Fluoranthene	ND	1.1	ug/L	1	11/11/25	B5K1030	8270	MF	
86-73-7	Fluorene	ND	1.1	ug/L	1	11/11/25	B5K1030	8270	MF	
193-39-5	Indeno(1,2,3-c,d)pyrene	ND	2.3	ug/L	1	11/11/25	B5K1030	8270	MF	
91-20-3	Naphthalene	ND	1.1	ug/L	1	11/11/25	B5K1030	8270	MF	
85-01-8	Phenanthrene	ND	1.1	ug/L	1	11/11/25	B5K1030	8270	MF	
129-00-0	Pyrene	ND	1.1	ug/L	1	11/11/25	B5K1030	8270	MF	
Surrogate: 2-Fluorobiphenyl			*64.0 %*	*20-101*		*11/11/25*	B5K1030	*8270*	*MF*	
Surrogate: Nitrobenzene-d5			*65.6 %*	*13-100*		*11/11/25*	B5K1030	*8270*	*MF*	
Surrogate: p-Terphenyl-d14			*96.7 %*	*18-150*		*11/11/25*	B5K1030	*8270*	*MF*	
Organics-Pesticides										
789-02-6	2,4'-DDT	ND	0.011	ug/L	1	11/23/25	B5K1042	EPA 8081	MK3	
72-54-8	4,4'-DDD	ND	0.022	ug/L	1	11/23/25	B5K1042	EPA 8081	MK3	
72-55-9	4,4'-DDE	ND	0.022	ug/L	1	11/23/25	B5K1042	EPA 8081	MK3	
50-29-3	4,4'-DDT	ND	0.022	ug/L	1	11/23/25	B5K1042	EPA 8081	MK3	
319-84-6	a-BHC	ND	0.022	ug/L	1	11/23/25	B5K1042	EPA 8081	MK3	
5103-71-9	a-Chlordane	ND	0.011	ug/L	1	11/23/25	B5K1042	EPA 8081	MK3	
309-00-2	Aldrin	ND	0.011	ug/L	1	11/23/25	B5K1042	EPA 8081	MK3	
319-85-7	b-BHC	ND	0.022	ug/L	1	11/23/25	B5K1042	EPA 8081	MK3	
319-86-8	d-BHC	ND	0.022	ug/L	1	11/23/25	B5K1042	EPA 8081	MK3	
60-57-1	Dieldrin	ND	0.022	ug/L	1	11/23/25	B5K1042	EPA 8081	MK3	
959-98-8	Endosulfan I	ND	0.022	ug/L	1	11/23/25	B5K1042	EPA 8081	MK3	
33213-65-9	Endosulfan II	ND	0.033	ug/L	1	11/23/25	B5K1042	EPA 8081	MK3	
1031-07-8	Endosulfan sulfate	ND	0.055	ug/L	1	11/23/25	B5K1042	EPA 8081	MK3	
72-20-8	Endrin	ND	0.022	ug/L	1	11/23/25	B5K1042	EPA 8081	MK3	A08
7421-93-4	Endrin aldehyde	ND	0.022	ug/L	1	11/23/25	B5K1042	EPA 8081	MK3	
53494-70-5	Endrin ketone	ND	0.022	ug/L	1	11/23/25	B5K1042	EPA 8081	MK3	
58-89-9	g-BHC (Lindane)	ND	0.022	ug/L	1	11/23/25	B5K1042	EPA 8081	MK3	
5103-74-2	g-Chlordane	ND	0.011	ug/L	1	11/23/25	B5K1042	EPA 8081	MK3	
76-44-8	Heptachlor	ND	0.011	ug/L	1	11/23/25	B5K1042	EPA 8081	MK3	
1024-57-3	Heptachlor epoxide	ND	0.011	ug/L	1	11/23/25	B5K1042	EPA 8081	MK3	

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TEL: (517) 335-9800
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Client ID: MW-8-07

Lab ID: 2511055-01

CAS #	Analyte	Result	RL	Units	Dilution	Analyzed Date	QC Batch	Method	Analyst	Qualifier
Organics-Pesticides										
87-82-1	Hexabromobenzene	ND	0.022	ug/L	1	11/23/25	B5K1042	EPA 8081	MK3	
72-43-5	Methoxychlor	ND	0.055	ug/L	1	11/23/25	B5K1042	EPA 8081	MK3	
2385-85-5	Mirex	ND	0.022	ug/L	1	11/23/25	B5K1042	EPA 8081	MK3	
59080-40-9	PBB (BP-6)	ND	0.055	ug/L	1	11/23/25	B5K1042	EPA 8081	MK3	
8001-35-2	Toxaphene	ND	0.11	ug/L	1	11/23/25	B5K1042	EPA 8081	MK3	
Surrogate: Decachlorobiphenyl			*50.0 %*	*10-140*		*11/23/25*	B5K1042	*EPA 8081*	*MK3*	
Surrogate: Tetrachloro-m-xylene			*44.9 %*	*17-84*		*11/23/25*	B5K1042	*EPA 8081*	*MK3*	
Organics-PCBs as Aroclors										
12674-11-2	Aroclor 1016	ND	0.11	ug/L	1	11/21/25	B5K1042	EPA 8082	MK3	
11104-28-2	Aroclor 1221	ND	0.11	ug/L	1	11/21/25	B5K1042	EPA 8082	MK3	
11141-16-5	Aroclor 1232	ND	0.11	ug/L	1	11/21/25	B5K1042	EPA 8082	MK3	
53469-21-9	Aroclor 1242	ND	0.11	ug/L	1	11/21/25	B5K1042	EPA 8082	MK3	
12672-29-6	Aroclor 1248	ND	0.11	ug/L	1	11/21/25	B5K1042	EPA 8082	MK3	
11097-69-1	Aroclor 1254	ND	0.11	ug/L	1	11/21/25	B5K1042	EPA 8082	MK3	
11096-82-5	Aroclor 1260	ND	0.11	ug/L	1	11/21/25	B5K1042	EPA 8082	MK3	
37324-23-5	Aroclor 1262	ND	0.11	ug/L	1	11/21/25	B5K1042	EPA 8082	MK3	
11100-14-4	Aroclor 1268	ND	0.11	ug/L	1	11/21/25	B5K1042	EPA 8082	MK3	
Surrogate: Decachlorobiphenyl			*54.2 %*	*17-132*		*11/21/25*	B5K1042	*EPA 8082*	*MK3*	
Surrogate: Tetrachloro-m-xylene			*44.8 %*	*20-104*		*11/21/25*	B5K1042	*EPA 8082*	*MK3*	
Inorganics-Metals										
7440-38-2	**Arsenic, Dissolved**	**160**	1.0	ug/L	1	11/26/25	B5K1330	200.8	ARH	
7440-39-3	**Barium, Dissolved**	**160**	50	ug/L	10	11/26/25	B5K1330	200.8	ARH	
7440-43-9	Cadmium, Dissolved	ND	0.2	ug/L	1	11/26/25	B5K1330	200.8	ARH	
7440-47-3	**Chromium, Dissolved**	**4.4**	1.0	ug/L	1	11/26/25	B5K1330	200.8	ARH	
7440-50-8	**Copper, Dissolved**	**2.3**	1.0	ug/L	1	11/26/25	B5K1330	200.8	ARH	
7439-92-1	**Lead, Dissolved**	**1.2**	1.0	ug/L	1	11/26/25	B5K1330	200.8	ARH	
7439-97-6	Mercury, Dissolved	ND	0.2	ug/L	1	11/10/25	B5K1028	EPA 7473	JH	
7782-49-2	Selenium, Dissolved	ND	1.0	ug/L	1	11/26/25	B5K1330	200.8	ARH	
7440-22-4	Silver, Dissolved	ND	0.2	ug/L	1	11/26/25	B5K1330	200.8	ARH	
7440-66-6	**Zinc, Dissolved**	**6.8**	5.0	ug/L	1	11/26/25	B5K1330	200.8	ARH	

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TEL: (517) 335-9800
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Client ID: MW-3-07

Lab ID: 2511055-02

CAS #	Analyte	Result	RL	Units	Dilution	Analyzed Date	QC Batch	Method	Analyst	Qualifier
Organics-Volatiles										
630-20-6	1,1,1,2-Tetrachloroethane	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
71-55-6	1,1,1-Trichloroethane	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
79-00-5	1,1,2-Trichloroethane	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
76-13-1	1,1,2-Trichlorotrifluoroethane	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
75-34-3	1,1-Dichloroethane	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
75-35-4	1,1-Dichloroethylene	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
87-61-6	1,2,3-Trichlorobenzene	ND	5.0	ug/L	1	11/08/25	B5K0702	8260	JT	
96-18-4	1,2,3-Trichloropropane	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
526-73-8	**1,2,3-Trimethylbenzene**	**4.5**	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
120-82-1	1,2,4-Trichlorobenzene	ND	5.0	ug/L	1	11/08/25	B5K0702	8260	JT	
95-63-6	**1,2,4-Trimethylbenzene**	**7.1**	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
96-12-8	1,2-Dibromo-3-chloropropane	ND	5.0	ug/L	1	11/08/25	B5K0702	8260	JT	
106-93-4	1,2-Dibromoethane	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
95-50-1	1,2-Dichlorobenzene	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
107-06-2	1,2-Dichloroethane	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
78-87-5	1,2-Dichloropropane	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
108-67-8	1,3,5-Trimethylbenzene	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
541-73-1	1,3-Dichlorobenzene	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
106-46-7	**1,4-Dichlorobenzene**	**12**	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
540-84-1	2,2,4-Trimethylpentane	ND	5.0	ug/L	1	11/08/25	B5K0702	8260	JT	
78-93-3	2-Butanone (MEK)	ND	5.0	ug/L	1	11/08/25	B5K0702	8260	JT	
91-57-6	2-Methylnaphthalene	ND	5.0	ug/L	1	11/08/25	B5K0702	8260	JT	
67-64-1	2-Propanone (acetone)	ND	20	ug/L	1	11/08/25	B5K0702	8260	JT	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	5.0	ug/L	1	11/08/25	B5K0702	8260	JT	
107-13-1	Acrylonitrile	ND	5.0	ug/L	1	11/08/25	B5K0702	8260	JT	
71-43-2	**Benzene**	**9.5**	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
74-97-5	Bromochloromethane	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
75-27-4	Bromodichloromethane	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
75-25-2	Bromoform	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
74-83-9	Bromomethane	ND	5.0	ug/L	1	11/08/25	B5K0702	8260	JT	
75-15-0	Carbon disulfide	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
56-23-5	Carbon tetrachloride	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
108-90-7	**Chlorobenzene**	**100**	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
75-00-3	Chloroethane	ND	5.0	ug/L	1	11/08/25	B5K0702	8260	JT	
67-66-3	Chloroform	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
74-87-3	Chloromethane	ND	5.0	ug/L	1	11/08/25	B5K0702	8260	JT	
156-59-2	cis-1,2-Dichloroethylene	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
10061-01-5	cis-1,3-Dichloropropylene	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
110-82-7	Cyclohexane	ND	5.0	ug/L	1	11/08/25	B5K0702	8260	JT	
124-48-1	Dibromochloromethane	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
74-95-3	Dibromomethane	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	

MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY

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ENVIRONMENTAL LABORATORY

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Lansing, MI 48909
TEL: (517) 335-9800
FAX: (517) 335-9600

Client ID: MW-3-07

Lab ID: 2511055-02

CAS #	Analyte	Result	RL	Units	Dilution	Analyzed Date	QC Batch	Method	Analyst	Qualifier
Organics-Volatiles										
75-71-8	Dichlorodifluoromethane	ND	5.0	ug/L	1	11/08/25	B5K0702	8260	JT	
60-29-7	**Diethyl ether**	**65**	5.0	ug/L	1	11/08/25	B5K0702	8260	JT	
108-20-3	Diisopropyl Ether	ND	5.0	ug/L	1	11/08/25	B5K0702	8260	JT	
100-41-4	Ethylbenzene	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
637-92-3	Ethyltertiarybutylether	ND	5.0	ug/L	1	11/08/25	B5K0702	8260	JT	
67-72-1	Hexachloroethane	ND	5.0	ug/L	1	11/08/25	B5K0702	8260	JT	
110-54-3	Hexane	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
98-82-8	**Isopropylbenzene**	**1.5**	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
1330-20-7	**m & p - Xylene**	**20**	2.0	ug/L	1	11/08/25	B5K0702	8260	JT	
96-37-7	Methylcyclopentane	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
75-09-2	Methylene chloride	ND	5.0	ug/L	1	11/08/25	B5K0702	8260	JT	
1634-04-4	**Methyltertiarybutylether**	**1.9**	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
91-20-3	**Naphthalene**	**8.1**	5.0	ug/L	1	11/08/25	B5K0702	8260	JT	
104-51-8	n-Butylbenzene	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
142-82-5	n-Heptane	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
103-65-1	**n-Propylbenzene**	**1.2**	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
95-47-6	o-Xylene	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
109-66-0	Pentane	ND	5.0	ug/L	1	11/08/25	B5K0702	8260	JT	
135-98-8	sec-Butylbenzene	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
100-42-5	Styrene	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
98-06-6	tert-Butylbenzene	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
75-65-0	**tertiary Butyl Alcohol**	**70**	50	ug/L	1	11/08/25	B5K0702	8260	JT	
994-05-8	tertiaryAmylmethylether	ND	5.0	ug/L	1	11/08/25	B5K0702	8260	JT	
127-18-4	Tetrachloroethylene	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
109-99-9	**Tetrahydrofuran**	**50**	5.0	ug/L	1	11/08/25	B5K0702	8260	JT	
108-88-3	Toluene	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
156-60-5	trans-1,2-Dichloroethylene	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
10061-02-6	trans-1,3-Dichloropropylene	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
79-01-6	Trichloroethylene	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
75-69-4	Trichlorofluoromethane	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
75-01-4	Vinyl chloride	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
Surrogate: Bromofluorobenzene			*92.2 %*	*85-115*		*11/08/25*	B5K0702	*8260*	*JT*	
Surrogate: Dibromofluoromethane			*103 %*	*83-115*		*11/08/25*	B5K0702	*8260*	*JT*	
Surrogate: Toluene-d8			*94.0 %*	*85-115*		*11/08/25*	B5K0702	*8260*	*JT*	

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Client ID: MW-3-07

Lab ID: 2511055-02

CAS #	Analyte	Result	RL	Units	Dilution	Analyzed Date	QC Batch	Method	Analyst	Qualifier
Organics-Semivolatiles										
91-57-6	2-Methylnaphthalene	ND	5.0	ug/L	1	11/11/25	B5K1030	8270	MF	
83-32-9	Acenaphthene	ND	1.0	ug/L	1	11/11/25	B5K1030	8270	MF	
208-96-8	Acenaphthylene	ND	1.0	ug/L	1	11/11/25	B5K1030	8270	MF	
120-12-7	Anthracene	ND	1.0	ug/L	1	11/11/25	B5K1030	8270	MF	
56-55-3	Benz[a]anthracene	ND	1.0	ug/L	1	11/11/25	B5K1030	8270	MF	
50-32-8	Benzo[a]pyrene	ND	1.0	ug/L	1	11/11/25	B5K1030	8270	MF	
205-99-2	Benzo[b]fluoranthene	ND	1.0	ug/L	1	11/11/25	B5K1030	8270	MF	
191-24-2	Benzo[g,h,i]perylene	ND	1.0	ug/L	1	11/11/25	B5K1030	8270	MF	
207-08-9	Benzo[k]fluoranthene	ND	1.0	ug/L	1	11/11/25	B5K1030	8270	MF	
218-01-9	Chrysene	ND	1.0	ug/L	1	11/11/25	B5K1030	8270	MF	
53-70-3	Dibenz[a,h]anthracene	ND	2.0	ug/L	1	11/11/25	B5K1030	8270	MF	
206-44-0	Fluoranthene	ND	1.0	ug/L	1	11/11/25	B5K1030	8270	MF	
86-73-7	Fluorene	ND	1.0	ug/L	1	11/11/25	B5K1030	8270	MF	
193-39-5	Indeno(1,2,3-c,d)pyrene	ND	2.0	ug/L	1	11/11/25	B5K1030	8270	MF	
91-20-3	**Naphthalene**	**5.1**	1.0	ug/L	1	11/11/25	B5K1030	8270	MF	100
85-01-8	Phenanthrene	ND	1.0	ug/L	1	11/11/25	B5K1030	8270	MF	
129-00-0	Pyrene	ND	1.0	ug/L	1	11/11/25	B5K1030	8270	MF	
Surrogate: 2-Fluorobiphenyl			*68.9 %*	*20-101*		*11/11/25*	B5K1030	*8270*	*MF*	
Surrogate: Nitrobenzene-d5			*63.2 %*	*13-100*		*11/11/25*	B5K1030	*8270*	*MF*	
Surrogate: p-Terphenyl-d14			*82.0 %*	*18-150*		*11/11/25*	B5K1030	*8270*	*MF*	
Organics-Pesticides										
789-02-6	2,4'-DDT	ND	0.010	ug/L	1	11/23/25	B5K1042	EPA 8081	MK3	
72-54-8	4,4'-DDD	ND	0.021	ug/L	1	11/23/25	B5K1042	EPA 8081	MK3	
72-55-9	4,4'-DDE	ND	0.021	ug/L	1	11/23/25	B5K1042	EPA 8081	MK3	
50-29-3	4,4'-DDT	ND	0.021	ug/L	1	11/23/25	B5K1042	EPA 8081	MK3	
319-84-6	a-BHC	ND	0.021	ug/L	1	11/23/25	B5K1042	EPA 8081	MK3	
5103-71-9	a-Chlordane	ND	0.010	ug/L	1	11/23/25	B5K1042	EPA 8081	MK3	
309-00-2	Aldrin	ND	0.010	ug/L	1	11/23/25	B5K1042	EPA 8081	MK3	
319-85-7	b-BHC	ND	0.021	ug/L	1	11/23/25	B5K1042	EPA 8081	MK3	
319-86-8	d-BHC	ND	0.021	ug/L	1	11/23/25	B5K1042	EPA 8081	MK3	
60-57-1	Dieldrin	ND	0.021	ug/L	1	11/23/25	B5K1042	EPA 8081	MK3	
959-98-8	Endosulfan I	ND	0.021	ug/L	1	11/23/25	B5K1042	EPA 8081	MK3	
33213-65-9	Endosulfan II	ND	0.031	ug/L	1	11/23/25	B5K1042	EPA 8081	MK3	
1031-07-8	Endosulfan sulfate	ND	0.052	ug/L	1	11/23/25	B5K1042	EPA 8081	MK3	
72-20-8	Endrin	ND	0.021	ug/L	1	11/23/25	B5K1042	EPA 8081	MK3	A08
7421-93-4	Endrin aldehyde	ND	0.021	ug/L	1	11/23/25	B5K1042	EPA 8081	MK3	
53494-70-5	Endrin ketone	ND	0.021	ug/L	1	11/23/25	B5K1042	EPA 8081	MK3	
58-89-9	g-BHC (Lindane)	ND	0.021	ug/L	1	11/23/25	B5K1042	EPA 8081	MK3	
5103-74-2	g-Chlordane	ND	0.010	ug/L	1	11/23/25	B5K1042	EPA 8081	MK3	
76-44-8	Heptachlor	ND	0.010	ug/L	1	11/23/25	B5K1042	EPA 8081	MK3	
1024-57-3	Heptachlor epoxide	ND	0.010	ug/L	1	11/23/25	B5K1042	EPA 8081	MK3	

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Lab ID: 2511055-02

CAS #	Analyte	Result	RL	Units	Dilution	Analyzed Date	QC Batch	Method	Analyst	Qualifier
Organics-Pesticides										
87-82-1	Hexabromobenzene	ND	0.021	ug/L	1	11/23/25	B5K1042	EPA 8081	MK3	
72-43-5	Methoxychlor	ND	0.052	ug/L	1	11/23/25	B5K1042	EPA 8081	MK3	
2385-85-5	Mirex	ND	0.021	ug/L	1	11/23/25	B5K1042	EPA 8081	MK3	
59080-40-9	PBB (BP-6)	ND	0.052	ug/L	1	11/23/25	B5K1042	EPA 8081	MK3	
8001-35-2	Toxaphene	ND	0.10	ug/L	1	11/23/25	B5K1042	EPA 8081	MK3	
Surrogate: Decachlorobiphenyl			*34.0 %*	*10-140*		*11/23/25*	B5K1042	*EPA 8081*	*MK3*	
Surrogate: Tetrachloro-m-xylene			*47.0 %*	*17-84*		*11/23/25*	B5K1042	*EPA 8081*	*MK3*	
Organics-PCBs as Aroclors										
12674-11-2	Aroclor 1016	ND	0.10	ug/L	1	11/21/25	B5K1042	EPA 8082	MK3	
11104-28-2	Aroclor 1221	ND	0.10	ug/L	1	11/21/25	B5K1042	EPA 8082	MK3	
11141-16-5	Aroclor 1232	ND	0.10	ug/L	1	11/21/25	B5K1042	EPA 8082	MK3	
53469-21-9	Aroclor 1242	ND	0.10	ug/L	1	11/21/25	B5K1042	EPA 8082	MK3	
12672-29-6	Aroclor 1248	ND	0.10	ug/L	1	11/21/25	B5K1042	EPA 8082	MK3	
11097-69-1	Aroclor 1254	ND	0.10	ug/L	1	11/21/25	B5K1042	EPA 8082	MK3	
11096-82-5	Aroclor 1260	ND	0.10	ug/L	1	11/21/25	B5K1042	EPA 8082	MK3	
37324-23-5	Aroclor 1262	ND	0.10	ug/L	1	11/21/25	B5K1042	EPA 8082	MK3	
11100-14-4	Aroclor 1268	ND	0.10	ug/L	1	11/21/25	B5K1042	EPA 8082	MK3	
Surrogate: Decachlorobiphenyl			*35.6 %*	*17-132*		*11/21/25*	B5K1042	*EPA 8082*	*MK3*	
Surrogate: Tetrachloro-m-xylene			*45.2 %*	*20-104*		*11/21/25*	B5K1042	*EPA 8082*	*MK3*	
Inorganics-Metals										
7440-38-2	**Arsenic**	**1.5**	1.0	ug/L	1	11/14/25	B5K1032	200.8	CL	
7440-39-3	**Barium**	**68**	5.0	ug/L	1	11/14/25	B5K1032	200.8	CL	
7440-43-9	**Cadmium**	**0.2**	0.2	ug/L	1	11/14/25	B5K1032	200.8	CL	
7440-47-3	**Chromium**	**3.9**	1.0	ug/L	1	11/14/25	B5K1032	200.8	CL	
7440-50-8	**Copper**	**1.9**	1.0	ug/L	1	11/14/25	B5K1032	200.8	CL	
7439-92-1	**Lead**	**9.3**	1.0	ug/L	1	11/14/25	B5K1032	200.8	CL	
7439-97-6	Mercury	ND	0.2	ug/L	1	11/10/25	B5K1028	EPA 7473	JH	
7782-49-2	Selenium	ND	1.0	ug/L	1	11/14/25	B5K1032	200.8	CL	
7440-22-4	Silver	ND	0.2	ug/L	1	11/14/25	B5K1032	200.8	CL	
7440-66-6	**Zinc**	**16**	5.0	ug/L	1	11/14/25	B5K1032	200.8	CL	

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Client ID: MW-4-07

Lab ID: 2511055-03

CAS #	Analyte	Result	RL	Units	Dilution	Analyzed Date	QC Batch	Method	Analyst	Qualifier
Organics-Volatiles										
630-20-6	1,1,1,2-Tetrachloroethane	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
71-55-6	1,1,1-Trichloroethane	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
79-00-5	1,1,2-Trichloroethane	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
76-13-1	1,1,2-Trichlorotrifluoroethane	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
75-34-3	1,1-Dichloroethane	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
75-35-4	1,1-Dichloroethylene	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
87-61-6	1,2,3-Trichlorobenzene	ND	5.0	ug/L	1	11/08/25	B5K0702	8260	JT	
96-18-4	1,2,3-Trichloropropane	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
526-73-8	1,2,3-Trimethylbenzene	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
120-82-1	1,2,4-Trichlorobenzene	ND	5.0	ug/L	1	11/08/25	B5K0702	8260	JT	
95-63-6	1,2,4-Trimethylbenzene	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
96-12-8	1,2-Dibromo-3-chloropropane	ND	5.0	ug/L	1	11/08/25	B5K0702	8260	JT	
106-93-4	1,2-Dibromoethane	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
95-50-1	1,2-Dichlorobenzene	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
107-06-2	1,2-Dichloroethane	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
78-87-5	1,2-Dichloropropane	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
108-67-8	1,3,5-Trimethylbenzene	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
541-73-1	1,3-Dichlorobenzene	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
106-46-7	**1,4-Dichlorobenzene**	**1.1**	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
540-84-1	2,2,4-Trimethylpentane	ND	5.0	ug/L	1	11/08/25	B5K0702	8260	JT	
78-93-3	2-Butanone (MEK)	ND	5.0	ug/L	1	11/08/25	B5K0702	8260	JT	
91-57-6	2-Methylnaphthalene	ND	5.0	ug/L	1	11/08/25	B5K0702	8260	JT	
67-64-1	2-Propanone (acetone)	ND	20	ug/L	1	11/08/25	B5K0702	8260	JT	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	5.0	ug/L	1	11/08/25	B5K0702	8260	JT	
107-13-1	Acrylonitrile	ND	5.0	ug/L	1	11/08/25	B5K0702	8260	JT	
71-43-2	Benzene	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
74-97-5	Bromochloromethane	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
75-27-4	Bromodichloromethane	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
75-25-2	Bromoform	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
74-83-9	Bromomethane	ND	5.0	ug/L	1	11/08/25	B5K0702	8260	JT	
75-15-0	Carbon disulfide	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
56-23-5	Carbon tetrachloride	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
108-90-7	**Chlorobenzene**	**5.8**	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
75-00-3	Chloroethane	ND	5.0	ug/L	1	11/08/25	B5K0702	8260	JT	
67-66-3	Chloroform	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
74-87-3	Chloromethane	ND	5.0	ug/L	1	11/08/25	B5K0702	8260	JT	
156-59-2	cis-1,2-Dichloroethylene	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
10061-01-5	cis-1,3-Dichloropropylene	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
110-82-7	Cyclohexane	ND	5.0	ug/L	1	11/08/25	B5K0702	8260	JT	
124-48-1	Dibromochloromethane	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
74-95-3	Dibromomethane	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	

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CAS #	Analyte	Result	RL	Units	Dilution	Analyzed Date	QC Batch	Method	Analyst	Qualifier
Organics-Volatiles										
75-71-8	Dichlorodifluoromethane	ND	5.0	ug/L	1	11/08/25	B5K0702	8260	JT	
60-29-7	**Diethyl ether**	**17**	5.0	ug/L	1	11/08/25	B5K0702	8260	JT	
108-20-3	Diisopropyl Ether	ND	5.0	ug/L	1	11/08/25	B5K0702	8260	JT	
100-41-4	Ethylbenzene	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
637-92-3	Ethyltertiarybutylether	ND	5.0	ug/L	1	11/08/25	B5K0702	8260	JT	
67-72-1	Hexachloroethane	ND	5.0	ug/L	1	11/08/25	B5K0702	8260	JT	
110-54-3	Hexane	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
98-82-8	**Isopropylbenzene**	**1.6**	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
1330-20-7	m & p - Xylene	ND	2.0	ug/L	1	11/08/25	B5K0702	8260	JT	
96-37-7	Methylcyclopentane	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
75-09-2	Methylene chloride	ND	5.0	ug/L	1	11/08/25	B5K0702	8260	JT	
1634-04-4	Methyltertiarybutylether	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
91-20-3	Naphthalene	ND	5.0	ug/L	1	11/08/25	B5K0702	8260	JT	
104-51-8	n-Butylbenzene	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
142-82-5	n-Heptane	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
103-65-1	n-Propylbenzene	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
95-47-6	o-Xylene	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
109-66-0	Pentane	ND	5.0	ug/L	1	11/08/25	B5K0702	8260	JT	
135-98-8	sec-Butylbenzene	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
100-42-5	Styrene	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
98-06-6	tert-Butylbenzene	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
75-65-0	tertiary Butyl Alcohol	ND	50	ug/L	1	11/08/25	B5K0702	8260	JT	
994-05-8	tertiaryAmylmethylether	ND	5.0	ug/L	1	11/08/25	B5K0702	8260	JT	
127-18-4	Tetrachloroethylene	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
109-99-9	Tetrahydrofuran	ND	5.0	ug/L	1	11/08/25	B5K0702	8260	JT	
108-88-3	Toluene	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
156-60-5	trans-1,2-Dichloroethylene	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
10061-02-6	trans-1,3-Dichloropropylene	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
79-01-6	Trichloroethylene	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
75-69-4	Trichlorofluoromethane	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
75-01-4	Vinyl chloride	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
Surrogate: Bromofluorobenzene			*92.8 %*	*85-115*		*11/08/25*	B5K0702	*8260*	*JT*	
Surrogate: Dibromofluoromethane			*100 %*	*83-115*		*11/08/25*	B5K0702	*8260*	*JT*	
Surrogate: Toluene-d8			*90.9 %*	*85-115*		*11/08/25*	B5K0702	*8260*	*JT*	

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Lansing, MI 48909
TEL: (517) 335-9800
FAX: (517) 335-9600

Client ID: MW-4-07

Lab ID: 2511055-03

CAS #	Analyte	Result	RL	Units	Dilution	Analyzed Date	QC Batch	Method	Analyst	Qualifier
Organics-Semivolatiles										
91-57-6	2-Methylnaphthalene	ND	5.0	ug/L	1	11/11/25	B5K1030	8270	MF	
83-32-9	Acenaphthene	ND	1.0	ug/L	1	11/11/25	B5K1030	8270	MF	
208-96-8	Acenaphthylene	ND	1.0	ug/L	1	11/11/25	B5K1030	8270	MF	
120-12-7	Anthracene	ND	1.0	ug/L	1	11/11/25	B5K1030	8270	MF	
56-55-3	Benz[a]anthracene	ND	1.0	ug/L	1	11/11/25	B5K1030	8270	MF	
50-32-8	Benzo[a]pyrene	ND	1.0	ug/L	1	11/11/25	B5K1030	8270	MF	
205-99-2	Benzo[b]fluoranthene	ND	1.0	ug/L	1	11/11/25	B5K1030	8270	MF	
191-24-2	Benzo[g,h,i]perylene	ND	1.0	ug/L	1	11/11/25	B5K1030	8270	MF	
207-08-9	Benzo[k]fluoranthene	ND	1.0	ug/L	1	11/11/25	B5K1030	8270	MF	
218-01-9	Chrysene	ND	1.0	ug/L	1	11/11/25	B5K1030	8270	MF	
53-70-3	Dibenz[a,h]anthracene	ND	2.0	ug/L	1	11/11/25	B5K1030	8270	MF	
206-44-0	Fluoranthene	ND	1.0	ug/L	1	11/11/25	B5K1030	8270	MF	
86-73-7	Fluorene	ND	1.0	ug/L	1	11/11/25	B5K1030	8270	MF	
193-39-5	Indeno(1,2,3-c,d)pyrene	ND	2.0	ug/L	1	11/11/25	B5K1030	8270	MF	
91-20-3	Naphthalene	ND	1.0	ug/L	1	11/11/25	B5K1030	8270	MF	
85-01-8	Phenanthrene	ND	1.0	ug/L	1	11/11/25	B5K1030	8270	MF	
129-00-0	Pyrene	ND	1.0	ug/L	1	11/11/25	B5K1030	8270	MF	
Surrogate: 2-Fluorobiphenyl			*70.8 %*	*20-101*		*11/11/25*	B5K1030	*8270*	*MF*	
Surrogate: Nitrobenzene-d5			*65.8 %*	*13-100*		*11/11/25*	B5K1030	*8270*	*MF*	
Surrogate: p-Terphenyl-d14			*89.4 %*	*18-150*		*11/11/25*	B5K1030	*8270*	*MF*	
Organics-Pesticides										
789-02-6	2,4'-DDT	ND	0.010	ug/L	1	11/23/25	B5K1042	EPA 8081	MK3	
72-54-8	4,4'-DDD	ND	0.021	ug/L	1	11/23/25	B5K1042	EPA 8081	MK3	
72-55-9	4,4'-DDE	ND	0.021	ug/L	1	11/23/25	B5K1042	EPA 8081	MK3	
50-29-3	4,4'-DDT	ND	0.021	ug/L	1	11/23/25	B5K1042	EPA 8081	MK3	
319-84-6	a-BHC	ND	0.021	ug/L	1	11/23/25	B5K1042	EPA 8081	MK3	
5103-71-9	a-Chlordane	ND	0.010	ug/L	1	11/23/25	B5K1042	EPA 8081	MK3	
309-00-2	Aldrin	ND	0.010	ug/L	1	11/23/25	B5K1042	EPA 8081	MK3	
319-85-7	b-BHC	ND	0.021	ug/L	1	11/23/25	B5K1042	EPA 8081	MK3	
319-86-8	d-BHC	ND	0.021	ug/L	1	11/23/25	B5K1042	EPA 8081	MK3	
60-57-1	Dieldrin	ND	0.021	ug/L	1	11/23/25	B5K1042	EPA 8081	MK3	
959-98-8	Endosulfan I	ND	0.021	ug/L	1	11/23/25	B5K1042	EPA 8081	MK3	
33213-65-9	Endosulfan II	ND	0.031	ug/L	1	11/23/25	B5K1042	EPA 8081	MK3	
1031-07-8	Endosulfan sulfate	ND	0.052	ug/L	1	11/23/25	B5K1042	EPA 8081	MK3	
72-20-8	Endrin	ND	0.021	ug/L	1	11/23/25	B5K1042	EPA 8081	MK3	A08
7421-93-4	Endrin aldehyde	ND	0.021	ug/L	1	11/23/25	B5K1042	EPA 8081	MK3	
53494-70-5	Endrin ketone	ND	0.021	ug/L	1	11/23/25	B5K1042	EPA 8081	MK3	
58-89-9	g-BHC (Lindane)	ND	0.021	ug/L	1	11/23/25	B5K1042	EPA 8081	MK3	
5103-74-2	g-Chlordane	ND	0.010	ug/L	1	11/23/25	B5K1042	EPA 8081	MK3	
76-44-8	Heptachlor	ND	0.010	ug/L	1	11/23/25	B5K1042	EPA 8081	MK3	
1024-57-3	Heptachlor epoxide	ND	0.010	ug/L	1	11/23/25	B5K1042	EPA 8081	MK3	

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Lab ID: 2511055-03

CAS #	Analyte	Result	RL	Units	Dilution	Analyzed Date	QC Batch	Method	Analyst	Qualifier
Organics-Pesticides										
87-82-1	Hexabromobenzene	ND	0.021	ug/L	1	11/23/25	B5K1042	EPA 8081	MK3	
72-43-5	Methoxychlor	ND	0.052	ug/L	1	11/23/25	B5K1042	EPA 8081	MK3	
2385-85-5	Mirex	ND	0.021	ug/L	1	11/23/25	B5K1042	EPA 8081	MK3	
59080-40-9	PBB (BP-6)	ND	0.052	ug/L	1	11/23/25	B5K1042	EPA 8081	MK3	
8001-35-2	Toxaphene	ND	0.10	ug/L	1	11/23/25	B5K1042	EPA 8081	MK3	
Surrogate: Decachlorobiphenyl			*59.8 %*	*10-140*		*11/23/25*	B5K1042	*EPA 8081*	*MK3*	
Surrogate: Tetrachloro-m-xylene			*50.9 %*	*17-84*		*11/23/25*	B5K1042	*EPA 8081*	*MK3*	
Organics-PCBs as Aroclors										
12674-11-2	Aroclor 1016	ND	0.10	ug/L	1	11/21/25	B5K1042	EPA 8082	MK3	
11104-28-2	Aroclor 1221	ND	0.10	ug/L	1	11/21/25	B5K1042	EPA 8082	MK3	
11141-16-5	Aroclor 1232	ND	0.10	ug/L	1	11/21/25	B5K1042	EPA 8082	MK3	
53469-21-9	Aroclor 1242	ND	0.10	ug/L	1	11/21/25	B5K1042	EPA 8082	MK3	
12672-29-6	Aroclor 1248	ND	0.10	ug/L	1	11/21/25	B5K1042	EPA 8082	MK3	
11097-69-1	Aroclor 1254	ND	0.10	ug/L	1	11/21/25	B5K1042	EPA 8082	MK3	
11096-82-5	Aroclor 1260	ND	0.10	ug/L	1	11/21/25	B5K1042	EPA 8082	MK3	
37324-23-5	Aroclor 1262	ND	0.10	ug/L	1	11/21/25	B5K1042	EPA 8082	MK3	
11100-14-4	Aroclor 1268	ND	0.10	ug/L	1	11/21/25	B5K1042	EPA 8082	MK3	
Surrogate: Decachlorobiphenyl			*61.8 %*	*17-132*		*11/21/25*	B5K1042	*EPA 8082*	*MK3*	
Surrogate: Tetrachloro-m-xylene			*49.1 %*	*20-104*		*11/21/25*	B5K1042	*EPA 8082*	*MK3*	
Inorganics-Metals										
7440-38-2	Arsenic	ND	1.0	ug/L	1	11/14/25	B5K1032	200.8	CL	
7440-39-3	**Barium**	**780**	5.0	ug/L	1	11/14/25	B5K1032	200.8	CL	
7440-43-9	Cadmium	ND	0.2	ug/L	1	11/14/25	B5K1032	200.8	CL	
7440-47-3	**Chromium**	**3.1**	1.0	ug/L	1	11/14/25	B5K1032	200.8	CL	
7440-50-8	**Copper**	**9.1**	1.0	ug/L	1	11/14/25	B5K1032	200.8	CL	
7439-92-1	**Lead**	**4.0**	1.0	ug/L	1	11/14/25	B5K1032	200.8	CL	
7439-97-6	Mercury	ND	0.2	ug/L	1	11/10/25	B5K1028	EPA 7473	JH	
7782-49-2	Selenium	ND	1.0	ug/L	1	11/14/25	B5K1032	200.8	CL	
7440-22-4	Silver	ND	0.2	ug/L	1	11/14/25	B5K1032	200.8	CL	
7440-66-6	**Zinc**	**6.2**	5.0	ug/L	1	11/14/25	B5K1032	200.8	CL	

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Client ID: MW-7-07

Lab ID: 2511055-04

CAS #	Analyte	Result	RL	Units	Dilution	Analyzed Date	QC Batch	Method	Analyst	Qualifier
Organics-Volatiles										
630-20-6	1,1,1,2-Tetrachloroethane	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
71-55-6	1,1,1-Trichloroethane	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
79-00-5	1,1,2-Trichloroethane	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
76-13-1	1,1,2-Trichlorotrifluoroethane	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
75-34-3	1,1-Dichloroethane	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
75-35-4	1,1-Dichloroethylene	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
87-61-6	1,2,3-Trichlorobenzene	ND	5.0	ug/L	1	11/08/25	B5K0702	8260	JT	
96-18-4	1,2,3-Trichloropropane	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
526-73-8	1,2,3-Trimethylbenzene	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
120-82-1	1,2,4-Trichlorobenzene	ND	5.0	ug/L	1	11/08/25	B5K0702	8260	JT	
95-63-6	1,2,4-Trimethylbenzene	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
96-12-8	1,2-Dibromo-3-chloropropane	ND	5.0	ug/L	1	11/08/25	B5K0702	8260	JT	
106-93-4	1,2-Dibromoethane	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
95-50-1	1,2-Dichlorobenzene	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
107-06-2	1,2-Dichloroethane	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
78-87-5	1,2-Dichloropropane	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
108-67-8	1,3,5-Trimethylbenzene	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
541-73-1	1,3-Dichlorobenzene	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
106-46-7	1,4-Dichlorobenzene	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
540-84-1	2,2,4-Trimethylpentane	ND	5.0	ug/L	1	11/08/25	B5K0702	8260	JT	
78-93-3	2-Butanone (MEK)	ND	5.0	ug/L	1	11/08/25	B5K0702	8260	JT	
91-57-6	2-Methylnaphthalene	ND	5.0	ug/L	1	11/08/25	B5K0702	8260	JT	
67-64-1	2-Propanone (acetone)	ND	20	ug/L	1	11/08/25	B5K0702	8260	JT	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	5.0	ug/L	1	11/08/25	B5K0702	8260	JT	
107-13-1	Acrylonitrile	ND	5.0	ug/L	1	11/08/25	B5K0702	8260	JT	
71-43-2	**Benzene**	**2.1**	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
74-97-5	Bromochloromethane	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
75-27-4	Bromodichloromethane	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
75-25-2	Bromoform	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
74-83-9	Bromomethane	ND	5.0	ug/L	1	11/08/25	B5K0702	8260	JT	
75-15-0	Carbon disulfide	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
56-23-5	Carbon tetrachloride	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
108-90-7	**Chlorobenzene**	**6.0**	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
75-00-3	Chloroethane	ND	5.0	ug/L	1	11/08/25	B5K0702	8260	JT	
67-66-3	Chloroform	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
74-87-3	Chloromethane	ND	5.0	ug/L	1	11/08/25	B5K0702	8260	JT	
156-59-2	cis-1,2-Dichloroethylene	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
10061-01-5	cis-1,3-Dichloropropylene	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
110-82-7	Cyclohexane	ND	5.0	ug/L	1	11/08/25	B5K0702	8260	JT	
124-48-1	Dibromochloromethane	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
74-95-3	Dibromomethane	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	

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CAS #	Analyte	Result	RL	Units	Dilution	Analyzed Date	QC Batch	Method	Analyst	Qualifier
Organics-Volatiles										
75-71-8	Dichlorodifluoromethane	ND	5.0	ug/L	1	11/08/25	B5K0702	8260	JT	
60-29-7	**Diethyl ether**	**9.4**	5.0	ug/L	1	11/08/25	B5K0702	8260	JT	
108-20-3	Diisopropyl Ether	ND	5.0	ug/L	1	11/08/25	B5K0702	8260	JT	
100-41-4	Ethylbenzene	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
637-92-3	Ethyltertiarybutylether	ND	5.0	ug/L	1	11/08/25	B5K0702	8260	JT	
67-72-1	Hexachloroethane	ND	5.0	ug/L	1	11/08/25	B5K0702	8260	JT	
110-54-3	Hexane	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
98-82-8	Isopropylbenzene	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
1330-20-7	m & p - Xylene	ND	2.0	ug/L	1	11/08/25	B5K0702	8260	JT	
96-37-7	Methylcyclopentane	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
75-09-2	Methylene chloride	ND	5.0	ug/L	1	11/08/25	B5K0702	8260	JT	
1634-04-4	Methyltertiarybutylether	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
91-20-3	Naphthalene	ND	5.0	ug/L	1	11/08/25	B5K0702	8260	JT	
104-51-8	n-Butylbenzene	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
142-82-5	n-Heptane	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
103-65-1	n-Propylbenzene	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
95-47-6	o-Xylene	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
109-66-0	Pentane	ND	5.0	ug/L	1	11/08/25	B5K0702	8260	JT	
135-98-8	sec-Butylbenzene	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
100-42-5	Styrene	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
98-06-6	tert-Butylbenzene	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
75-65-0	tertiary Butyl Alcohol	ND	50	ug/L	1	11/08/25	B5K0702	8260	JT	
994-05-8	tertiaryAmylmethylether	ND	5.0	ug/L	1	11/08/25	B5K0702	8260	JT	
127-18-4	Tetrachloroethylene	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
109-99-9	Tetrahydrofuran	ND	5.0	ug/L	1	11/08/25	B5K0702	8260	JT	
108-88-3	Toluene	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
156-60-5	trans-1,2-Dichloroethylene	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
10061-02-6	trans-1,3-Dichloropropylene	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
79-01-6	Trichloroethylene	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
75-69-4	Trichlorofluoromethane	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
75-01-4	Vinyl chloride	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
Surrogate: Bromofluorobenzene			*99.5 %*	*85-115*		*11/08/25*	B5K0702	*8260*	*JT*	
Surrogate: Dibromofluoromethane			*107 %*	*83-115*		*11/08/25*	B5K0702	*8260*	*JT*	
Surrogate: Toluene-d8			*95.8 %*	*85-115*		*11/08/25*	B5K0702	*8260*	*JT*	

MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY

MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY
ENVIRONMENTAL LABORATORY

P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-9800
FAX: (517) 335-9600

Client ID: MW-6-07

Lab ID: 2511055-05

CAS #	Analyte	Result	RL	Units	Dilution	Analyzed Date	QC Batch	Method	Analyst	Qualifier
Organics-Volatiles										
630-20-6	1,1,1,2-Tetrachloroethane	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
71-55-6	1,1,1-Trichloroethane	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
79-00-5	1,1,2-Trichloroethane	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
76-13-1	1,1,2-Trichlorotrifluoroethane	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
75-34-3	1,1-Dichloroethane	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
75-35-4	1,1-Dichloroethylene	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
87-61-6	1,2,3-Trichlorobenzene	ND	5.0	ug/L	1	11/08/25	B5K0702	8260	JT	
96-18-4	1,2,3-Trichloropropane	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
526-73-8	1,2,3-Trimethylbenzene	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
120-82-1	1,2,4-Trichlorobenzene	ND	5.0	ug/L	1	11/08/25	B5K0702	8260	JT	
95-63-6	1,2,4-Trimethylbenzene	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
96-12-8	1,2-Dibromo-3-chloropropane	ND	5.0	ug/L	1	11/08/25	B5K0702	8260	JT	
106-93-4	1,2-Dibromoethane	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
95-50-1	1,2-Dichlorobenzene	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
107-06-2	1,2-Dichloroethane	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
78-87-5	1,2-Dichloropropane	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
108-67-8	1,3,5-Trimethylbenzene	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
541-73-1	1,3-Dichlorobenzene	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
106-46-7	**1,4-Dichlorobenzene**	**2.1**	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
540-84-1	2,2,4-Trimethylpentane	ND	5.0	ug/L	1	11/08/25	B5K0702	8260	JT	
78-93-3	2-Butanone (MEK)	ND	5.0	ug/L	1	11/08/25	B5K0702	8260	JT	
91-57-6	2-Methylnaphthalene	ND	5.0	ug/L	1	11/08/25	B5K0702	8260	JT	
67-64-1	2-Propanone (acetone)	ND	20	ug/L	1	11/08/25	B5K0702	8260	JT	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	5.0	ug/L	1	11/08/25	B5K0702	8260	JT	
107-13-1	Acrylonitrile	ND	5.0	ug/L	1	11/08/25	B5K0702	8260	JT	
71-43-2	**Benzene**	**2.8**	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
74-97-5	Bromochloromethane	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
75-27-4	Bromodichloromethane	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
75-25-2	Bromoform	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
74-83-9	Bromomethane	ND	5.0	ug/L	1	11/08/25	B5K0702	8260	JT	
75-15-0	Carbon disulfide	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
56-23-5	Carbon tetrachloride	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
108-90-7	**Chlorobenzene**	**9.9**	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
75-00-3	Chloroethane	ND	5.0	ug/L	1	11/08/25	B5K0702	8260	JT	
67-66-3	Chloroform	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
74-87-3	Chloromethane	ND	5.0	ug/L	1	11/08/25	B5K0702	8260	JT	
156-59-2	cis-1,2-Dichloroethylene	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
10061-01-5	cis-1,3-Dichloropropylene	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
110-82-7	Cyclohexane	ND	5.0	ug/L	1	11/08/25	B5K0702	8260	JT	
124-48-1	Dibromochloromethane	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
74-95-3	Dibromomethane	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	

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Client ID: MW-6-07

Lab ID: 2511055-05

CAS #	Analyte	Result	RL	Units	Dilution	Analyzed Date	QC Batch	Method	Analyst	Qualifier
Organics-Volatiles										
75-71-8	Dichlorodifluoromethane	ND	5.0	ug/L	1	11/08/25	B5K0702	8260	JT	
60-29-7	**Diethyl ether**	**6.4**	5.0	ug/L	1	11/08/25	B5K0702	8260	JT	
108-20-3	Diisopropyl Ether	ND	5.0	ug/L	1	11/08/25	B5K0702	8260	JT	
100-41-4	Ethylbenzene	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
637-92-3	Ethyltertiarybutylether	ND	5.0	ug/L	1	11/08/25	B5K0702	8260	JT	
67-72-1	Hexachloroethane	ND	5.0	ug/L	1	11/08/25	B5K0702	8260	JT	
110-54-3	Hexane	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
98-82-8	Isopropylbenzene	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
1330-20-7	m & p - Xylene	ND	2.0	ug/L	1	11/08/25	B5K0702	8260	JT	
96-37-7	Methylcyclopentane	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
75-09-2	Methylene chloride	ND	5.0	ug/L	1	11/08/25	B5K0702	8260	JT	
1634-04-4	Methyltertiarybutylether	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
91-20-3	Naphthalene	ND	5.0	ug/L	1	11/08/25	B5K0702	8260	JT	
104-51-8	n-Butylbenzene	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
142-82-5	n-Heptane	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
103-65-1	n-Propylbenzene	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
95-47-6	o-Xylene	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
109-66-0	Pentane	ND	5.0	ug/L	1	11/08/25	B5K0702	8260	JT	
135-98-8	sec-Butylbenzene	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
100-42-5	Styrene	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
98-06-6	tert-Butylbenzene	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
75-65-0	tertiary Butyl Alcohol	ND	50	ug/L	1	11/08/25	B5K0702	8260	JT	
994-05-8	tertiaryAmylmethylether	ND	5.0	ug/L	1	11/08/25	B5K0702	8260	JT	
127-18-4	Tetrachloroethylene	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
109-99-9	Tetrahydrofuran	ND	5.0	ug/L	1	11/08/25	B5K0702	8260	JT	
108-88-3	Toluene	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
156-60-5	trans-1,2-Dichloroethylene	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
10061-02-6	trans-1,3-Dichloropropylene	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
79-01-6	Trichloroethylene	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
75-69-4	Trichlorofluoromethane	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
75-01-4	Vinyl chloride	ND	1.0	ug/L	1	11/08/25	B5K0702	8260	JT	
Surrogate: Bromofluorobenzene			*91.8 %*	*85-115*		*11/08/25*	B5K0702	*8260*	*JT*	
Surrogate: Dibromofluoromethane			*97.4 %*	*83-115*		*11/08/25*	B5K0702	*8260*	*JT*	
Surrogate: Toluene-d8			*89.6 %*	*85-115*		*11/08/25*	B5K0702	*8260*	*JT*	

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Organics-Volatiles - Quality Control

Analyte	Result	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Analyzed	Qualifier
Batch B5K0702 - Method: 5030			**Prepared: 11/07/2025**							
Blank (B5K0702-BLK1)										
1,1,1,2-Tetrachloroethane	ND	ug/L							11/07/2025	
1,1,1-Trichloroethane	ND	ug/L							11/07/2025	
1,1,2,2-Tetrachloroethane	ND	ug/L							11/07/2025	
1,1,2-Trichloroethane	ND	ug/L							11/07/2025	
1,1,2-Trichlorotrifluoroethane	ND	ug/L							11/07/2025	
1,1-Dichloroethane	ND	ug/L							11/07/2025	
1,1-Dichloroethylene	ND	ug/L							11/07/2025	
1,2,3-Trichlorobenzene	ND	ug/L							11/07/2025	
1,2,3-Trichloropropane	ND	ug/L							11/07/2025	
1,2,3-Trimethylbenzene	ND	ug/L							11/07/2025	
1,2,4-Trichlorobenzene	ND	ug/L							11/07/2025	
1,2,4-Trimethylbenzene	ND	ug/L							11/07/2025	
1,2-Dibromo-3-chloropropane	ND	ug/L							11/07/2025	
1,2-Dibromoethane	ND	ug/L							11/07/2025	
1,2-Dichlorobenzene	ND	ug/L							11/07/2025	
1,2-Dichloroethane	ND	ug/L							11/07/2025	
1,2-Dichloropropane	ND	ug/L							11/07/2025	
1,3,5-Trimethylbenzene	ND	ug/L							11/07/2025	
1,3-Dichlorobenzene	ND	ug/L							11/07/2025	
1,4-Dichlorobenzene	ND	ug/L							11/07/2025	
2,2,4-Trimethylpentane	ND	ug/L							11/07/2025	
2-Butanone (MEK)	ND	ug/L							11/07/2025	
2-Methylnaphthalene	ND	ug/L							11/07/2025	
2-Propanone (acetone)	ND	ug/L							11/07/2025	
4-Methyl-2-pentanone (MIBK)	ND	ug/L							11/07/2025	
Acrylonitrile	ND	ug/L							11/07/2025	
Benzene	ND	ug/L							11/07/2025	
Bromochloromethane	ND	ug/L							11/07/2025	
Bromodichloromethane	ND	ug/L							11/07/2025	
Bromoform	ND	ug/L							11/07/2025	
Bromomethane	ND	ug/L							11/07/2025	
Carbon disulfide	ND	ug/L							11/07/2025	
Carbon tetrachloride	ND	ug/L							11/07/2025	
Chlorobenzene	ND	ug/L							11/07/2025	
Chloroethane	ND	ug/L							11/07/2025	
Chloroform	ND	ug/L							11/07/2025	
Chloromethane	ND	ug/L							11/07/2025	
cis-1,2-Dichloroethylene	ND	ug/L							11/07/2025	
cis-1,3-Dichloropropylene	ND	ug/L							11/07/2025	
Cyclohexane	ND	ug/L							11/07/2025	
Dibromochloromethane	ND	ug/L							11/07/2025	
Dibromomethane	ND	ug/L							11/07/2025	
Dichlorodifluoromethane	ND	ug/L							11/07/2025	
Diethyl ether	ND	ug/L							11/07/2025	
Diisopropyl Ether	ND	ug/L							11/07/2025	
Ethylbenzene	ND	ug/L							11/07/2025	
Ethyltertiarybutylether	ND	ug/L							11/07/2025	
Hexachloroethane	ND	ug/L							11/07/2025	
Hexane	ND	ug/L							11/07/2025	
Isopropylbenzene	ND	ug/L							11/07/2025	
m & p - Xylene	ND	ug/L							11/07/2025	
Methylcyclopentane	ND	ug/L							11/07/2025	

MICHIGAN DEPARTMENT OF
ENVIRONMENT, GREAT LAKES, AND ENERGY

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Lansing, MI 48909
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Organics-Volatiles - Quality Control

Analyte	Result	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Analyzed	Qualifier
Batch B5K0702 - Method: 5030			**Prepared: 11/07/2025**							
Blank (B5K0702-BLK1)										
Methylene chloride	ND	ug/L							11/07/2025	
Methyltertiarybutylether	ND	ug/L							11/07/2025	
Naphthalene	ND	ug/L							11/07/2025	
n-Butylbenzene	ND	ug/L							11/07/2025	
n-Heptane	ND	ug/L							11/07/2025	
n-Propylbenzene	ND	ug/L							11/07/2025	
o-Xylene	ND	ug/L							11/07/2025	
Pentane	ND	ug/L							11/07/2025	
sec-Butylbenzene	ND	ug/L							11/07/2025	
Styrene	ND	ug/L							11/07/2025	
tert-Butylbenzene	ND	ug/L							11/07/2025	
tertiary Butyl Alcohol	ND	ug/L							11/07/2025	
tertiaryAmylmethylether	ND	ug/L							11/07/2025	
Tetrachloroethylene	ND	ug/L							11/07/2025	
Tetrahydrofuran	ND	ug/L							11/07/2025	
Toluene	ND	ug/L							11/07/2025	
trans-1,2-Dichloroethylene	ND	ug/L							11/07/2025	
trans-1,3-Dichloropropylene	ND	ug/L							11/07/2025	
Trichloroethylene	ND	ug/L							11/07/2025	
Trichlorofluoromethane	ND	ug/L							11/07/2025	
Vinyl chloride	ND	ug/L							11/07/2025	
Surrogate: Bromofluorobenzene	*50.6*	ug/L	*50.00*		*101*	*85-115*			11/07/2025	
Surrogate: Dibromofluoromethane	*52.9*	ug/L	*50.00*		*106*	*83-115*			11/07/2025	
Surrogate: Toluene-d8	*47.5*	ug/L	*50.00*		*95.1*	*85-115*			11/07/2025	
LCS (B5K0702-BS1)										
1,1,1,2-Tetrachloroethane	50.7	ug/L	50.00		101	70-130			11/07/2025	
1,1,1-Trichloroethane	54.4	ug/L	50.00		109	70-130			11/07/2025	
1,1,2,2-Tetrachloroethane	47.4	ug/L	50.00		94.8	70-130			11/07/2025	
1,1,2-Trichloroethane	49.5	ug/L	50.00		98.9	70-130			11/07/2025	
1,1,2-Trichlorotrifluoroethane	51.5	ug/L	50.00		103	70-130			11/07/2025	
1,1-Dichloroethane	49.1	ug/L	50.00		98.3	70-130			11/07/2025	
1,1-Dichloroethylene	52.9	ug/L	50.00		106	70-130			11/07/2025	
1,2,3-Trichlorobenzene	50.5	ug/L	50.00		101	70-130			11/07/2025	
1,2,3-Trichloropropane	47.2	ug/L	50.00		94.3	70-130			11/07/2025	
1,2,3-Trimethylbenzene	53.4	ug/L	50.00		107	70-130			11/07/2025	
1,2,4-Trichlorobenzene	51.4	ug/L	50.00		103	70-130			11/07/2025	
1,2,4-Trimethylbenzene	54.9	ug/L	50.00		110	70-130			11/07/2025	
1,2-Dibromo-3-chloropropane	52.3	ug/L	50.00		105	70-130			11/07/2025	
1,2-Dibromoethane	49.2	ug/L	50.00		98.4	70-130			11/07/2025	
1,2-Dichlorobenzene	49.7	ug/L	50.00		99.4	70-130			11/07/2025	
1,2-Dichloroethane	50.3	ug/L	50.00		101	70-130			11/07/2025	
1,2-Dichloropropane	50.7	ug/L	50.00		101	70-130			11/07/2025	
1,3,5-Trimethylbenzene	53.6	ug/L	50.00		107	70-130			11/07/2025	
1,3-Dichlorobenzene	50.5	ug/L	50.00		101	70-130			11/07/2025	
1,4-Dichlorobenzene	50.1	ug/L	50.00		100	70-130			11/07/2025	
2,2,4-Trimethylpentane	49.5	ug/L	50.00		99.1	70-130			11/07/2025	
2-Butanone (MEK)	49.0	ug/L	50.00		97.9	70-130			11/07/2025	
2-Methylnaphthalene	46.0	ug/L	50.00		92.0	70-130			11/07/2025	
2-Propanone (acetone)	48.5	ug/L	50.00		97.0	70-130			11/07/2025	
4-Methyl-2-pentanone (MIBK)	48.6	ug/L	50.00		97.2	70-130			11/07/2025	
Acrylonitrile	49.9	ug/L	50.00		99.8	70-130			11/07/2025	

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Organics-Volatiles - Quality Control

Analyte	Result	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Analyzed	Qualifier
Batch B5K0702 - Method: 5030			**Prepared: 11/07/2025**							
LCS (B5K0702-BS1)										
Benzene	50.0	ug/L	50.00		99.9	70-130			11/07/2025	
Bromochloromethane	49.4	ug/L	50.00		98.8	70-130			11/07/2025	
Bromodichloromethane	49.1	ug/L	50.00		98.1	70-130			11/07/2025	
Bromoform	47.4	ug/L	50.00		94.8	70-130			11/07/2025	
Bromomethane	54.1	ug/L	50.00		108	70-130			11/07/2025	
Carbon disulfide	49.7	ug/L	50.00		99.4	70-130			11/07/2025	
Carbon tetrachloride	51.2	ug/L	50.00		102	70-130			11/07/2025	
Chlorobenzene	49.0	ug/L	50.00		98.0	70-130			11/07/2025	
Chloroethane	53.5	ug/L	50.00		107	70-130			11/07/2025	
Chloroform	48.2	ug/L	50.00		96.4	70-130			11/07/2025	
Chloromethane	53.8	ug/L	50.00		108	70-130			11/07/2025	
cis-1,2-Dichloroethylene	49.7	ug/L	50.00		99.3	70-130			11/07/2025	
cis-1,3-Dichloropropylene	49.9	ug/L	50.00		99.8	70-130			11/07/2025	
Cyclohexane	52.7	ug/L	50.00		105	70-130			11/07/2025	
Dibromochloromethane	49.3	ug/L	50.00		98.6	70-130			11/07/2025	
Dibromomethane	47.5	ug/L	50.00		95.0	70-130			11/07/2025	
Dichlorodifluoromethane	49.0	ug/L	50.00		98.0	70-130			11/07/2025	A11
Diethyl ether	51.6	ug/L	50.00		103	70-130			11/07/2025	
Diisopropyl Ether	49.9	ug/L	50.00		99.7	70-130			11/07/2025	
Ethylbenzene	51.4	ug/L	50.00		103	70-130			11/07/2025	
Ethyltertiarybutylether	51.5	ug/L	50.00		103	70-130			11/07/2025	
Hexachloroethane	48.4	ug/L	50.00		96.9	70-130			11/07/2025	
Hexane	49.3	ug/L	50.00		98.6	70-130			11/07/2025	
Isopropylbenzene	52.5	ug/L	50.00		105	70-130			11/07/2025	
m & p - Xylene	106	ug/L	100.0		106	70-130			11/07/2025	
Methylcyclopentane	56.4	ug/L	50.00		113	70-130			11/07/2025	
Methylene chloride	49.9	ug/L	50.00		99.9	70-130			11/07/2025	
Methyltertiarybutylether	49.4	ug/L	50.00		98.9	70-130			11/07/2025	
Naphthalene	50.8	ug/L	50.00		102	70-130			11/07/2025	
n-Butylbenzene	52.3	ug/L	50.00		105	70-130			11/07/2025	
n-Heptane	48.6	ug/L	50.00		97.3	70-130			11/07/2025	
n-Propylbenzene	51.7	ug/L	50.00		103	70-130			11/07/2025	
o-Xylene	52.2	ug/L	50.00		104	70-130			11/07/2025	
Pentane	52.4	ug/L	50.00		105	70-130			11/07/2025	
sec-Butylbenzene	53.8	ug/L	50.00		108	70-130			11/07/2025	
Styrene	53.6	ug/L	50.00		107	70-130			11/07/2025	
tert-Butylbenzene	53.3	ug/L	50.00		107	70-130			11/07/2025	
tertiary Butyl Alcohol	269	ug/L	250.0		107	70-130			11/07/2025	
tertiaryAmylmethylether	52.3	ug/L	50.00		105	70-130			11/07/2025	
Tetrachloroethylene	49.1	ug/L	50.00		98.2	70-130			11/07/2025	
Tetrahydrofuran	50.2	ug/L	50.00		100	70-130			11/07/2025	
Toluene	50.1	ug/L	50.00		100	70-130			11/07/2025	
trans-1,2-Dichloroethylene	50.1	ug/L	50.00		100	70-130			11/07/2025	
trans-1,3-Dichloropropylene	51.9	ug/L	50.00		104	70-130			11/07/2025	
Trichloroethylene	50.9	ug/L	50.00		102	70-130			11/07/2025	
Trichlorofluoromethane	54.7	ug/L	50.00		109	70-130			11/07/2025	
Vinyl chloride	56.0	ug/L	50.00		112	70-130			11/07/2025	
Surrogate: Bromofluorobenzene	*48.7*	ug/L	*50.00*		*97.4*	*85-115*			11/07/2025	
Surrogate: Dibromofluoromethane	*46.9*	ug/L	*50.00*		*93.9*	*83-115*			11/07/2025	
Surrogate: Toluene-d8	*47.2*	ug/L	*50.00*		*94.4*	*85-115*			11/07/2025	
Matrix Spike (B5K0702-MS1)	**Source: 2511051-09**									

MICHIGAN DEPARTMENT OF
ENVIRONMENT, GREAT LAKES, AND ENERGY

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ENVIRONMENTAL LABORATORY**

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Organics-Volatiles - Quality Control

Analyte	Result	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Analyzed	Qualifier
Batch B5K0702 - Method: 5030			**Prepared: 11/08/2025**							
Matrix Spike (B5K0702-MS1)	**Source: 2511051-09**									
1,1,1,2-Tetrachloroethane	48.6	ug/L	50.00	ND	97.2	70-130			11/08/2025	
1,1,1-Trichloroethane	52.2	ug/L	50.00	ND	104	70-130			11/08/2025	
1,1,2,2-Tetrachloroethane	44.1	ug/L	50.00	ND	88.3	70-130			11/08/2025	
1,1,2-Trichloroethane	47.5	ug/L	50.00	ND	94.9	70-130			11/08/2025	
1,1,2-Trichlorotrifluoroethane	53.4	ug/L	50.00	ND	107	70-130			11/08/2025	
1,1-Dichloroethane	47.8	ug/L	50.00	ND	95.7	70-130			11/08/2025	
1,1-Dichloroethylene	53.1	ug/L	50.00	ND	106	70-130			11/08/2025	
1,2,3-Trichlorobenzene	47.9	ug/L	50.00	ND	95.8	70-130			11/08/2025	
1,2,3-Trichloropropane	43.2	ug/L	50.00	ND	86.4	70-130			11/08/2025	
1,2,3-Trimethylbenzene	49.5	ug/L	50.00	ND	99.0	70-130			11/08/2025	
1,2,4-Trichlorobenzene	47.2	ug/L	50.00	ND	94.5	70-130			11/08/2025	
1,2,4-Trimethylbenzene	51.6	ug/L	50.00	ND	103	70-130			11/08/2025	
1,2-Dibromo-3-chloropropane	47.8	ug/L	50.00	ND	95.6	70-130			11/08/2025	
1,2-Dibromoethane	46.9	ug/L	50.00	ND	93.8	70-130			11/08/2025	
1,2-Dichlorobenzene	46.0	ug/L	50.00	ND	92.0	70-130			11/08/2025	
1,2-Dichloroethane	47.7	ug/L	50.00	ND	95.4	70-130			11/08/2025	
1,2-Dichloropropane	47.2	ug/L	50.00	ND	94.3	70-130			11/08/2025	
1,3,5-Trimethylbenzene	50.1	ug/L	50.00	ND	100	70-130			11/08/2025	
1,3-Dichlorobenzene	47.1	ug/L	50.00	ND	94.2	70-130			11/08/2025	
1,4-Dichlorobenzene	47.0	ug/L	50.00	ND	94.1	70-130			11/08/2025	
2,2,4-Trimethylpentane	51.9	ug/L	50.00	ND	104	70-130			11/08/2025	
2-Butanone (MEK)	45.7	ug/L	50.00	ND	91.4	70-130			11/08/2025	
2-Methylnaphthalene	42.1	ug/L	50.00	ND	84.3	70-130			11/08/2025	
2-Propanone (acetone)	43.0	ug/L	50.00	ND	85.9	70-130			11/08/2025	
4-Methyl-2-pentanone (MIBK)	44.6	ug/L	50.00	ND	89.2	70-130			11/08/2025	
Acrylonitrile	44.9	ug/L	50.00	ND	89.8	70-130			11/08/2025	
Benzene	47.5	ug/L	50.00	ND	95.0	70-130			11/08/2025	
Bromochloromethane	46.2	ug/L	50.00	ND	92.4	70-130			11/08/2025	
Bromodichloromethane	46.2	ug/L	50.00	ND	92.5	70-130			11/08/2025	
Bromoform	45.2	ug/L	50.00	ND	90.4	70-130			11/08/2025	
Bromomethane	53.3	ug/L	50.00	ND	107	70-130			11/08/2025	
Carbon disulfide	51.3	ug/L	50.00	ND	103	70-130			11/08/2025	
Carbon tetrachloride	50.5	ug/L	50.00	ND	101	70-130			11/08/2025	
Chlorobenzene	47.9	ug/L	50.00	ND	95.7	70-130			11/08/2025	
Chloroethane	54.0	ug/L	50.00	ND	108	70-130			11/08/2025	
Chloroform	46.5	ug/L	50.00	ND	92.9	70-130			11/08/2025	
Chloromethane	52.7	ug/L	50.00	ND	105	70-130			11/08/2025	
cis-1,2-Dichloroethylene	48.4	ug/L	50.00	ND	96.7	70-130			11/08/2025	
cis-1,3-Dichloropropylene	46.9	ug/L	50.00	ND	93.8	70-130			11/08/2025	
Cyclohexane	52.3	ug/L	50.00	ND	105	70-130			11/08/2025	
Dibromochloromethane	48.1	ug/L	50.00	ND	96.1	70-130			11/08/2025	
Dibromomethane	45.6	ug/L	50.00	ND	91.3	70-130			11/08/2025	
Dichlorodifluoromethane	52.5	ug/L	50.00	ND	105	70-130			11/08/2025	A11
Diethyl ether	49.9	ug/L	50.00	ND	99.7	70-130			11/08/2025	
Diisopropyl Ether	47.0	ug/L	50.00	ND	94.1	70-130			11/08/2025	
Ethylbenzene	49.5	ug/L	50.00	ND	98.9	70-130			11/08/2025	
Ethyltertiarybutylether	48.7	ug/L	50.00	ND	97.3	70-130			11/08/2025	
Hexachloroethane	46.5	ug/L	50.00	ND	93.1	70-130			11/08/2025	
Hexane	53.0	ug/L	50.00	ND	106	70-130			11/08/2025	
Isopropylbenzene	50.3	ug/L	50.00	ND	101	70-130			11/08/2025	
m & p - Xylene	103	ug/L	100.0	ND	103	70-130			11/08/2025	
Methylcyclopentane	56.2	ug/L	50.00	ND	112	70-130			11/08/2025	

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Organics-Volatiles - Quality Control

Analyte	Result	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Analyzed	Qualifier
Batch B5K0702 - Method: 5030			**Prepared: 11/08/2025**							
Matrix Spike (B5K0702-MS1)	**Source: 2511051-09**									
Methylene chloride	48.4	ug/L	50.00	ND	96.7	70-130			11/08/2025	
Methyltertiarybutylether	47.1	ug/L	50.00	ND	94.2	70-130			11/08/2025	
Naphthalene	46.0	ug/L	50.00	ND	91.9	70-130			11/08/2025	
n-Butylbenzene	50.4	ug/L	50.00	ND	101	70-130			11/08/2025	
n-Heptane	52.6	ug/L	50.00	ND	105	70-130			11/08/2025	
n-Propylbenzene	49.2	ug/L	50.00	ND	98.5	70-130			11/08/2025	
o-Xylene	50.5	ug/L	50.00	ND	101	70-130			11/08/2025	
Pentane	57.7	ug/L	50.00	ND	115	70-130			11/08/2025	
sec-Butylbenzene	51.6	ug/L	50.00	ND	103	70-130			11/08/2025	
Styrene	51.4	ug/L	50.00	ND	103	70-130			11/08/2025	
tert-Butylbenzene	49.8	ug/L	50.00	ND	99.7	70-130			11/08/2025	
tertiary Butyl Alcohol	236	ug/L	250.0	ND	94.5	70-130			11/08/2025	
tertiaryAmylmethylether	48.6	ug/L	50.00	ND	97.1	70-130			11/08/2025	
Tetrachloroethylene	50.3	ug/L	50.00	ND	101	70-130			11/08/2025	
Tetrahydrofuran	47.3	ug/L	50.00	ND	94.7	70-130			11/08/2025	
Toluene	48.9	ug/L	50.00	ND	97.9	70-130			11/08/2025	
trans-1,2-Dichloroethylene	48.3	ug/L	50.00	ND	96.6	70-130			11/08/2025	
trans-1,3-Dichloropropylene	48.2	ug/L	50.00	ND	96.4	70-130			11/08/2025	
Trichloroethylene	48.2	ug/L	50.00	ND	96.5	70-130			11/08/2025	
Trichlorofluoromethane	57.5	ug/L	50.00	ND	115	70-130			11/08/2025	
Vinyl chloride	57.2	ug/L	50.00	ND	114	70-130			11/08/2025	
Surrogate: Bromofluorobenzene	*46.1*	ug/L	*50.00*		*92.2*	*85-115*			11/08/2025	
Surrogate: Dibromofluoromethane	*45.4*	ug/L	*50.00*		*90.8*	*83-115*			11/08/2025	
Surrogate: Toluene-d8	*46.3*	ug/L	*50.00*		*92.6*	*85-115*			11/08/2025	
Matrix Spike Dup (B5K0702-MSD1)	**Source: 2511051-09**									
1,1,1,2-Tetrachloroethane	51.7	ug/L	50.00	ND	103	70-130	6.27	30	11/08/2025	
1,1,1-Trichloroethane	55.7	ug/L	50.00	ND	111	70-130	6.42	30	11/08/2025	
1,1,2,2-Tetrachloroethane	46.9	ug/L	50.00	ND	93.8	70-130	6.10	30	11/08/2025	
1,1,2-Trichloroethane	50.4	ug/L	50.00	ND	101	70-130	5.98	30	11/08/2025	
1,1,2-Trichlorotrifluoroethane	54.7	ug/L	50.00	ND	109	70-130	2.42	30	11/08/2025	
1,1-Dichloroethane	50.3	ug/L	50.00	ND	101	70-130	4.96	30	11/08/2025	
1,1-Dichloroethylene	55.8	ug/L	50.00	ND	112	70-130	5.10	30	11/08/2025	
1,2,3-Trichlorobenzene	51.5	ug/L	50.00	ND	103	70-130	7.23	30	11/08/2025	
1,2,3-Trichloropropane	47.2	ug/L	50.00	ND	94.5	70-130	8.97	30	11/08/2025	
1,2,3-Trimethylbenzene	53.6	ug/L	50.00	ND	107	70-130	8.01	30	11/08/2025	
1,2,4-Trichlorobenzene	52.4	ug/L	50.00	ND	105	70-130	10.3	30	11/08/2025	
1,2,4-Trimethylbenzene	55.7	ug/L	50.00	ND	111	70-130	7.64	30	11/08/2025	
1,2-Dibromo-3-chloropropane	53.3	ug/L	50.00	ND	107	70-130	10.8	30	11/08/2025	
1,2-Dibromoethane	49.6	ug/L	50.00	ND	99.2	70-130	5.60	30	11/08/2025	
1,2-Dichlorobenzene	50.0	ug/L	50.00	ND	100	70-130	8.42	30	11/08/2025	
1,2-Dichloroethane	50.9	ug/L	50.00	ND	102	70-130	6.58	30	11/08/2025	
1,2-Dichloropropane	50.4	ug/L	50.00	ND	101	70-130	6.57	30	11/08/2025	
1,3,5-Trimethylbenzene	53.7	ug/L	50.00	ND	107	70-130	6.81	30	11/08/2025	
1,3-Dichlorobenzene	48.4	ug/L	50.00	ND	96.8	70-130	2.65	30	11/08/2025	
1,4-Dichlorobenzene	50.2	ug/L	50.00	ND	100	70-130	6.47	30	11/08/2025	
2,2,4-Trimethylpentane	53.6	ug/L	50.00	ND	107	70-130	3.22	30	11/08/2025	
2-Butanone (MEK)	49.2	ug/L	50.00	ND	98.4	70-130	7.45	30	11/08/2025	
2-Methylnaphthalene	47.5	ug/L	50.00	ND	94.9	70-130	11.9	30	11/08/2025	
2-Propanone (acetone)	51.3	ug/L	50.00	ND	103	70-130	17.6	30	11/08/2025	
4-Methyl-2-pentanone (MIBK)	49.6	ug/L	50.00	ND	99.2	70-130	10.6	30	11/08/2025	
Acrylonitrile	47.9	ug/L	50.00	ND	95.9	70-130	6.57	30	11/08/2025	

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Organics-Volatiles - Quality Control

Analyte	Result	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Analyzed	Qualifier
Batch B5K0702 - Method: 5030			**Prepared: 11/08/2025**							
Matrix Spike Dup (B5K0702-MSD1)	**Source: 2511051-09**									
Benzene	51.2	ug/L	50.00	ND	102	70-130	7.43	30	11/08/2025	
Bromochloromethane	50.0	ug/L	50.00	ND	100	70-130	7.89	30	11/08/2025	
Bromodichloromethane	50.0	ug/L	50.00	ND	99.9	70-130	7.78	30	11/08/2025	
Bromoform	48.7	ug/L	50.00	ND	97.3	70-130	7.39	30	11/08/2025	
Bromomethane	56.7	ug/L	50.00	ND	113	70-130	6.12	30	11/08/2025	
Carbon disulfide	54.0	ug/L	50.00	ND	108	70-130	5.15	30	11/08/2025	
Carbon tetrachloride	54.8	ug/L	50.00	ND	110	70-130	8.22	30	11/08/2025	
Chlorobenzene	50.7	ug/L	50.00	ND	101	70-130	5.67	30	11/08/2025	
Chloroethane	56.8	ug/L	50.00	ND	114	70-130	4.92	30	11/08/2025	
Chloroform	50.3	ug/L	50.00	ND	101	70-130	7.90	30	11/08/2025	
Chloromethane	55.8	ug/L	50.00	ND	112	70-130	5.82	30	11/08/2025	
cis-1,2-Dichloroethylene	50.7	ug/L	50.00	ND	101	70-130	4.61	30	11/08/2025	
cis-1,3-Dichloropropylene	50.6	ug/L	50.00	ND	101	70-130	7.60	30	11/08/2025	
Cyclohexane	55.9	ug/L	50.00	ND	112	70-130	6.65	30	11/08/2025	
Dibromochloromethane	51.5	ug/L	50.00	ND	103	70-130	6.97	30	11/08/2025	
Dibromomethane	49.1	ug/L	50.00	ND	98.2	70-130	7.32	30	11/08/2025	
Dichlorodifluoromethane	55.1	ug/L	50.00	ND	110	70-130	4.97	30	11/08/2025	A11
Diethyl ether	53.0	ug/L	50.00	ND	106	70-130	6.11	30	11/08/2025	
Diisopropyl Ether	50.4	ug/L	50.00	ND	101	70-130	6.90	30	11/08/2025	
Ethylbenzene	52.9	ug/L	50.00	ND	106	70-130	6.66	30	11/08/2025	
Ethyltertiarybutylether	52.9	ug/L	50.00	ND	106	70-130	8.36	30	11/08/2025	
Hexachloroethane	49.6	ug/L	50.00	ND	99.1	70-130	6.29	30	11/08/2025	
Hexane	53.7	ug/L	50.00	ND	107	70-130	1.24	30	11/08/2025	
Isopropylbenzene	53.5	ug/L	50.00	ND	107	70-130	6.19	30	11/08/2025	
m & p - Xylene	110	ug/L	100.0	ND	110	70-130	5.86	30	11/08/2025	
Methylcyclopentane	59.7	ug/L	50.00	ND	119	70-130	6.10	30	11/08/2025	
Methylene chloride	51.0	ug/L	50.00	ND	102	70-130	5.31	30	11/08/2025	
Methyltertiarybutylether	50.4	ug/L	50.00	ND	101	70-130	6.84	30	11/08/2025	
Naphthalene	51.5	ug/L	50.00	ND	103	70-130	11.3	30	11/08/2025	
n-Butylbenzene	53.9	ug/L	50.00	ND	108	70-130	6.78	30	11/08/2025	
n-Heptane	56.4	ug/L	50.00	ND	113	70-130	7.05	30	11/08/2025	
n-Propylbenzene	53.4	ug/L	50.00	ND	107	70-130	8.02	30	11/08/2025	
o-Xylene	53.9	ug/L	50.00	ND	108	70-130	6.39	30	11/08/2025	
Pentane	57.2	ug/L	50.00	ND	114	70-130	0.824	30	11/08/2025	
sec-Butylbenzene	55.2	ug/L	50.00	ND	110	70-130	6.75	30	11/08/2025	
Styrene	55.4	ug/L	50.00	ND	111	70-130	7.41	30	11/08/2025	
tert-Butylbenzene	53.9	ug/L	50.00	ND	108	70-130	7.86	30	11/08/2025	
tertiary Butyl Alcohol	258	ug/L	250.0	ND	103	70-130	8.94	30	11/08/2025	
tertiaryAmylmethylether	53.1	ug/L	50.00	ND	106	70-130	8.91	30	11/08/2025	
Tetrachloroethylene	52.5	ug/L	50.00	ND	105	70-130	4.27	30	11/08/2025	
Tetrahydrofuran	50.3	ug/L	50.00	ND	101	70-130	6.08	30	11/08/2025	
Toluene	52.2	ug/L	50.00	ND	104	70-130	6.51	30	11/08/2025	
trans-1,2-Dichloroethylene	51.8	ug/L	50.00	ND	104	70-130	7.09	30	11/08/2025	
trans-1,3-Dichloropropylene	51.2	ug/L	50.00	ND	102	70-130	6.13	30	11/08/2025	
Trichloroethylene	52.1	ug/L	50.00	ND	104	70-130	7.63	30	11/08/2025	
Trichlorofluoromethane	60.5	ug/L	50.00	ND	121	70-130	5.04	30	11/08/2025	
Vinyl chloride	60.0	ug/L	50.00	ND	120	70-130	4.73	30	11/08/2025	
Surrogate: Bromofluorobenzene	*50.3*	ug/L	*50.00*		*101*	*85-115*			11/08/2025	
Surrogate: Dibromofluoromethane	*48.8*	ug/L	*50.00*		*97.7*	*83-115*			11/08/2025	
Surrogate: Toluene-d8	*50.0*	ug/L	*50.00*		*100*	*85-115*			11/08/2025	

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Organics-Semivolatiles - Quality Control

Analyte	Result	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Analyzed	Qualifier
Batch B5K1030 - Method: 3510 Water SVOC			**Prepared: 11/10/2025**							
Blank (B5K1030-BLK1)										
2-Methylnaphthalene	ND	ug/L							11/10/2025	
Acenaphthene	1.75	ug/L							11/10/2025	
Acenaphthylene	1.76	ug/L							11/10/2025	
Anthracene	2.08	ug/L							11/10/2025	
Benz[a]anthracene	4.42	ug/L							11/10/2025	
Benzo[a]pyrene	5.93	ug/L							11/10/2025	
Benzo[b]fluoranthene	5.19	ug/L							11/10/2025	
Benzo[g,h,i]perylene	6.18	ug/L							11/10/2025	
Benzo[k]fluoranthene	5.98	ug/L							11/10/2025	
Chrysene	5.07	ug/L							11/10/2025	
Dibenz[a,h]anthracene	5.46	ug/L							11/10/2025	
Fluoranthene	2.76	ug/L							11/10/2025	
Fluorene	1.84	ug/L							11/10/2025	
Indeno(1,2,3-c,d)pyrene	6.32	ug/L							11/10/2025	
Naphthalene	1.39	ug/L							11/10/2025	
Phenanthrene	2.12	ug/L							11/10/2025	
Pyrene	2.76	ug/L							11/10/2025	
Surrogate: 2-Fluorobiphenyl	*15.0*	ug/L	*25.00*		*59.9*	*20-101*			11/10/2025	
Surrogate: Nitrobenzene-d5	*14.5*	ug/L	*25.00*		*57.8*	*13-100*			11/10/2025	
Surrogate: p-Terphenyl-d14	*21.8*	ug/L	*25.00*		*87.2*	*18-150*			11/10/2025	
LCS (B5K1030-BS1)										
2-Methylnaphthalene	33.0	ug/L	50.00		66.0	25.3-79.1			11/10/2025	
Acenaphthene	37.4	ug/L	50.00		74.7	35.2-90.9			11/10/2025	
Acenaphthylene	38.6	ug/L	50.00		77.2	38.7-99.1			11/10/2025	
Anthracene	43.9	ug/L	50.00		87.9	53.9-106.8			11/10/2025	
Benz[a]anthracene	43.5	ug/L	50.00		86.9	52.5-113.7			11/10/2025	
Benzo[a]pyrene	46.0	ug/L	50.00		91.9	43.7-118			11/10/2025	
Benzo[b]fluoranthene	44.1	ug/L	50.00		88.3	44.1-118.6			11/10/2025	
Benzo[g,h,i]perylene	43.9	ug/L	50.00		87.9	25.8-127			11/10/2025	
Benzo[k]fluoranthene	44.2	ug/L	50.00		88.4	41.9-117.7			11/10/2025	
Chrysene	42.8	ug/L	50.00		85.6	53.1-114.9			11/10/2025	
Dibenz[a,h]anthracene	38.6	ug/L	50.00		77.3	23.4-134.7			11/10/2025	
Fluoranthene	46.3	ug/L	50.00		92.6	55-112.1			11/10/2025	
Fluorene	39.4	ug/L	50.00		78.7	42-98			11/10/2025	
Indeno(1,2,3-c,d)pyrene	44.7	ug/L	50.00		89.5	29.1-133.2			11/10/2025	
Naphthalene	32.2	ug/L	50.00		64.4	22-76.8			11/10/2025	
Phenanthrene	41.6	ug/L	50.00		83.2	54.5-102.4			11/10/2025	
Pyrene	43.7	ug/L	50.00		87.3	54.2-110.5			11/10/2025	
Surrogate: 2-Fluorobiphenyl	*17.7*	ug/L	*25.00*		*70.8*	*20-101*			11/10/2025	
Surrogate: Nitrobenzene-d5	*17.5*	ug/L	*25.00*		*69.9*	*13-100*			11/10/2025	
Surrogate: p-Terphenyl-d14	*21.9*	ug/L	*25.00*		*87.8*	*18-150*			11/10/2025	
LCS Dup (B5K1030-BSD1)										
2-Methylnaphthalene	27.4	ug/L	50.00		54.7	25.3-79.1	18.7	21.8	11/10/2025	
Acenaphthene	32.8	ug/L	50.00		65.5	35.2-90.9	13.1	19.1	11/10/2025	
Acenaphthylene	34.3	ug/L	50.00		68.5	38.7-99.1	11.8	18	11/10/2025	
Anthracene	42.7	ug/L	50.00		85.5	53.9-106.8	2.75	15	11/10/2025	
Benz[a]anthracene	44.0	ug/L	50.00		88.0	52.5-113.7	1.25	16	11/10/2025	
Benzo[a]pyrene	43.9	ug/L	50.00		87.7	43.7-118	4.70	22.8	11/10/2025	
Benzo[b]fluoranthene	43.2	ug/L	50.00		86.4	44.1-118.6	2.20	23.4	11/10/2025	
Benzo[g,h,i]perylene	41.8	ug/L	50.00		83.7	25.8-127	4.93	32.2	11/10/2025	

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Organics-Semivolatiles - Quality Control

Analyte	Result	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Analyzed	Qualifier
Batch B5K1030 - Method: 3510 Water SVOC			**Prepared: 11/10/2025**							
LCS Dup (B5K1030-BSD1)										
Benzo[k]fluoranthene	42.9	ug/L	50.00		85.7	41.9-117.7	3.07	22.8	11/10/2025	
Chrysene	44.0	ug/L	50.00		88.0	53.1-114.9	2.72	16.3	11/10/2025	
Dibenz[a,h]anthracene	37.1	ug/L	50.00		74.3	23.4-134.7	3.91	29.8	11/10/2025	
Fluoranthene	46.8	ug/L	50.00		93.6	55-112.1	1.14	16.3	11/10/2025	
Fluorene	36.1	ug/L	50.00		72.3	42-98	8.52	16.4	11/10/2025	
Indeno(1,2,3-c,d)pyrene	42.8	ug/L	50.00		85.6	29.1-133.2	4.38	29.3	11/10/2025	
Naphthalene	26.1	ug/L	50.00		52.2	22-76.8	21.0	24.2	11/10/2025	
Phenanthrene	40.1	ug/L	50.00		80.2	54.5-102.4	3.67	15	11/10/2025	
Pyrene	46.0	ug/L	50.00		91.9	54.2-110.5	5.12	18.6	11/10/2025	
Surrogate: 2-Fluorobiphenyl	*16.0*	ug/L	*25.00*		*64.0*	*20-101*			11/10/2025	
Surrogate: Nitrobenzene-d5	*15.2*	ug/L	*25.00*		*60.7*	*13-100*			11/10/2025	
Surrogate: p-Terphenyl-d14	*21.8*	ug/L	*25.00*		*87.0*	*18-150*			11/10/2025	
Matrix Spike (B5K1030-MS1)	**Source: 2511065-01**									
2-Methylnaphthalene	104	ug/L	100.0	24.5	80.0	13.4-95.1			11/10/2025	
Acenaphthene	74.5	ug/L	100.0	ND	74.5	35.2-95.8			11/10/2025	
Acenaphthylene	77.8	ug/L	100.0	ND	77.8	38.3-103.1			11/10/2025	
Anthracene	80.4	ug/L	100.0	ND	80.4	54.2-105.4			11/10/2025	
Benz[a]anthracene	76.4	ug/L	100.0	ND	76.4	39.8-119.3			11/10/2025	A07
Benzo[a]pyrene	78.0	ug/L	100.0	ND	78.0	30-125.5			11/10/2025	
Benzo[b]fluoranthene	75.6	ug/L	100.0	ND	75.6	29.9-124.8			11/10/2025	
Benzo[g,h,i]perylene	73.7	ug/L	100.0	ND	73.7	10-133.9			11/10/2025	
Benzo[k]fluoranthene	74.6	ug/L	100.0	ND	74.6	28.6-120.8			11/10/2025	
Chrysene	76.5	ug/L	100.0	ND	76.5	39.3-119.7			11/10/2025	
Dibenz[a,h]anthracene	66.3	ug/L	100.0	ND	66.3	10-140.4			11/10/2025	
Fluoranthene	83.2	ug/L	100.0	ND	83.2	53.7-110.6			11/10/2025	
Fluorene	77.2	ug/L	100.0	ND	77.2	43.6-100.7			11/10/2025	
Indeno(1,2,3-c,d)pyrene	76.2	ug/L	100.0	ND	76.2	12.4-140.5			11/10/2025	
Naphthalene	165	ug/L	100.0	73.8	91.3	10-104.5			11/10/2025	
Phenanthrene	78.7	ug/L	100.0	ND	78.7	55.4-103.2			11/10/2025	
Pyrene	80.1	ug/L	100.0	ND	80.1	49.1-113.8			11/10/2025	
Surrogate: 2-Fluorobiphenyl	*38.9*	ug/L	*50.00*		*77.9*	*20-101*			11/10/2025	
Surrogate: Nitrobenzene-d5	*46.4*	ug/L	*50.00*		*92.8*	*13-100*			11/10/2025	
Surrogate: p-Terphenyl-d14	*44.0*	ug/L	*50.00*		*88.0*	*18-150*			11/10/2025	
Matrix Spike Dup (B5K1030-MSD1)	**Source: 2511065-01**									
2-Methylnaphthalene	80.0	ug/L	100.0	24.5	55.5	13.4-95.1	26.6	54.2	11/10/2025	
Acenaphthene	68.0	ug/L	100.0	ND	68.0	35.2-95.8	9.17	34.5	11/10/2025	
Acenaphthylene	72.0	ug/L	100.0	ND	72.0	38.3-103.1	7.75	35	11/10/2025	
Anthracene	71.8	ug/L	100.0	ND	71.8	54.2-105.4	11.3	15	11/10/2025	
Benz[a]anthracene	61.7	ug/L	100.0	ND	61.7	39.8-119.3	21.3	21.1	11/10/2025	A07
Benzo[a]pyrene	59.5	ug/L	100.0	ND	59.5	30-125.5	26.9	27.1	11/10/2025	
Benzo[b]fluoranthene	60.0	ug/L	100.0	ND	60.0	29.9-124.8	23.1	27.2	11/10/2025	
Benzo[g,h,i]perylene	55.7	ug/L	100.0	ND	55.7	10-133.9	27.8	35.9	11/10/2025	
Benzo[k]fluoranthene	59.7	ug/L	100.0	ND	59.7	28.6-120.8	22.2	26.7	11/10/2025	
Chrysene	62.3	ug/L	100.0	ND	62.3	39.3-119.7	20.5	22.2	11/10/2025	
Dibenz[a,h]anthracene	51.2	ug/L	100.0	ND	51.2	10-140.4	25.6	39.2	11/10/2025	
Fluoranthene	70.9	ug/L	100.0	ND	70.9	53.7-110.6	16.0	18.2	11/10/2025	
Fluorene	70.5	ug/L	100.0	ND	70.5	43.6-100.7	9.15	24.7	11/10/2025	
Indeno(1,2,3-c,d)pyrene	59.1	ug/L	100.0	ND	59.1	12.4-140.5	25.3	33.5	11/10/2025	
Naphthalene	110	ug/L	100.0	73.8	36.6	10-104.5	39.7	71.1	11/10/2025	
Phenanthrene	70.3	ug/L	100.0	ND	70.3	55.4-103.2	11.2	15	11/10/2025	

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Organics-Semivolatiles - Quality Control

Analyte	Result	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Analyzed	Qualifier
Batch B5K1030 - Method: 3510 Water SVOC			**Prepared: 11/10/2025**							
Matrix Spike Dup (B5K1030-MSD1)	**Source: 2511065-01**									
Pyrene	68.9	ug/L	100.0	ND	68.9	49.1-113.8	15.0	18.9	11/10/2025	
Surrogate: 2-Fluorobiphenyl	*33.4*	ug/L	*50.00*		*66.8*	*20-101*			11/10/2025	
Surrogate: Nitrobenzene-d5	*35.8*	ug/L	*50.00*		*71.6*	*13-100*			11/10/2025	
Surrogate: p-Terphenyl-d14	*36.4*	ug/L	*50.00*		*72.9*	*18-150*			11/10/2025	

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Organics-Pesticides - Quality Control

Analyte	Result	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Analyzed	Qualifier
Batch B5K1042 - Method: 3510 Water pest/pcb			**Prepared: 11/10/2025**							
Blank (B5K1042-BLK1)										
2,4'-DDT	0.0893	ug/L							11/14/2025	
4,4'-DDD	0.108	ug/L							11/14/2025	
4,4'-DDE	0.0885	ug/L							11/14/2025	
4,4'-DDT	0.0918	ug/L							11/14/2025	
a-BHC	0.0846	ug/L							11/14/2025	
a-Chlordane	0.0830	ug/L							11/14/2025	
Aldrin	0.0660	ug/L							11/14/2025	
b-BHC	0.0923	ug/L							11/14/2025	
d-BHC	0.0916	ug/L							11/14/2025	
Dieldrin	0.0943	ug/L							11/14/2025	
Endosulfan I	0.0968	ug/L							11/14/2025	
Endosulfan II	0.0953	ug/L							11/14/2025	
Endosulfan sulfate	0.0963	ug/L							11/14/2025	
Endrin	0.108	ug/L							11/14/2025	
Endrin aldehyde	0.0824	ug/L							11/14/2025	
Endrin ketone	0.0951	ug/L							11/14/2025	
g-BHC (Lindane)	0.0902	ug/L							11/14/2025	
g-Chlordane	0.0861	ug/L							11/14/2025	
Heptachlor	0.0797	ug/L							11/14/2025	
Heptachlor epoxide	0.0952	ug/L							11/14/2025	
Hexabromobenzene	0.0535	ug/L							11/14/2025	
Methoxychlor	0.0929	ug/L							11/14/2025	
Mirex	0.0724	ug/L							11/14/2025	
PBB (BP-6)	ND	ug/L							11/14/2025	
Toxaphene	ND	ug/L							11/14/2025	
Surrogate: Decachlorobiphenyl	*0.0844*	ug/L	*0.1000*		*84.4*	*10-140*			11/14/2025	
Surrogate: Tetrachloro-m-xylene	*0.0545*	ug/L	*0.1000*		*54.5*	*17-84*			11/14/2025	
LCS (B5K1042-BS1)										
2,4'-DDT	0.0705	ug/L	0.1000		70.5	44-104			11/23/2025	
4,4'-DDD	0.0728	ug/L	0.1000		72.8	57-114			11/23/2025	
4,4'-DDE	0.0649	ug/L	0.1000		64.9	44-102			11/23/2025	
4,4'-DDT	0.0700	ug/L	0.1000		70.0	36-116			11/23/2025	
a-BHC	0.0644	ug/L	0.1000		64.4	45-96			11/23/2025	
a-Chlordane	0.0710	ug/L	0.1000		71.0	38-100			11/23/2025	
Aldrin	0.0540	ug/L	0.1000		54.0	28-77			11/23/2025	
b-BHC	0.0698	ug/L	0.1000		69.8	49-106			11/23/2025	
d-BHC	0.0723	ug/L	0.1000		72.3	50-111			11/23/2025	
Dieldrin	0.0730	ug/L	0.1000		73.0	54-106			11/23/2025	
Endosulfan I	0.0711	ug/L	0.1000		71.1	38-113			11/23/2025	
Endosulfan II	0.0674	ug/L	0.1000		67.4	48-118			11/23/2025	
Endosulfan sulfate	0.0732	ug/L	0.1000		73.2	35-128			11/23/2025	
Endrin	0.0536	ug/L	0.1000		53.6	60-123			11/23/2025	A08
Endrin aldehyde	0.0684	ug/L	0.1000		68.4	10-110			11/23/2025	
Endrin ketone	0.0784	ug/L	0.1000		78.4	46-121			11/23/2025	
g-BHC (Lindane)	0.0677	ug/L	0.1000		67.7	47-99			11/23/2025	
g-Chlordane	0.0708	ug/L	0.1000		70.8	44-98			11/23/2025	
Heptachlor	0.0588	ug/L	0.1000		58.8	34-85			11/23/2025	
Heptachlor epoxide	0.0716	ug/L	0.1000		71.6	54-106			11/23/2025	
Hexabromobenzene	0.0665	ug/L	0.1000		66.5	14-135			11/23/2025	
Methoxychlor	0.0684	ug/L	0.1000		68.4	49-124			11/23/2025	
Mirex	0.0656	ug/L	0.1000		65.6	24-92			11/23/2025	

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Analyte	Result	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Analyzed	Qualifier
Batch B5K1042 - Method: 3510 Water pest/pcb			**Prepared: 11/10/2025**							
LCS (B5K1042-BS1)										
PBB (BP-6)	0.0688	ug/L	0.1000		68.8	16-135			11/23/2025	
Surrogate: Decachlorobiphenyl	*0.0650*	ug/L	*0.1000*		*65.0*	*10-140*			11/23/2025	
Surrogate: Tetrachloro-m-xylene	*0.0441*	ug/L	*0.1000*		*44.1*	*17-84*			11/23/2025	
LCS Dup (B5K1042-BSD1)										
2,4'-DDT	0.0699	ug/L	0.1000		69.9	44-104	0.838	33	11/23/2025	
4,4'-DDD	0.0730	ug/L	0.1000		73.0	57-114	0.322	26	11/23/2025	
4,4'-DDE	0.0604	ug/L	0.1000		60.4	44-102	7.13	30	11/23/2025	
4,4'-DDT	0.0724	ug/L	0.1000		72.4	36-116	3.32	23	11/23/2025	
a-BHC	0.0672	ug/L	0.1000		67.2	45-96	4.24	30	11/23/2025	
a-Chlordane	0.0716	ug/L	0.1000		71.6	38-100	0.879	29	11/23/2025	
Aldrin	0.0474	ug/L	0.1000		47.4	28-77	13.2	44	11/23/2025	
b-BHC	0.0708	ug/L	0.1000		70.8	49-106	1.43	28	11/23/2025	
d-BHC	0.0728	ug/L	0.1000		72.8	50-111	0.739	26	11/23/2025	
Dieldrin	0.0730	ug/L	0.1000		73.0	54-106	0.00959	27	11/23/2025	
Endosulfan I	0.0713	ug/L	0.1000		71.3	38-113	0.188	31	11/23/2025	
Endosulfan II	0.0668	ug/L	0.1000		66.8	48-118	0.855	26	11/23/2025	
Endosulfan sulfate	0.0717	ug/L	0.1000		71.7	35-128	2.15	23	11/23/2025	
Endrin	0.0548	ug/L	0.1000		54.8	60-123	2.32	26	11/23/2025	A08
Endrin aldehyde	0.0620	ug/L	0.1000		62.0	10-110	9.83	54	11/23/2025	
Endrin ketone	0.0747	ug/L	0.1000		74.7	46-121	4.83	31	11/23/2025	
g-BHC (Lindane)	0.0702	ug/L	0.1000		70.2	47-99	3.60	29	11/23/2025	
g-Chlordane	0.0710	ug/L	0.1000		71.0	44-98	0.417	30	11/23/2025	
Heptachlor	0.0540	ug/L	0.1000		54.0	34-85	8.57	36	11/23/2025	
Heptachlor epoxide	0.0722	ug/L	0.1000		72.2	54-106	0.839	28	11/23/2025	
Hexabromobenzene	0.0601	ug/L	0.1000		60.1	14-135	10.2	27	11/23/2025	
Methoxychlor	0.0668	ug/L	0.1000		66.8	49-124	2.43	24	11/23/2025	
Mirex	0.0534	ug/L	0.1000		53.4	24-92	20.6	39	11/23/2025	
PBB (BP-6)	0.0583	ug/L	0.1000		58.3	16-135	16.5	34	11/23/2025	
Surrogate: Decachlorobiphenyl	*0.0441*	ug/L	*0.1000*		*44.1*	*10-140*			11/23/2025	
Surrogate: Tetrachloro-m-xylene	*0.0421*	ug/L	*0.1000*		*42.1*	*17-84*			11/23/2025	

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P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-9800
FAX: (517) 335-9600

Organics-PCBs as Aroclors - Quality Control

Analyte	Result	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Analyzed	Qualifier
Batch B5K1042 - Method: 3510 Water pest/pcb			**Prepared: 11/10/2025**							
Blank (B5K1042-BLK1)										
Aroclor 1016	ND	ug/L							11/13/2025	
Aroclor 1221	ND	ug/L							11/13/2025	
Aroclor 1232	ND	ug/L							11/13/2025	
Aroclor 1242	ND	ug/L							11/13/2025	
Aroclor 1248	ND	ug/L							11/13/2025	
Aroclor 1254	ND	ug/L							11/13/2025	
Aroclor 1260	ND	ug/L							11/13/2025	
Aroclor 1262	ND	ug/L							11/13/2025	
Aroclor 1268	ND	ug/L							11/13/2025	
Surrogate: Decachlorobiphenyl	*0.0783*	ug/L	*0.1000*		*78.3*	*17-132*			11/13/2025	
Surrogate: Tetrachloro-m-xylene	*0.0555*	ug/L	*0.1000*		*55.5*	*20-104*			11/13/2025	

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Inorganics-Metals - Quality Control

Analyte	Result	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Analyzed	Qualifier
Batch B5K1028 - Method: No Prep - 7473 Water			**Prepared: 11/10/2025**							
Blank (B5K1028-BLK1)										
Mercury	ND	ug/L							11/10/2025	
Blank (B5K1028-BLK2)										
Mercury	ND	ug/L							11/10/2025	
LCS (B5K1028-BS1)										
Mercury	4.9	ug/L	5.000		97.6	80-120			11/10/2025	
LCS (B5K1028-BS2)										
Mercury	4.8	ug/L	5.000		96.8	80-120			11/10/2025	
Matrix Spike (B5K1028-MS1)	**Source: 2511055-01**									
Mercury	4.1	ug/L	5.000	ND	82.4	70-130			11/10/2025	
Matrix Spike (B5K1028-MS2)	**Source: 2511059-16**									
Mercury	4.3	ug/L	5.000	ND	86.2	70-130			11/10/2025	
Matrix Spike Dup (B5K1028-MSD1)	**Source: 2511055-01**									
Mercury	4.2	ug/L	5.000	ND	85.0	70-130	3.11	20	11/10/2025	
Matrix Spike Dup (B5K1028-MSD2)	**Source: 2511059-16**									
Mercury	4.7	ug/L	5.000	ND	93.4	70-130	8.02	20	11/10/2025	
Batch B5K1032 - Method: 200.7/200.8			**Prepared: 11/10/2025**							
Blank (B5K1032-BLK1)										
Arsenic	ND	ug/L							11/14/2025	
Barium	ND	ug/L							11/14/2025	
Cadmium	ND	ug/L							11/14/2025	
Chromium	ND	ug/L							11/14/2025	
Copper	ND	ug/L							11/14/2025	
Lead	ND	ug/L							11/14/2025	
Selenium	ND	ug/L							11/14/2025	
Silver	ND	ug/L							11/14/2025	
Zinc	ND	ug/L							11/14/2025	
LCS (B5K1032-BS1)										
Arsenic	50.8	ug/L	50.00		102	85-115			11/14/2025	
Barium	49.5	ug/L	50.00		98.9	85-115			11/14/2025	
Cadmium	49.9	ug/L	50.00		99.8	85-115			11/14/2025	
Chromium	49.4	ug/L	50.00		98.9	85-115			11/14/2025	
Copper	50.0	ug/L	50.00		100	85-115			11/14/2025	
Lead	50.9	ug/L	50.00		102	85-115			11/14/2025	
Selenium	52.6	ug/L	50.00		105	85-115			11/14/2025	
Silver	48.1	ug/L	50.00		96.2	85-115			11/14/2025	
Zinc	51.6	ug/L	50.00		103	85-115			11/14/2025	
Matrix Spike (B5K1032-MS1)	**Source: 2511055-02**									
Arsenic	51.3	ug/L	50.00	1.5	99.5	70-130			11/14/2025	
Barium	125	ug/L	50.00	67.7	114	70-130			11/14/2025	
Cadmium	47.6	ug/L	50.00	0.2	94.8	70-130			11/14/2025	
Chromium	56.4	ug/L	50.00	3.9	105	70-130			11/14/2025	
Copper	49.8	ug/L	50.00	1.9	95.7	70-130			11/14/2025	
Lead	58.8	ug/L	50.00	9.3	99.1	70-130			11/14/2025	
Selenium	48.2	ug/L	50.00	ND	96.4	70-130			11/14/2025	

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Inorganics-Metals - Quality Control

Analyte	Result	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Analyzed	Qualifier
Batch B5K1032 - Method: 200.7/200.8			**Prepared: 11/10/2025**							
Matrix Spike (B5K1032-MS1)	**Source: 2511055-02**									
Silver	45.5	ug/L	50.00	ND	91.0	70-130			11/14/2025	
Zinc	60.6	ug/L	50.00	16.1	88.9	70-130			11/14/2025	
Matrix Spike Dup (B5K1032-MSD1)	**Source: 2511055-02**									
Arsenic	51.2	ug/L	50.00	1.5	99.3	70-130	0.196	20	11/14/2025	
Barium	121	ug/L	50.00	67.7	107	70-130	2.88	20	11/14/2025	
Cadmium	47.7	ug/L	50.00	0.2	94.9	70-130	0.105	20	11/14/2025	
Chromium	56.9	ug/L	50.00	3.9	106	70-130	0.885	20	11/14/2025	
Copper	50.0	ug/L	50.00	1.9	96.2	70-130	0.539	20	11/14/2025	
Lead	58.5	ug/L	50.00	9.3	98.5	70-130	0.462	20	11/14/2025	
Selenium	48.2	ug/L	50.00	ND	96.5	70-130	0.143	20	11/14/2025	
Silver	44.6	ug/L	50.00	ND	89.1	70-130	2.08	20	11/14/2025	
Zinc	61.4	ug/L	50.00	16.1	90.4	70-130	1.27	20	11/14/2025	
Batch B5K1330 - Method: 200.7/200.8			**Prepared: 11/13/2025**							
Blank (B5K1330-BLK1)										
Arsenic	ND	ug/L							11/26/2025	
Barium	ND	ug/L							11/26/2025	
Cadmium	ND	ug/L							11/26/2025	
Chromium	ND	ug/L							11/26/2025	
Copper	ND	ug/L							11/26/2025	
Lead	ND	ug/L							11/26/2025	
Selenium	ND	ug/L							11/26/2025	
Silver	ND	ug/L							11/26/2025	
Zinc	ND	ug/L							11/26/2025	
LCS (B5K1330-BS1)										
Arsenic	51.5	ug/L	50.00		103	85-115			11/26/2025	
Barium	50.0	ug/L	50.00		99.9	85-115			11/26/2025	
Cadmium	49.6	ug/L	50.00		99.1	85-115			11/26/2025	
Chromium	50.7	ug/L	50.00		101	85-115			11/26/2025	
Copper	49.0	ug/L	50.00		97.9	85-115			11/26/2025	
Lead	49.4	ug/L	50.00		98.8	85-115			11/26/2025	
Selenium	51.3	ug/L	50.00		103	85-115			11/26/2025	
Silver	48.8	ug/L	50.00		97.7	85-115			11/26/2025	
Zinc	50.9	ug/L	50.00		102	85-115			11/26/2025	
Matrix Spike (B5K1330-MS1)	**Source: 2511055-01**									
Arsenic	209	ug/L	50.00	157	104	70-130			11/26/2025	
Barium	205	ug/L	50.00	155	99.4	70-130			11/26/2025	
Cadmium	44.7	ug/L	50.00	ND	89.4	70-130			11/26/2025	
Chromium	58.1	ug/L	50.00	4.4	107	70-130			11/26/2025	
Copper	49.1	ug/L	50.00	2.3	93.6	70-130			11/26/2025	
Lead	46.9	ug/L	50.00	1.2	91.5	70-130			11/26/2025	
Selenium	49.1	ug/L	50.00	0.3	97.6	70-130			11/26/2025	
Silver	44.5	ug/L	50.00	ND	89.0	70-130			11/26/2025	
Zinc	51.7	ug/L	50.00	6.8	89.8	70-130			11/26/2025	
Matrix Spike Dup (B5K1330-MSD1)	**Source: 2511055-01**									
Arsenic	205	ug/L	50.00	157	96.3	70-130	1.86	20	11/26/2025	
Barium	202	ug/L	50.00	155	92.7	70-130	1.65	20	11/26/2025	
Cadmium	45.8	ug/L	50.00	ND	91.7	70-130	2.53	20	11/26/2025	

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Inorganics-Metals - Quality Control

Analyte	Result	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Analyzed	Qualifier
Batch B5K1330 - Method: 200.7/200.8			**Prepared: 11/13/2025**							
Matrix Spike Dup (B5K1330-MSD1)	**Source: 2511055-01**									
Chromium	57.5	ug/L	50.00	4.4	106	70-130	0.982	20	11/26/2025	
Copper	48.3	ug/L	50.00	2.3	92.1	70-130	1.53	20	11/26/2025	
Lead	46.5	ug/L	50.00	1.2	90.7	70-130	0.852	20	11/26/2025	
Selenium	48.1	ug/L	50.00	0.3	95.5	70-130	2.15	20	11/26/2025	
Silver	44.3	ug/L	50.00	ND	88.6	70-130	0.394	20	11/26/2025	
Zinc	50.9	ug/L	50.00	6.8	88.2	70-130	1.53	20	11/26/2025	

EGLE

MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY

Laboratory Services Section
Environmental Lab

Analysis Request - Water

2511055	Project Name:	Flint Bishop Airport Landfill		Matrix:	Water
Location ID:	25000453	Activity:	M100	Sample Collector:	Marc Thompson
Dept / Division / District:	EGLE RRD Lansing	Location Code:	6838	Sample Collector Phone:	517-402-5755
State Project Manager:	Brian Kuberski	Sub Location Code:		Contract Firm Primary Contact:	Scott Park
State Project Mgr Email:	kuberskib@michigan.gov			Primary Contact Phone:	517-348-2260
CC Email 1:	mthompson@dlz.com			Overflow Lab Choice:	Fibertec/Metiri
CC Email 2:	jhines@dlz.com			*Rush Turnaround Request	Temp: 2.7 °C / ROI: 0 / N
CC Email 3:	envsampleresults@dlz.com			Days: Appr By:	

*Project Turnaround Time other than standard (15 business days) must be pre-approved and scheduled with a Laboratory Manager. Details on Page 2.

	Lab Use Only	Field Sample ID	Collection Date	Collection Time	Bottle Count	Comments
1	61	MW-8-07	11/4/25	10:30 am	7	Add Herbicide to analysis
2	62	MW-3-07	11/4/25	11:30 am	7	Add Herbicide to analysis
3	63	MW-4-07	11/4/25	1:45 pm	7	Add Herbicide to analysis
4	64	MW-7-07	11/4/25	2:00 pm	3	
5	65	MW-6-07	11/4/25	5:00 pm	3	
6						
7						
8						
9						
10						

ORGANIC CHEMISTRY

VOA-Volatile Organic Analysis

Volatiles-Full List	● ● ● ● ● 6 7 8 9 10
BTEX/MTBE/TMB	1 2 3 4 5 6 7 8 9 10
Chlorinated Only	1 2 3 4 5 6 7 8 9 10
GRO	1 2 3 4 5 6 7 8 9 10
1,4 Dioxane	1 2 3 4 5 6 7 8 9 10

METH - Methane, Ethane, Ethene

VOA-Methane	1 2 3 4 5 6 7 8 9 10

ON - Pesiticides, PCBs

Pesticides & PCBs	● ● ● 4 5 6 7 8 9 10
Pesticides Only	1 2 3 4 5 6 7 8 9 10
PCBs Only	1 2 3 4 5 6 7 8 9 10
Toxaphene	1 2 3 4 5 6 7 8 9 10
Chlordane	1 2 3 4 5 6 7 8 9 10

BNA - Base Neutral Acids

BNAs	1 2 3 4 5 6 7 8 9 10
PNAs Only	● ● ● 4 5 6 7 8 9 10
BNs Only	1 2 3 4 5 6 7 8 9 10
Acids Only	1 2 3 4 5 6 7 8 9 10

Organic Specialty Requests

Lib Search-Volatiles	1 2 3 4 5 6 7 8 9 10
Lib Search-SemiVols	1 2 3 4 5 6 7 8 9 10
Finger Print	1 2 3 4 5 6 7 8 9 10
DRO / ORO	1 2 3 4 5 6 7 8 9 10

METALS CHEMISTRY PACKAGES

OpMemo2-Total	1 2 3 4 5 6 7 8 9 10
OpMemo2-Dissolved	1 2 3 4 5 6 7 8 9 10
Includes Sb,As,Ba,Be,Cd,Cr,Cu,Co,Fe,Pb,Mn,Hg,Mo,Ni,Se,Ag,Tl,V,Zn	
Michigan10-Total	● ● ● 4 5 6 7 8 9 10
Michigan10-Dissolved	1 2 3 4 5 6 7 8 9 10
Includes As,Ba,Cd,Cr,Cu,Pb,Hg,Se,Ag,Zn	

METALS	DISSOLVED (HNO_3) (*FF)	TOTAL (HNO_3)
Aluminum-Al	1 2 3 4 5 6 7 8 9 10	1 2 3 4 5 6 7 8 9 10
Antimony-Sb	1 2 3 4 5 6 7 8 9 10	1 2 3 4 5 6 7 8 9 10
Arsenic-As	1 2 3 4 5 6 7 8 9 10	1 2 3 4 5 6 7 8 9 10
Barium-Ba	1 2 3 4 5 6 7 8 9 10	1 2 3 4 5 6 7 8 9 10
Beryllium-Be	1 2 3 4 5 6 7 8 9 10	1 2 3 4 5 6 7 8 9 10
Boron-B	1 2 3 4 5 6 7 8 9 10	1 2 3 4 5 6 7 8 9 10
Cadmium-Cd	1 2 3 4 5 6 7 8 9 10	1 2 3 4 5 6 7 8 9 10
Calcium-Ca	1 2 3 4 5 6 7 8 9 10	1 2 3 4 5 6 7 8 9 10
Chromium-Cr	1 2 3 4 5 6 7 8 9 10	1 2 3 4 5 6 7 8 9 10
Cobalt-Co	1 2 3 4 5 6 7 8 9 10	1 2 3 4 5 6 7 8 9 10
Copper-Cu	1 2 3 4 5 6 7 8 9 10	1 2 3 4 5 6 7 8 9 10
Iron-Fe	1 2 3 4 5 6 7 8 9 10	1 2 3 4 5 6 7 8 9 10
Lead-Pb	1 2 3 4 5 6 7 8 9 10	1 2 3 4 5 6 7 8 9 10
Lithium-Li	1 2 3 4 5 6 7 8 9 10	1 2 3 4 5 6 7 8 9 10
Magnesium-Mg	1 2 3 4 5 6 7 8 9 10	1 2 3 4 5 6 7 8 9 10
Manganese-Mn	1 2 3 4 5 6 7 8 9 10	1 2 3 4 5 6 7 8 9 10
Mercury-Hg	1 2 3 4 5 6 7 8 9 10	1 2 3 4 5 6 7 8 9 10
Molybdenum-Mo	1 2 3 4 5 6 7 8 9 10	1 2 3 4 5 6 7 8 9 10
Nickel-Ni	1 2 3 4 5 6 7 8 9 10	1 2 3 4 5 6 7 8 9 10
Potassium-K	1 2 3 4 5 6 7 8 9 10	1 2 3 4 5 6 7 8 9 10
Selenium-Se	1 2 3 4 5 6 7 8 9 10	1 2 3 4 5 6 7 8 9 10
Silver-Ag	1 2 3 4 5 6 7 8 9 10	1 2 3 4 5 6 7 8 9 10
Sodium-Na	1 2 3 4 5 6 7 8 9 10	1 2 3 4 5 6 7 8 9 10
Strontium-Sr	1 2 3 4 5 6 7 8 9 10	1 2 3 4 5 6 7 8 9 10
Thallium-Tl	1 2 3 4 5 6 7 8 9 10	1 2 3 4 5 6 7 8 9 10
Titanium-Ti	1 2 3 4 5 6 7 8 9 10	1 2 3 4 5 6 7 8 9 10
Uranium-U	1 2 3 4 5 6 7 8 9 10	1 2 3 4 5 6 7 8 9 10
Vanadium-V	1 2 3 4 5 6 7 8 9 10	1 2 3 4 5 6 7 8 9 10
Zinc-Zn	1 2 3 4 5 6 7 8 9 10	1 2 3 4 5 6 7 8 9 10
Hardness (Ca, Mg)	1 2 3 4 5 6 7 8 9 10	1 2 3 4 5 6 7 8 9 10
Low Level Mercury	Not Applicable	1 2 3 4 5 6 7 8 9 10

*FF: All Dissolved Metals Samples **MUST** be Field Filtered

INORGANIC CHEMISTRY

General Chemistry - Neutral

Ortho Phosphate	1 2 3 4 5 6 7 8 9 10
Diss O-Phos (*FF)	1 2 3 4 5 6 7 8 9 10
Nitrite-NO_2	1 2 3 4 5 6 7 8 9 10
Nitrate-NO_3 (*Calc)	1 2 3 4 5 6 7 8 9 10
Suspended Solids	1 2 3 4 5 6 7 8 9 10
Diss Solids	1 2 3 4 5 6 7 8 9 10
Turbidity	1 2 3 4 5 6 7 8 9 10
Total Alkalinity	1 2 3 4 5 6 7 8 9 10
Bicarb/Carb Alk	1 2 3 4 5 6 7 8 9 10
Chloride-Cl	1 2 3 4 5 6 7 8 9 10
Sulfate-SO_4	1 2 3 4 5 6 7 8 9 10
Diss Cr6+ (*FF)	1 2 3 4 5 6 7 8 9 10
pH	1 2 3 4 5 6 7 8 9 10
Conductivity	1 2 3 4 5 6 7 8 9 10
TDS-Calculated	1 2 3 4 5 6 7 8 9 10

General Chemistry - Acidic

Total Org Carbon	1 2 3 4 5 6 7 8 9 10
Ammonia-NH_3	1 2 3 4 5 6 7 8 9 10
Nitrate+Nitrite	1 2 3 4 5 6 7 8 9 10
Kjeldahl Nitrogen	1 2 3 4 5 6 7 8 9 10
Total Phosphorus	1 2 3 4 5 6 7 8 9 10
Diss Org Carb (*FF)	1 2 3 4 5 6 7 8 9 10
Chem Oxyg Dem	1 2 3 4 5 6 7 8 9 10

General Chemistry - Basic

Chlorophyll	1 2 3 4 5 6 7 8 9 10
Total Cyanide	1 2 3 4 5 6 7 8 9 10
Available Cyanide	1 2 3 4 5 6 7 8 9 10

Available Cyanide is equivalent to Amenable Cyanide

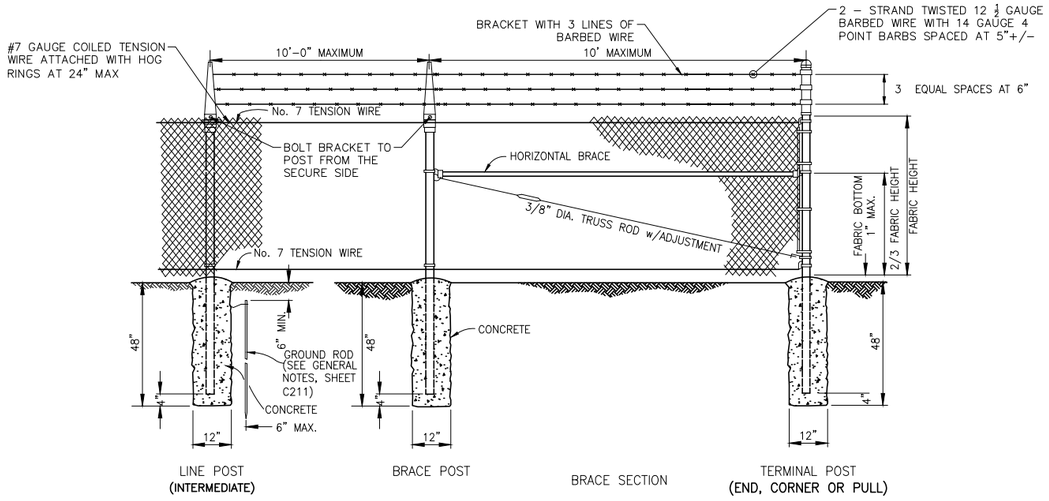
*FF: Samples must be Field Filtered

*Calc: Includes Nitrite and Nitrite+Nitrate Analyses

Any Known Hazards:

Chain of Custody	Relinquished By	Received By	Date / Time
	Marc Thompson, DLZ Print Name & Org	Melissa Smith Print Name & Org	11/5/25 14:15
	Signature	Signature	
	Print Name & Org	Print Name & Org	
	Signature	Signature	

APPENDIX VII
FENCE DETAILS



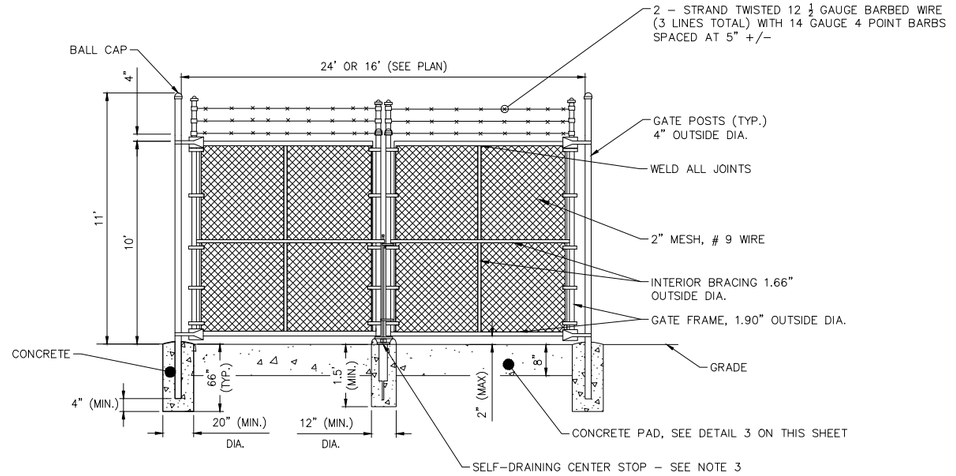
NOTES:

1. ALL COST ASSOCIATED WITH 10 FOOT CHAIN LINK FENCE SHALL BE INCLUDED IN ITEMS F-162-5.1 AND F-162-5.2.
2. FENCE SHALL BE INSTALLED WITH THE FABRIC ON THE NON-AOA SIDE OF THE AIRFIELD.
3. ANY GRADING REQUIRED TO OBTAIN THE DIMENSION OF POST DEPTH AND PROVIDE 1" (MAX.) DISTANCE FROM FABRIC TO GRADE, SHALL BE IN INCLUDED IN THE FENCE PAY ITEM.

FENCE MEMBER DIMENSIONS

TYPE	OUTSIDE DIAMETER
CORNER, END, PULL AND BRACE POSTS	2.875"
LINE POSTS	2.875"
HORIZONTAL BRACES	1.66"

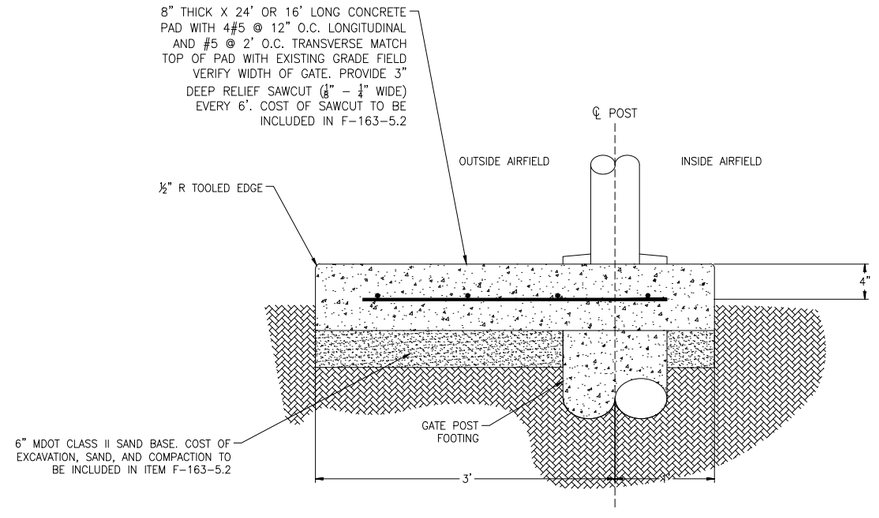
1 / C210 **CHAIN LINK FENCE - (CLASS E, FAA SPEC. F-162)**
SCALE: NTS



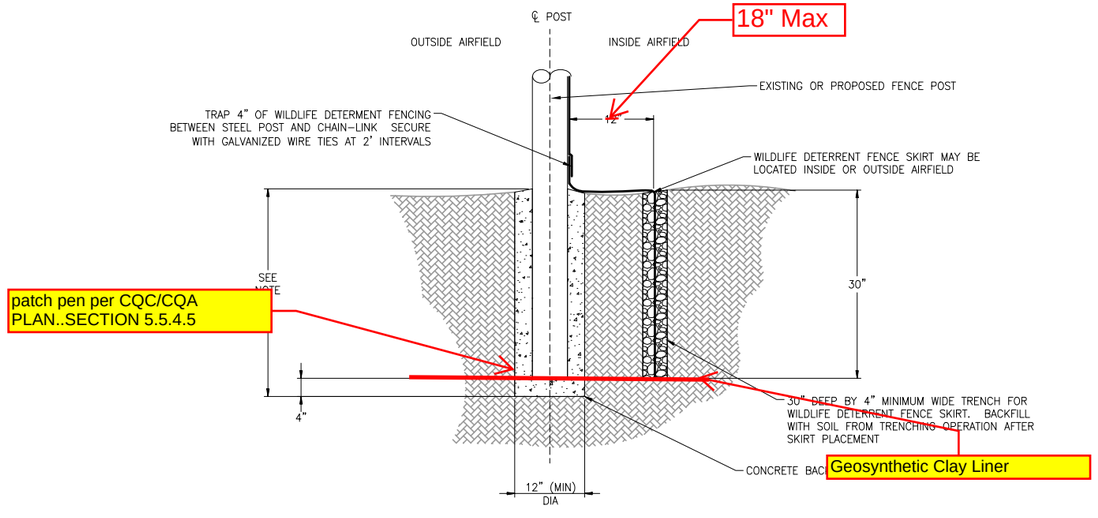
NOTES:

1. ALL COSTS ASSOCIATED WITH DOUBLE-LEAF GATE SHALL BE INCLUDED IN ITEMS F-162-5.9 AND F-162-5.10.
2. WHEN GATE IS IN CLOSED POSITION, OPENINGS AT GATE POSTS, BETWEEN LEAFS, OR BETWEEN GATE AND GROUND SURFACE SHALL BE A MAXIMUM OF 2 INCHES.
3. ALL DOUBLE-LEAF GATES SHALL INCLUDE A LOCKABLE DROP ROD WITH A SELF DRAINING CENTER STOP.

2 / C210 **DOUBLE SWING GATE DETAIL**
SCALE: NTS



3 / C210 **WIDLIFE EXCLUSION GATE CONCRETE PAD DETAIL**
SCALE: NTS



NOTE: TYPICAL DEPTH OF FENCE POST FOOTING SHALL BE 48". FOOTING HOLE SHALL BE FILLED WITH COMMERCIAL GRADE CONCRETE WITH A MINIMUM 28-DAY COMPRESSIVE STRENGTH OF 2500 PSI.

5 / C210 **WILDLIFE EXCLUSION FENCE SKIRT DETAIL**
SCALE: NTS

RS&H Michigan, Inc.
G-3101 W. Bristol Road, Suite 300
Flint, Michigan 48507
810-232-6899 FAX 810-232-6840
www.rsandh.com

Bishop International Airport Authority

BISHOP INTERNATIONAL AIRPORT

SECURITY FENCING IMPROVEMENTS (NORTH)

CONSULTANTS

3 WORKING DAYS BEFORE YOU DIG CALL MISS DIG 1-800-482-7171 FOR THE LOCATION OF UNDERGROUND FACILITIES

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED:	MAY 2018
REVIEWED BY:	DMJ
DRAWN BY:	MM
DESIGNED BY:	MM

RS&H PROJECT NUMBER
210-2820-013

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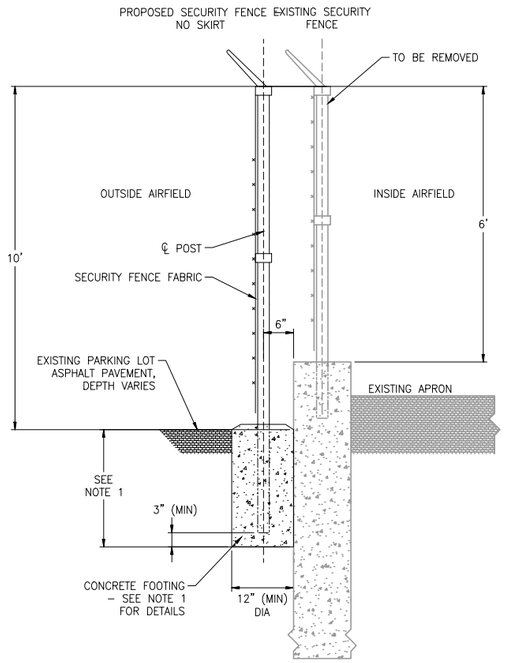
SHEET TITLE

FENCING AND GATE DETAILS - 1

SHEET NUMBER

C210

BID DOCUMENTS

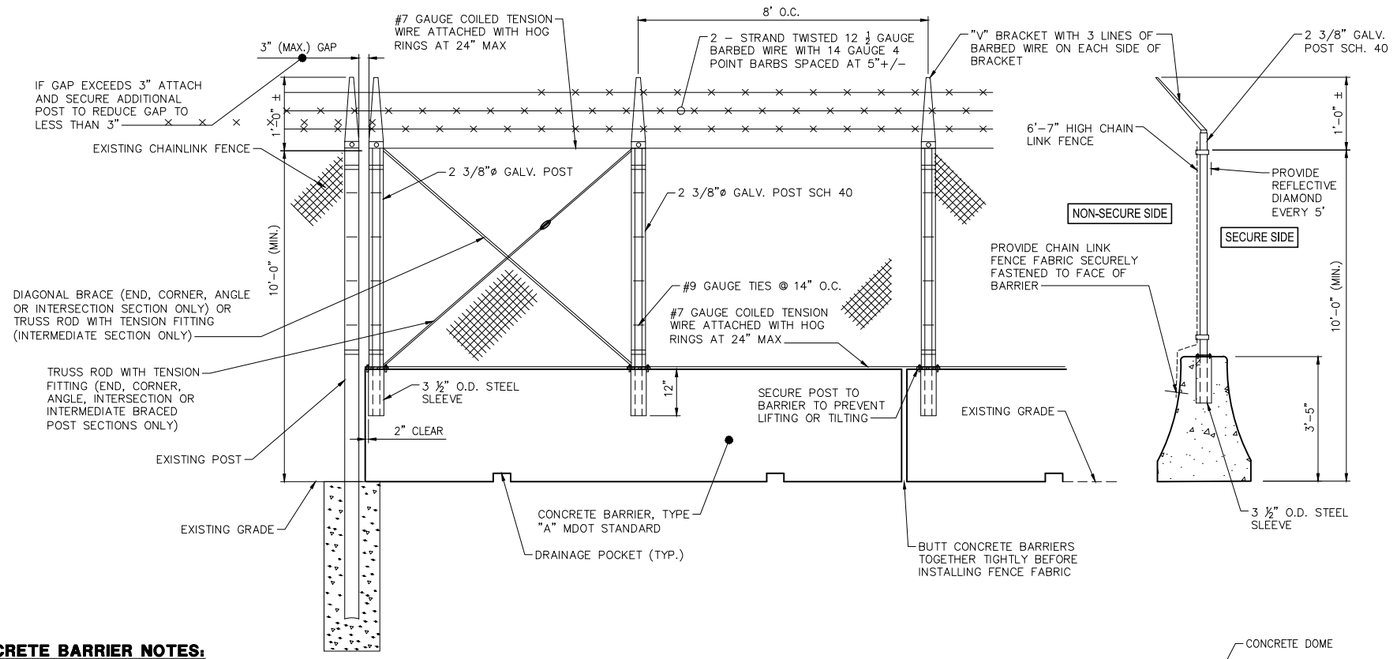


NOTES:

1. BORE THROUGH EXISTING PAVEMENT TO A DEPTH OF 48". BORE HOLE SHALL BE FILLED WITH COMMERCIAL GRADE CONCRETE WITH A MINIMUM 28–DAY COMPRESSIVE STRENGTH OF 2500 PSI.
2. PROPOSED SECURITY FENCE SHALL BE CONSTRUCTED BEFORE THE REMOVAL OF THE EXISTING SECURITY FENCE

1 C212 INSTALLATION OF FENCE IN PAVEMENT

SCALE: NTS

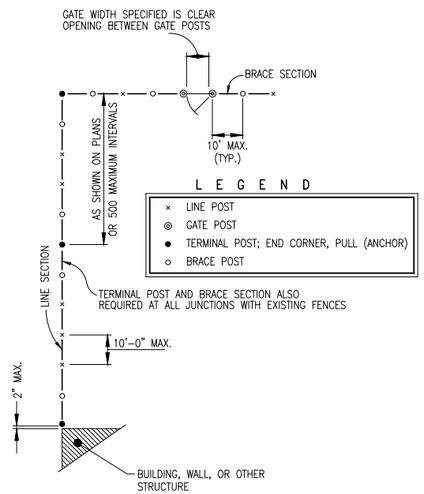


CONCRETE BARRIER NOTES:

1. ALL COST ASSOCIATED WITH INSTALLATION AND REMOVAL OF TEMPORARY CHAIN LINK FENCE MOUNTED ON CONCRETE BARRIER SHALL BE INCLUDED IN ITEM F–162–5.12.
2. CONCRETE BARRIER SHALL BE HAVE A 28–DAY DESIGN COMPRESSIVE STRENGTH OF 4000 PSI. CONCRETE SHALL CONSIST OF CEMENT TYPE I CONFORMING TO ASTM C150.

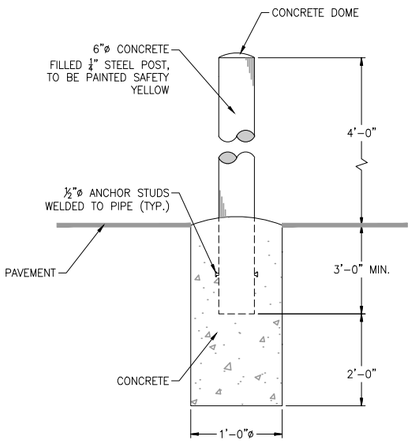
2 C212 TEMPORARY CHAIN LINK FENCE MOUNTED ON CONCRETE BARRIER

SCALE: NTS

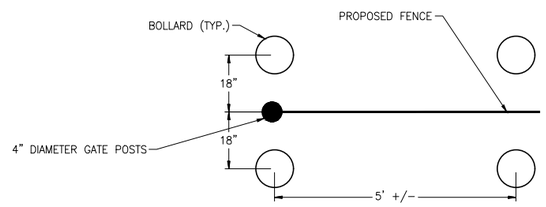


3 C212 TYPICAL FENCE LAYOUT

SCALE: NTS



SECTION VIEW



PLAN VIEW

4 C212 BOLLARD DETAIL

SCALE: NTS

RS&H Michigan, Inc.
G-3101 W. Bristol Road, Suite 300
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810-232-6899 FAX 810-232-6840
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Bishop International Airport Authority

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REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED:	MAY 2018
REVIEWED BY:	DMJ
DRAWN BY:	MM
DESIGNED BY:	MM

RS&H PROJECT NUMBER
210-2820-013

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SHEET TITLE

FENCING AND GATE DETAILS - 3

SHEET NUMBER

C212

BID DOCUMENTS

APPENDIX VIII
FAA FORM 7460-1

NOTICE OF PROPOSED CONSTRUCTION OR ALTERATION

§ 77.7 Form and time of notice.

(a) If you are required to file notice under §77.9, you must submit to the FAA a completed FAA Form 7460–1, Notice of Proposed Construction or Alteration. FAA Form 7460–1 is available at FAA regional offices and on the Internet.

(b) You must submit this form at least 45 days before the start date of the proposed construction or alteration or the date an application for a construction permit is filed, whichever is earliest.

(c) If you propose construction or alteration that is also subject to the licensing requirements of the Federal Communications Commission (FCC), you must submit notice to the FAA on or before the date that the application is filed with the FCC.

(d) If you propose construction or alteration to an existing structure that exceeds 2,000 ft. in height above ground level (AGL), the FAA presumes it to be a hazard to air navigation that results in an inefficient use of airspace. You must include details explaining both why the proposal would not constitute a hazard to air navigation and why it would not cause an inefficient use of airspace.

(e) The 45-day advance notice requirement is waived if immediate construction or alteration is required because of an emergency involving essential public services, public health, or public safety. You may provide notice to the FAA by any available, expeditious means. You must file a completed FAA Form 7460–1 within 5 days of the initial notice to the FAA. Outside normal business hours, the nearest flight service station will accept emergency notices.

§ 77.9 Construction or alteration requiring notice.

If requested by the FAA, or if you propose any of the following types of construction or alteration, you must file notice with the FAA of:

(a) Any construction or alteration that is more than 200 ft. AGL at its site.

(b) Any construction or alteration that exceeds an imaginary surface extending outward and upward at any of the following slopes:

(1) 100 to 1 for a horizontal distance of 20,000 ft. from the nearest point of the nearest runway of each airport described in paragraph (d) of this section with its longest runway more than 3,200 ft. in actual length, excluding heliports.

(2) 50 to 1 for a horizontal distance of 10,000 ft. from the nearest point of the nearest runway of each airport described in paragraph (d) of this section with its longest runway no more than 3,200 ft. in actual length, excluding heliports.

(3) 25 to 1 for a horizontal distance of 5,000 ft. from the nearest point of the nearest landing and takeoff area of each heliport described in paragraph (d) of this section.

(c) Any highway, railroad, or other traverse way for mobile objects, of a height which, if adjusted upward 17 feet for an Interstate Highway that is part of the National System of Military and Interstate Highways where overcrossings are designed for a minimum of 17 feet vertical distance, 15 feet for any other public roadway, 10 feet or the height of the highest mobile object that would normally traverse the road, whichever is greater, for a private road, 23 feet for a railroad, and for a waterway or any other traverse way not previously mentioned, an amount equal to the height of the highest mobile object that would normally traverse it, would exceed a standard of paragraph (a) or (b) of this section.

(d) Any construction or alteration on any of the following airports and heliports:

(1) A public use airport listed in the Airport/Facility Directory, Alaska Supplement, or Pacific Chart Supplement of the U.S. Government Flight Information Publications;

(2) A military airport under construction, or an airport under construction that will be available for public use;

(3) An airport operated by a Federal agency or the DOD.

(4) An airport or heliport with at least one FAA-approved instrument approach procedure.

(e) You do not need to file notice for construction or alteration of:

(1) Any object that will be shielded by existing structures of a permanent and substantial nature or by natural terrain or topographic features of equal or greater height, and will be located in the congested area of a city, town, or settlement where the shielded structure will not adversely affect safety in air navigation;

(2) Any air navigation facility, airport visual approach or landing aid, aircraft arresting device, or meteorological device meeting FAA-approved siting criteria or an appropriate military service siting criteria on military airports, the location and height of which are fixed by its functional purpose;

(3) Any construction or alteration for which notice is required by any other FAA regulation.

(4) Any antenna structure of 20 feet or less in height, except one that would increase the height of another antenna structure.

Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177
Fax: (817) 222-5920

Website: https://oeaaa.faa.gov

INSTRUCTIONS FOR COMPLETING FAA FORM 7460-1

PLEASE TYPE or PRINT

ITEM #1. Please include the name, address and phone number of a personal contact point as well as the company name.

ITEM #2. Please include the name, address and phone number of a personal contact point as well as the company name.

ITEM #3. New Construction would be a structure that has not yet been built.

Alteration is a change to an existing structure such as the addition of a side mounted antenna, a change to the marking and lighting, a change to power and/or frequency, or a change to the height. The nature of the alteration shall be included in ITEM #21 "Complete Description of Proposal".

Existing would be a correction to the latitude and/or longitude, a correction to the height, or if filing on an existing structure which has never been studied by the FAA. The reason for the notice shall be included in ITEM #21 "Complete Description of Proposal".

ITEM #4. If Permanent, so indicate. If Temporary, such as a crane or drilling derrick, enters the estimated length of time the temporary structure will be up.

ITEM #5. Enter the date that construction is expected to start and the date that construction should be completed.

ITEM #6. Please indicate the type of structure. DO NOT LEAVE BLANK.

ITEM #7. In the event that obstruction marking and lighting is required, please indicate type desired. If no preference, check "other" and indicate "no preference" DO NOT LEAVE BLANK. NOTE: High Intensity lighting shall be used only for structures over 500' AGL. In the absence of high intensity lighting for structures over 500' AGL, marking is also required.

ITEM #8. If this is an existing tower that has been registered with the FCC, enter the FCC Antenna Structure Registration number here.

ITEM #9 and #10. Latitude and longitude must be geographic coordinates, accurate to within the nearest second or to the nearest hundredth of a second if known. Latitude and longitude derived solely from a hand-held G P S instrument is NOT acceptable. A hand-held GPS is only accurate to within 100 meters (328 feet) 95 percent of the time. This data, when plotted, should match the site depiction submitted under ITEM #20.

ITEM #11. NAD 83 is preferred; however, latitude and longitude may be submitted in NAD 27. Also, in some geographic areas where NAD 27 and NAD 83 are not available other datum may be used. It is important to know which datum is used. DO NOT LEAVE BLANK.
ITEM #12. Enter the name of the nearest city and state to the site. If the structure is or will be in a city, enter the name of that city and state.

ITEM #13. Enter the full name of the nearest public-use (not private-use) airport or heliport or military airport or heliport to the site.

ITEM #14. Enter the distance from the airport or heliport listed in #13 to the structure.

ITEM #15. Enter the direction from the airport or heliport listed in #13 to the structure.

ITEM #16. Enter the site elevation above mean sea level and expressed in whole feet rounded to the nearest foot (e.g. 17'3" rounds to 17', 17'6" rounds to 18'). This data should match the ground contour elevations for site depiction submitted under ITEM #20.
ITEM #17. Enter the total structure height above ground level in whole feet rounded to the next highest foot (e.g. 17'3" rounds to 18'). The total structure height shall include anything mounted on top of the structure, such as antennas, obstruction lights, lightning rods, etc.

ITEM #18. Enter the overall height above mean sea level and expressed in whole feet. This will be the total of ITEM #16 + ITEM #17.

ITEM #19. If an FAA aeronautical study was previously conducted, enter the previous study number.

ITEM #20. Enter the relationship of the structure to roads, airports, prominent terrain, existing structures, etc. Attach an 8-1/2" x 11" non-reduced copy of the appropriate 7.5 minute U.S. Geological Survey (USGS) Quadrangle Map MARKED WITH A PRECISE INDICATION OF THE SITE LOCATION. To obtain maps, contact USGS at 1-888-275-8747 or via internet at "http://store.usgs.gov". If available, attach a copy of a documented site survey with the surveyor's certification stating the amount of vertical and horizontal accuracy in feet.

ITEM #21.
- For transmitting stations, include maximum effective radiated power (ERP) and all frequencies.
- For antennas, include the type of antenna and center of radiation (Attach the antenna pattern, if available).
- For microwave, include azimuth relative to true north.
- For overhead wires or transmission lines, include size and configuration of wires and their supporting structures (Attach depiction).
- For each pole/support, include coordinates, site elevation, and structure height above ground level or water.
- For buildings, include site orientation, coordinates of each corner, dimensions, and construction materials.
- For alterations, explain the alteration thoroughly.
- For existing structures, thoroughly explain the reason for notifying the FAA (e.g. corrections, no record or previous study, etc.).

Filing this information with the FAA does not relieve the sponsor of this construction or alteration from complying with any other federal, state or local rules or regulations. If you are not sure what other rules or regulations apply to your proposal, contact local/state aviation's and zoning authorities.

Paperwork Reduction Work Act Statement: A federal agency may not conduct or sponsor, and a person is not required to respond to, nor shall a person be subject to a penalty for failure to comply with a collection of information subject to the requirements of the Paperwork Reduction Act unless that collection displays a currently valid OMB Control Number. The OMB control number for this information collection is 2120-0001. Public reporting for this collection of information is estimated to be approximately 19 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, completing and reviewing the collection of information. All responses to this collection of information are mandatory for anyone proposing construction or alteration that meets the criteria contained in 14 CFR 77. This information is collected to evaluate the effect of proposed construction or alteration on air navigation and is not confidential. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden to: Information Collection Clearance Officer, Federal Aviation Administration, 10101 Hillwood Parkway, Fort Worth, TX 76177-1524.

Privacy Act Statement (5 U.S.C. § 552a, as amended): AUTHORITY: The FAA is responsible for issuing a determination based on extensive analysis completed in accordance with 49 United States Code (USC) Sections 44718. Title 14 of the Code of Federal Regulations (14 CFR), part 77 authorizes FAA to collect this information. PURPOSE(S): FAA will use the information provided to administer the Aeronautical Study Process. ROUTINE USE(S): In accordance with DOT's system of records notice, DOT/ALL 16 Mailing Management System and DOT/FAA 826 Petitions for Exemption, Other than Medical Exemption-Public Dockets, the information provided may be disclosed to officials within the Federal government and the public in general.

Please Type or Print on This Form

Form Approved OMB No.2120-0001
Expiration Date: 05/31/2026

U.S. Department of Transportation
Federal Aviation Administration

Failure To Provide All Requested Information May Delay Processing of Your Notice

Notice of Proposed Construction or Alteration

FOR FAA USE ONLY
Aeronautical Study Number

1. Sponsor *(person, company, etc. proposing this action):*
Attn. of
Name: _____
Address: _____
_____
City: _____ State: _____ Zip: _____
Telephone: _____ Fax: _____

2. Sponsor's Representative *(if other than #1):*
Attn. of
Name: _____
Address: _____
_____
City: _____ State: _____ Zip: _____
Telephone: _____ Fax: _____

3. Notice of: ☐ New Construction ☐ Alteration ☐ Existing

4. Duration: ☐ Permanent ☐ Temporary (___ months, ____days)

5. Work Schedule: Beginning _____ End _____

6. Type: ☐ Antenna Tower ☐ Crane ☐ Building ☐ Power Line
☐ Landfill ☐ Water Tank ☐ Other _____

7. Marking/Painting and/or Lighting Preferred:
☐ Red Lights and Paint ☐ Dual - Red and Medium Intensity
☐ White-Medium Intensity ☐ Dual - Red and high Intensity
☐ White -High Intensity ☐ Other

8. FCC Antenna Structure Registration Number *(if applicable)*:
_____

9. Latitude: ____ 0 ____ ____ . ____ "

10. Longitude: ____ 0 ____ ____ . ____ "

11. Datum: ☐ NAD 83 ☐ NAD 27 ☐ Other

12. Nearest: City: _____ State _____

13. Nearest *Public-use* *(not private-use)* or Military Airport or Heliport:
_____

14. Distance from #13. to Structure: _____

15. Direction from #13. to Structure: _____

16. Site Elevation ***(AMSL)***: _____ ft.

17. Total Structure Height ***(AGL)***: _____ ft.

18. Overall Height (#16 + #17) ***(AMSL)***: _____ ft.

19. Previous FAA Aeronautical Study Number *(if applicable)*:
_____-OE

20. Description of Location: *(Attach a USGS 7.5 minute Quadrangle Map with the precise site marked and any certified survey)*

21. Complete Description of Proposal:

Frequency/Power (kW)	

Notice is required by 14 Code of Federal Regulations, part 77 pursuant to 49 U.S.C., Section 44718. Persons who knowingly and willingly violate the notice requirements of part 77 are subject to a civil penalty of $1,000 per day until the notice is received, pursuant to 49 U.S.C., Section 46301(a)

I hereby certify that all of the above statements made by me are true, complete, and correct to the best of my knowledge. In addition, I agree to mark and/or light the structure in accordance with established marking & lighting standards as necessary.

Date	Typed or Printed Name and Title of Person Filing Notice	Signature

APPENDIX IX
CQA/CQC

CQC/CQA PLAN

CONSTRUCTION QUALITY CONTROL / CONSTRUCTION QUALITY ASSURANCE PLAN FOR FLINT BISHOP AIRPORT LANDFILL COVER (CAP)

1.0 DESCRIPTION OF THE WORK

This special provision represents the Construction Quality Control/Construction Quality Assurance Plan (CQC/CQA) for the geosynthetic clay liner/final cover construction at the indicated areas.

The landfill is located in Genesee County, Michigan and is within an area approximately bounded by I-69 to the north, Linden Road to the west, Flint Bishop Airport to the east, and Linden Creek Parkway to the south. The entire landfill has an area of approximately 33 acres and is situated on a property of Flint Bishop Airport.

This CQC/CQA Plan addresses the procedures to be used for earthen materials and for the construction of the final cover (cap).

1.1 Purpose and Scope

The purpose of this CQC/CQA Plan is to address the quality control and quality assurance requirements for the capping as indicated in the Project Manual for "**FLINT BISHOP AIRPORT LANDFILL COVER (CAP)"**. The Project Manual includes the specifications and the contract drawings (Drawings) for the project.

1.2 Definition of Construction Quality Assurance and Construction Quality Control

Construction Quality Assurance (CQA) and Construction Quality Control (CQC) are defined as follows:

A. CQA: A planned system of activities that provides assurance that the areas to be capped were constructed according to the approved design. CQA refers to measures taken by an engineer to assess if the installer or contractor is in compliance with approved design Specification and Contract Drawings.

B. CQC: A planned system of inspections that are used to directly monitor and control the quality of construction. The inspections are performed to determine compliance with the requirements for materials and workmanship as stated in the approved Specifications and Contract Drawings.

2.0 RESPONSIBILITIES, AUTHORITY, AND QUALIFICATIONS

2.1 Responsibility and Authority

2.1.1 Owner/Operator

The owner/operator is the State of Michigan, Department of Environment, Great Lakes, and Energy (EGLE). The responsibilities of the owner/operator include; complying with the requirements of EGLE, the approval of the final CQC/CQA document, and assuring the permitting agency that the cap was

constructed as indicated in the specifications and contract drawings. The owner/operator has the authority to select and to dismiss organizations charged with the design, construction and the CQA process.

2.1.2 Engineer (Professional)

The Engineer (Professional) is the company hired by the owner/operator to furnish the construction level design, drawings, contract drawings, and specifications for the capping of the indicated areas. The term “engineer” is used throughout this document to indicate the official representative of the design engineer. The specifications may refer to the “engineer” as the “professional”.

2.1.3 Construction Quality Assurance (CQA) Officer

The CQA Officer role shall be performed by a representative of the Owner. The CQA Officer shall provide oversight and potentially perform verification field tests to ensure the cap and other project components are constructed in accordance with the contract drawings and specifications. The CQA Officer will work closely with the CQC Officer. The CQA Officer has the responsibility to notify the owner/operator of all identified areas of non-conformance with the specifications and contract drawings.

2.1.4 Contractor

The Contractor is a company hired by the owner/operator to furnish all materials and services for the overall construction of the cap and has the responsibility for the completion of the construction project. The contractor’s responsibilities include the purchase of materials, entering into contracts with subcontractors, and having overall control over the construction operation including scheduling and coordination with the CQC.

Earthwork shall be performed by the Contractor. The Contractor’s responsibilities include grading the site to the lines, grades, and cross sections depicted on the construction drawings, providing all testing and testing data as required herein, and for constructing all components as indicated in the specifications and the contract drawings.

The Contractor is responsible for informing the CQC and CQA Officers of the scheduling, the occurrence of all construction activities, transport and storage of materials, and the placement and compaction of the materials.

2.1.5 Construction Quality Control (CQC) Officer

The CQC Officer is an independent third party representative hired by the contractor whose job it is to ensure that construction is taking place in accordance with the contract drawings and specifications as developed by the engineer. The CQC Officer shall provide overall coordination of documentation submitted in support of the CQC/CQA Plan.

2.1.6 Testing Laboratory

An independent geotechnical testing agency shall be hired by the contractor to perform CQC soil tests as indicated in this CQC/CQA Plan. The testing agency will obtain and analyze samples through the CQC Officer. The independent testing agency shall perform all field and laboratory testing.

2.2 Qualifications

The following qualifications are required of all parties involved with the design, installation and quality assurance for the construction of the final cover.

2.2.1 Engineer

The engineer (or sometimes referred to as the "Professional") shall be a Michigan registered and licensed professional engineer. The engineer shall have experience that demonstrates familiarity with landfill components, construction techniques, and documentation.

2.2.2 Construction Quality Assurance (CQA) Officer

The CQA Officer shall be a Michigan registered and licensed professional engineer. The CQA Officer shall have experience in landfill construction and have the proper technical, practical, managerial, and communication skills to provide oversight and coordination of the CQA program.

2.2.3 Contractor

The contractor shall be experienced in soil excavation, transportation, placement, compaction, geosynthetic clay liner (GCL) placement, and testing work. All construction employees shall be trained in hazardous waste operations per the requirements outlined in title 29 of the Code of Federal Regulation, Section 1910.120 and 29 of the Code of Federal Regulation, Section 1926.65.

2.2.4 Construction Quality Control (CQC) Officer

The CQC Officer shall be an experienced Michigan registered and licensed professional engineer having experience with earthen method construction techniques, liner installation techniques, equipment methods and abilities, scheduling of work, and the development of documentation.

2.2.5 Testing Laboratory

The independent geotechnical testing agency shall have experience in testing soils and shall be familiar with ASTM and ASHTO test methods. The testing agency shall be required to be responsive to project scheduling needs and shall provide results within a reasonable time.

3.0 PROJECT MEETINGS

3.1 Pre-Construction Meeting

A pre-construction meeting will be held prior to the commencement of construction. A site visit will be performed immediately following the meeting. The meeting shall include the parties involved in

construction including the owner/operator, the Flint Bishop Airport personnel, the engineer, the CQA Officer, the Contractor, the CQC Officer, and EGLE. The purpose of the meeting will be to begin the planning and coordination of work, to discuss all potential problems, and to review the CQC/CQA Plan to all parties involved. Special topics for the meeting shall include:

A. Critical design details as identified in the contract drawings, specifications and in the CQC/CQA Plan.
B. Develop a list of modifications to the CQC/CQA Plan; develop an addendum as needed.
C. The responsibilities of each party.
D. The lines of authority and methods of communication.
E. The methods for documenting, reporting, and distribution of documents.
F. The number and test locations required for soils, observation, sampling strategies.
G. Precautions to be taken to maximize bonding between lifts of compacted soil.
H. Submittal by contractor of a schedule for all operations, including phasing of the project and compliance with airport regulations and procedures.
I. Observe the existing site survey benchmarks and review methods for maintaining vertical and horizontal control.
J. Permit documentation requirements.
K. Conduct a site walk to review material storage locations.
L. Health and Safety Plan (HASP).
M. Submittal by contractor of the borrow source grain size analysis data.
N. Submittal of Work Plan and all other pre-construction submittals as detailed in the specifications.
O. Submittal by contractor of the types of equipment to be used and the purpose for each pay item.
P. Work stoppage due to weather or other conditions.
Q. Acceptance and rejection criteria.
R. Methods for storage and protection of construction equipment and materials.
S. Other items listed in the Specifications.

The meeting shall be documented by the engineer's representative and minutes transmitted to all parties. The CQC Officer must approve, and the engineer review/approve, the applicable submittals prior to the Contractor being given the approval to proceed with work.

3.2 Daily Progress Meetings

A progress meeting shall be held daily at the work area. At a minimum, the contractor field supervisor and the CQC Officer shall attend the meeting. Items to be evaluated at the meeting include the following:

A. A review of the proposed work activity and location for the calendar day.
B. A discussion of the contractor's personnel and equipment assignments for the calendar day.
C. A review of the previous calendar day's activities and accomplishments.
D. An evaluation of the schedule.
E. A discussion of problems/issues/solutions, including health and safety items.

F. Evaluation of all new test data.
G. Discuss data documentation requirements.

The above items for daily evaluation shall be noted on a daily field report prepared by the contractor.

3.3 Weekly Progress Meetings

Progress meetings shall be held weekly at the site or at another frequency approved by the CQA Officer, engineer, and EGLE. Representatives of the owner/operator, EGLE, airport, the Contractor, the CQC Officer, the CQA Officer, and potential representatives of the engineer will be invited to attend. Items to be evaluated at the meetings include the following:

A. A review of the proposed work activities performed for the prior two weeks and a summary of work to be performed for the following two weeks.
B. A review of quantities completed and proposed.
C. An evaluation of the schedule.
D. An evaluation of test data.
E. A review of submittals.
F. A discussion of project needs and potential resolutions.
G. Other items as specified in Section 01310 of the specifications.

The engineer shall create the meeting minutes which will be distributed to the attendees.

4.0 ORGANIZATION AND DOCUMENTATION REQUIREMENTS

4.1 Organization of the CQC/CQA Plan

Overall responsibility of carrying out the provisions of this CQC/CQA Plan is with the CQA Officer and the CQC Officer. The CQC Officer is responsible for verifying that construction is consistent with the contract drawings and specifications. The CQC Officer shall maintain a complete set of contract drawings and specifications, a copy of the CQA/CQC Plan, and a file of the required field documentation forms, addenda and other work related forms. The contractor personnel shall report to the CQC Officer for matters relating to the CQC/CQA Plan.

The testing agency is responsible to the CQC Officer. Test data shall be submitted directly to the CQC Officer. It is the responsibility of the CQC Officer to resolve all disputes between the testing agency and the contractor. All disputes and potential resolution shall be approved by the CQA Officer.

The CQA Officer is responsible for all modifications that may have to be made as the result of an identified problem or deficiency noted during construction. The CQC Officer is responsible for reporting all identified problem or deficiency to the CQA Officer.

4.2 Documentation

Documentation is the responsibility of the CQC Officer and the CQA Officer. The CQC Officer shall have the responsibility of providing the CQA Officer fully completed reports, forms, data sheets, and

checklists to document that all CQC/CQA Plan requirements have been carried out. The CQC Officer submitted reports shall include a statement that all quality assurance/quality control procedures have been met.

4.2.1 Daily Construction Reports

A daily construction report, using a contractor standardized form, shall be completed for each calendar day of work by the contractor superintendent and submitted to the CQC Officer and the CQA Officer on a weekly basis. The CQC Officer and the CQA Officer shall each prepare a report for any calendar day a site visit is made. The CQC Officer daily construction report shall include, at a minimum, the following:

A. Date, project name, company name, name of person who prepared the report.
B. The number and name of each employee and visitor on the site and the task assigned for each employee.
C. Time work started and ended each calendar day. Included should be all work stoppages due to inclement weather or other reasons. Reasons shall be documented and include the time period of the stoppage and recommencement of work.
D. Data on weather conditions including temperature, humidity, wind direction and speed, cloud cover and precipitation.
E. Contractors work force, type and quantity of equipment in use, and a list of materials delivered or removed from the job site.
F. Reference to the results of test data or comment on where results are located for review.
G. Notation on the quantity of laboratory samples collected, date submitted to the testing agency, and date of anticipated receipt of test data.
H. A record of communication with all parties.
I. A record of calibration of all equipment.
J. A log of truck tickets per calendar day. The log shall be kept with the tickets and shall indicate the date, truck number, tonnage of material, material source and type (e.g., subbase B-Borrow, etc.).

The reports must be approved for organization and content by the CQC Officer. The CQC Officer is responsible for ensuring all data is presented as required and in an accurate manner.

4.2.2 Forms, Checklists and Data Sheets

It is the responsibility of the CQC Officer to prepare, in advance, all forms, checklists or data sheets to allow for more expedient handling or organization of data, communications and routine observations. The CQA Officer prior to the start of all construction work must approve any form, checklist, or data sheet. These forms must be prepared in advance of the pre-construction meeting and brought to the pre-construction meeting for approval.

4.2.3 Problem/Deficiency Identification and Corrective Action

Problems or deficiency identification and corrective actions shall be documented in daily construction reports by the contractor superintendent when any construction method, material or activity is observed or tested that does not meet the requirements set forth in this CQC/CQA Plan. The reports

shall cross reference the forms, data sheets, checklists or other reports that contain data or observations leading to the determination of a problem or deficiency. Problem/deficiency identification and corrective action documentation may include the following:

A. A description of the problem or deficiency, including reference to any supplemental data or observations used to determine the problem or deficiency.
B. Location of the problem or deficiency, including how and when the problem or deficiency was discovered. In addition, an estimate of how long the problem or deficiency has existed should be included.
C. A recommended corrective action for resolving the problem or deficiency. If the corrective action has already been implemented, then the observations and documentation to show that the problem or deficiency has been resolved should be included. If it has not been resolved, then the report should clearly state that it hasn't been resolved.

If the problem or deficiency has not been resolved, the CQC Officer and the CQA Officer shall discuss the necessary actions to resolve the problem or deficiency as soon as possible.

The CQC Officer, working with the contractor personnel, shall determine if the problem or deficiency is an indication of a situation that might require changes to the contract drawings and specifications or the CQC/CQA Plan. If this situation develops, then a meeting shall be held on-site with the appropriate parties to determine if revisions will be required. The CQA Officer must approve all revisions to the contract drawings, specifications or the CQC/CQA Plan.

Stoppage of work may occur due to weather or other unforeseen conditions. It is the intent of this CQC/CQA Plan that stoppages shall be minimized to those caused by weather. Weather conditions that cause a work stoppage shall be documented in the contractor's daily construction report. Protective measures shall be applied to the work area by the contractor, under the direction of the CQC Officer, to prevent erosion or damage to the work surface due to the weather conditions. These corrective measures shall be documented in the daily construction report. The contractor shall repair all damages that occur with the repaired areas inspected by the CQC Officer to ensure compliance with this CQC/CQA Plan, the specifications and the contract drawings.

4.2.4 Construction Documentation Report

The CQC Officer shall prepare a Construction Documentation Report for submittal to the CQA Officer after the completion of the work. The report will contain all information summarizing the construction project as prepared by all contractor and CQC Officer personnel. At a minimum, the report shall contain the following information:

A. An entire set of contract drawings including as-built mark-ups documenting changes to the original design. This includes survey data.
B. All written correspondence with the permitting authorities.
C. Summary of all field observations, tests performed, laboratory samples collected, and test results reported by the testing agency.
D. Truck tickets and summary log.

E. Summary of all problems or deficiencies encountered during construction, including all recurring problems or deficiencies that were discovered.

F. Documentation that acceptance criteria were met, including comparison of procedure data with the contract drawings, specifications, and requirements set forth in this CQC/CQA Plan.

G. Certification by the CQC Officer that construction met the requirements of the contract drawings, specifications and the CQC/CQA Plan. The certification shall include the CQC Officer's Engineering Seal.

5.0 MATERIAL AND CONSTRUCTION REQUIREMENTS

5.1 LANDFILL EXCAVATION AND GRADING

The Contractor shall excavate and grade the site to meet the proposed landfill sub-base elevations as shown of the plans. Contractor shall place all excavated materials comingled with solid waste debris on top of the former landfill area within the cap limits.

Areas where solid waste has been exposed or where solid waste materials have been deposited should be uniformly graded, free from irregular surface changes, and then compacted using a sheepsfoot compactor or equivalent. All protruding surface objects or debris shall be either flattened or removed so that there are no protrusions extending above the final landfill sub-base elevations shown on the plans. The Contractor shall be responsible for placing a temporary cover consisting of wood chips, or clean (non-contaminated) soil, over areas with exposed waste so as to control erosion. The Contractor shall also meet the requirements in the Specifications.

5.2 LANDFILL SOIL SUBBASE CQA REQUIREMENTS

This section includes the CQA requirements for the placement, compaction, and grading of the general soils used for constructing the landfill subbase to be located beneath the landfill cap. All field tests, soil sample types, and survey measurements shall be recorded in daily construction reports by the contractor supervisor, under the authority of the CQC Officer, including locations and elevations of all field tests and laboratory sample points.

5.2.1 Pre-Construction

General soil placement shall be performed in accordance with the construction drawings and specifications. The CQC Officer shall be on-site at all time during the placement, compaction, or grading operations to observe and document the activities of the Contractor and to document compliance with the construction drawings, specifications, and the CQC/CQA Plan.

5.2.2 Construction

5.2.2.1 Materials of Construction

All landfill subbase material shall consist of soil, which may include previously placed Type II landfill household waste and demolition materials, obtained from on-site sources within the cap boundaries. Any solid waste that is excavated and redeposited, shall receive a cover soil of 12". The cover soils shall

be excavated from the area within the boundaries of the cap. No materials from an off-site source shall be authorized until approvals from the CQA and Engineer have been made. If off site soils are needed, the Contractor shall be responsible for identifying an off-site source, including any specified testing. The soil from an off-site source to be used as landfill subbase material shall be in accordance with the Specifications. The soil shall not include blast furnace slag or any hazardous substances. The Contractor shall be responsible for ensuring the material for subbase construction meets the testing requirements as set forth herein and in the Specifications.

5.2.2.2 Survey Requirements

Prior to construction, the engineer will provide on the horizontal control points, survey control points and temporary benchmarks , used for the design, for the contractor's use. This information will be provided to Contractor's surveyor, along with the electronic survey data in AutoCAD format. The Contractor shall transfer the line and grade from the engineer's controls as necessary to do the work. All discrepancies to the engineer performed survey work shall be immediately reported to the CQA Officer for clarification.

The Contractor shall verify locations of the survey control points, horizontal control points, and the temporary benchmarks prior to starting the work. All discrepancies shall be immediately reported to the CQC Officer and to the CQA Officer for clarification.

5.2.2.3 Testing Requirements

The following tests are required for soils used as landfill subbase material:

A. Laboratory Tests:

Routine laboratory testing shall be performed by the geotechnical testing agency, under the direction of the CQC Officer, on samples from the off-site borrow areas. The Contractor shall provide equipment and labor to assist the geotechnical testing agency in obtaining the samples. During landfill subbase construction, samples shall be obtained from the borrow area and tested according to the following frequency:

Test Method	Method No.	Frequency of Testing
Grain Size	ASTM D 422	One initial, then 1 per 5,000 tons; and again, if soil material changes
Moisture-Density Curve	ASTM D 1557	One initial, then 1 per 5,000 tons; and again, if soil material changes

All soil material change shall be reported immediately to the CQC Officer.

B. Field Tests:

The Contractor shall place and compact soil or refuse material as necessary to achieve required subgrades under the soil cover. Prior to any surface excavation activities, the Contractor shall submit his

proposed method of compaction to the CQA/Engineer for review. Refer to the Specifications for additional requirements.

The CQC Officer is responsible for providing the necessary documentation indicating how compaction was conducted in the Daily Construction Reports. The plans and Daily Construction Reports documenting subgrade compaction shall be a part of the Construction Document Report.

5.2.2.4 Placement and Grading Requirements

The CQC Officer shall observe construction work, including observation of the physical properties of the soils and soil surface.

The CQC Officer shall observe and document the placement and grading of the subbase soils to make certain that the work is in accordance with the contract drawings and specifications. All placement and compaction shall be accomplished in accordance with the following requirements:

A. Clear and grub all surface objects, trees, and other protruding objects that exist within the construction boundaries as noted on the contract drawings and specifications. Protect all utilities.

B. Place excavated solid waste brought to the surface on top of the landfill within the cap limits. Refer to Specifications for specific requirements. All solid waste shall be covered with a minimum of 12" of earthen materials. These earthen materials shall either come from existing cover soils within the cap boundaries or off-site sources, as approved by the Engineer.

C. The CQC Officer shall immediately notify the CQA Officer of the presence of potentially hazardous waste. The CQC Officer shall immediately have the potentially hazardous waste stored at a temporary storage area located at the project site outside of the immediate area of operation, after approval by the CQA Officer. The hazardous waste shall be stored on eight mil. thick visqueen and protected from the weather. Arrangements for testing and disposal will be coordinated/conducted by the CQA Officer and Engineer.

D. The cleared and grubbed vegetation including grasses, shrubs, and the trees, stumps, and logs that are less than two inches in diameter shall be placed on the top of the former landfill within the cap limits. This material shall be placed a minimum of 9 inches below the base elevation of the landfill cap.

E. The cleared and grubbed vegetation that exceeds two inches in diameter shall be processed into wood chips on-site at a location approved by the Engineer. The processed wood chips shall not exceed 4 inches in length. The processed wood chips shall be used as cover material and shall be placed over the areas where exposed solid waste has been excavated and/or placed. The thickness of the wood chips shall not exceed 8 inches in any location. The remaining wood chips that are not placed within the cap limits shall become the property of the Contractor. The Contractor shall be responsible for all costs associated with the removal and proper disposal of this material.

F. Undisturbed sound stumps, roots, and nonperishable solid objects located within the former landfill boundary which are a minimum of 9 inches below the base elevation of the landfill cap may be left, provided they are nearly flush as possible.

G. No frozen soils shall be used for backfilling. The Contractor shall remove all frozen soils. All areas to be backfilled shall be free of puddles or ponded water.

H. Place the subbase materials within the construction limits. The CQC Officer shall document the placement and grading of the subbase to make sure the work is performed according to the contract drawings and specifications. Lift thickness shall not exceed nine inches loose thickness.

I. All lifts shall be compacted with a sheepsfoot roller or equivalent, as required by the Specifications.

J. The surface of the subbase shall be proof-rolled and shall be free of deleterious debris, ruts, soft spots, yielding, or other unsuitable materials or conditions that can not be compacted. The final lift shall display a stability such that all equipment, such as dozer and loaded rubber tired trucks, which are used for constructing the cap, will not create ruts or displacement of the subbase surface.

K. Upon completion of subbase construction, the entire subbase shall be smooth drum, seal rolled to prevent ponding on the surface.

L. Upon completion of the landfill subbase construction and final grading the Contractor shall be responsible for protecting the surface until the landfill cap is placed. Any costs associated with the temporary protection and/or maintenance and repair of the surface are incidental to the contract.

M. The Contractor shall survey the final grade of the landfill subbase under the supervision of a Michigan licensed surveyor. Elevations will be obtained every 100 feet using the grid system established on the drawings and at the break lines. The Contractor shall submit the survey data to the CQA Officer for review prior to commencement of the construction of the landfill venting/gas collection layer. Failure to meet the indicated final elevations for the landfill subbase, as established on the plans, shall require contractor repair. The Contractor shall bear all costs associated with any and all additional resurveying of the landfill subbase material that is required.

N. Payment for placement and grading of the landfill subbase material shall be as provided in the Specifications.

O. All costs associated with the labor, materials, equipment, and appurtenances required to complete the required materials testing and surveying as set forth in the CQC/CQA Plan and the specifications shall be included in the lump sum price for “Site Services”.

5.2.2.5 Landfill Subbase Deficiencies and Resolution

If a deficiency is discovered during subbase construction, the CQC Officer shall immediately determine the extent and nature of the defect by additional testing, observation, review of data, or other appropriate means. The CQC Officer shall then discuss the conditions with the contractor and CQA Officer for deficiency resolution.

The Contractor shall be directed to correct the deficiency by the agreed upon resolution. After the Contractor corrects the deficiency, the CQC Officer shall inspect the area prior to the recommencement of subbase construction to document that the deficiency has been satisfactorily corrected.

5.3 STRUCTURAL FILL LAYER

This section includes the CQA requirements for the placement, compaction, and grading of the structural fill material. All field tests, soil sample types, and survey measurements shall be recorded in daily construction reports by the contractor supervisor, under the authority of the CQC Officer, including

locations and elevations of all field tests and laboratory sample points. The Contractor requirement is to place a 8 inch thick layer of structural fill as indicated in the contract drawings and specifications.

5.3.1 Pre-Construction

Placement of the structural fill material shall be performed in accordance with the contract drawings and specifications. The CQC Officer shall be on-site at all time during the placement, compaction, or grading operations to observe and document the activities of the contractor and to document compliance with the contract drawings, specifications, and the CQC/CQA Plan.

The contractor shall construct the structural fill layer to the lines, grades, and cross sections shown on the contract drawings.

5.3.2 Construction

5.3.2.1 Materials of Construction

All structural fill material shall be taken from an off-site borrow The Contractor shall be responsible for identifying an off-site source. The off-site source shall be approved in writing by the CQA Officer prior to the material being brought on-site. The soil from an off-site source to be used as structural fill shall be in accordance with MDOT Class IIA as noted in the 2012 MDOT Standard Specifications, Section 902. The soil shall not include blast furnace slag or any hazardous substances. No more than 10% of the material shall pass a number 200 sieve. The Contractor shall be responsible for ensuring the material for structural fill meets the testing requirements as set forth herein and in the specifications.

No structural fill material shall be placed that contains organic matter, roots, large rocks, and other foreign objects. If the material becomes unsuitable, the CQC Officer shall immediately stop the transport of this material and notify the CQA Officer.

5.3.2.2 Testing Requirements

The following tests are required for the structural fill material:

A. Laboratory Tests:

The geotechnical testing requirements for the structural fill material and the testing frequencies are identified in the following table.

Test Method	Method No.	Frequency of Testing	
		On-Site Borrow Pit	Off-Site Borrow
Grain Size	ASTM D 422	One initial and then per soil material change	One initial and then per soil material change
Moisture-Density Curve	ASTM D 1557	One initial and then per soil material change	One initial and then per soil material change

If a change in material is observed, the CQC and CQA Officers shall be immediately informed. The previously identified geotechnical tests shall be performed by the independent geotechnical testing agency under the authority of the CQC Officer. The results shall be submitted to the CQA Officer for approval. Refer to the Specifications for chemical testing required.

B. Field Tests:

Test methods during structural fill layer construction are summarized as follows:

Test Method	Method No.	Frequency of Testing(min.)
Density	ASTM D 2922	5 tests per acre per lift distributed evenly
Moisture	ASTM D 2922	5 tests per acre per lift distributed evenly

After each field test, the CQC Officer shall ensure the sampling location is filled with structural fill material and is tamped into place. The CQC Officer shall inspect the sampling location to ensure a smooth surface exists that meets the compaction criteria.

All sampling locations shall be staggered between lifts. The purpose is to prevent the creation of a more preferential pathway for water migration.

The above field tests shall be performed by the geotechnical testing agency under the authority of the CQC Officer. The CQC Officer is responsible for providing the necessary documentation indicating test locations and depths on plan and in the Daily Construction Reports. The plans and Daily Construction Reports documenting field test locations shall be a part of the Construction Document Report. The Contractors work shall be coordinated with the CQC Officer to allow for sampling by the geotechnical testing agency.

5.3.2.3 Placement and Grading Requirements

The CQC Officer shall observe construction work, including observation of the physical properties of the soils and soil surface. The contractor shall remove boulders, cobbles, roots, and other objects larger than 1/2 inches in diameter.

The CQC Officer shall observe and document the placement and grading of the structural fill materials to make certain that the work is in accordance with the contract drawings and specifications. All placement and compaction shall be accomplished in accordance with the following requirements:

A. Obtain CQC Officer approval of the landfill subbase layer prior to commencement of placement of the structural fill layer.
B. The soil used for the structural fill layer shall be free of organic matter, roots, large rocks, pockets of permeable materials and other foreign objects. No frozen soils shall be used. The structural fill layer shall be protected from freezing.
C. Place the structural fill material where identified on the drawings or specifications. The CQC Officer shall document the placement and grading of the structural fill material to make sure the work is performed according to the contract drawings and specifications. The structural fill layer shall be a minimum of 9 inches in thickness.

D. The material shall be compacted to a minimum of 95% of the maximum dry density as determined by the Modified Proctor Test (ASTM D 1557), unless stated otherwise in the specifications or drawings. The Contractor shall be responsible for ensuring adequate compaction is achieved over the entire surface.

E. Upon completion of placement of the structural fill, the Contractor shall be responsible for all costs associated with the replacement of all or any portion of the structural fill that does not meet the specifications.

F. The CQC Officer shall observe and document the thickness of the structural fill material.

G. Payment for placement of the structural fill material shall include all costs associated with proof rolling, grading, excavating, loading, transporting, placing, and compacting the structural fill soil in accordance with the requirements set forth herein and in the CQC/CQA Plan and shall be paid for at the contract price for "Structural Fill".

H. All costs associated with the labor, materials, equipment, and appurtenances required to complete the required materials testing and surveying as set forth in the CQC/CQA Plan and the specifications shall be included in the lump sum price for "Site Services".

5.3.2.4 Structural Fill Layer Deficiencies and Resolution

If a deficiency is discovered during structural fill layer construction, the CQC Officer shall immediately determine the extent and nature of the defect by additional testing, observation, review of data, or other appropriate means. The CQC Officer shall then discuss the conditions with the contractor and CQA Officer for deficiency resolution.

The Contractor shall be directed to correct the deficiency by the agreed upon resolution. After the contractor corrects the deficiency, the CQC Officer shall inspect the area prior to the recommencement of the placement of the structural fill material to document that the deficiency has been satisfactorily corrected.

5.4 GRANULAR VENTING AND DRAINAGE LAYERS

This section includes the CQA requirements for the placement, compaction, and grading of the granular soil materials used for constructing the landfill cap venting/drainage layer. All field tests, soil sample types, and survey measurements shall be recorded in daily construction reports by the contractor supervisor, under the authority of the CQC Officer, including locations and elevations of all field tests and laboratory sample points. The contractor requirement is to place a twelve inch thick layer of granular material as indicated in the contract drawings and specifications.

5.4.1 Pre-Construction

Placement of the granular soil material shall be performed in accordance with the contract drawings and specifications. The CQC Officer shall be on-site at all time during the placement, compaction, or grading operations to observe and document the activities of the contractor and to document compliance with the contract drawings, specifications, and the CQC/CQA Plan.

The Contractor shall construct the landfill venting/drainage layer to the lines, grades, and cross sections shown on the contract drawings.

5.4.2 Construction

5.4.2.1 Materials of Construction

The granular soil used to construct the granular venting/drainage layer shall have an in-place hydraulic conductivity of $1x10^{-3}$ cm/sec or greater.

The Contractor shall be responsible for identifying a source of this granular material. The Contractor shall be responsible for performing the required geotechnical testing to demonstrate that the granular material meets the testing requirements as set forth herein and in the specifications. The off-site source shall be approved in writing by the CQA Officer prior to the material being brought on-site.

No granular material shall be placed that contains organic matter, roots, large rocks, and other foreign objects. If the material becomes unsuitable, the CQC Officer shall immediately stop the transport of this material and notify the CQA Officer.

5.4.2.2 Testing Requirements

The following tests are required for the granular soil material:

A. Laboratory Tests:

The geotechnical testing requirements for the granular material and the testing frequencies are identified in the following table.

Test Method	Method No.	Frequency of Testing
		Off-Site Borrow
Grain Size	ASTM D 422	One per 10,000 Cubic Yards or when soil material change
Moisture-Density Curve	ASTM D 1557	None
Lab Hydraulic Conductivity (Remolded samples)	ASTM D 2434	One per 10,000 Cubic Yards

If a change in material is observed, the CQC and CQA Officers shall be immediately informed. The previously identified geotechnical tests shall be performed by the independent geotechnical testing agency under the authority of the CQC Officer. The results shall be submitted to the CQA Officer for approval.

B. Field Tests:

Test methods during granular material venting layer construction are summarized as follows:

Test Method	Method No.	Frequency of Testing
Density	ASTM D 2922	None.

Test Method	Method No.	Frequency of Testing
Lab Hydraulic Conductivity	ASTM D 2434	1 per every 5 acre.
Grain Size	ASTM D 422	1 per every 5 acre

After each field test, the CQC Officer shall ensure the sampling location is filled with granular material tamped into place. The CQC Officer shall inspect the sampling location to ensure a smooth surface exists.

The above field tests shall be performed by the geotechnical testing agency under the authority of the CQC Officer. The CQC Officer is responsible for providing the necessary documentation indicating test locations and depths on plan and in the Daily Construction Reports. The plans and Daily Construction Reports documenting field test locations shall be a part of the Construction Document Report. The Contractors work shall be coordinated with the CQC Officer to allow for sampling by the geotechnical testing agency.

5.4.2.3 Placement and Grading Requirements

The CQC Officer shall observe construction work, including observation of the physical properties of the soils and soil surface. The contractor shall remove boulders, cobbles, roots, and other objects larger than 1/2 inches in diameter.

The CQC Officer shall observe and document the placement and grading of the granular soils to make certain that the work is in accordance with the contract drawings and specifications. All placement and compaction shall be accomplished in accordance with the following requirements:

A. Obtain CQC Officer approval of the subgrade prior to commencement of construction of the venting layer.
B. The soil used for the venting/drainage layer shall be free of organic matter, roots, large rocks, pockets of permeable materials and other foreign objects. No frozen soils shall be used. The venting layer shall be protected from freezing.
C. Place the granular material within the Cap boundaries. The CQC Officer shall document the placement and grading of the granular material to make sure the work is performed according to the contract drawings and specifications. The venting/drainage layer shall be 12 inches in thickness.
D. The material shall be compacted during placement with standard tracked equipment (i.e., bull dozer) and then proof rolled smooth prior to placing geosynthetic clay liner. Proof rolling is not required for the drainage layer. The Contractor shall be responsible for ensuring adequate and consistent compaction is achieved over the entire surface
E. Upon completion of granular material venting/drainage layer construction, the Contractor shall be responsible for all costs associated with the replacement of all or any portion of the granular material venting/drainage layer that does not have a maximum hydraulic conductivity of at least 10^{-3} cm/sec.
F. The CQC Officer shall observe and document the thickness of the granular material venting/drainage layer. Two soil borings, or other means as determined by the CQA Officer, per acre shall be collected to verify the thickness of the material.

G. Payment for placement of the granular material venting/drainage layer shall include all costs associated with proof rolling, grading, excavating, loading, transporting, placing, and compacting the granular material/soil from Contractor designated source in accordance with the requirements set forth herein and in the CQC/CQA Plan and shall be paid for at the contract price for "Granular Material".

H. All costs associated with the labor, materials, equipment, and appurtenances required to complete the required materials testing and surveying as set forth in the CQC/CQA Plan and the specifications shall be included in the lump sum price for "Site Services".

I. The entire completed granular venting/drainage layer shall be maintained by the contractor during the time frame between the completion of the venting/drainage layer and the installation of the overlying geosynthetic clay liner or general fill.

5.4.2.4 Granular Venting Layer Deficiencies and Resolution

If a deficiency is discovered during granular venting layer construction, the CQC Officer shall immediately determine the extent and nature of the defect by additional testing, observation, review of data, or other appropriate means. The CQC Officer shall then discuss the conditions with the contractor and CQA Officer for deficiency resolution.

The contractor shall be directed to correct the deficiency by the agreed upon resolution. After the contractor corrects the deficiency, the CQC Officer shall inspect the area prior to the recommencement of the placement of the granular material to document that the deficiency has been satisfactorily corrected.

5.5 GEOSYNTHETIC CLAY LINER (GCL)

This section includes the specification and CQA/CQC requirements for the placement and installation of the geosynthetic clay liner (GCL) in accordance with the Drawings and as specified in this section. In the event that the GCL Manufacturer's specifications are stricter than those listed herein, the stricter specifications shall apply.

5.5.1 REFERENCES

AMERICAN SOCIETY FOR TESTING AND MATERIALS

ASTM D 4643	Determination of Water (Moisture) Content of Soil by Microwave Oven Method
ASTM D 4632	Standard Test Method for Grab Breaking Load and Elongation of Geotextiles
ASTM D 5084	Standard Test Method for Measurement of Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter
ASTM D 5261	Standard Test Method for Measuring Mass Per Unit Area of Geotextiles
ASTM D 5321	Determining the Coefficient of Soil and Geosynthetic or Geosynthetic and Geosynthetic Friction by the Direct Shear Method
ASTM D 5887	Measurement of Index Flux Through Saturated Geosynthetic Clay Liner Specimens Using a Flexible Wall Permeameter
ASTM D 5888	Standard Guide for Storage and Handling of Geosynthetic Clay Liners
ASTM D 5889	Standard Practice for Quality Control of Geosynthetic Clay Liners

ASTM D 5890	Standard Test Method for Swell Index of Clay Mineral Component of Geosynthetic Clay Liners
ASTM D 5891	Standard Test Method for Fluid Loss of Clay Component of Geosynthetic Clay Liners
ASTM D 5993	Standard Test Method for Measuring Mass Per Unit of Geosynthetic Clay Liners
ASTM D 6102	Standard Guide for Installation of Geosynthetic Clay Liners
ASTM D 6243	Standard Test Method for Determining the Internal and Interface Shear Resistance of Geosynthetic Clay Liner by the Direct Shear Method
ASTM D 6496	Standard Test Method for Determining Average Bonding Peel Strength Between the Top and Bottom Layers of Needle-Punched Geosynthetic Clay Liners
ASTM D 6768	Standard Test Method for Tensile Strength of Geosynthetic Clay Liners
ASTM E 96	Standard Test Methods for Water Vapor Transmission of Materials

5.5.2 PRECONSTRUCTION

5.5.2.1 SUBMITTALS

Submit the following to the CQA Officer prior to construction:

A. Drawings: Panel layout with seam locations and details for approval before material shipment.

B. Instructions: Installation details distinctive to manufacturer's product.

C. Statements: Experience information for the following, as specified in this Section.

1. Manufacturer's experience information for approval before material shipment.
2. Installer's experience information for approval before material shipment.

D. Test Reports: Quality control testing reports before material shipment, as specified in Source Quality Control in this Section.

E. Field Test Reports: Field Technical Service reports during installation and before acceptance as specified in Field Quality Control of this Section.

F. Certificates

1. Suppliers and manufacturer's certificates for approval before material shipment, as specified in Quality Control of this Section.
2. Site preparation certificate before start of installation as specified in Quality Control of this Section.

5.5.2.2 Quality Control

A. Manufacturer's Qualifications

1. Production and in service use of GCL products for not less than 3 years.

2. At least 10 million square feet of needle punched GCL product has been manufactured and installed in the past 3 years.

B. Installer's Qualifications: Has installed at least 1 million square feet of GCL products by both company and its field representative.

C. Certifications:

1. Manufacturer's and supplier's certificates for the GCL.
2. Installer's certificate that site subgrade preparation is acceptable for GCL installation.

5.5.3 GCL MATERIALS

A. The GCL shall meet the following requirements, including those requirements specific to the GCL manufacturer, whichever is stricter:

1. The GCLs shall consist of a layer of natural sodium bentonite clay encapsulated between two geotextiles and laminated to a thin flexible membrane liner. The GCL shall comply with all of the criteria listed in this Section.
2. The bentonite used in the manufacture of the GCL must meet the testing and acceptance criteria listed in GCL Technical Specification Table. The testing shall be performed on the materials obtained from the finished GCL product.
3. The bentonite shall be sandwiched between the geotextiles that are needle punched together. No glues or adhesives may be used in lieu of the needle punch.
4. The finished GCL shall be demonstrated to meet or exceed all of the testing procedures and acceptance criteria listed in Table 6.2.3.
5. Six inch minimum overlap marks shall be marked longitudinally on both sides of the GCL by the manufacturer to assist in obtaining proper overlap.

GCL TECHNICAL SPECIFICATIONS TABLE			
Material Property	**Test Method**	**Test Frequency, ft2 (m2)**	**Required Values**
Bentonite Swell Index	ASTM D 5890	1 per 50 tonnes	24 mL/2g min.
Bentonite Fluid Loss	ASTM D 5891	1 per 50 tonnes	18 mL max.
Bentonite Mass/Area	ASTM D 5993	40,000ft^2 (4,000 m^2)	0.75 lb/ft^2 (3.6 kg/m^2) min @ 0% moisture
GCL Tensile Strength	ASTM D 6768	200,000ft^2 (20,000 m^2)	30 lbs/in (53 N/cm) MARV
GCL Peel Strength	ASTM D 6496	40,000 ft^2 (4,000 m^2)	1 lbs/in (1.75 N/cm) min.
GCL Index Flux	ASTM D 5887	Periodic	1 x 10^{-9} m^3/m^2/sec max.
GCL Hyd. Conductivity	ASTM D 5887 or ASTM D 5084	Periodic	5 x 10^{-10} cm/sec max.
GCL Hydrated Internal Shear Strength	ASTM D 5321 or ASTM D 6243	Periodic	150 psf (7.2kPa) typ.
Roll Dimension	Typical	Every roll	15 foot x 125 foot, min.*

*Use of shorter length rolls shall be permitted, as approved in writing by the CQA officer, except that the area of shorter roll material shall be no greater than 5% of the cap area. Other exceptions are mentioned in this section.

5.5.3.1 Source Quality Control

A. Furnish factory quality control test data on rolls to be shipped for bentonite mass per unit area, swell index and fluid loss.

B. Furnish factory quality control test data on rolls to be shipped for GCL properties listed in GCL Specifications Table.

5.5.3.2 Acceptable Manufactures

A. CETCO - Bentomat® 600CL.

B. Solmax – Bentoliner® NS.

C. Or Engineer approved alternate.

5.5.4 CONSTRUCTION

5.5.4.1 Delivery, Storage, and Handling of GCL

A. Handling: During all stages of shipping, handling, and storage of these materials, care must be taken to prevent puncturing of other damage to the rolls, and to protect against wetting of the rolls. Manufacturer is responsible for the loading, Contractor is responsible for unloading in accordance with the GCL manufacturer's methods/guidelines. If damage to the GCL occurs, the CQA Officer shall be notified immediately, and the material shall be repaired per the GCL manufacturer's recommendation, or replaced, if deemed necessary by the CQA Officer.

B. Identification Requirements: Using indelible marking, identify each roll with:

1. Name of manufacturer
2. Lot number
3. Dimensions (thickness, length, width and weight).
4. Roll number
5. Date of fabrication

C. Packing and Storage Requirements:

1. Storage of the GCL rolls shall be the responsibility of the Installer. A dedicated storage area shall be selected at the job site that is away from high traffic areas and is level, dry and well drained.
2. Rolls should be stored in a manner that prevents sliding or rolling from the stacks and may be accomplished by the use of chock blocks. Rolls should be stacked at a height no

higher than that at which the lifting apparatus can be safely handled (typically no higher than four).

3. All stored GCL materials and the accessory bentonite must be covered with a plastic sheet or tarpaulin until their installation.
4. The integrity and legibility of the labels shall be preserved during storage.

5.5.4.2 Project Conditions

A. Weather Constraints: The GCL must be installed and covered under dry conditions, which is defined as no standing water or wet or muddy soils.

5.5.4.3 Handling and Placement

A. The GCL may be deployed as follows:

1. Deploy GCL in strict accordance with good construction practice, manufacturer's installation guidelines, and in such a manner as to prevent any damage to the material.
2. Place panels with non-woven and thin polyethylene liner side up.
3. Place GCL from the highest to lowest elevation to facilitate drainage in the event of precipitation and place panels parallel to the direction of the slope.
4. At the top of sloped areas a minimum 50' runout shall be utilized or other equivalent method as approved by the CQC Officer and Design Engineer
5. For deployment, insert a steel support pipe through the roll core. Attach the slings or lifting chains at one end of the support pipe and at the other end to the bucket of a front end loader or lifting device. A spreader bar shall be used to support and spread the slings. The bar and support pipe must be long enough to prevent drainage to the edges.
6. All GCL panels shall lie flat on the underlying surface, with no wrinkles or folds, especially at the exposed edges of the panels.
7. GCL rolls shall not be released on the slope and allowed to unroll freely by gravity.
8. Soil cover shall be placed in a manner that prevents the soil from entering the GCL overlap zones. Soil cover shall be pushed up slopes, not down slopes, to minimize tensile forces on the GCL.
9. Only as much GCL as can be covered at the end of the day shall be deployed, or such amount that can be covered in a reasonably short time in the event of precipitation.

5.5.4.4 Field Seams

A. Panel Layout: Contractor shall provide drawings identifying location of all panels and seams.

B. Preparation

1. Clean dust and dirt from areas to become seam interfaces.
2. Keep sheet dry.

C. Seaming Methods

1. Once the first run has been laid, lay adjoining runs with a 6 inch minimum overlap on the longitudinal seams and 24 inches on end seams. Overlap shall be free from wrinkles, folds or "fish mouths."
2. Remove all dirt, gravel or other debris from the overlap area.
3. Place seam overlap on the bottom such that the direction of flow is from the top sheet to the bottom to form a shingle effect.
4. On slopes, maintain continuous runs from crest to toe with the GCL longitudinal direction running perpendicular to the toe. Ensure proper runout beyond the crest.
5. Orient seams perpendicular to the toe of the slope at all times. End seams (seams that are parallel to the toe) near the base of the slope must be a minimum of 5 feet away from the toe, for slopes less than 1V:4H. For slopes greater than or equal to 1V:4H, no end seams are allowed.
6. In the event a roll end seam or joint cannot be avoided and occurs on a slope less than 1V:4H, construction adhesive shall be used in the lap area, with the overlap increased to 3 feet in a rainlap orientation.
7. Where recommended by the GCL manufacturer, place granular bentonite along all seams and overlap areas from the panel edge to the lapline at a minimum rate of a quarter pound per lineal foot.

5.5.4.5 Pipe Penetrations and Repair

A. Sealing Penetrations

1. Pack granular bentonite sealing compound provided by the manufacturer, around the circumference of the pipe.
2. Slit panel with a "pie" configuration where the pipe is to protrude, and place the panel over the penetration.
3. Place additional bentonite around the cut edges.
4. Place an additional skirt of GCL over the penetration to prevent the bentonite from being displaced.

B. Damage Repair

1. Appropriately mark rolls or pieces damaged during shipping, handling or deployment, or those with manufacturing flaws in the material. Set aside or remove damaged materials from the site to avoid use.
2. Where material rips or tears on the slope, make repairs by exposing the affected area, removing all foreign objects or soil, and by then placing a patch over the damaged area with a minimum overlap of 12 inches on all edges.
3. Place accessory bentonite between the patch and the repaired material at a rate of one quarter pound per lineal foot of edge, spread in a 6-inch width. Patch seams shall be secured with a non toxic, water soluble adhesive glue as approved by the Contractor, the CQC Officer, and the GCL manufacturer.

4. Remove prematurely hydrated (greater than 30%) GCL from the site and provide new material at no additional cost to the Owner.

5.5.5 Protection of GCL

A. To prevent premature hydration or contraction during hot or arid conditions, install only the amount of GCL that can be placed, inspected, repaired and covered in the same day.

B. Cover the GCL with temporary liners or earthen cover soils on the same day of placement, except at edges, as dictated by the project requirements.

C. Cover any panels of GCL left unprotected with a heavy, waterproofing tarp, which is adequately secured and protected with sand bags or other ballast.

D. No vehicles shall drive on the GCL until proper cover has been placed to the GCL manufacturer's specified depth.

E. Areas that are inadvertently exposed to standing water or excess precipitation and allowed to hydrate prior to being covered shall be examined for damage by subsequent activities. If it is determined by the Engineer or CQC Officer that the GCL has been hydrated and damaged, the GCL shall be covered with new material.

F. Any GCL material exposed to hydrocarbon fuels, chemicals, pesticides, non-compatible leachates, or other harmful liquids during the installation, shall be removed and replace or covered with non-affected material.

G. Any damaged areas noted must be repaired and brought to the attention of the CQA and CQC Officers.

5.5.6 Field Quality Assurance

A. Cooperate with the efforts and schedules of the work performed by the Contractor's Quality Control Manager.

B. The Contractor shall:

1. Observe each roll of liner material for defects.
2. Review the manufacturer's quality control certificate for each roll delivered to the site.
3. Conduct photographic documentation of the GCL installation.
4. Keep a logical record of documentation of GCL installation. This will include panel placement log, inspection log, and GCL repair log.

5.5.7 Field Quality Control

A. Provide liner manufacturer technical representative at job site for two days when GCL installation begins to ensure compliance with installation directions.

B. Contractor shall observe all installation of GCL and report daily progress to the CQA and CQC Officers.

5.5.8 Measurement and Payment

A. Payment for placement of the GCL shall include all costs associated with obtaining transporting, placing, and testing the GCL in accordance with the requirements set forth herein and in the CQC/CQA Plan and shall be paid for at the contract price for "Geosynthetic Clay Liner".

5.6 GRANULAR DRAINAGE LAYER

This section includes the CQA requirements for the placement, compaction, and grading of the granular soil materials used for constructing the landfill drainage layer. All field tests, soil sample types, and survey measurements shall be recorded in daily construction reports by the contractor supervisor, under the authority of the CQC Officer, including locations and elevations of all field tests and laboratory sample points. The contractor requirement is to place a twelve inch thick layer of granular material as indicated in the contract drawings and specifications. The contractor placing the granular drainage material shall have placed a minimum of at least 1 million square foot of soil material over a geoysnthetic clay liner or other type of flexible membrane liner.

5.6.1 Pre-Construction

Placement of the granular soil material shall be performed in accordance with the contract drawings and specifications. The CQC Officer shall be on-site at all time during the placement, compaction, or grading operations to observe and document the activities of the contractor and to document compliance with the contract drawings, specifications, and the CQC/CQA Plan.

The contractor shall construct the landfill drainage layer to the lines, grades, and cross sections shown on the contract drawings.

5.6.2 Construction

5.6.2.1 Materials of Construction

The granular soil used to construct the landfill drainage layer shall have a hydraulic conductivity of $1x10^{-3}$ cm/sec or greater.

The Contractor shall be responsible for identifying a source of this granular material. The Contractor shall be responsible for performing the required geotechnical testing to demonstrate that the granular material meets the testing requirements as set forth herein and in the specifications. The off-site source shall be approved in writing by the CQA Officer prior to the material being brought on-site.

No granular material shall be placed that contains organic matter, roots, large rocks, and other foreign objects. If the material becomes unsuitable, the CQC Officer shall immediately stop the transport of this material and notify the CQA Officer.

5.6.2.2 Testing Requirements

The following tests are required for the granular soil material:

A. Laboratory Tests:

The geotechnical testing requirements for the granular material and the testing frequencies are identified in the following table.

Test Method	Method No.	Frequency of Testing
		Off-Site Borrow
Grain Size	ASTM D 422	One per 10,000 Cubic Yards or when soil material change
Lab Hydraulic Conductivity (Remolded samples)	ASTM D 2434	One per 10,000 Cubic Yards

If a change in material is observed, the CQC and CQA Officers shall be immediately informed. The previously identified geotechnical tests shall be performed by the independent geotechnical testing agency under the authority of the CQC Officer. The results shall be submitted to the CQA Officer for approval.

B. Field Tests:

Test methods during granular material drainage layer construction are summarized as follows:

Test Method	Method No.	Frequency of Testing
Lab Hydraulic Conductivity (Remolded samples)	ASTM D 5084	1 per every 5 acre.
Grain Size	ASTM D 422	1 per every 5 acre

After each field test, the CQC Officer shall ensure the sampling location is filled with granular material tamped into place. The CQC Officer shall inspect the sampling location to ensure a smooth surface exists that meets the compaction criteria.

All sampling locations shall be staggered between lifts.

The above field tests shall be performed by the geotechnical testing agency under the authority of the CQC Officer. The CQC Officer is responsible for providing the necessary documentation indicating test locations and depths on plan and in the Daily Construction Reports. The plans and Daily Construction Reports documenting field test locations shall be a part of the Construction Document Report. The Contractors work shall be coordinated with the CQC Officer to allow for sampling by the geotechnical testing agency.

5.6.2.3 Placement and Grading Requirements

The CQC Officer shall observe construction work, including observation of the physical properties of the soils and soil surface. The contractor shall remove boulders, cobbles, roots, and other objects larger than 1/2 inches in diameter.

The CQC Officer shall observe and document the placement and grading of the granular soils to make certain that the work is in accordance with the contract drawings and specifications. All placement and compaction shall be accomplished in accordance with the following requirements:

A. Obtain CQC Officer approval of the geosynthetic clay liner prior to commencement of construction of the drainage layer.
B. The soil used for the drainage layer shall be free of organic matter, roots, large rocks, pockets of permeable materials and other foreign objects. No frozen soils shall be used. The drainage layer shall be protected from freezing.
C. Place the granular material within the Cap boundaries. The CQC Officer shall document the placement and grading of the granular material to make sure the work is performed according to the contract drawings and specifications. The drainage layer shall be a twelve inches in thickness.
D. Soil shall be placed with low ground pressure equipment that minimizes the stress on the liner. A minimum of twelve inches of soil shall be placed prior to any equipment being allowed over the top of the geosynthetic clay liner. The use of heavy pressure rubber tired vehicles (i.e., pick-up trucks), scrapers or pans directly over the liner is strictly prohibited. Soil placed on sloped areas shall be pushed up-slope to minimize tension on the geosynthetic clay liner.
E. A minimum of thickness of twenty inches of cover material shall be required in frequently high-traffic areas or roadways. No heavy vehicles or equipment should be driven directly on the geosynthetic clay liner until the proper thickness of cover has been placed.
F. Upon completion of granular material drainage layer construction, the Contractor shall be responsible for all costs associated with the replacement of all or any portion of the granular material drainage layer that does not have a maximum hydraulic conductivity of at least 10^{-3} cm/sec.
G. The CQC Officer shall observe and document the thickness of the granular material drainage layer. Two soil borings/probes/depth markers per acre shall be collected to verify the thickness of the material. Care shall be used to ensure that the soil borings/probes do not damage the underlying liner.
H. Payment for placement of the granular material drainage layer shall include all costs associated with proof rolling, grading, excavating, loading, transporting, placing, and compacting the granular soil from Contractor designated source in accordance with the requirements set forth herein and in the CQC/CQA Plan and shall be paid for at the contract price for “Granular Material”.
I. All costs associated with the labor, materials, equipment, and appurtenances required to complete the required materials testing and surveying as set forth in the CQC/CQA Plan and the specifications shall be included in the lump sum price for “Site Services”.

5.6.2.4 Granular Drainage Layer Deficiencies and Resolution

If a deficiency is discovered during granular drainage layer construction, the CQC Officer shall immediately determine the extent and nature of the defect by additional testing, observation, review of data, or other appropriate means. The CQC Officer shall then discuss the conditions with the contractor and CQA Officer for deficiency resolution.

The contractor shall be directed to correct the deficiency by the agreed upon resolution. After the contractor corrects the deficiency, the CQC Officer shall inspect the area prior to the recommencement of the placement of the granular material to document that the deficiency has been satisfactorily corrected.

5.7 GENERAL FILL LAYER

This section includes the CQA requirements for the placement, compaction, and grading of the general fill material, which will be placed over the top of the drainage layer. All field tests, soil sample types, and survey measurements shall be recorded in daily construction reports by the contractor supervisor, under the authority of the CQC Officer, including locations and elevations of all field tests and laboratory sample points. The contractor requirement is to place a 12 inch thick layer of general fill as indicated in the contract drawings and specifications.

5.7.1 Pre-Construction

Placement of the general fill material shall be performed in accordance with the contract drawings and specifications. The CQC Officer shall be on-site at all time during the placement, compaction, or grading operations to observe and document the activities of the contractor and to document compliance with the contract drawings, specifications, and the CQC/CQA Plan.

The contractor shall construct the general fill layer to the lines, grades, and cross sections shown on the contract drawings.

5.7.2 Construction

5.7.2.1 Materials of Construction

All general fill material shall be taken from the an off-site borrow pit. No borrow from an off-site source shall be authorized for placement until the proposed subgrade elevation for general fill have been met. The Contractor shall be responsible for identifying an off-site source. The off-site source shall be approved in writing by the CQA Officer prior to the material being brought on-site. The soil from an off-site source to be used as general fill shall be Material free from organic matter, masonry, metal, sharp objects, boulders, snow, and ice and shall have no solid material larger than 2 inches in its largest dimension. MDOT Class IIA soils are acceptable. The soil shall not include blast furnace slag or any hazardous substances. The Contractor shall be responsible for ensuring the material for general fill meets the testing requirements as set forth herein and in the specifications.

No general fill material shall be placed that contains organic matter, roots, large rocks, and other foreign objects. If the material becomes unsuitable, the CQC Officer shall immediately stop the transport of this material and notify the CQA Officer.

5.7.2.2 Testing Requirements

The following tests are required for the general fill material:

A. Laboratory Tests:

The geotechnical testing requirements for the general material and the testing frequencies are identified in the following table.

Test Method	Method No.	Frequency of Testing	
		On-Site Borrow Pit	Off-Site Borrow
Grain Size	ASTM D 422	One initial and then per soil material change	One initial and then per soil material change
Moisture-Density Curve	ASTM D 1557	None	None

If a change in material is observed, the CQC and CQA Officers shall be immediately informed. The previously identified geotechnical tests shall be performed by the independent geotechnical testing agency under the authority of the CQC Officer. The results shall be submitted to the CQA Officer for approval.

B. Field Tests:

Test methods during general fill layer construction are summarized as follows:

Test Method	Method No.	Frequency of Testing
Density	ASTM D 2922	None
Moisture	ASTM D 2922	None

5.7.2.3 Placement and Grading Requirements

The CQC Officer shall observe construction work, including observation of the physical properties of the soils and soil surface. The contractor shall remove boulders, cobbles, roots, and other objects larger than 2 inches in diameter.

The CQC Officer shall observe and document the placement and grading of the general fill materials to make certain that the work is in accordance with the contract drawings and specifications. All placement shall be accomplished in accordance with the following requirements:

A. Obtain CQC Officer approval of the granular drainage layer prior to commencement of placement of the general fill layer.

B. The soil used for the general fill layer shall be free of organic matter, roots, large rocks, pockets of permeable materials and other foreign objects. No frozen soils shall be used. The general fill layer shall be protected from freezing.

C. Place the general fill material within the 3 Cap boundaries. The CQC Officer shall document the placement and grading of the general fill material to make sure the work is performed according to the contract drawings and specifications. The general fill layer shall be 12 inches in thickness.

D. Soil shall be placed with low ground pressure equipment (i.e., standard tracked low ground pressure equipment such as a small bull dozer) to minimize the stress on the liner. The use of scrapers or pans directly over the liner is strictly prohibited. Soil placed on sloped areas shall be pushed up-slope to minimize tension on the geosynthetic clay liner.

E. A minimum of thickness of twenty inches of cover material shall be required in frequently high-traffic areas or roadways. No heavy vehicles or equipment should be driven directly on the geosynthetic clay liner until the proper thickness of cover has been placed.

F. Upon completion of placement of the general fill layer, the Contractor shall be responsible for all costs associated with the replacement of all or any portion of the general fill layer that does not meet the specifications.

G. The CQC Officer shall observe and document the thickness of the general fill material. Two soil borings/probes per acre shall be collected to verify the thickness of the material.

H. The Contractor shall survey the final grade of the general fill material layer under the supervision of a Michigan licensed surveyor. Elevations will be obtained every 100 feet and at the break lines. The Contractor shall submit the survey data to the CQA Officer for review prior to commencement of the placement of the compost amended soil I.

I Payment for placement of the general fill material shall include all costs associated with proof rolling, grading, excavating, loading, transporting, placing, and compacting the general fill soil in accordance with the requirements set forth herein and in the CQC/CQA Plan and shall be paid for at the contract price for “General Fill”.

J. All costs associated with the labor, materials, equipment, and appurtenances required to complete the required materials testing and surveying as set forth in the CQC/CQA Plan and the specifications shall be included in the lump sum price for “Site Services”.

5.7.2.4 General Fill Layer Deficiencies and Resolution

If a deficiency is discovered during general fill layer construction, the CQC Officer shall immediately determine the extent and nature of the defect by additional testing, observation, review of data, or other appropriate means. The CQC Officer shall then discuss the conditions with the contractor and CQA Officer for deficiency resolution.

The contractor shall be directed to correct the deficiency by the agreed upon resolution. After the contractor corrects the deficiency, the CQC Officer shall inspect the area prior to the recommencement of the placement of the granular material to document that the deficiency has been satisfactorily corrected.

5.8 OTHER CONSTRUCTION REQUIREMENTS

Other construction requirements exist as noted in the contract drawings and specifications that are outside of the scope of this CQC/CQA Plan. Refer to the contract drawings and specifications for specific information in regard to these other construction requirements.

6.0 METHOD OF MEASUREMENT

The CQA / CQC Plan will not be measured for payment. "Material Testing for Landfill" will not be measured for payment.

7.0 BASIS OF PAYMENT

No separate payment will be made for the CQC/CQA plan as outlined above. Adherence to the plan will be included in the payment at the contract unit price of the geosynthetic clay liner. This will include all materials, equipment, labor and appurtenances required to complete the outlined work. "Site Services" will be paid for at a contract lump sum price for all testing and surveying as required by these specifications.

APPENDIX X
SESC MANUAL

SOIL EROSION AND SEDIMENTATION CONTROL MANUAL

March 2021

MDOT

Michigan Department of Transportation

CONSTRUCTION FIELD SERVICES DIVISION

Attention Department Users

This manual will no longer be printed and distributed to individual users. It can be found on the Michigan Department of Transportation's webpage at MDOT - Manuals & Guides.

FOREWORD

This manual has been developed to aid Michigan Department of Transportation (MDOT) personnel in the selection and application of adequate and efficient soil erosion and sedimentation control (SESC) measures during project development and delivery. The information provided by this manual is used in conjunction with the Standard Specifications for Construction; the project plans and proposal; and other Department publications. When considered as a whole, these documents satisfy the requirement for MDOT as an Authorized Public Agency under Part 91 of Public Act 451 of 1994, Natural Resources and Environmental Protection Act, as amended to develop, implement and enforce approved soil erosion and sedimentation control procedures.

This 2021 edition incorporates input from design, construction, and maintenance staff in Lansing, region offices and the TSCs and the Michigan Department of Environment, Great Lakes, and Energy (EGLE); new and revised legislation; and improved construction materials and processes. This document is formatted to allow revised pages to be easily substituted. It may be necessary to retain superseded pages for reference on projects which have been advertised prior to the date revisions are implemented (ref. Standard Specifications for Construction, subsection 101.01).

The information in this manual is subject to continuous review and evaluation. All revisions to this manual must be approved by EGLE prior to implementation. Comments and questions should be directed to the Environmental Field Services Engineer (EFSE). This manual provides guidance to administrative, engineering, and technical staff. Engineering practice requires that professionals use a combination of technical skills and judgment in decision making. Engineering judgment is necessary to allow decisions to account for unique site-specific conditions and considerations to provide high quality products, within budget, and to protect the public health, safety, and welfare. This manual provides the general operational guidelines; however, it is understood that adaptation, adjustments, and deviations are sometimes necessary. Innovation is a key foundational element to advance the state of engineering practice and develop more effective and efficient engineering solutions and materials. As such, it is essential that our engineering manuals provide a vehicle to promote, pilot, or implement technologies or practices that provide efficiencies and quality products, while maintaining the safety, health, and welfare of the public. It is expected when making significant deviations from the technical information from these guidance materials, that reasonable consultations with experts, technical committees, and/or policy setting bodies occur prior to actions within the timeframes allowed. It is also expected that these consultations will eliminate any potential conflicts of interest, perceived or otherwise. MDOT Leadership is committed to a culture of innovation to optimize engineering solutions.

The National Society of Professional Engineers Code of Ethics for Engineering is founded on six fundamental canons. Those canons are provided below.

Engineers, in the fulfillment of their professional duties, shall:

1. Hold paramount the safety, health, and welfare of the public.
2. Perform services only in areas of their competence.
3. Issue public statement only in an objective and truthful manner.
4. Act for each employer or client as faithful agents or trustees.
5. Avoid deceptive acts.

6. Conduct themselves honorably, reasonably, ethically and lawfully to enhance the honor, reputation, and usefulness of the profession.

AUTHORIZED PUBLIC AGENCY - POLICY STATEMENT

MDOT is aware of our responsibilities to preserve the natural resources of the State of Michigan when providing transportation services. MDOT's Mission Statement, and more specifically, the Vision Statement, recognizes this responsibility.

MDOT Mission Statement: Providing the highest quality integrated transportation services for economic benefit and improved quality of life.

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TERMINOLOGY USED IN THIS MANUAL

In addition to the terms defined in subsection 101.02 of the *MDOT Standard Specifications for Construction* the terms defined here are used in this manual.

Construction Project	A project that is administered and completed by Department construction staff or by a consultant on behalf of the Department. Construction projects may include a full set of plans or may be log projects. Used to differentiate from a maintenance project.
Contract Agency	County or other local unit of government with which MDOT has entered into a contract for provision of specific functions generally related to the maintenance of state-owned roadways.
Department	As used in this document, Department refers to the Michigan Department of Transportation (MDOT).
Earth Change	A man-made change in the natural cover or topography of land including cut and fill which may result in or contribute to soil erosion or sedimentation. The term includes, but is not limited to, clearing, grading, excavating and filling activities (a.k.a. earth disturbance).
Earth Change Plan (ECP) or Soil Erosion And Sedimentation Control Plan	A document that meets all requirements of Part 17 rule R 323.1703. The elements of this plan may be incorporated throughout the construction contract documents or the plan may be a stand-alone document for projects that do not involve preparation of a full set of plans. (e.g., log project or maintenance projects/activities).
Soil Erosion and Sedimentation Control (SESC) Measure or Best Management Practice (BMP)	Any of the specific measures described in this manual, section 208 of the Standard Specifications for Construction or other contract documents; designed, constructed, and maintained to reduce or control soil erosion or off-site sedimentation. SESC measures may be constructed devices or construction practices intended to minimize soil erosion and off-site sedimentation.
Floodplain	An area of land adjoining a river or stream that will be inundated by a 1 percent chance (100 year) flood. (ref: MDOT Drainage Manual, Section 2.9.10.3)
Limits of Earth Disturbance	Unless stated otherwise in the contract documents, the limits of earth disturbance will extend ten feet beyond the slope stake line except in areas adjacent to wetlands where the earth disturbance limits will be at the slope stake line.
Log Project	Straightforward and uncomplicated construction or maintenance project for which a full set of plans is not prepared, relying instead on sketches,

	written narrative and other information, in the proposal. If an earth change plan is required for a log project, this will also be included in the proposal. The project log is a contract document. (ref. MDOT Road Design Manual, Section 1.04)
Maintenance Project	A project that is administered and completed by Department maintenance staff or by a contract agency on behalf of the Department. Maintenance projects are typically limited in scope and impact and are often log projects. Used to differentiate from a construction project.
Maintenance Activity	Routine work performed by MDOT direct forces or by a contract agency for the purpose of extending the useful life and ensuring the safe condition of the transportation infrastructure.
Part 31 Inspector	Certified construction storm water operator authorized to conduct inspections as required by Part 31 of Act 451.
Part 91 Inspector	An individual with certification whose responsibilities include ensuring that MDOT maintenance projects/activities and construction projects comply with Part 91 of Act 451.
Part 91 Rules	Terminology generally used in this manual when referring to Part 91 of Act 451 and the Part 91 Rules.
Private Party	Permitted entity that is not a governmental agency and not a utility as defined by the Standard Specifications for Construction. Used in the context of permitted work on MDOT right-of-way.
Stabilization	The establishment of vegetation or the proper placement, grading, or covering of soil to ensure its resistance to soil erosion, sliding, or other earth movement.
Wetland	Land characterized by the presence of water at a frequency and duration sufficient to support and under normal circumstances does support wetland vegetation or aquatic life. Wetland area may be commonly referred to as a bog, fen, swamp or marsh. Consult with Region or Lansing central office staff, if necessary, for wetland designation.

1. INTRODUCTION

EGLE has designated the MDOT as an Authorized Public Agency (APA) under Part 91, Soil Erosion and Sedimentation Control, of Public Act 451 of 1994, Natural Resources and Environmental Protection Act, as amended (hereinafter referred to as Act 451). This status is evaluated on a region-by-region basis through an audit process conducted by EGLE. SESC program audits generally take place on a five-year cycle. As an APA, preparation and approval of individual project specific soil erosion and sedimentation control permits is not required. In return, MDOT accepts responsibility for enforcement of the Department's program and procedures related to soil erosion and sedimentation control. The mechanism for enforcement is through the implementation of this manual, the Standard Specifications for Construction and all other contract documents.

The information and direction provided in this manual satisfies the Part 91 requirement for MDOT to have a documented program and adequate procedures to comply with applicable soil erosion and sedimentation control regulations. To ensure continued APA status, earth change activities on MDOT right-of-way, regardless of size or location, will be conducted in accordance with Part 91, the rules promulgated thereunder, this manual, and all related MDOT manuals and guides.

It is important that all MDOT personnel support the Department's commitment to minimize soil erosion and off-site sedimentation as part of the overall environmental stewardship responsibility accepted by the Department. This is accomplished, in part, by compliance with and enforcement of all contract documents, performance guides and manuals.

1.1 Applicable Laws and Administrative Rules

Act 451 requires various environmental measures to be enacted throughout the life of state transportation projects and activities to ensure that issues related to a healthy environment are appropriately considered. Act 451 includes several parts, two of which (Part 31 and Part 91) govern the soil erosion and sedimentation control procedures described in this manual. The remaining parts of Act 451 involve project specific permits such as those related to floodplains; inland lakes and streams; wetlands; dam safety; shoreline protection; Great Lakes submerged lands; and sand dunes.

1.1.1 Part 31, Water Resources Protection - Part 31 of Act 451 addresses the protection and conservation of the water resources of the state. This includes prohibition of pollution of the waters of the state by storm water runoff carrying sediment from earth change activities.

Part 21 Wastewater Discharge Permit of the state administrative rules contains the administrative rules promulgated for Part 31 of Act 451. These rules were promulgated to implement amendments to Act 451 that authorized the state wastewater discharge permit system compatible with the National Pollutant Discharge Elimination System (NPDES). Whenever this document references NPDES regulations or rules this is construed to mean Part 31 and the rules promulgated thereunder.

NPDES rule R 323.2190(2)(e) requires construction sites disturbing one or more acres of land to undergo NPDES inspections with documentation of these inspections kept on file by MDOT for a period of at least three years from the date of the inspection.

1.1.2 Part 91, Soil Erosion and Sedimentation Control - The primary intent of Part 91 of Act 451 is to protect the waters of the state and adjacent properties by minimizing soil erosion and controlling sediment.

Part 17 Soil Erosion and Sedimentation Control of the state administrative rules contains the administrative rules promulgated for Part 91 of Act 451. Whenever this document references SESC regulations or rules this is construed to mean Part 91 and the rules promulgated thereunder. In general, the term "Part 91 rules" is used in this manual to refer to both the regulations and the rules governing soil erosion and sedimentation control.

SESC rule R 323.1704(1) requires soil erosion and sedimentation control permits for earth change projects which disturb one or more acres of land, and/or is within 500 feet from the water's edge of a lake or stream. MDOT's APA status supersedes the individual permit process provided that the Department enforces soil erosion and sedimentation control procedures approved by EGLE.

1.2 MDOT's Soil Erosion and Sedimentation Control Program

This manual represents one facet of MDOT's overall soil erosion and sedimentation control program. The overall program consists of commitment to environmental stewardship responsibilities; appropriate staff training; specifications and project plans that address erosion control issues; and preparation and/or enforcement of earth change plans as required.

1.2.1 Environmental Stewardship Commitment - The commitment to fully support the activities necessary to maintain APA status is embodied in the MDOT mission statement and vision statement. MDOT is committed to complying with the procedures outlined in this manual and other EGLE permit conditions throughout all phases of project development (planning and design) and delivery (construction and maintenance).

A proactive approach is necessary to effectively minimize erosion from disturbed areas thereby reducing resulting off-site sedimentation. Whenever practicable, stronger contract language; stronger enforcement of this contract language; and better inspection, documentation and follow-up will be implemented to reach this goal.

Project/activity specific inspection and maintenance of soil erosion and sedimentation controls are the responsibility of MDOT and the Contractor. If deficiencies are documented, MDOT will notify the Contractor of the deficiency and work to bring the site into compliance within five days from the date of the notice, or other time frame stated in the notice. A discharge to a surface water of the state will be addressed no later than 24 hours of the inspection.

1.2.2 SESC (Part 31 and 91) Training – Individuals responsible for administering and enforcing Part 31 and 91 through MDOT's SESC program must complete both EGLE-sponsored Construction Stormwater Operator (CSWO) training and the SESC Plan Review and Design (PRD) examination. The CSWO certification must be obtained prior to taking the SESC PRD class. These individuals may prepare to take the examination through either a self-study course using materials available from the EGLE or by completing a training class offered by EGLE. Refer to section 1.2.4 for additional information on recertification.

Administering and enforcing the MDOT program consists of quality assurance oversight; preparation of standards and specifications related to SESC; and preparing and reviewing construction and maintenance project plans involving earth change activities.

At a minimum, SESC program administrators within MDOT include the following positions:

- CFS Resource Specialist
- Design Project Managers
- Construction Engineers and assistants
- Region Resource Analysts/Specialists
- Region Soils Engineers
- Transportation Technicians
- Maintenance Supervisors/Coordinators
- Operations Engineers
- Cost and Scheduling Engineers
- Aeronautics Project Managers; and
- Transportation Maintenance Workers (9 level)

The EGLE-sponsored SESC PRD examination for program administrators covers the following topics:

- Requirements for Administering and Enforcing Part 91 Programs
- Soils, Erosion, and Runoff
- SESC Plan Review Document Exercises

Exception for SESC Inspectors: Individuals responsible only for conducting SESC inspections, including enforcing MDOT standards and specifications to ensure continued site compliance during earth change operations, will complete the EGLE-sponsored CSWO Inspector exam. SESC Inspectors are responsible for ensuring that SESC measures are implemented and maintained according to the plans, procedures and specification requirements and that the prescribed measures are effective in minimizing soil erosion and preventing off-site sedimentation. SESC Inspectors may order a contractor or in-house staff to install or maintain any control measures identified on the plans or in established Activity Guides in the case of maintenance operations. If the prescribed SESC measures included on the plans or performance guides are not effective, the SESC Inspector will seek the advice and assistance of an individual who has completed the SESC PRD exam.

The EGLE-sponsored certification program for SESC inspectors consists of general instruction on sedimentation and erosion control issues including the following topics:

- Storm Water Runoff, Soil Erosion: Processes and Impacts
- Controlling Runoff, Erosion, and Sedimentation on Construction Sites
- Vegetative Stabilization
- Plan Development, Information Sources, Plan Review and Inspections
- Laws, Rules and Inspections Pertinent to CSWO Inspectors

1.2.3 Specifications and Project Plans – MDOT has a series of contract documents and procedures in the form of specifications and project plans that address erosion control issues. In conjunction with this manual other contract documents include the Standard Specifications for Construction, Road and Bridge Standard Plans and project specific

plans which are used to conduct the SESC program during the execution of MDOT construction projects.

1.2.4 Recertification - The Construction Field Services Resource Specialist will notify the Region Soils Engineer and Region Resource Specialist in November of each year of those MDOT staff that their certifications will expire the following July and are required to be renewed as required by the EGLE.

Certification for either the CSWO or the SESC PRD is valid for five years. Completing the recertification process, for the level of recertification sought, is required for renewal. Recertification for the CSWO is achieved by submitting an EGLE provided renewal form. CSWO certification is a prerequisite to the SESC PRD certification. Recertification for the SESC PRD will be complete upon attending the refresher course and submitting the proper recertification form to EGLE.

1.2.5 Earth Change Plan - An earth change plan conforming to rule R 323.1703 will be prepared by MDOT for projects and activities involving earth changes that are not covered by the approved procedures in this manual. The elements of this plan may be incorporated throughout the MDOT contract documents or the ECP document may be a stand-alone document for projects and activities that do not involve preparation of a full set of plans. At this time, the only exception to this requirement is ditch clean-out (Activity 1230) when this activity is conducted according to MDOT-approved work methods.

The Contractor is required to develop an earth change plan for earth change activity undertaken outside the limits of earth disturbance but within the right-of-way. This earth change plan must be submitted on form 1568, Approval for Project Staging or Excess Material Locations on MDOT ROW. The Engineer will review all earth change plans submitted by the Contractor to determine if all requirements of rule R 323.1703 are addressed and that the plan is effective. This form must be reviewed and approved before the Contractor is allowed to begin any earth change activity in the area between the limits of earth disturbance and the right-of-way. Construction Field Services will enter the earth change plan in MiWaters.

NOTE: The Contractor is required to develop an earth change plan unless the only earth change activity undertaken outside the limits of earth disturbance is within the clearing limits as specified by subsection 201 of the Standard Specifications for Construction and as shown on the plans. However, adequate measures must be implemented and maintained to effectively prevent or reduce erosion and subsequent off-site sedimentation that may result from this activity.

1.3 Key MDOT Organizational and Procedural Definitions

This manual is organized to complement MDOT's Development and Operations structure. The development organization consists of staff dedicated to planning, obtaining right-of-way, and designing construction projects. The operations organization consists of staff overseeing or performing construction and maintenance of the highway system.

During a construction project, construction staff is responsible for contract administration and oversight of private construction firms or vendors (hereinafter referred to as Contractors) performing highway/bridge projects. These projects are constructed in conformance with the MDOT Standard Specifications for Construction, which states: *"It is the responsibility of the*

Contractor to take such measures as may be necessary and comply with all federal, state and local laws and regulations for the protection of the public health, safety, welfare, and environment in the performance of the work." The Contractor is further bound by contract language to comply with all such laws and regulations throughout the life of the project, including the installation and maintenance of temporary soil erosion control measures and the installation of permanent measures. (Ref. Standard Specifications for Construction subsections 107.01, 107.15 and 208.03).

This contractual obligation placed on the Contractor does not diminish MDOT's ultimate responsibility under Act 451 for minimizing soil erosion and reducing the subsequent off-site sedimentation to the maximum extent practicable during construction of our transportation system.

A maintenance project/activity may be completed by MDOT maintenance forces, contract agencies, or Contractors with oversight provided by maintenance staff. This work includes the installation and maintenance of temporary erosion control measures on maintenance projects. Maintenance staff is also responsible for maintaining permanent erosion control measures along all state highways after a construction project or a maintenance project contract is closed out.

1.3.1 Contract Documents - For MDOT projects, the term 'contract documents' used throughout this manual is construed as, *"The written agreement between the Department and the Contractor setting forth the obligations of the parties for the performance of and payment for the prescribed work. The contract includes the advertisement for bids, bidding document, progress schedule, contract form, contract bonds, standard specifications, supplemental specifications, special details, standard plans, plans, proposal, addenda, notice of award, … "and* other documents as applicable. (Ref. Standard Specifications for Construction, subsection 101.03)

This manual is included by reference in the standard specifications and is therefore a contract document. The E&S Details in this manual may be modified within special details, plans, the proposal, or other contract documents to meet site-specific field conditions for a given project.

1.3.2 Project Manager - The 'Project Manager' referenced in this document is the person responsible for developing the contract documents. By signing the title page of the plans, the Project Manager and Construction Engineer are recommending approval of the contract documents to the Director or designee of MDOT. All project managers responsible for developing construction or maintenance contract documents will complete the EGLE-sponsored SESC (Part 91) PRD Training.

1.3.3 Engineer - The 'Engineer' referenced in this document is defined in the Standard Specifications for Construction as: "*The Director of the Department or the Engineer designated by the Director, acting directly or through authorized representatives, who is responsible for engineering supervision of the construction...*" (Ref. Standard Specifications for Construction, subsection 101.03). The Engineer assigned responsibility for a specific project is the TSC Construction Engineer for the geographic area in which the project is located. The Construction Engineer assigns engineers and technicians as authorized representatives to perform inspection and testing on all projects.

1.3.4 MDOT Construction Permits - Non-MDOT work performed by others on MDOT right-of-way requires a permit from MDOT to occupy the right-of-way. In accordance with

definitions contained in the Part 91 rules, an applicant for a utility or other governmental agencies engaged in construction in a public right-of-way is considered to be the landowner for purposes of obtaining and complying with a soil erosion permit, when applicable, from the appropriate enforcing agency (municipal or county). Information related to SESC and storm water management requirements is provided with each application package. (Ref. Construction Permit Manual and Act 368)

Utility companies and private parties performing utility/driveway work under an MDOT permit to occupy the right-of-way must minimize soil erosion and off right-of-way sedimentation. It is the responsibility of the appropriate MEA or CEA to enforce compliance with Act 451 on those projects.

1.4 Related MDOT Documents

This manual includes the procedures for establishing soil erosion and sedimentation controls for earth change activities regulated under Part 31 and Part 91 of Act 451 resulting from the construction, maintenance and operation of the state transportation system. MDOT is committed to the careful consideration and implementation of these procedures during the planning, design and completion of all operations that involve earth change activities.

References are made in this manual to other MDOT publications as well as to specific parts of relevant environmental statutes. Due to the volume of information necessary for MDOT to carry out its mission and the need to stay current with changing laws, rules and engineering technology, no attempt is made to reproduce all related MDOT documents in this manual. Where reference is made in this manual to related MDOT procedures and publications, the portions of those documents that address soil erosion and sedimentation control are considered to be included as if they were repeated here in their totality. Where practical, cross references are specifically listed in this manual. If information, direction, or procedures related to soil erosion and sedimentation control contained in related documents is less restrictive than Part 91, or this manual, then Part 91 and this manual will take precedence.

For projects let under the Standard Specifications for Construction, this manual is considered a contract document. The Contractor is obligated to conform to the information and guidance provided herein and all site specific soil erosion and sedimentation control measures included in the contract documents.

At a minimum, the following MDOT documents contain specifications, standards and/or practices related to soil erosion and sedimentation control and are referenced herein.

1.4.1 MDOT Standard Specifications for Construction - Contains the current written directions, provisions and requirements pertaining to performance of work on MDOT projects. It is the base document controlling a project. The standard specifications may be modified by supplemental specifications and special provisions contained in the contract documents.

- Section 107 Legal Relations and Responsibilities to the Public
- Section 108 Prosecution and Progress
- Section 109 Measurement and Payment
- Section 201 Clearing
- Section 205 Roadway Earthwork
- Section 208 Soil Erosion and Sedimentation Control
- Section 813 Slope Protection
- Section 816 Turf Establishment

- Section 916 Erosion and Sedimentation Control Materials
- Section 917 Turf and Landscaping Materials

1.4.2 Standard Plans - Drawings approved for repetitive use, showing details to be used where appropriate for the construction of road and bridge appurtenances.
- R-96 Series - Soil Erosion and Sedimentation Control Measures
- R-100 Series - Seeding and Tree Planting

1.4.3 Road Design Manual - Provides criteria for the design of roads and for the preparation of road plans.
- Subsection 2.02.03.F Erosion Control
- Subsection 10.04.04.B Drainage and NPDES Runoff Controls
- Subsection 10.04.04 C Soil Erosion and Sedimentation Control

1.4.4 Drainage Manual - Gives the design engineer a basic working knowledge of hydrology, hydraulics and storm water management.
- Subsection 9.1.2 Soil Erosion and Sedimentation Control

1.4.5 Storm Water Management Plan - The SESC program is directly related to the MDOT storm water management program as one of six minimum measures required for compliance with the statewide permit issued to MDOT under Part 31 of Act 451. Section 3.5 of the Storm Water Management Plan contains a discussion of the SESC program in the context of storm water control to minimize sediment load to the waters of the state during the construction and operation of MDOT facilities.

1.4.6 Planisware Preconstruction Process Documentation Manual - Documents the Department's preconstruction process as it pertains to construction project development. The preconstruction process begins with the preliminary planning for projects and ends with the construction contract award.
- Task 3710 Develop Required Mitigation
- Task 3720 Submit Environmental Permit Applications
- Task 3730 Obtain Environmental Permits

1.4.7 Construction Manual - Guide detailing the authority and responsibility for project administration. Provides instructions on project management, construction surveying, construction inspection and materials sampling.
- Section 103 Work Orders
- Section 201 Clearing
- Section 205 Roadway Earthwork
- Section 208 Soil Erosion and Sedimentation Control

1.4.8 Construction Permit Manual - Guidance on procedures for administering the permit process for public utility or private party work on, or use of, the trunkline right-of-way within the provisions of federal and state laws.

1.4.9 Maintenance Activity Guides - These guides describe the equipment, materials and recommended work methods for various maintenance activities.

1.4.10 EGLE Soil Erosion and Sedimentation Control Training Manual - While not an MDOT publication, this training manual contains useful information on the proper selection, design and construction of SESC measures. The training manual is available from the EGLE website.

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2. PROJECT DEVELOPMENT

Project Development involves the planning, design and acquisition of real estate, if required, for the project.

2.1 Planning Phase

Effective erosion control begins in the planning phase of a project. Areas with unstable or transportable soils, such as loess soils, alluvial fans, and some glacial deposits are potential problem areas for erosion during construction. Identification of these soil types is a necessary prerequisite to selecting erosion control measures for a project. If applicable, soil borings and reports will be reviewed, and field investigations conducted during the planning phase of a project to identify these areas. Information on the potential for a given soil to erode can be found in county soil surveys and by contacting the local Conservation District office or the Central Office Geotechnical staff.

During the planning phase of a project, areas susceptible to damage from excessive sedimentation will also be identified. Some examples are rivers, impoundments, irrigation systems, lakes, streams, and wetlands. Cropland, home sites, and other developed areas will also be considered.

Each construction project is subject to one of three types of early preliminary engineering analysis during the planning phase depending on the nature of the project and the anticipated social, economic, and environmental impacts and necessary mitigation. These reviews establish the environmental clearances required from federal, state, and/or local resource agencies. Recommended erosion control measures will be incorporated into the contract documents during the design phase for implementation in the construction phase.

2.1.1 Categorical Exclusion - The basic review level is a Categorical Exclusion. This review considers actions that individually or cumulatively do not involve significant environmental impacts. They are actions that:

- Do not induce significant impacts to planned growth or land use;
- Do not require the relocation of significant numbers of people;
- Do not have a significant impact on any cultural, natural, recreational, historic, or other resources;
- Do not involve significant air, noise, or water quality impacts; and,
- Do not have a significant impact on travel patterns.

2.1.2 Environmental Assessment - The next level of review is an Environmental Assessment. This review is considered a decision document. The assessment is performed when there is uncertainty as to the significance of the impacts of a particular project. The assessment considers the project need, alternatives considered, impacts, and comments and coordination with the Federal Highway Administration (FHWA) and the public. If a Finding of No Significant Impact is received from FHWA, the project proceeds. If significant impacts are found, the project moves to the Environmental Impact Statement process.

2.1.3 Environmental Impact Statement - The highest, most comprehensive, level of review is an Environmental Impact Statement (EIS). This review considers multiple studies and analyses with extensive involvement of environmental resource agencies throughout the review. The final EIS reports on the environmental impacts and mitigation necessary for

the particular project. A Record of Decision is required from the FHWA for a project to proceed. The EIS process is a comprehensive environmental analysis of the purpose of and need for the project; the potential transportation solutions by considering corridors with various alignments, and a detailed environmental analysis of a recommended alternative.

For major new alignment projects undergoing the EIS environmental process the alignment and grade, especially at stream crossings, will be carefully considered in an attempt to minimize SESC and NPDES concerns. The alignment of a highway may be shifted to eliminate or minimize encroachment into a surface water environment. A change in grade may be made to avoid exposing highly erodible soils.

Proposed alignment and grade changes need to be consistent with highway safety criteria and should be made to blend and fit the highway to the natural landscape. This will minimize the extent of cut and fill during construction and reduce future erosion related maintenance problems. In designing the project's line and grade, it is important that ground water and surface water be allowed to pass through the highway right-of-way or be intercepted with minimal disturbance to streams and without causing erosion problems.

Whenever practical, stream crossings will be made at stable reaches of a stream where straight banks are evident and there are no meanders. The direction and amount of water flowing at various stages must be considered in locating hydraulic openings to avoid excessive scour and erosion problems. To reduce the potential for these problems, stream crossings and encroachments should be kept to a minimum.

2.2 Design Phase

Projects are designed to minimize earth disturbances with emphasis placed on areas with highly erodible soils and areas adjacent to lakes, streams, and wetlands. The Planisware Preconstruction Process Documentation Manual discusses specific responsibilities for development of soil erosion and sedimentation controls as they relate to recommended mitigation measures.

Each region has designated staff responsible for identifying locations and quantities for erosion control measures for projects in the region. Soil erosion and sedimentation control items of work must be practical, reasonable and effective during the construction phase of a project to prevent off-site sedimentation and ensure adequate protection of the waters of the state.

The project manager will review environmental mitigation commitments and EGLE permits and will consult with appropriate staff to ensure that additional erosion control measures, pay items, or quantities are included to protect specific areas with highly erodible soils and areas adjacent to lakes, streams, and wetlands. Staff available to the project manager for this consultation includes Region Soils Engineers, Drainage Engineers, and Resource Analyst/Specialists along with Construction Field Services staff including the Resource Specialist and the Grading and Drainage Engineer. The project manager will refer to Chapter 9 of the MDOT Drainage Manual for additional design and placement considerations for the various temporary and permanent soil erosion and sedimentation control measures to be incorporated into a project. The contract documents will clearly indicate the location for all appropriate measures.

MDOT Standard Plan R-96 Series Soil Erosion and Sedimentation Control Measures serves as the key to the soil erosion and sedimentation control measures typically used by MDOT. The

Soil Erosion and Sedimentation Control (E&S) Details include a brief discussion of appropriate use and application of the measures. The soil erosion and sedimentation control key numbers from Standard Plan R-96 Series associated with pay items will be shown on the plan sheets in the general location where the measure is to be placed in the field. Standard Plan R-96 Series and the E&S Details are included in Section 6 of this manual.

For a log project, the need for erosion control measures will be considered; appropriate erosion control pay items included as required; and an earth change plan prepared for those log projects involving earth change activities.

The success of erosion control and sediment collection during construction is highly dependent on the measures specified in the contract documents and available for use in the field. By providing a sufficient quantity of erosion control measures with clearly written specifications for their use and payment, MDOT will more readily fulfill the commitment to prevent off right-of-way sedimentation.

2.2.1 Earth Change Plan - Projects/activities that involve an earth disturbance are required by rule R 323.1703 to have a soil erosion and sedimentation control plan that includes the following information:

- Scaled drawing of the work site
- Legal description (town, range and section number)
- Site location sketch
- Proximity to lakes and streams
- Predominant land features (including wetlands)
- Slope descriptions or contour intervals
- General description of soil types
- Physical limits of each proposed earth change
- Drainage and/or dewatering features
- Timing and sequence of earth change
- Location and description for installing and removing all proposed temporary SESC measures
- Descriptions and location of temporary and permanent soil erosion control measures
- Maintenance plan for soil erosion control measures

This information is included as part of the plan set and other contract documents for construction projects. When there is no set of plans, as for log projects and some maintenance projects/activities, this information will be included in the proposal (log projects), or in the MDOT-approved work methods for a specific earth change activity (maintenance projects). In certain circumstances the earth change plan will be a stand-alone document prepared by MDOT or the Contractor. (Refer to chapter 3 of this manual)

An example of an earth change plan that complies with the SESC rules is included in the Appendix of this manual.

2.2.2 Principles of Earth Change Plan Preparation - Three general principles apply when developing the earth change plan for a project.

- Erosion prevention is generally more effective than sediment control.
- Sediment control is generally more effective and less costly than repairing damage caused by uncontrolled sediment.

- Specific erosion control measures and details are more effective than generalized procedures.

2.2.3 Design Plan Preparation - Guidelines for designing to minimize soil erosion and sedimentation control include the following:

- Design slopes consistent with soil properties.
- Limit the area of unprotected soil exposure.
- Minimize and control concentrated flow rates with temporary and permanent barriers, basins, or other measures.
- Minimize the duration of unprotected soil exposure.
- Protect soil with vegetative cover, mulch, or other erosion resistant material.
- Retard or redirect runoff with engineered devices such as, ditches, dikes, and diversions.
- Trap sediment with temporary or permanent barriers, basins, or other measures as close to the source as possible.

2.2.4 Temporary Erosion Control Measures - Temporary soil erosion and sedimentation control measures will be specified in the contract documents. Temporary measures are used during construction to control erosion and sediment until the disturbed area is stabilized. Temporary measures include those that:

- Provide direct protection of the soil surface (ground cover, turf establishment, and riprap).
- Direct the runoff to an area where concentrated flows will not cause erosion (diversion dikes and ditches).
- Remove sediment from the concentrated flow of waters by filtering or slowing the velocity of the sediment-laden water (gravel filter berms, check dams, and sediment traps).
- Remove sediment from the non-concentrated overland flow of waters by filtering or slowing the velocity of the sediment-laden water (silt fence)

2.2.5 Permanent Erosion Control Measures - Permanent soil erosion and sedimentation control measures will be specified in the contract documents. Permanent measures are placed during construction to minimize erosion and sedimentation in the project area during and after construction. Permanent measures remain in place after construction and may require periodic maintenance to remain effective until the area is stabilized.

2.2.6 Notifications During the Design Phase

- **NPDES Notification for Construction Projects -** For projects disturbing five acres or more and discharging to waters of the state, a Notice of Coverage (NOC) will be prepared by Project Development staff and submitted to the CFS Resource Specialist for processing to EGLE. Projects disturbing one to five acres do not require a NOC. However, these projects must still comply with the Permit-by-Rule requirements. Refer to Section 3.1.1 of this manual for notification requirements for these projects.

- **County Drain Commissioner Notification -** When work on an MDOT project involves activities within a designated county drain, the Michigan Drain Code requires that Project Development personnel send plans to the County Drain Commissioner.

3. PROJECT DELIVERY

As used in this section, MDOT right-of-way includes areas covered by Consent to Grade where these areas are shown on the plans.

3.1 Construction Projects

Soil erosion and sedimentation control measures selected during the development phase of a project are included in the contract documents. It is the responsibility of the Contractor as well as the Engineer to implement those measures. The Contractor must maintain temporary and permanent erosion control measures during construction until the disturbed area is stabilized or until the contract is closed out. If a disturbed area has not been stabilized at the time the contract is closed out, arrangements will be made for maintaining the erosion control measures until the area is stabilized and for their removal as necessary. As necessary, erosion control measures may be adapted, adjusted, and added to maintain the level of control required to comply with Act 451, and project specific permits.

3.1.1 Notification for Construction Projects

- **SESC Notification for Construction Projects** – As an APA, MDOT is exempt from obtaining individual SESC permits from the municipal enforcing agency (MEA) or county enforcing agency (CEA). However, MDOT must notify the MEA or CEA of all construction activities that involve earth disturbances within MDOT right-of-way. The complete list of MEA and CEA contacts is available on the EGLE website at www.michigan.gov/egle. Click on <Land>, then <Soil Erosion and Storm Water Construction>, then <Part 91 Agency Resources>, then <Soil Erosion and Sedimentation Control Agencies>. Only those agencies listed as MEAs or CEAs will be notified. The APAs and Conservation Districts included on the website do not need to be notified.

  NOTE: *Notification to the enforcing agency of the proposed earth change activity on MDOT construction projects is documented by including the agency(ies) in the distribution of the minutes of the preconstruction meeting.*

- **NPDES Notification for Construction Projects -** On projects for which a NOC is submitted during the design phase, MDOT will receive a letter of authorization from EGLE. The Engineer will complete and submit the Notice of Termination (NOT) to the CFS Resource Specialist for processing to EGLE upon project stabilization.

  Submission of the NOT may generate an EGLE site inspection. All NOT requests should go to CFS Resource Specialist and should be submitted by either the Region Resource Specialist or the Region Soils Engineer. The site must be reviewed by either position, and the site must be stabilized, prior to submitting the NOT. Projects disturbing one to five acres, and discharging to the waters of the state, do not require a NOC or NOT but must comply with the requirements of Part 31.

3.1.2 Contractor's Operations

- **Off the Right-of-Way -** The Contractor is required to coordinate directly with the landowner to obtain all applicable federal, state, and local permits, including SESC and NPDES permits, when working outside of MDOT right-of-way. The Contractor is responsible for the design and implementation of erosion control measures and for

site restoration in areas off MDOT right-of-way. Payment for this restoration will not be included in the contract.

Prior to disturbing any site off MDOT's right-of-way for borrow operations, waste or disposal areas, haul roads, storage sites, or any other earth change activity, the Contractor is responsible for ensuring that all required permits and property owner agreements are obtained. The Contractor must provide the Engineer copies of these permits and agreements for the project file.

- **On the Right-of-Way but Outside the Limits of Earth Disturbance -** When a Contractor chooses to perform earth change activities within MDOT's right-of-way but outside the limits of earth disturbance the Contractor is responsible for preparing the earth change plan for this work. These activities include, but are not limited to, placement of a portable plant, stockpiling materials, or establishing a haul road. The plan must be submitted to, and approved by, the Engineer prior to the start of the earth change activities. The plan must include all details listed in Section 2.2.1 of this manual and recorded on form 1568.

  NOTE: *The Contractor is required to develop an earth change plan unless the only earth change activity undertaken outside the limits of earth disturbance is within the clearing limits as specified by subsection 201 of the standard specifications and as shown on the plans. However, adequate measures must be implemented and maintained to effectively prevent or reduce erosion and subsequent off-site sedimentation that may result from this activity.*

3.1.3 Soil Erosion and Sedimentation Control During Construction - The Engineer will discuss the contract provisions related to soil erosion and sedimentation control with the Contractor prior to the start of related work. The Contractor must not disturb any land or water outside of the limits of earth disturbance but within the project right-of-way or acquired easements without prior authorization from the Engineer and approval of an earth change plan. The plan must include all details listed in section 2.2.1 of this manual. Restoration of any disturbed area beyond the approved limits must be performed by the Contractor - at the Contractor's expense. This work must be completed in accordance with MDOT restoration specifications and as directed by the Engineer.

Construction operations must be conducted in a manner that minimizes erosion and off-site sedimentation. Prior to commencing any construction operation, that constitutes an earth change activity, including clearing; appropriate temporary and permanent erosion and sedimentation control measures must be installed as specified on the plans. Temporary erosion and sedimentation control measures must be installed to minimize potential problems, to correct erosive conditions that develop during construction, and to stabilize inactive construction areas.

3.1.4 Time Limitations During Construction - All grading sections must be brought to final grade as soon as possible. Permanent erosion and sedimentation control for slopes, channels, ditches and other disturbed areas must be completed within five calendar days after final grading or final earth change. Slopes and ditches within 150 feet of a stream, lake or wetland must be permanently restored within 24 hours of final grading or final earth change. A site is considered to be permanently stabilized when all permanent control structures have been installed, maintenance for the permanent controls has been arranged, vegetation is well established, and temporary controls have been removed.

If it is not possible to permanently stabilize a disturbed area after an earth change has been completed or if significant earth change activity ceases, then temporary soil erosion and sedimentation control measures must be maintained until permanent soil erosion and sedimentation control measures are in place and the area is stabilized.
Refer to subsection 208.03.B of the Standard Specifications for Construction for additional information on time limitations.

3.1.5 Inspections During Construction - SESC regulations require that temporary erosion control measures be maintained daily. SESC regulations do not explicitly call for regularly scheduled inspections. NPDES regulations require regular inspection and documentation of the condition and effectiveness of soil erosion and sedimentation control measures on earth change activities one or more acres in size and discharging to the waters of the state.

At a minimum, inspection of all soil erosion and sedimentation control measures and devices will be completed once per week and within 24 hours after every precipitation event that results in a discharge from the right-of-way. If an area is temporarily stabilized, as discussed in section 3.1.4 above, inspections will continue in the temporarily stabilized areas to ensure the adequacy of the temporary measures. These inspections will continue until the disturbed area is permanently stabilized.

The need for corrective actions will be documented and followed up on to ensure the actions are carried out. When needed, corrective action is required within 24 hours of the inspection if sediment is discharging to the waters of the state and within 5 days of the inspection in all other circumstances.

These inspections and corrective actions will be documented using the National Pollutant Discharge Elimination System and Soil Erosion and Sedimentation Control Inspection Report (Form 1126). Deficiencies, including a deadline for completing the corrective actions, will be brought to the attention of the Contractor. This notice may be made by providing a copy of Form 1126 to the Contractor with any corrective actions and related deadlines indicated under “Remarks”. A log of the inspections and corrective actions will be placed in the project file and will be retained for a period of three years from the date of the inspection.

Completed corrective action will be documented in the project file with reference to the appropriate inspection report(s). If corrective actions are not completed within the specified timeframe, the steps outlined in Section 4 of this manual will be initiated. All resulting documentation placed in the file will also be referenced to the appropriate inspection report(s).

3.1.6 <u>Winter Construction SESC and Storm Water Inspection Reports</u>
EGLE does not accept “frozen ground” as a weather condition for determining construction site inspection frequency. On-site inspections must be resumed within 24 hours of any change in earth disturbance conditions that may allow construction storm water runoff to occur as a result of construction operations resuming, rainfall, or warming conditions that will cause snow melt. Detailed weather conditions must be recorded on Form 1126. If EGLE or MDOT receives a complaint while inspections are suspended, MDOT staff will perform an inspection within 24 hours of receiving the complaint.

Construction activities with an earth disturbance of one acre or greater or located within 500 feet of a lake or a stream must be inspected once every 7 days and within 24 hours after a precipitation event that results in a discharge from the site including weekend days regardless if the contractor is working or not. During inactive periods when a construction site has been temporarily stabilized and below freezing temperatures predominate, the Storm Water Construction Site Operator, without performing an onsite inspection, may certify on Form 1126 that weather and inactive conditions are such that runoff from the site will not occur.

3.1.7 Storm Water Construction Site Operator Procedures

1. In order to cease on site weekly inspections during periods of inactive earth change activity and/or during periods of time where discharges from the site are unlikely, each of the following must occur:
    A. Ensure that earth change activity has ceased. Document this condition on Form 1126.
    B. Confirm with an onsite inspection that the site has temporary soil erosion and sedimentation control measures implemented to minimize discharge of sediment from the site. Document this condition on Form 1126.
    C. Document weather conditions. Weather conditions must be consistently below freezing and unlikely to result in runoff from the site. Document this condition on Form 1126.

Once conditions 1A, 1B and 1C are met, subsequent weekly inspection documentation may be completed without a site visit by documenting weather conditions for the site on Form 1126.

During the suspension of weekly inspections and site visits, SESC inspections must be performed at least once every 30 days during the inactive period if weather conditions are deemed safe for travel. If site or weather conditions are deemed unsafe for travel, inspections must resume as soon as feasible. Document these inspections on Form 1126.

2. Onsite inspections must resume if any of the following occurs:
    A. Earth change activity resumes.
    B. Weather conditions are such that snow melt runoff or precipitation in the form of rain is likely to leave the right of way.
    C. Weather conditions are consistently above freezing for several days in a row and the possibility exists for surface runoff, an inspection would be required.
    D. The site becomes unstabilized and erosion could occur.

3. Once any of the conditions identified in 2A-2D occur, onsite inspections must resume within 24 hours. Onsite inspections must be performed weekly or within 24 hours of a precipitation event that results in a discharge from the site.

3.1.8 Detailed Reporting of Weather Conditions Affecting a Construction Site

Warming conditions may result in runoff from the site. However, the ground may still be frozen. Typical weather condition documentation that is acceptable may be obtained from any reliable weather source. This documentation should include the reporting period and the high temperature and average for the week.

3.2 Maintenance Projects and Maintenance Activities

Some maintenance operations have potential for impact on lakes, streams, and wetlands. MDOT will conduct maintenance projects and activities in a manner that minimizes potential for soil erosion and off right-of-way sedimentation and will incorporate applicable soil erosion and sedimentation control measures included in this manual.

Appropriate SESC measures and NPDES requirements will be included when planning, designing, and completing maintenance projects and activities involving earth disturbances, regardless of size and location. An earth change plan, as described in section 2.2.1 of this manual, will be prepared for all maintenance projects and activities involving earth disturbances unless an alternate process has been approved by the EGLE for a specific maintenance activity. **NOTE:** *The environmental procedures for ditch clean-out (Activity #1230), included in the Appendix of this manual, is the only MDOT- approved work method for a specific earth change activity at this time.*

Permits are necessary for activities related to draining, dredging or filling a wetland, floodplain, lake or stream. Other EGLE and/or U.S. Army Corp of Engineer permits may be necessary. Contact appropriate MDOT staff to determine the need for additional permits prior to the start of a maintenance project or activity.

3.2.1 Notifications for Maintenance Projects and Activities

- **SESC Notification for Maintenance Projects and Activities -** As an APA, MDOT is exempt from obtaining individual SESC permits from the MEA or CEA. However, MDOT must notify the MEA or CEA prior to the start of maintenance projects and activities involving earth change activities. The complete list of MEA and CEA contacts is available on the EGLE website at www.michigan.gov/egle: Click on <Land>, then <Soil Erosion and Storm Water Construction>, then <Part 91 Agency Resources>, then <Soil Erosion and Sedimentation Control Agencies>. Only those agencies listed as an MEA or CEA need to be notified. The APAs and Conservation Districts included on the website do not need to be notified.

  NOTE: *An annual notice can be provided to the MEA/CEA to cover projects and activities planned for the coming year. An individual notice will be required for projects and activities added to the program after the annual notice.*

- **County Drain Commissioner Notification for Maintenance Projects -** When a MDOT maintenance project or activity involves work within a designated county drain, the Michigan Drain Code requires notification of the County Drain Commissioner prior to the start of work.

- **NPDES Notice of Coverage for Maintenance Projects -** For projects and activities disturbing five acres or more and discharging to the waters of the state, a Notice of Coverage (NOC) will be prepared and submitted to the CFS Resource Specialist for processing to EGLE.

  On projects and activities for which a NOC is submitted, MDOT will receive a letter of authorization from EGLE. The TSC maintenance supervisor/coordinator, or designee, will complete and submit the Notice of Termination (NOT) to CFS Resource Specialist for processing to the EGLE upon stabilization of the affected area.

Submission of the NOT may generate an EGLE site inspection. All NOT requests should go to CFS Resource Specialist and should be submitted by either the Region Resource Specialist or the Region Soils Engineer. The site must be reviewed by either position, and the site must be stabilized, prior to submitting the NOT.

Projects and activities disturbing one to five acres, and discharging to the waters of the state, do not require a NOC or NOT but must comply with the requirements of Permit-by-Rule.

3.2.2 Soil Erosion and Sedimentation Control for Maintenance Projects and Activities - Maintenance projects and activities that involve earth changes will be conducted in a manner that minimizes soil erosion and off-site sedimentation. Before starting any maintenance project or activity involving earth changes, appropriate erosion and sedimentation control measures will be installed. Temporary soil erosion and sedimentation control measures will be installed to minimize potential problems, to correct erosive conditions that develop during the maintenance operation, and to stabilize inactive work areas. All necessary erosion control measures will be maintained until disturbed areas are stabilized.

3.2.3 Time Limitations for Maintenance Projects and Activities - Permanent soil erosion and sedimentation control measures for all slopes, channels, ditches, or any disturbed land area will be complete within five calendar days after final grading or the final earth change is complete. If it is not possible to permanently stabilize a disturbed area after an earth change is complete or if significant earth change activity ceases, temporary soil erosion and sedimentation control measures will be maintained until permanent soil erosion and sedimentation control measures are in place and the area is stabilized.

3.2.4 Inspections for Maintenance Projects and Activities - SESC regulations require that temporary erosion control measures be maintained daily. SESC regulations do not explicitly call for regularly scheduled inspections. NPDES regulations require regular inspection and documentation of the condition and effectiveness of soil erosion and sedimentation control measures on earth change activities one or more acres in size and discharging to the waters of the state.

At a minimum, inspection of all soil erosion and sedimentation control measures and devices will be completed once per week and within 24 hours after every precipitation event that results in a discharge from the right-of-way. If an area is temporarily stabilized, as discussed in section 3.2.2 above, inspections will continue in the temporarily stabilized areas to ensure the adequacy of the temporary measures. These inspections will continue until the disturbed area is permanently stabilized.

The need for corrective actions will be documented and followed up on to ensure the actions are carried out. When needed, corrective action is required within 24 hours of the inspection if sediment is discharging to the waters of the state and within 5 days of the inspection in all other circumstances.

This inspection may be documented using the National Pollutant Discharge Elimination System and Soil Erosion and Sedimentation Control Inspection Report (Form 1126) and the notice may be made by providing the Contractor or appropriate Maintenance staff with a copy of Form 1126 with any corrective actions and related deadlines indicated under “Remarks.” A log of the inspections and corrective actions will be maintained on

file at the TSC for review and will be retained for a period of three years from the date of the inspection.

Alternate methods of documenting inspections must be approved by the maintenance supervisor/coordinator or other individual designated by the TSC Manager or Region Engineer. Regardless of the form or format used, all documentation of erosion and sedimentation control inspections must be retained for a period of three years from the date of the inspection.

3.2.5 Maintenance Activity Guides - Operational guidelines for maintenance activities are described in the performance guides found on MDOT's Transportation Asset Management (TAMS) SharePoint site. The ditch clean-out activity has been identified as the most common maintenance activity subject to SESC and NPDES regulations and therefore is included in the Appendix for reference. The procedures for minimizing soil erosion and sedimentation described in the ditch clean-out performance guide will be followed in lieu of preparation of individual earth change plans.

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4. COMPLIANCE AND ENFORCEMENT

During the course of construction and maintenance of transportation facilities, even well designed and properly placed erosion control measures can fail to perform as originally expected. Compliance and enforcement actions may be necessary to ensure that erosion control measures are implemented or improved to preserve the natural resources of the State of Michigan and to prevent off-site sedimentation.

Subsections 4.1 and 4.2 identify options available to MDOT when progressive enforcement of the contract becomes necessary to correct and/or prevent soil erosion and sedimentation control problems. Current Department specifications, procedures, and guidance documents will be followed when implementing any of the actions listed in subsections 4.1 and 4.2. Subsection 4.3 identifies coordination efforts with EGLE to resolve on-going soil erosion and sedimentation control issues.

The Department's goal is not to wait until EGLE has to get involved before taking steps to bring the project into compliance with the approved MDOT SESC program. A successful and effective APA program is one in which EGLE is not relied upon to provide the level of enforcement needed to ensure compliance with our program. All compliance and enforcement actions will be documented carefully so that in the event that a Contractor claim results, the Department will have the necessary information to determine the validity of the claim. This documentation will also be used to support the Contractor Performance Evaluation for the environmental category.

4.1 Construction Projects

MDOT contracts will be enforced to ensure the Contractor installs, inspects, and maintains appropriate soil erosion and sedimentation control measures in the field. Depending on the site and contract specific issues, the Engineer will determine the appropriate and progressive compliance and enforcement actions, including but not limited to the following. (Ref. Standard Specifications for Construction sections 108 and 109; MDOT Construction Manual section 103 and 208).

The first action is always to conduct adequate inspections throughout the project. If necessary, communicate deficiencies to the Contractor with specific actions that must be taken to repair, replace or modify SESC measures.

4.1.1 Minor Deficiencies

- Conditions of SESC measures observed by any Department employee can be noted on the IDR and brought to the Contractor's attention (project staff) or brought to the attention of the Construction Engineer (non-project staff).
- Use Form 1126 to document the condition, effectiveness and need for additional SESC measures during required inspections.
- Contact region or Lansing CFS staff with responsibility for SESC activities to discuss methods to improve site specific soil erosion and sedimentation control.
- If an EGLE field inspector visits the site, use this opportunity to get their input on methods to effectively minimize erosion and reduce off-site sedimentation.

4.1.2 Moderate and Continuing Problems - When taking any of the following actions, provide as much detail as necessary to convey the scope of the problem and the required action to bring the site into compliance.

- Issue Notice of Non-Compliance with Contract Requirements (Form 1165).

- Invoke special provision for Non-Compliance with Soil Erosion and Sedimentation Control Requirements.
- Issue a Work Order (Form 1137) directing the Contractor to correct deficiencies in a specified time frame.
- Withhold payment for erosion control devices, erosion control maintenance and/or related items of work.
- Report deficiencies using interim and final Contractor Performance Evaluations as detailed in subsection 102.01 of the MDOT Construction Manual. Refer to the rating guidance included in the manual for this item. The guidance, which was current at the time of approval of this manual, is included here for reference. Always refer to the most current Department guidance on this subject when completing a Contractor Performance Evaluation.

14. To what degree does the Contractor meet the environmental requirements of the contract?

Rating of 10: The Contractor exceeds the environmental requirements and provides required documentation without prompting by the Engineer.

Rating of 8: The Contractor meets the environmental requirements and provides required documentation without prompting by the Engineer.

Rating of 5: The Contractor meets the environmental requirements and provides required documentation only after notification by the Engineer.

Rating of 1: The Contractor meets environmental requirements only after repeated notification from the Engineer. The Engineer may issue orders to stop work, hold up payments, or have work completed by others.

4.1.3 Severe and Non-Responsive - These steps require advice and consent from one or more of the following: TSC Manager, Associate Region Engineer for Operations, Region Engineer and the Assistant Attorney General – Transportation.

- Arrange for others to perform the work.
- Involve the performance bond company.
- Place the contract in default.

4.2 Maintenance Projects and Activities

Maintenance work involving earth change activities performed by direct forces, contract agencies, or Contractors will incorporate appropriate soil erosion and sedimentation control measures. The Part 91 Inspector is responsible for compliance and enforcement on these projects. All individuals who have decision-making authority for enforcement on a site must be SESC PRD certified. In the event that progressive compliance and enforcement is necessary, the Part 91 Inspector will work with Maintenance Supervisors/Coordinators, Maintenance Superintendents, Operations Engineers, and, if necessary, TSC Managers to seek appropriate action as follows:

4.2.1 Direct Forces Work - Minor to Moderate

- Issue directions to staff to correct deficiencies in a specified time frame; follow up to ensure corrective action has been completed.
- Arrange additional staff training on proper work methods and the importance of soil erosion and sedimentation control.
- Arrange for others to perform the work.

4.2.2 Contract Agency Work - Minor to Moderate

- Issue work orders (Form 1137) to correct deficiencies in a specified time frame; follow up to ensure corrective action has been completed.
- Arrange additional agency training on proper work methods and the importance of soil erosion and sedimentation control.

4.2.3 Contract Agency Work – Severe - These steps require advice and consent from one or more of the following: Maintenance Superintendent, Operations Engineers, TSC Manager, Associate Region Engineer for Operations, Region Engineer and possibly the Assistant Attorney General – Transportation.

- Withhold payment.
- Issue stop work notices.
- Arrange for others to perform the work.

4.2.4 Contractor Work - Use actions described above for construction projects experiencing minor to moderate SESC problems. Follow the Department's Vendor Performance process to document unsatisfactory performance of the work. If the Contractor is non-responsive and the problem is severe, take steps necessary to terminate the contract and arrange for others to perform the work.

4.3 EGLE Progressive Compliance (Escalation) Process

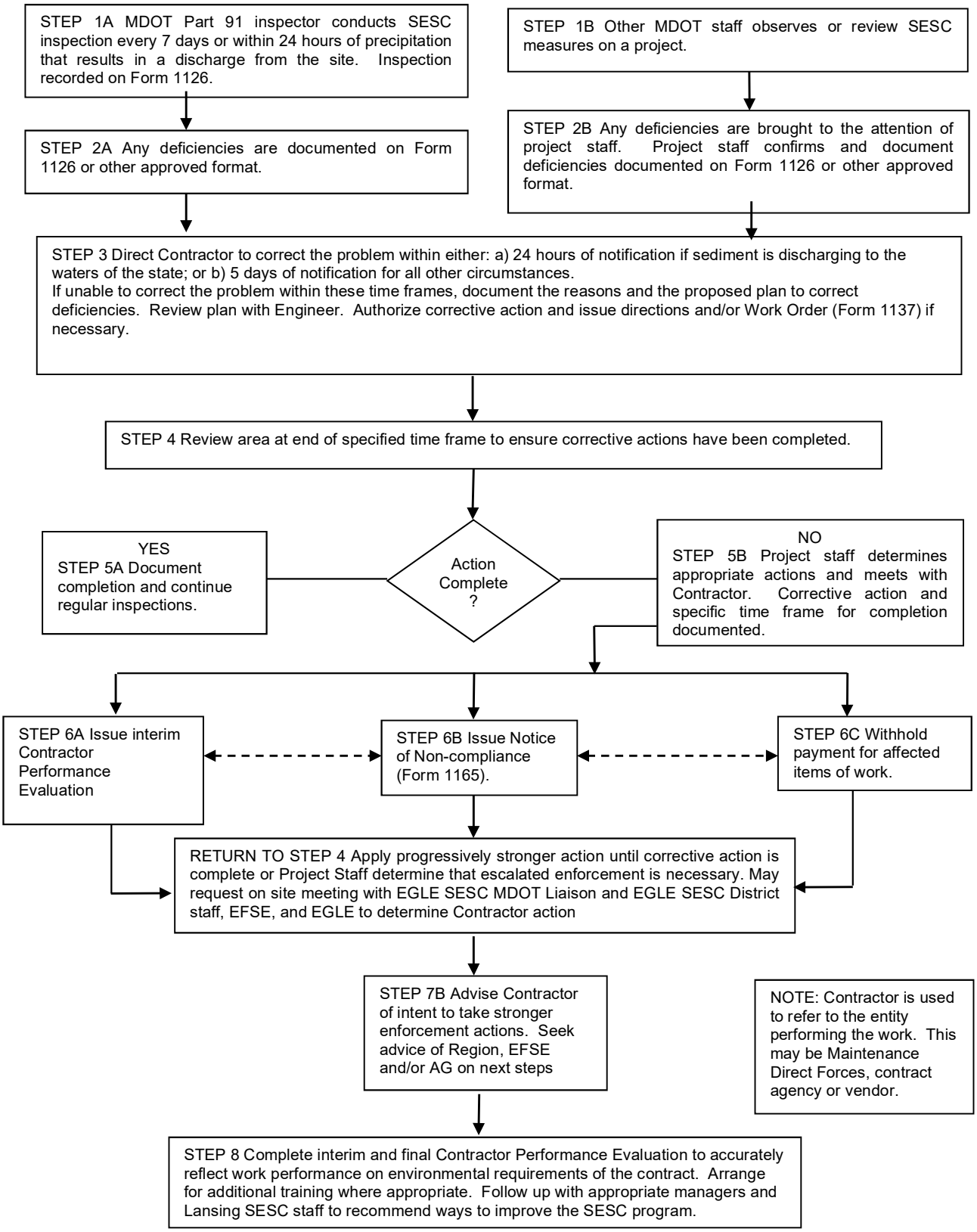
Every effort will be made to resolve soil erosion and sedimentation control issues as quickly as possible rather than wait for EGLE to issue a notice of noncompliance.

If progressive compliance involving EGLE becomes necessary, the process shown in the flow chart at the end of this section will be followed by EGLE and MDOT. It may not be necessary to follow each step in the order shown provided the appropriate actions are taken to minimize the impacts to the environment and to bring the work area into compliance.

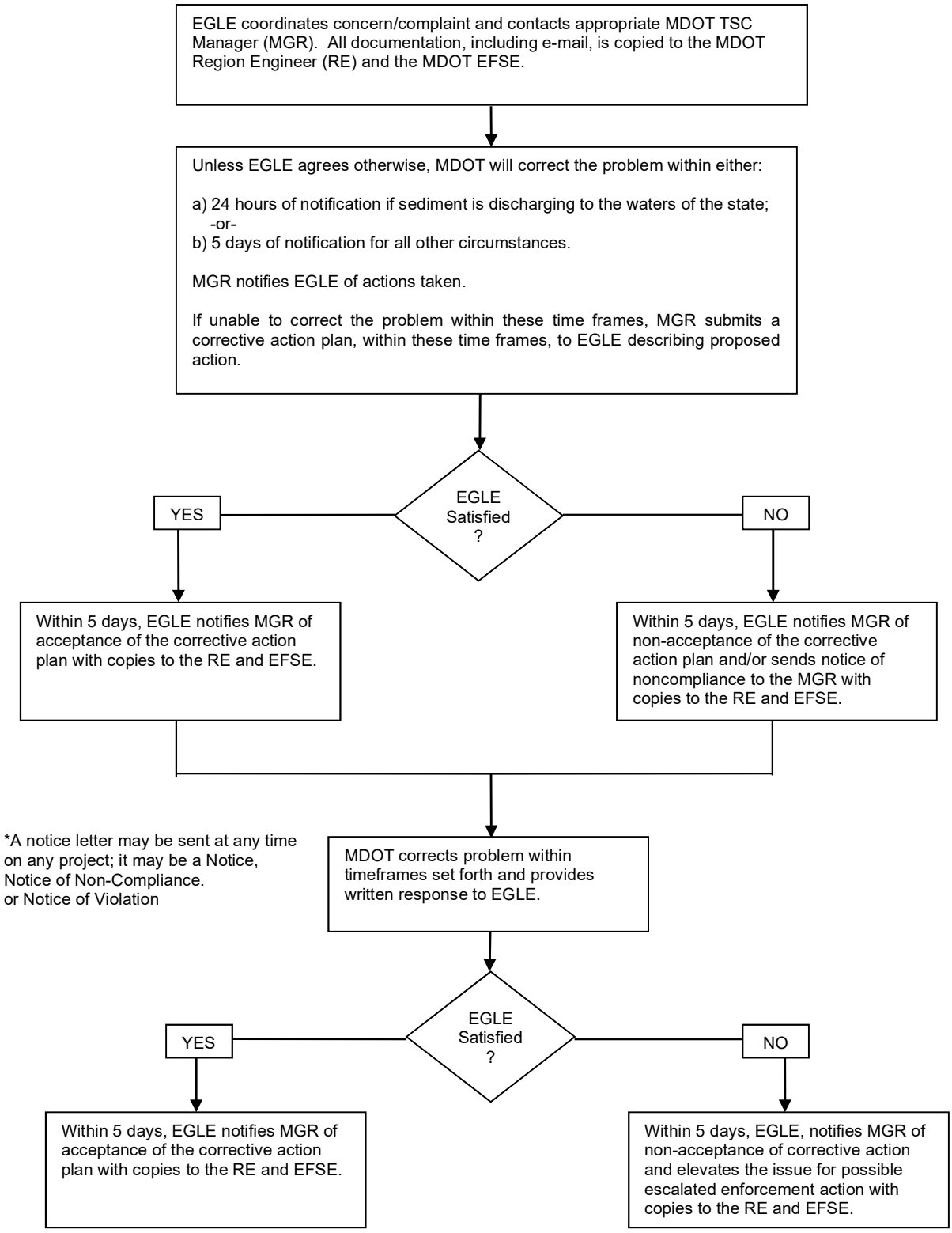
The TSC Manager will work to resolve the concerns as expeditiously as possible and in a time frame that is mutually agreed upon by EGLE and the TSC Manager. TSC staff may work with designated region and Lansing central office staff to make the best decisions possible to improve deficient erosion control measures. If additional information is required, EGLE may arrange a site meeting with the TSC staff. TSC staff will invite region resource staff and, if necessary, Lansing central office staff to this meeting.

When written correspondence is advised or required, e-mail or formal letters are acceptable. When formal correspondence is necessary, this correspondence may be sent electronically to save time but must be followed up with a signed hard copy. All correspondence will be copied to the appropriate Region Engineer and the Environmental Field Services Engineer in Bureau of Development.

MDOT SESC COMPLIANCE PROCESS



EGLE SESC PROGRESSIVE COMPLIANCE PROCESS



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5. PERMIT REQUIREMENTS, ACTS AND RULES

This section contains information on additional permits that may be required on MDOT construction or maintenance projects. Always consult with designated staff in the region, TSC or Lansing central office on project specific permit requirements.

The full text of Parts 31 and 91 of Act 451 and the related administrative rules, Parts 21 and 17, respectively, are found on the EGLE website.

Part 91 and Part 17 (SESC)
www.michigan.gov/egle, click on <Land>, then <Soil Erosion and Storm Water Construction>, then <Part 91 Agency Resources>, then Laws <Part 91, as Amended (pdf)>, and/or <Rules: R323. 1701-1714 (pdf)

Part 31 and Part 21 (NPDES)
www.michigan.gov/egle, click on <Water>, then <Michigan Surface Water Programs>, then <NPDES Permits>, then <Applicable Rules and Regulations>, then <Part 31 statute> or <Part 21 Rules>

5.1 MDOT Permit Coordinators

When an activity conducted by MDOT requires a permit from EGLE under state and/or federal statutes it will be coordinated in the following manner.

Permit acquisition for projects located in the Grand Region will be coordinated by the Environmental Permit Coordinator of the MDOT Grand Region Office at 1420 Front Ave. N.W., Grand Rapids, MI 49504, Phone: 616-451-3091.

Permit acquisition for projects located in the University Region will be coordinated by the Environmental Permit Coordinator of the MDOT University Region Office at 4701 W. Michigan Ave., Jackson, MI 49201, Phone: 517-750-0401.

Permit acquisition for projects located in the Bay and North Regions will be coordinated by the Environmental Permit Coordinator of the MDOT Bay Region Office at 5859 Sherman Rd, Saginaw, MI 48604: Phone: 989-233-5475.

Permit acquisition for projects located in the Southwest Region will be coordinated by the Environmental Permit Coordinator of the MDOT Southwest Region Office at 1501 E. Kilgore Road, Kalamazoo, MI 49001, Phone: 269-337-3900.

Permit acquisition for projects located in Metro Region will be coordinated by the Environmental Permit Coordinator of the MDOT Metro Region Office at 18101 W. 9 Mile Rd, Southfield, MI 48075: Phone: 248-483-5100

Permit acquisition for projects located in the Superior Region will be coordinated by the Environmental Permit Coordinator of the MDOT Superior Region Office at 1818 Third Avenue North, Escanaba, MI 49829, Phone: 906-786-1800.

This coordinated approach will ensure compliance with the current state and federal permit requirements and allow for efficient processing of MDOT applications by EGLE.

5.2 Permit Requirements

One or more of the following permits may be required for a construction project, maintenance project or maintenance activity.

5.2.1 Floodplain and Floodways - Part 31 of Act 451 requires a Floodplain Permit from EGLE for construction in a floodplain of any river or stream having a contributing drainage area of two square miles or more upstream of the crossing. In addition, MDOT must comply with the Governor's State Executive Order 1977-4, "State Flood Hazard Management Plan" which establishes flood standards and design requirements.

5.2.2 Inland Lakes and Streams - Part 301 of Act 451 requires an Inland Lakes and Streams Permit from EGLE for construction in, over or adjacent to inland lakes or streams.

5.2.3 Wetland Protection - Part 303 of Act 451 requires a Wetland Permit from EGLE for construction in wetland areas. Any unavoidable wetland impacts resulting from construction activities in a regulated wetland must be properly mitigated based on specific ratios. Wetland mitigation plans must be developed and coordinated with EGLE during the project development stage.

5.2.4 Dam Safety - Part 315 of Act 451 requires a Dam Safety Permit from EGLE for construction, enlargement, repair, reconstruction, alteration, removal or abandonment of any dam in the State of Michigan.

5.2.5 Shorelands Protection and Management - Part 323 of Act 451 may require a permit for work in EGLE designated high-risk erosion areas, environmental areas, and flood risk areas. Such work includes erection of permanent structures in designated high-risk erosion areas or flood plain areas, or grading, dredging and filling in designated environmental areas.

5.2.6 Great Lakes Submerged Lands - Part 325 of Act 451 requires a Great Lakes Submerged Land Permit from EGLE for any dredging, filling or related construction activities in, over, or adjacent to any of the Great Lakes.

5.2.7 Sand Dunes Protection and Management - Part 353 of Act 451 may require EGLE permits for uses in critical dunes areas, as designated by the EGLE, which would include grading, filling or excavating activity.

5.2.8 Section 404C (Federal) - The Federal 404 Permit Program of the Clean Water Act authorizes coordination of federal permits under the joint permit system with the U.S. Army Corps of Engineers (USACE). EGLE is the responsible agency for this coordination of permits. A separate permit from the USACE is required for navigable watercourses.

6. SESC MEASURES (E & S DETAILS)

This section contains the current MDOT soil erosion and sedimentation control measures for use on construction and maintenance projects. All measures shown reflect MDOT's experience with soil erosion and sedimentation control for road and bridge construction and, as such, are considered best management practices. Additional design and placement considerations for these measures are found in Chapter 9 of the MDOT Drainage Manual.

Refer to Standard Plan R-96 Series for the key numbers to be shown on plan sheets and information on when to use various control measures. Discussion of measurement and payment is included on the E&S details for information only. In the case of conflict between the contract items shown on these details and contract items included in the contract documents for a specific project, the contract documents will prevail.

Dimensions on E&S Details not shown as maximum or minimum dimensions may be modified to fit existing field conditions or to improve the effectiveness of the soil erosion or sedimentation control of the device. Dimensions shown as maximum or minimum dimensions must be adhered to unless modifications are discussed with region or Lansing SESC staff and approved changes are noted in the inspection reports. The designer and construction engineer will determine the need for all items shown as optional on the E&S Details. Refer to the contract documents for additional information on the materials, construction or placement of these devices.

Individual erosion control devices will be constructed to provide the most effective and efficient soil erosion and sedimentation control for a specific construction or maintenance site. Based on site conditions, the Engineer or the Part 91 Inspector may authorize minor adjustments to the E&S Details. Any major deviations, especially in areas of concentrated flows, will be discussed with the appropriate staff and approved changes must be noted in the inspection reports. Prior review and approval is not required if the changes are needed to mitigate the effects of a pending sediment release.

The Department has a process to experiment with and evaluate new materials for possible use during the execution of construction and maintenance projects. These new materials can include BMPs used for SESC measures. To strive to provide continuous improvement to the SESC program the Department is willing to use innovative products that may be more effective for controlling erosion and any subsequent sedimentation. Typically, a manufacturer or distributor will contact the Department and submit a request for consideration to use a product as a SESC BMP. The Department provides an initial assessment of the product and either accepts it, rejects it or is willing to try it on a trial basis. In most cases new SESC products are considered on a trial basis where the performance is monitored throughout the life of the installation. After the trial period the effectiveness of the product as a SESC BMP is evaluated and consideration is given for future use.

APPLICABLE SOIL EROSION AND SEDIMENTATION CONTROL MEASURES

(COMPREHENSIVE DETAILS ARE LOCATED IN SECTION 6 OF THE SOIL EROSION & SEDIMENTATION CONTROL MANUAL)

A = SLOPES

B = STREAMS AND WATERWAYS

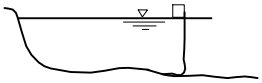
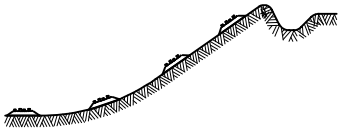
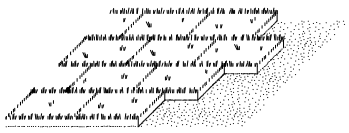
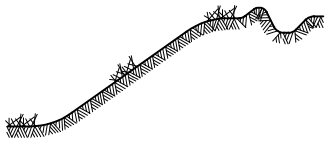
C = SURFACE DRAINAGEWAYS

D = ENCLOSED DRAINAGE (INLET & OUTFALL CONTROL)

E = LARGE FLAT SURFACE AREAS

F = BORROW AND STOCKPILE AREAS

G = DNRE PERMIT MAY BE REQUIRED

KEY	DETAIL	CHARACTERISTICS	A	B	C	D	E	F	G
1	 TURBIDITY CURTAIN	A Turbidity Curtain is used when slack water area is necessary to isolate construction activities from the watercourse. The still water area contains the sediments within the construction limits.		●					
2	 GRUBBING OMITTED	Retains existing root mat which assists in stabilizing slopes. Assists in the revegetation process by providing sprout growth. Reduces sheet flow velocities preventing rilling and gullying. Discourages off-road vehicle use.	●				●		
3	 PERMANENT/TEMPORARY SEEDING	Inexpensive but effective erosion control measure to stabilize flat areas and mild slopes. Permits runoff to infiltrate soil, reducing runoff volumes. Proper preparation of the seed bed, fertilizing, mulching and watering is critical to its success.	●		●		●	●	
4	 DUST CONTROL	Dust control can be accomplished by watering, and/or applying calcium chloride. The disturbed areas should be kept to a minimum. PERMANENT/TEMPORARY SEEDING (KEY 3) should be applied as soon as possible.	●				●	●	
5	 SODDING	Provides immediate vegetative cover such as at spillways and ditch bottoms. Proper preparation of the topsoil, placement of the sod, and watering is critical to its success.	●				●	●	
6	 VEGETATED BUFFER STRIPS	Reduces sheet flow velocities preventing rilling and gullying. Assists in the collection of sediments by filtering runoff. Assists in the establishment of a permanent vegetative cover.	●				●		

MDOT Michigan Department of Transportation

PREPARED BY DESIGN DIVISION

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CHECKED BY: W.K.P.

DEPARTMENT DIRECTOR
Kirk T. Steudle

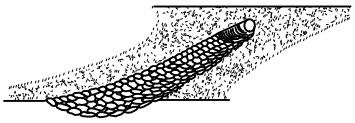
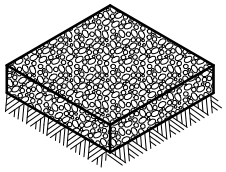
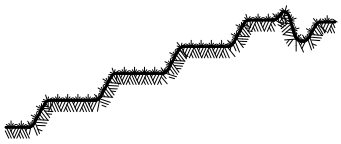
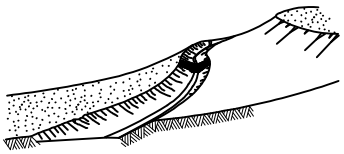
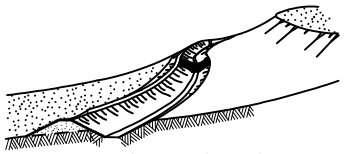
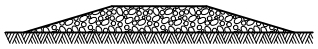
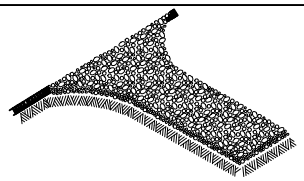
APPROVED BY: John C. Friend
ENGINEER OF DELIVERY

APPROVED BY: Paul A Van Portfleet
ENGINEER OF DEVELOPMENT

MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF HIGHWAY DEVELOPMENT STANDARD PLAN FOR

SOIL EROSION & SEDIMENTATION CONTROL MEASURES

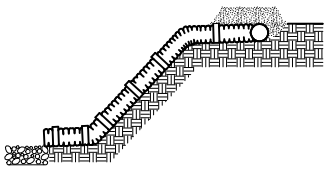
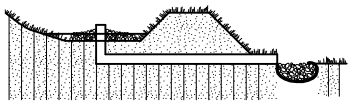
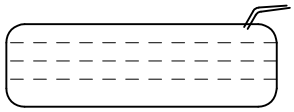
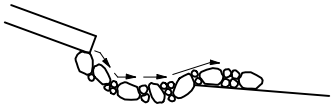
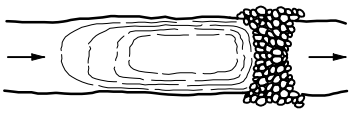
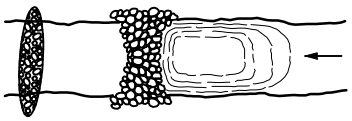
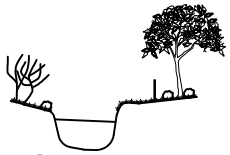
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KEY	DETAIL	CHARACTERISTICS	A	B	C	D	E	F	G
7	 RIPRAP	Used where vegetation cannot be established. Very effective in protecting against high velocity flows. Should be placed over a geotextile liner.	●	●	●	●			●
8	 AGGREGATE COVER	Can be used in any area where a stable condition is needed for construction operations, equipment storage or in heavy traffic areas. Reduces potential soil erosion and fugitive dust by stabilizing raw areas.	●				●	●	
9	 BENCHES	Reduces sheet flow velocities preventing rilling and gullying. Assists in the collection and filtering of sediments. Provides access for stabilizing slopes.	●					●	
10	 DIVERSION DIKE	Assists in the diversion of runoff to a stable outlet or sediment control device. Reduces sheet flow velocities preventing rilling and gullying. Collects and diverts runoff to properly stabilized drainage ways. Works well with INTERCEPTING DITCH (KEY 11)	●				●	●	
11	 INTERCEPTING DITCH	Assists in the diversion of runoff to a stable outlet or sediment control device. Reduces sheet flow velocities preventing rilling and gullying. Works well with DIVERSION DIKE (KEY 10)	●				●	●	
12	 INTERCEPTING DITCH AND DIVERSION DIKE	Assists in the diversion of runoff to a stable outlet or sediment control device. Reduces sheet flow velocities preventing rilling and gullying.	●				●	●	
13	 GRAVEL FILTER BERM	Useful in filtering flow prior to its reentry into a lake, stream or wetland. Works well with SEDIMENT TRAP (KEY 20) and TEMPORARY BYPASS CHANNEL (KEY 35). Not to be used in lieu of a CHECK DAM (KEY 37) in a ditch.	●		●			●	
14	 GRAVEL ACCESS APPROACH	Provides a stable access to roadways minimizing fugitive dust and tracking of materials onto public streets and highways.					●	●	

MICHIGAN DEPARTMENT OF TRANSPORTATION
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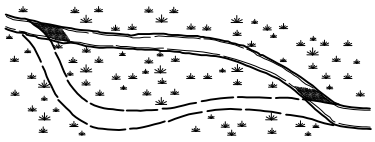
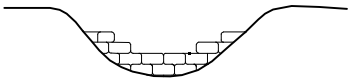
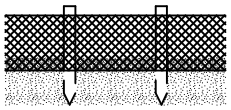
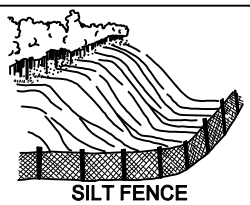
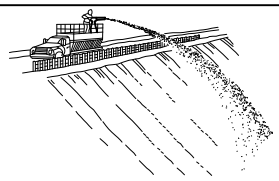
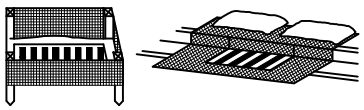
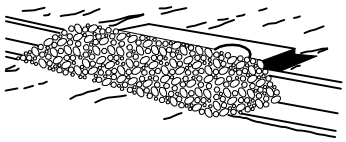
9-10-2010 F.H.W.A. APPROVAL	6-3-2010 PLAN DATE	R-96-E	SHEET 2 OF 6

KEY	DETAIL	CHARACTERISTICS	A	B	C	D	E	F	G
15	 SLOPE DRAIN SURFACE	Excellent device for carrying water down slopes without creating an erosive condition. Generally used in conjunction with DIVERSION DIKE (KEY 10), INTERCEPTING DITCH (KEY 11) and INTERCEPTING DITCH AND DIVERSION DIKE (KEY 12) to direct flow to a stable discharge area or SEDIMENT TRAP (KEY 20).	●		●				
16	 TREES, SHRUBS AND PERENNIALS	Trees, shrubs and perennials can provide low maintenance long term erosion protection. These plants may be particularly useful where site aesthetics are important along the roadside slopes.	●				●		
17	 PIPE DROP	Effective way to allow water to drop in elevation very rapidly without causing an erosive condition. Also works as a sediment collector device. May be left in place as a permanent erosion control device.	●		●				
18	 DEWATERING WITH FILTER BAG	It may be necessary to dewater from behind a cofferdam or construction dam to create a dry work site. Discharged water must be pumped to a filter bag. A GRAVEL FILTER BERM (KEY 13) may be placed downslope of the filter bag to provide additional filtration prior to entering any stream or wetland.		●					●
19	 ENERGY DISSIPATORS	A device to prevent the erosive force of water from eroding soils. Used at outlets of culverts, drainage pipes or other conduits to reduce the velocity of the water. Prevents structure scouring and undermining.	●	●	●	●			
20	 SEDIMENT TRAP	Used to intercept concentrated flows and prevent sediments from being transported off site or into a watercourse or wetland. The size of a Sediment Trap is 5 cubic yards or less. Works well when used with CHECK DAM (KEY 37).	●		●	●			
21	 SEDIMENT BASIN	A Sediment Basin is used to trap sediments from an upstream construction site. Requires periodic inspections, repairs, and maintenance. Where practical, sediments should be contained on site. A Sediment Basin should be the last choice of sediment control. The size of a Sediment Basin is greater than 5 cubic yards.		●					●
22	 VEGETATIVE BUFFER AT WATERCOURSE	This practice is used to maintain a vegetative buffer adjacent to a watercourse. When utilized with SILT FENCE (KEY 26) it will, under normal circumstances, prevent sediment from leaving the construction site.	●	●	●		●	●	

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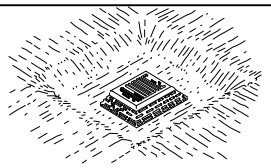
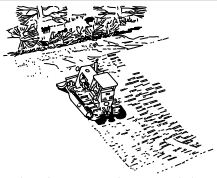
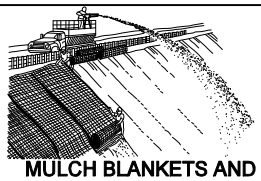
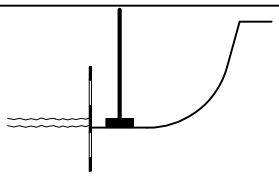
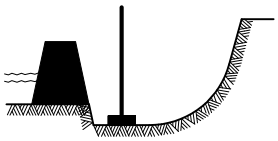
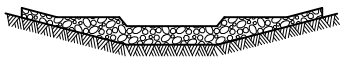
9-10-2010 F.H.W.A. APPROVAL	6-3-2010 PLAN DATE	R-96-E	SHEET 3 OF 6

KEY	DETAIL	CHARACTERISTICS	A	B	C	D	E	F	G
23	 STREAM RELOCATION	A detail depicting the proper procedures for stream relocation. Maintains same width, depth, and flow velocity as the natural stream. Revegetate banks with PERMANENT/TEMPORARY SEEDING (KEY 3), MULCHING AND MULCH ANCHORING (KEY 28), MULCH BLANKETS AND HIGH VELOCITY MULCH BLANKETS (KEY 33) and woody plants to shade the stream.		●					●
24	 SAND AND STONE BAGS	Sand and stone bags are a useful tool in the prevention of erosion. Can be used to divert water around a construction site by creating a DIVERSION DIKE (KEY 10). Works well for creating a CONSTRUCTION DAM (KEY 36) and temporary culvert end fill.	●	●	●	●	●	●	●
25	 SAND FENCE AND DUNE STABILIZATION	A Sand Fence traps blowing sand by reducing wind velocities. Can be used to prevent sand from blowing onto roads. Must be maintained until sand source is stabilized.	●				●	●	
26	 SILT FENCE	A permeable barrier erected below disturbed areas to capture sediments from sheet flow. Can be used to divert small volumes of water to stable outlets. Ineffective as a filter and should never be placed across streams or ditches where flow is concentrated.	●				●	●	
27	 PLASTIC SHEETS OR GEOTEXTILE COVER	Plastic Sheets can be used to create a liner in temporary channels. Can also be used to create a temporary cover to prevent erosion of stockpiled materials.	●	●	●			●	
28	 MULCHING AND MULCH ANCHORING	Anchored mulch provides erosion protection against rain and wind. Mulch must be used on seeded areas to promote water retention and growth. Should be inspected after every rainstorm and repaired as necessary until vegetation is well established.	●		●		●	●	
29	 INLET PROTECTION FABRIC DROP	Provides settling and filtering of silt laden water prior to its entry into the drainage system. Can be used in median and side ditches where vegetation will be disturbed. Allows for early use of drainage systems prior to project completion.			●		●		
30	 INLET PROTECTION GEOTEXTILE AND STONE	Provides settling and filtering of silt laden water prior to its entry into the drainage system. Should be used in paved areas where drainage structures are existing or proposed. Allows for early use of drainage systems prior to project completion.			●		●		

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9-10-2010 F.H.W.A. APPROVAL	6-3-2010 PLAN DATE	R-96-E	SHEET 4 OF 6

KEY	DETAIL	CHARACTERISTICS	A	B	C	D	E	F	G
31	 INLET PROTECTION SEDIMENT TRAP	An Inlet Protection Sediment Trap is a temporary device that can be used in areas where medium flows are anticipated. Effective in trapping small quantities of sediments prior to water entering the drainage system. Can be used in areas such as median and side ditches.			●		●		
32	 SLOPE ROUGHENING AND SCARIFICATION	A simple and economical way to reduce soil erosion by wind and water. Can be accomplished by harrowing with a disk, back blading, or tracking with a dozer perpendicular to the slope.	●				●	●	
33	 MULCH BLANKETS AND HIGH VELOCITY MULCH BLANKETS	Mulch blankets provide an immediate and effective cover over raw erodible slopes affording excellent protection against rain and wind erosion. High velocity mulch blankets work well for stabilizing the bottom of ditches in waterways.	●		●		●	●	
34	 COFFERDAM	Used to create a dry construction area and protect the stream from raw erodible areas. Must be pumped dry or dewatered according to DEWATERING WITH FILTER BAG (KEY 18).		●					●
35	 TEMPORARY BYPASS CHANNEL	Utilized when a dry construction area is needed. Isolates stream flows from raw erodible areas minimizing erosion and subsequent siltation. Can incorporate SEDIMENT BASIN (KEY 21), CHECK DAM (KEY 37), and GRAVEL FILTER BERM (KEY 13) to remove sediments from water. Construction sequence of events may be necessary.		●					●
36	 CONSTRUCTION DAM	Used to create a dry or slack water area for construction. Isolates the stream from raw erodible areas. Can be created out of any non-erodible materials such as SAND AND STONE BAGS (KEY 24), a gravel dike with clay core or plastic liner, steel plates or plywood.		●					●
37	 CHECK DAM	Can be constructed across ditches or any area of concentrated flow. Protects vegetation in early stages of growth. A Check Dam is intended to reduce water velocities and capture sediment. A Check Dam is not a filtering device.	●		●			●	

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9-10-2010 F.H.W.A. APPROVAL	6-3-2010 PLAN DATE	R-96-E	SHEET 5 OF 6

NOTES:

THIS STANDARD PLAN WILL SERVE AS A KEY IN THE SELECTION OF THE APPROPRIATE SOIL EROSION AND SEDIMENTATION CONTROL DETAILS. THIS PLAN ALSO PROVIDES THE KEY TO THE NUMBERED EROSION CONTROL ITEMS SPECIFIED ON THE CONSTRUCTION PLANS. REFER TO THE MDOT SOIL EROSION & SEDIMENTATION CONTROL MANUAL, SECTION 6 FOR SPECIFIC DETAILS, CONTRACT ITEMS (PAY ITEMS), AND PAY UNITS.

COLLECTED SILT AND SEDIMENT SHALL BE REMOVED PERIODICALLY TO MAINTAIN THE EFFECTIVENESS OF THE SEDIMENT TRAP, SEDIMENT BASIN, AND SILT FENCE. AGGREGATES PLACED IN STREAMS SHOULD CONTAIN A MINIMUM OF FINES.

TEMPORARY EROSION AND SEDIMENTATION CONTROL PROVISIONS SHALL BE COORDINATED WITH THE PERMANENT CONTROL MEASURES TO ASSURE EFFECTIVE CONTROL OF SEDIMENTS DURING CONSTRUCTION OF THE PROJECT.

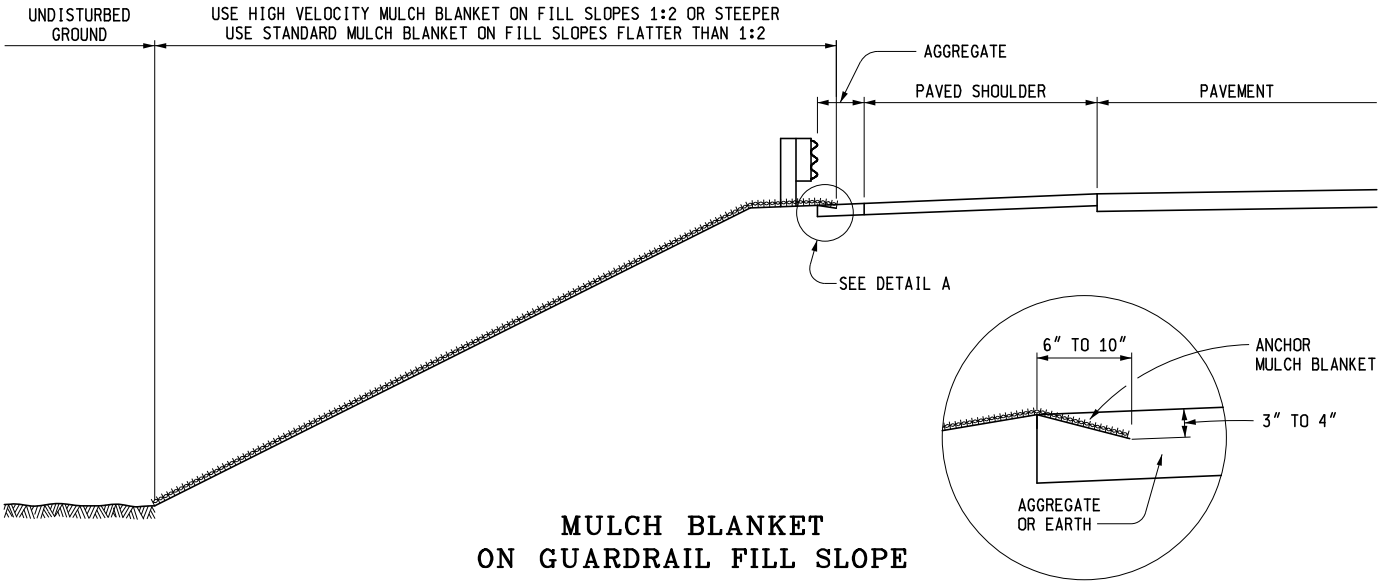
ALL TEMPORARY EROSION CONTROL DEVICES SHALL BE REMOVED AFTER VEGETATION ESTABLISHMENT OR AT THE DISCRETION OF THE ENGINEER. CARE SHALL BE TAKEN DURING REMOVAL TO MINIMIZE SILTATION IN NEARBY DRAINAGE COURSES.

MICHIGAN DEPARTMENT OF TRANSPORTATION

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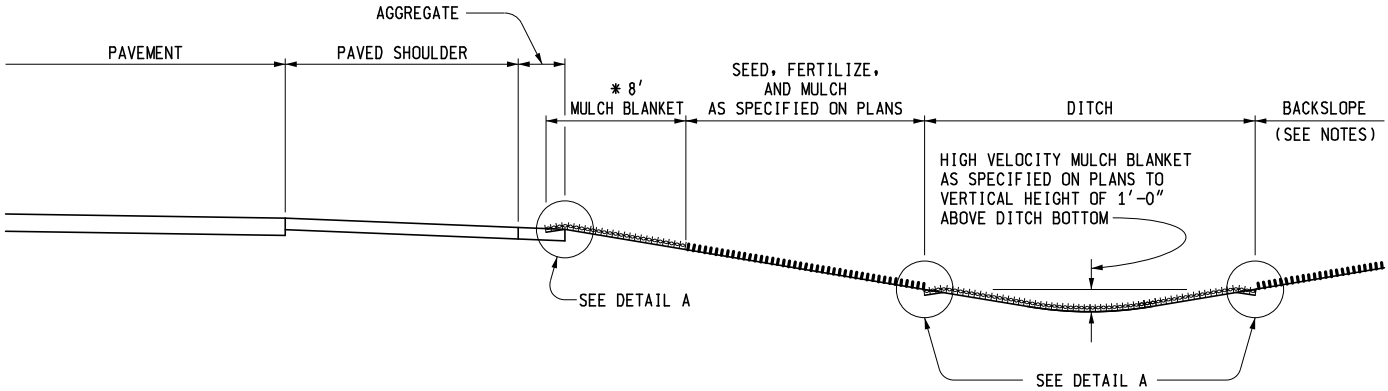
SOIL EROSION & SEDIMENTATION CONTROL MEASURES

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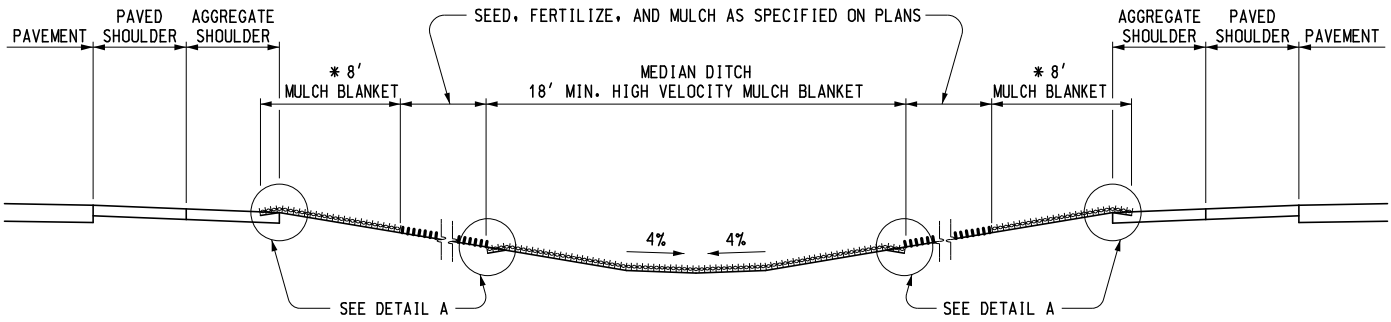


MULCH BLANKET ON GUARDRAIL FILL SLOPE

DETAIL A



TYPICAL SLOPE AND DITCH PROTECTION



MULCH BLANKET SPILLWAY DITCH

* NOTE:

MULCH BLANKET SHALL BE USED ON BOTH SIDES OF NORMAL SECTIONS, HIGH SIDES OF ALL SUPERELEVATED SECTIONS, AND LOW SIDES OF PAVEMENTS HAVING A SUPERELEVATION OF 5% OR LESS. HIGH VELOCITY MULCH BLANKET SHALL BE USED ON THE LOW SIDE OF PAVEMENTS HAVING A RATE OF SUPERELEVATION GREATER THAN 5%.

MDOT Michigan Department of Transportation

PREPARED BY DESIGN DIVISION

DRAWN BY: B.L.T.

CHECKED BY: W.K.P.

DEPARTMENT DIRECTOR
Kirk T. Steudle

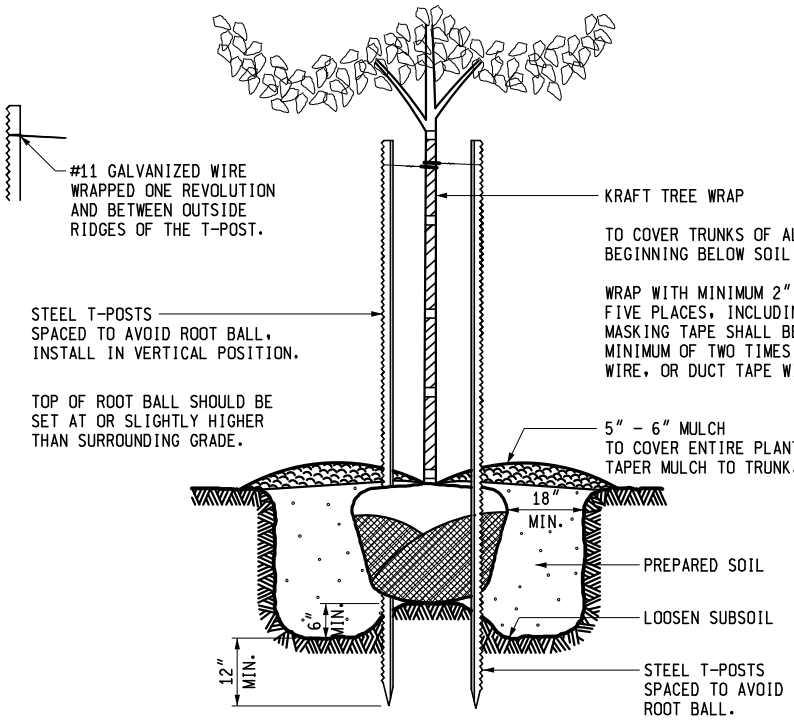
APPROVED BY: _____
DIRECTOR, BUREAU OF FIELD SERVICES

APPROVED BY: _____
DIRECTOR, BUREAU OF HIGHWAY DEVELOPMENT

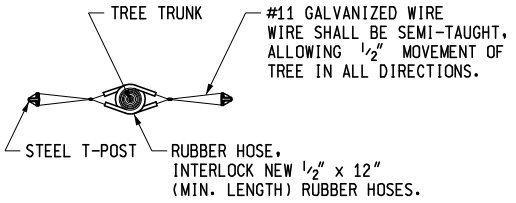
MICHIGAN DEPARTMENT OF TRANSPORTATION
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SEEDING AND TREE PLANTING

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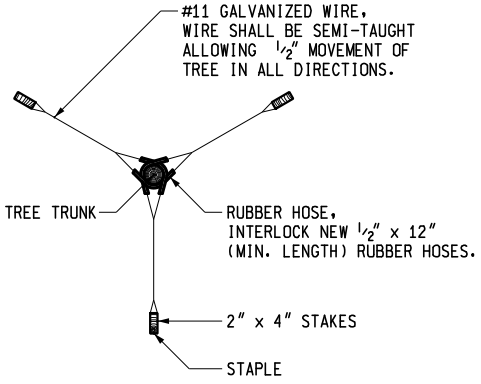
BRACING - VERTICAL STAKES



BRACING DETAIL

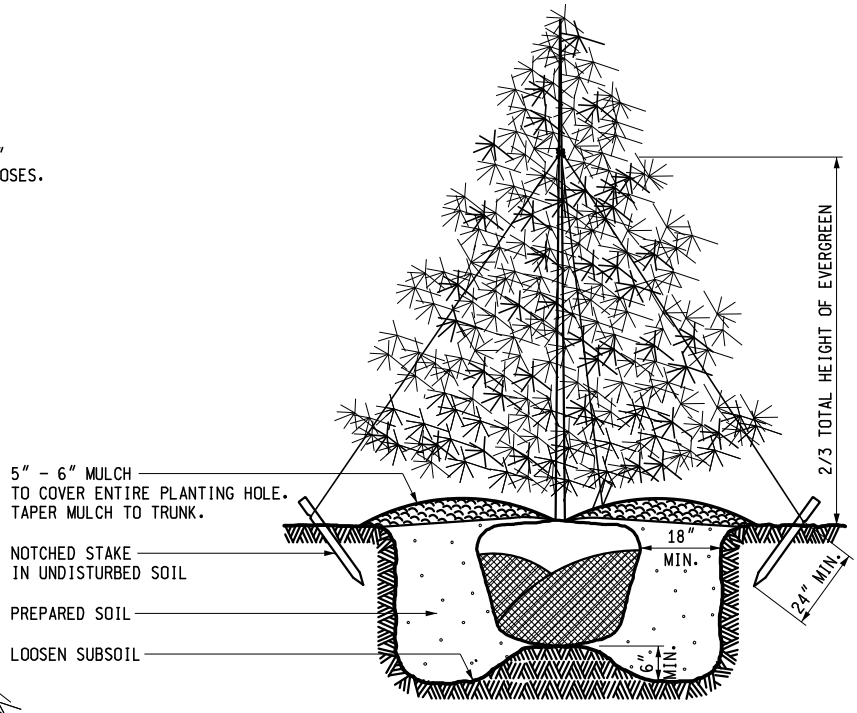
BRACE DECIDUOUS TREES 2" TO 4" IN CALIPER OR 8' OR MORE IN HEIGHT WITH TWO STAKES.

BRACE DECIDUOUS TREES LESS THAN 2" IN CALIPER OR 8' IN HEIGHT WITH ONE STAKE ON THE WESTERLY SIDE OF THE PLANT.

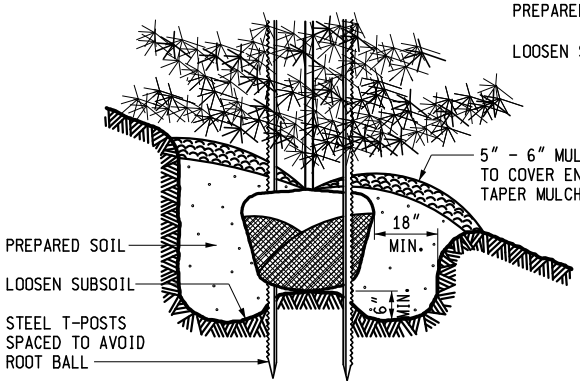


TRIPOD GUYING DETAIL

GUY EVERGREENS OVER 4" IN CALIPER OR 6' IN HEIGHT WITH THE TRIPOD METHOD AND UNDER 6' IN HEIGHT WITH TWO STAKES.



GUYING - TRIPOD METHOD

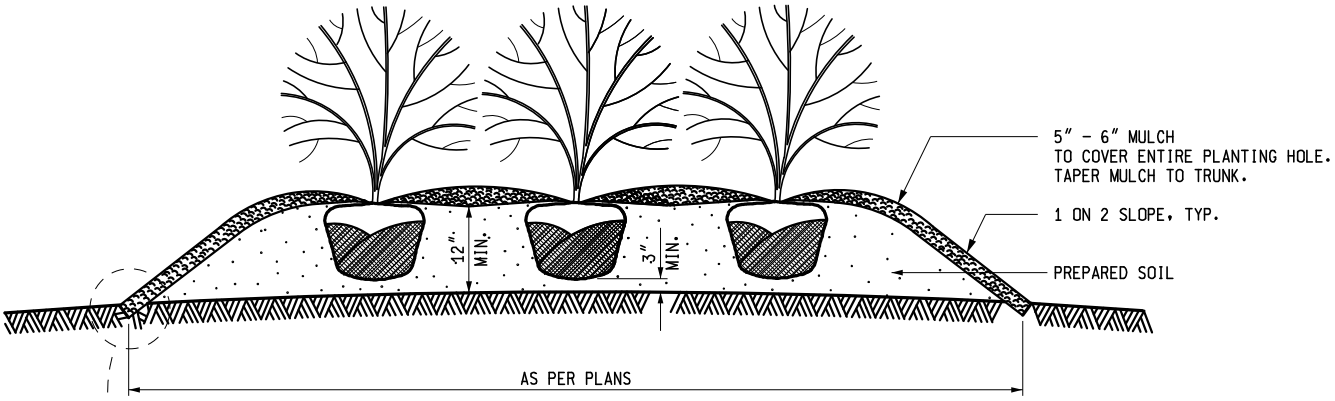


SLOPE PLANTING

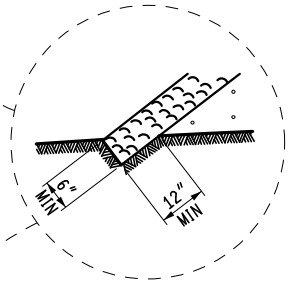
MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF HIGHWAY DEVELOPMENT STANDARD PLAN FOR

SEEDING AND TREE PLANTING

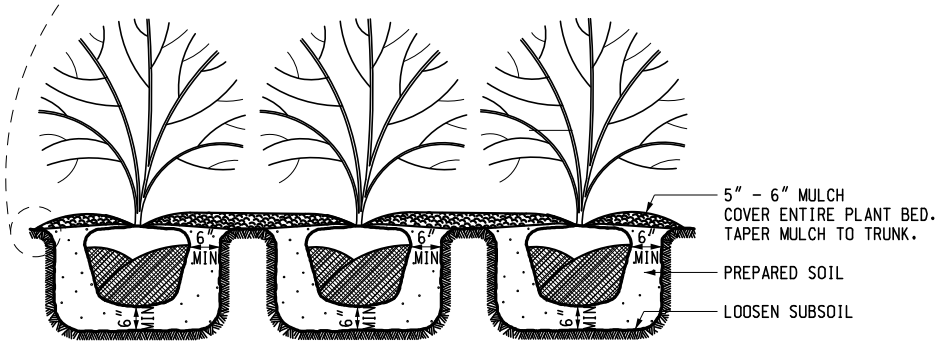
9-30-2014 F.H.W.A. APPROVAL	9-26-2013 PLAN DATE	R-100-H	SHEET 2 OF 4



RAISED SHRUB BED DETAIL



SHRUB BED EDGING DETAIL



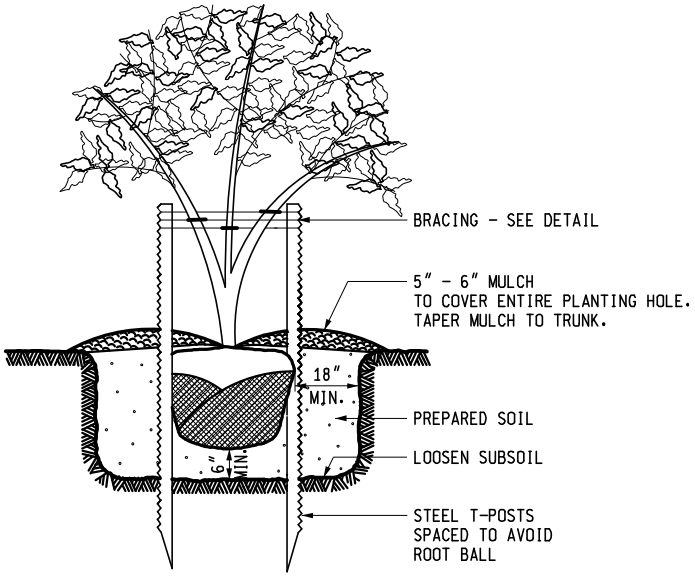
SHRUB BED DETAIL

FIRST AND SECOND WATERING AND CULTIVATION SHALL INCLUDE SHRUB BEDS.

CUT 6″ X 12″ (MIN.) EDGING AROUND THE PERIMETER OF ALL SHRUB BEDS SHOWN ON THE PLANS. SPRAY A NON-PERSISTANT GLYPHOSATE HERBICIDE TO ENTIRE SHRUB BEDS PRIOR TO PLANTING AND BARK PLACEMENT.

SHRUB BEDS ARE TO BE PAID FOR BY THE PAY ITEM 'SITE PREPARATION'.

ALL PLANTS SHALL BE SET PLUMB AND HAVE THE BEST SIDE OF PLANT FACING THE MAIN VIEWING DIRECTION.



MULTIPLE STEM TREES

PLANTING NOTES:

ALL EXCAVATED MATERIAL SHALL BE REMOVED FROM THE SITE – IMMEDIATELY.

LOOSEN SUBSOIL TO A DEPTH OF 4″. LOOSEN EARTH ON SIDES OF PLANT POCKET TO BREAK ANY GLAZING CAUSED BY DIGGING.

FILL PREPARED SOIL TO $^1/_2$ THE DEPTH OF THE ROOT BALL, PACK FIRMLY, AND PUDDLE WITH WATER.

BACKFILL WITH PREPARED SOIL WHICH, AFTER COMPACTION, IS FLUSH WITH SURROUNDING GROUND LEVEL.

COVER ENTIRE PLANT POCKET AREA WITH 5″–6″ MULCH. PRUNE, WRAP, AND BRACE AND GUY.

WHEN PLANTS ARE FURNISHED IN CONTAINERS, CONTAINERS SHALL BE COMPLETELY REMOVED AT THE TIME OF PLANTING.

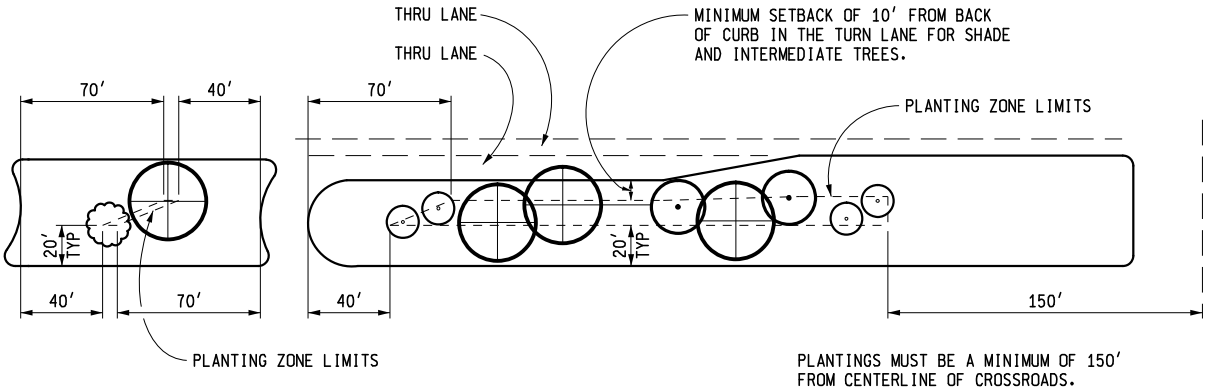
TREE HEIGHTS ARE SHOWN BEFORE PRUNING. TREE PLANTING DEPTHS ARE SHOWN AFTER SETTLING.

TREES AND SHRUBS SHALL NOT BE PLANTED WITHIN 50′ AND 30′ RESPECTIVELY OF THE NEAREST EDGE OF METAL – EXCEPT WHERE INACCESSIBLE TO VEHICLES.

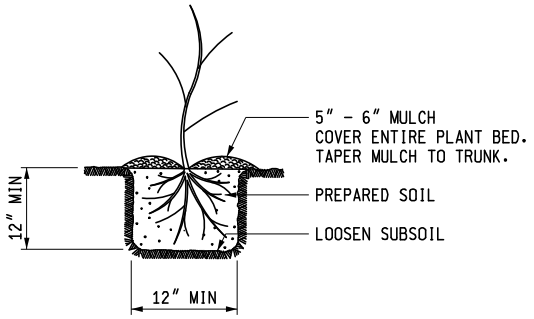
MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF HIGHWAY DEVELOPMENT STANDARD PLAN FOR

SEEDING AND TREE PLANTING

9-30-2014 F.H.W.A. APPROVAL	9-26-2013 PLAN DATE	R-100-H	SHEET 3 OF 4



MEDIAN PLANTING
NOT TO SCALE



BARE ROOT PLANTS

PLANTING BARE ROOT PLANT MATERIAL

REFER TO THE "SPECIAL PROVISIONS FOR BARE ROOT PLANTING" FOR SHIPPING, STORAGE AND HANDLING REQUIREMENTS.

MAINTAIN ROOT MOISTURE BY KEEPING ROOTS IMMERSED IN WATER PRIOR TO PLANTING.

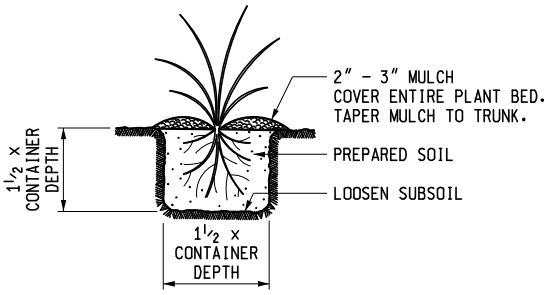
ROOT PRUNE AS NECESSARY TO REMOVE ALL DAMAGED OR BROKEN ROOTS, AND AS REQUIRED BY THE DISTRICT FORESTER OR RESOURCE SPECIALIST.

DIG PLANTING HOLES AT LEAST 12″ WIDE AND 12″ DEEP TO ACCOMODATE ROOT MASS.

SET PLANTS PLUMB WITH THE ROOTS SPREAD PUT IN A NATURAL POSITION AT A DEPTH EQUAL TO THE DEPTH AT THE NURSERY.

HOLD PLANT FIRMLY AND PUDDLE (NOT TAMP) THE BACKFILL AROUND THE ROOTS WITH WATER. SUFFICIENT WATER SHALL BE USED TO ENSURE SATURATION OF THE BACKFILL, BUT CARE SHOULD BE TAKEN NOT TO OVERWATER, CAUSING A FLOATING SOIL MASS THAT PREVENTS COMPACTION AND MAY RESULT IN AIR POCKETS ADJACENT TO THE ROOTS. BACKFILL SHOULD BE FLUSH WITH THE GROUND AFTER COMPACTION.

COVER ENTIRE PLANT POCKET AREA WITH 5″ – 6″ MULCH AS SHOWN.



PERENNIAL PLANTS

FIRST AND SECOND WATERING AND CULTIVATION SHALL INCLUDE PERENNIAL BEDS.

PERENNIALS ARE TO BE FULLY DEVELOPED TWO YEAR #2 CONTAINER PLANTS.

ENTIRE PERENNIAL BED SHALL BE EXCAVATED DOWN 12″ AND REPLACED WITH 12″ OF PREPARED SOIL.

PERENNIAL BEDS ARE TO BE PAID FOR BY THE PAY ITEM 'SITE PREPARATION'.

SEEDING NOTES:

THIS STANDARD ILLUSTRATES THE TYPICAL USE OF SEEDING WITH MULCH, AS THESE ITEMS RELATE TO ROADWAY CONSTRUCTION. THE ACTUAL DESIGN AND MATERIALS USED TO CONSTRUCT THE COMPLETE SECTION, WHICH INCLUDES SEEDING WITH MULCHING, WILL BE ACCORDING TO THE PLANS AND CURRENT SPECIFICATIONS.

ITEMS CALLED FOR ON THIS STANDARD MAY ALSO BE USED DURING CONSTRUCTION AS AN EROSION CONTROL MEASURE. SEE STANDARD PLAN R-96-SERIES.

ALL DITCHES SHOULD HAVE HIGH VELOCITY MULCH BLANKET FOR EROSION CONTROL.

THE FIRST 6′ BEHIND THE CURB OR SHOULDER IN URBAN MEDIAN AREAS WILL BE SEEDED, FERTILIZED, AND MULCHED WITH MULCH BLANKET. THE REMAINING AREAS WILL BE SEEDED, FERTILIZED, AND MULCHED WITH MULCH BLANKET OR STANDARD MULCH ANCHORED IN PLACE WITH A MULCH ADHESIVE OR WITH A MULCH NET.

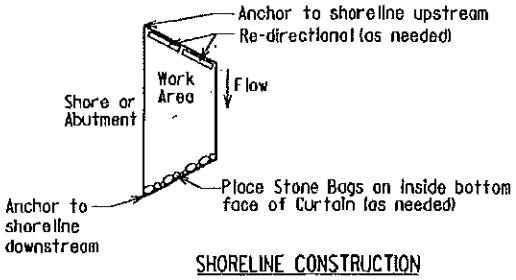
ALL AREAS WHERE MULCH BLANKET IS CALLED FOR SHALL BE SEEDED, FERTILIZED, AND TOPSOILED AS SPECIFIED ON PLANS. NO MULCH OR ANCHORING MULCH IS REQUIRED WHERE MULCH BLANKET IS INSTALLED.

BACKSLOPE RESTORATION TREATMENT SHALL BE THE SAME AS THE FRONT SLOPE.

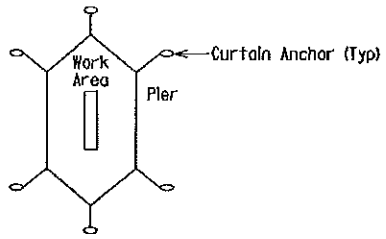
MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF HIGHWAY DEVELOPMENT STANDARD PLAN FOR

SEEDING AND TREE PLANTING

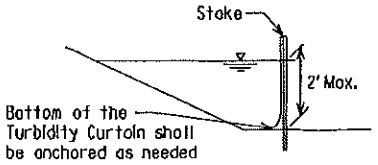
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SHORELINE CONSTRUCTION



IN-STREAM CONSTRUCTION



TURBIDITY CURTAIN (SHALLOW)



TURBIDITY CURTAIN (DEEP)

Use:

A Turbidity Curtain is used when slack water area is necessary to isolate construction activities from the watercourse.

The Turbidity Curtain system shall be designed to handle site specific drainage or flow patterns.

When water is less than 2 feet deep and has low flow, Turbidity Curtain (Shallow) may be used. Curtain shall be securely fastened to stakes. Water greater than 2 feet deep or where high flow exists requires the use of Turbidity Curtain (Deep).

Installation and Maintenance:

The Turbidity Curtain shall be installed at the location shown on the plans and according to the special provision.

The Turbidity Curtain shall be placed parallel to the direction of flow and anchored upstream, downstream, and to the stream bed to maximize protection to the watercourse.

The Contractor shall maintain the Turbidity Curtain until the construction activity within the watercourse is complete or as approved by the Engineer. Retained sediment shall be removed to the maximum extent practicable prior to removing the curtain

Optional Measures:

The Turbidity Curtain may include a re-directional barrier on the upstream end of the work area.

Related SESC Measures:

E & S-18 Dewatering with Filter Bag
E & S-24 Sand and Stone Bags
E & S-34 Cofferdam

Measurement and Payment:

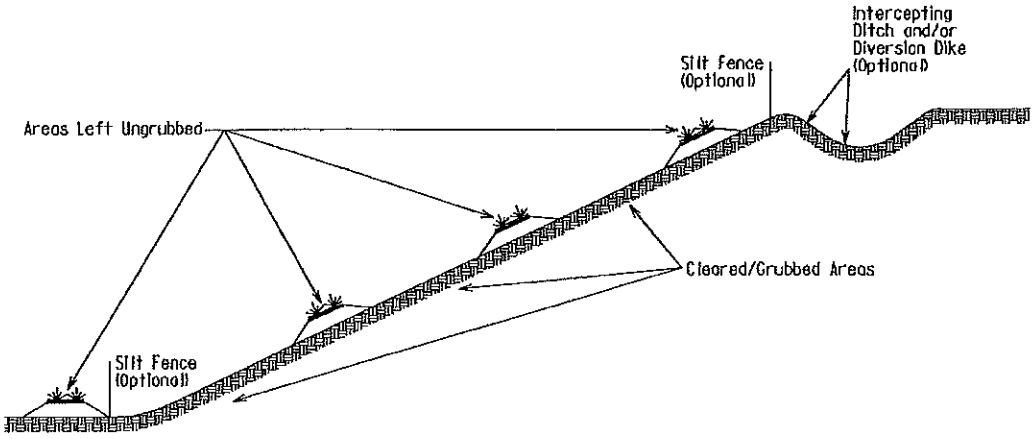
Turbidity Curtain requires inclusion of the appropriate special provision in the contract documents. Payment includes furnishing and installing sufficient anchors, tie-downs, or other mechanisms to ensure proper position and performance of the Turbidity Curtain. Optional work shown, when installed and maintained as directed by the Engineer, will be paid using the associated contract item listed here.

Contract Item (Pay Item)	Pay Unit
Turbidity Curtain (Shallow)	Foot
Turbidity Curtain (Deep)	Foot

MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF HIGHWAY DEVELOPMENT SESC DETAIL FOR

Turbidity Curtain

MDOT	09-30-2005 PLAN DATE	E&S-1-A	SHEET 1 OF 1



Use:

When long, steep slopes are proposed to be cleared and grubbed, it is a good soil erosion control practice to leave strips of ungrubbed slopes running perpendicular to the flow of water. This practice will reduce sheet flow velocities and prevent rilling and gullying. This practice works well on all slopes regardless of length.

This practice is similar to Vegetative Buffer Strips (E & S-6) since it leaves a portion of the natural vegetation in place to protect and assist in stabilizing the slope.

This practice is not effective in areas of concentrated flows.

Installation and Maintenance:

The strips of natural vegetation to be left undisturbed should be approximately 20 feet wide and spaced approximately 50 feet apart. The spacing of the strips of natural vegetation may be closer than 50 feet on steep slopes.

Optional Measures:

This grading practice may incorporate the use of Silt Fence (E & S-26) for added protection to off-site areas.

A Diversion Dike (E & S-10), Intercepting Ditch (E & S-11), and Intercepting Ditch and Diversion Dike (E & S-12) may be placed at the top of the slope to prevent water from running over the graded area.

Related SESC Measures:

E & S-6 Vegetative Buffer Strips
E & S-10 Diversion Dike
E & S-11 Intercepting Ditch
E & S-12 Intercepting Ditch and Diversion Dike
E & S-26 Silt Fence

Measurement and Payment:

There is no separate contract item for this E & S measure. Payment for Grubbing Omitted will be included in related items of work. Optional work shown, when installed and maintained as directed by the engineer, will be paid using the associated contract item listed here.

Contract Item (Pay Item)	Pay Unit
Ditch, Intercepting	Station
Embankment, LM	Cubic Yard
Erosion Control, Silt Fence	Foot

MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF HIGHWAY DEVELOPMENT SESC DETAIL FOR

Grubbing Omitted

MDOT	04-07-2006 PLAN DATE	E&S-2-A	SHEET 1 OF 1

Use:

Permanent/Temporary Seeding of grasses and legumes is the most common and economical means of establishing protective cover. The advantages of seeding over other means of establishing vegetation includes low initial cost, a wide variety of available grasses and legumes, lower labor input and ease of application.

Permanent/Temporary Seeding controls erosion by physically protecting bare soil from raindrop impact, flowing water and wind. Vegetation binds soil particles together with a dense root system and reduces the velocity and volume of overland flow. Wherever site conditions permit, this is the preferred method of surface stabilization.

Problems to consider are: the potential for erosion during the establishment period, the need to reseed areas, seasonal limitations on seeding, weed competition, and the need for water during germination and early growth.

Installation and Maintenance:

Permanent/Temporary seedbed preparation, seeding mixtures, rate of application for seed, fertilizer, mulch and water, as well as seeding limitations, shall be in accordance with the Michigan Department of Transportation Standard Specifications for Construction Section 816 Turf Establishment and the Standard Plans, R-100 Series.

Optional Measures:

Temporary seeding shall only be done with the approval of the Engineer.

Related SESC Measures:

E & S-28 Mulching & Mulch Anchoring
E & S-32 Surface Roughening & Scarification
E & S-33 Mulch Blankets and High Velocity Mulch Blankets

Measurement and Payment:

Optional measures, when installed and maintained as directed by the Engineer, will be paid using the associated pay items listed here.

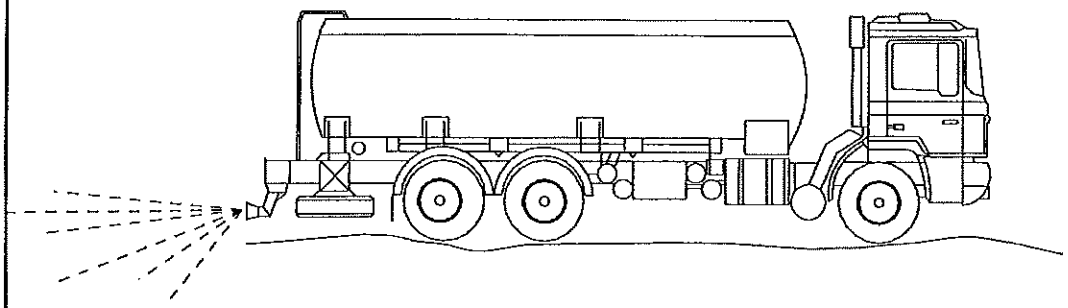
Contract Item (Pay Item)	Pay Unit
Seeding, Mixture __*	Pound
Water, Sodding/Seeding	Unit

* Note: Seeding Mixture may be modified by Special Provision.

MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF HIGHWAY DEVELOPMENT SESC DETAIL FOR

Permanent/Temporary Seeding

MDOT	09-30-2005 PLAN DATE	E&S-3-A	SHEET 1 OF 1



Use:
For disturbed areas not subject to traffic, vegetation (temporary or permanent) provides the most practical and effective means of Dust Control. For other areas, Dust Control measures include, but are not limited to, mulching, sweeping, watering, and applying calcium chloride or polymers.

Installation and Maintenance:
For off-road areas where vegetation will be the final stabilization method, calcium chloride shall not be used since it would inhibit vegetation establishment.

Optional Measures:

Related SESC Measures:
E & S-3 Permanent/Temporary Seeding
E & S-8 Aggregate Cover
E & S-14 Gravel Access Approach
E & S-28 Mulching and Mulch Anchoring
E & S-32 Surface Roughening and Scarification
E & S-33 Mulch Blankets and High Velocity Mulch Blankets

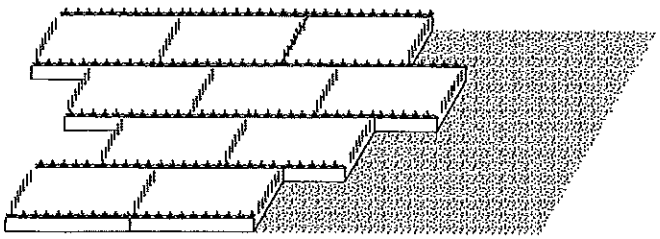
Measurement and Payment:
If not shown as a pay item, payment for Dust Control will be included in related items of work.

Contract Item (Pay Item)	Pay Unit
Dust Palliative, Applied	Ton

MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF HIGHWAY DEVELOPMENT SESC DETAIL FOR

Dust Control

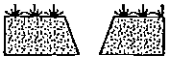
MDOT	04-07-2008 PLAN DATE	E&S-4-A	SHEET 1 OF 1



Lay sod in a staggered pattern with strips butted tightly against each other.
A sharpened mason's trowel can be used to tuck down the ends and trim pieces.



Correct



Incorrect

Angled Ends must be matched correctly.

Use:
Sodding provides an immediate vegetative cover for spillways and ditches.

Installation and Maintenance:
Due to high maintenance and difficult roadside establishment conditions, Sodding should only be used in areas where Permanent/Temporary Seeding (E & S-3) or Mulch Blankets (E & S-33) will not work. Since Sod requires frequent watering for its survival, it is not a good substitute for seeding.

Optional Measures:
In areas of concentrated ditch flow, seed and High Velocity Mulch Blankets (E & S-33) may be used.

See subsection 816.03 of the Standard Specifications for details and limitations for sodding.

Related SESC Measures:
E & S-33 Mulch Blankets and High Velocity Mulch Blankets

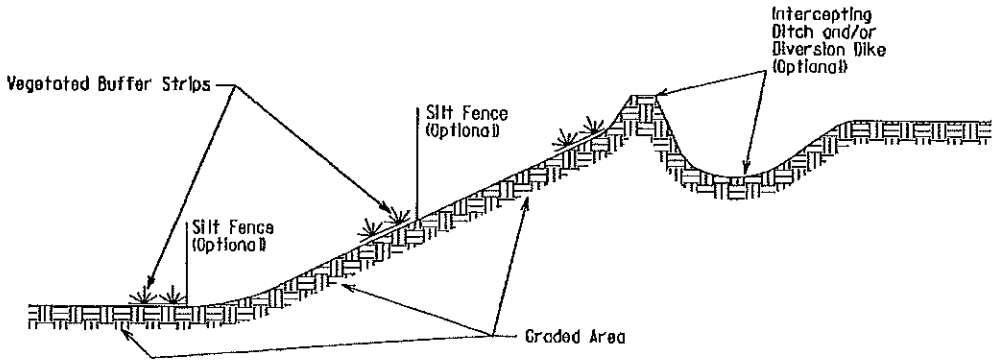
Measurement and Payment:

Contract Item (Pay Item)	Pay Unit
Sodding	Square Yard
Water, Sodding/Seeding	Unit

MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF HIGHWAY DEVELOPMENT SESC DETAIL FOR

Sodding

MDOT	04-07-2006 PLAN DATE	E&S-5-A	SHEET 1 OF 1



Use:

When slopes are proposed to be graded, it is a good practice to leave Vegetated Buffer Strips or undisturbed areas running perpendicular to the flow of water. This practice will reduce sheet flow velocities and prevent rilling and gullying.

Vegetated Buffer Strips will also assist in the establishment of a permanent vegetative cover, preventing slope sloughing and loss of seed and mulch. Vegetative Buffer Strips also provide wind breaks, reducing the potential for wind erosion.

This practice is similar to Grubbing Omitted (E & S-2) since it leaves a portion of the natural vegetation in place to protect and assist in stabilizing the slope.

This practice is not effective in areas of concentrated flows.

Installation and Maintenance:

The strips of natural vegetation to be left undisturbed should be approximately 20 feet wide and spaced approximately 50 feet apart. The spacing of the strips of natural vegetation may be closer than 50 feet on steep slopes.

Optional Measures:

For added protection to off-site areas, this grading practice may include the use of Silt Fence (E & S-26).

A Diversion Dike (E & S-10), Intercepting Ditch (E & S-11), and Intercepting Ditch and Diversion Dike (E & S-12) may be placed at the top of the slope to prevent water from running over the graded area.

Related SESC Measures:

E & S-2 Grubbing Omitted
E & S-10 Diversion Dike
E & S-11 Intercepting Ditch
E & S-12 Intercepting Ditch and Diversion Dike
E & S-26 Silt Fence

Measurement and Payment:

There is no separate contract item for this E & S measure. Payment for Vegetated Buffer Strips will be included in related items of work. Optional work shown, when installed and maintained as directed by the Engineer, will be paid using the associated contract item listed here.

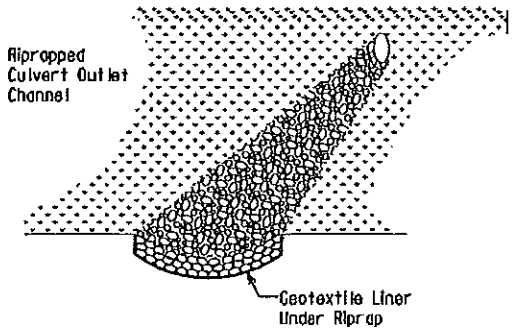
Contract Item (Pay Item)	Pay Unit
Ditch, Intercepting	Station
Erosion Control, Silt Fence	Foot
Embankment, LM	Cubic Yard
Embankment, CP	Cubic Yard

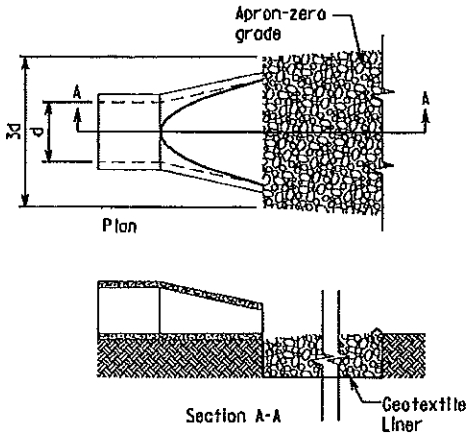
MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF HIGHWAY DEVELOPMENT SESC DETAIL FOR

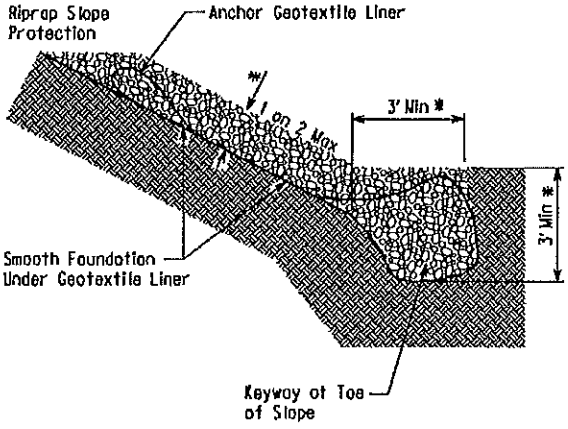
Vegetated Buffer Strips

MDOT	04-07-2006 PLAN DATE	E&S-6-A	SHEET 1 OF 1

Pipe outlet to flat areas with no well-defined channel

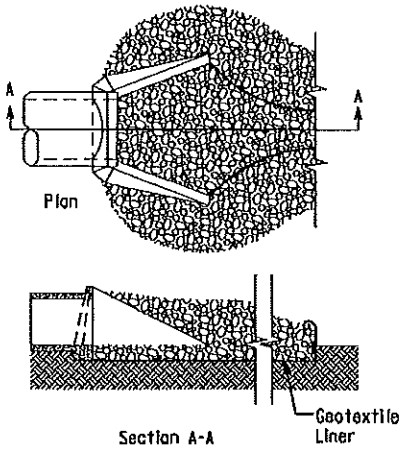






* Refer to Subsection 916.02 of Standard Specifications for Construction for minimum thickness of Riprap.

Pipe outlet to well-defined channel



MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF HIGHWAY DEVELOPMENT SESC DETAIL FOR

Riprap

MDOT	09-30-2005 PLAN DATE	E&S-7-A	SHEET 1 OF 2

Use:

Riprap should be sized to ensure that the size of stone is adequate to protect the area from erosion and subsequent siltation to off-site locations. Refer to Chapter 9 of the Drainage Manual for additional information on specifying Riprap.

Riprap provides an immediate and effective, non-erodible cover over raw erodible areas. A properly designed layer of stone can be used to control erosion. Riprap protects the soil surface from direct erosive forces such as wind, rain and surface runoff. It is often used on steep slopes subject to weathering or seepage, for channel liners, inlet and outlet protection of culverts, streambank protection and to protect shorelines subjected to wave action.

Clean, well-graded Riprap forms a dense, flexible, self-healing cover that will adapt well to uneven surfaces. Care must be exercised in the design and installation process so that the Riprap is clean, free of visible rebar, sized correctly and placed to the proper thickness.

Riprap placed at culvert outlets can be used to protect the stream bed and channel, thus reducing the flow velocity to a level that is non-erosive.

Riprap is used at the outlet of storm drains and as channel linings when flow velocities and concentrations are high and/or the channel slope is steep. Riprap is effective on the banks of channels, at changes in flow direction and to stabilize erodible slopes.

Installation and Maintenance:

Riprap shall be placed on Geotextile Liner to prevent soil 'piping' from seepage or runoff. The edges of the Geotextile Liner shall be overlapped a minimum of 2 feet. Place Riprap immediately after installing Geotextile Liner.

When Riprap, Heavy is specified, Geotextile Liner, Heavy must be used.

Refer to Subsection 810.03.E of the Standard Specifications for Construction for additional installation details.

Care must be taken to properly secure edges of Geotextile Liner to prevent piping.

When Riprap is placed as a permanent erosion control measure, the top of Riprap should be approximately level with surrounding soil surface.

Do not mix erodible soil with Riprap during placement.

Optional Measures:

Related SESC Measures:

S & E-19 Energy Dissipators

Measurement and Payment:

Contract Item (Pay Item)	Pay Unit
Riprap, Heavy	Square Yard
Riprap, Heavy, LM	Cubic Yard
Riprap, Plain	Square Yard
Riprap, Plain LM	Cubic Yard
Grouted Riprap	Square Yard

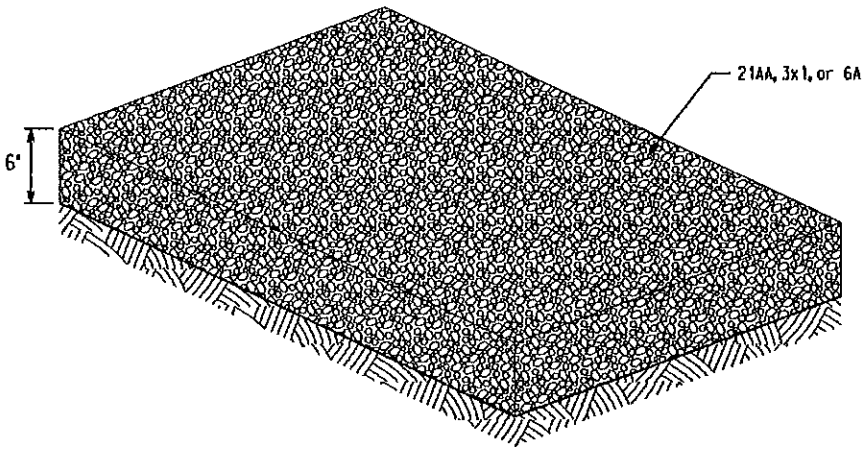
Note: Gradations and dimensions of Riprap may be modified by Special Provision.

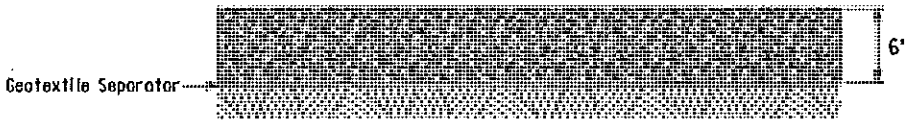
PERMITS FROM THE MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY MAY BE REQUIRED.

MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF HIGHWAY DEVELOPMENT SESC DETAIL FOR

Riprap

MDOT	04-07-2006 PLAN DATE	E&S-7-A	SHEET 2 OF 2





Use:

Temporary Aggregate Cover can be used anywhere on a construction site where a stable area is desired for construction operations, equipment storage, heavy traffic use, or any areas which could develop into a soil erosion problem, as a result of intensive activities and loss of vegetative cover.

Aggregate Cover may be used in conjunction with Gravel Access Approach (E & S-14).

Installation and Maintenance:

Replace or replenish aggregate cover during construction if it is no longer preventing soil erosion.

Optional Measures:

Related SESC Measures:

E & S-14 Gravel Access Approach

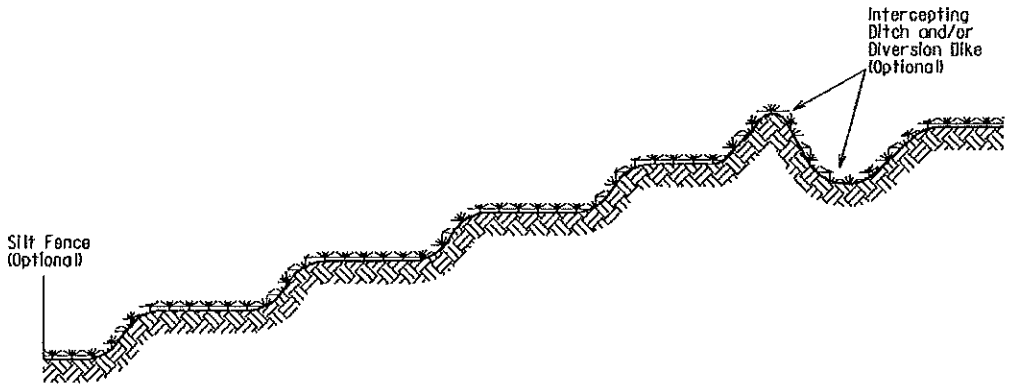
Measurement and Payment:

Contract Item (Pay Item)	Pay Unit
Erosion Control, Aggregate Cover	Square Yard
Erosion Control, Gravel Access Approach	Each

MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF HIGHWAY DEVELOPMENT SESC DETAIL FOR

Aggregate Cover

MDOT	04-07-2006 PLAN DATE	E&S-8-A	SHEET 1 OF 1



Use:

Benches are generally placed on long slopes to reduce runoff velocity by reducing the effective slope length.

Benches prevent sheet flow from gaining velocity and developing concentrated flows, preventing rilling and gullying.

Installation and Maintenance:

Bench dimensions to be determined by the engineer in field to maximize effectiveness.

If sediment is being transported by sheet flow coming down the slopes, it will be deposited on the benched area and not transported to the toe of slope or off-site. Sediment can then be removed or stabilized in place by the use of seed, fertilizer and mulch.

Optional Measures:

A Diversion Dike (E & S-10), Intercepting Ditch (E & S-11), and Intercepting Ditch and Diversion Dike (E & S-12) may be used at the top of slopes to minimize flow over the benched areas.

A Silt Fence (E & S-26) may be installed at the toe of slope for added protection to off-site areas.

Related SESC Measures:

E & S-3 Permanent/Temporary Seeding
E & S-10 Diversion Dike
E & S-11 Intercepting Ditch
E & S-12 Intercepting Ditch and Diversion Dike
E & S-26 Silt Fence

Measurement and Payment:

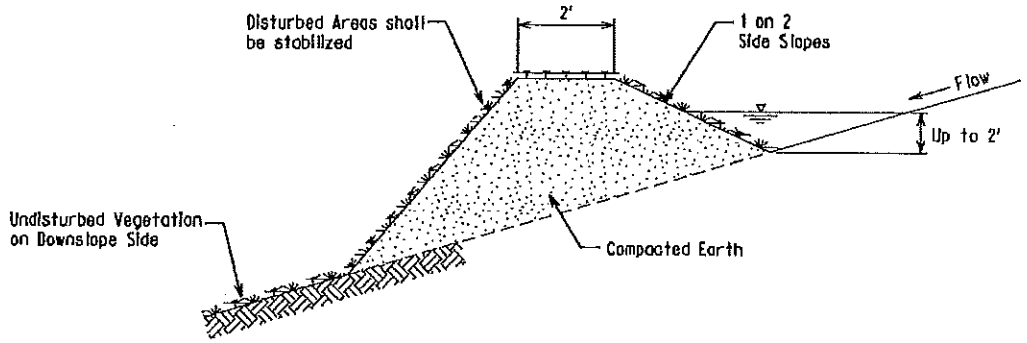
There is no separate contract item for this E & S measure. Payment for Benches will be included in related items of work. Optional work shown, when installed and maintained as directed by the Engineer, will be paid using the associated contract item listed here.

Contract Item (Pay Item)	Pay Unit
Ditch, Intercepting	Station
Erosion Control, Silt Fence	Foot
Embankment, LM	Cubic Yard
Embankment, CIP	Cubic Yard

MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF HIGHWAY DEVELOPMENT SESC DETAIL FOR

Benches

MDOT	04-07-2006 PLAN DATE	E&S-9-A	SHEET 1 OF 1



Use:

Refer to the Drainage Manual for additional design considerations when specifying this device.

A Diversion Dike is a temporary or permanent ridge of compacted earth constructed across sloping land, on a predetermined grade, to protect work areas or sensitive areas from upslope runoff by diverting flow away from the site to an appropriate outlet. The Diversion Dike shall be stabilized.

Installation and Maintenance:

This practice is best utilized in construction areas where runoff can be diverted and properly outletted to control erosion, sedimentation or flood damage. Specific locations and conditions may include:

- Above disturbed slopes to prevent runoffs over the slope;
- Across unprotected slopes or at slope breaks to reduce slope length;
- Below slopes to divert excess runoff to stabilized outlets;
- Diversion of sediment-laden water to sediment traps;
- At or near the perimeter of the construction area to keep sediment from leaving the site;

Optional Measures:

Related SESC Measures:

E & S-11 Intercepting Ditch
E & S-12 Intercepting Ditch and Diversion Dike
E & S-13 Gravel Filter Berm
E & S-15 Slope Drain Surface
E & S-20 Sediment Trap
E & S-37 Check Dam

Measurement and Payment:

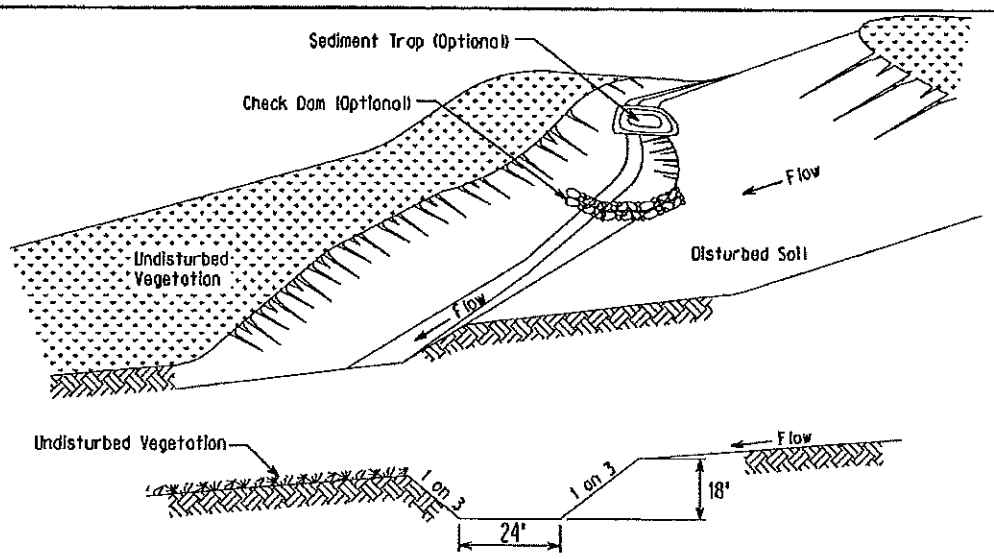
There is no separate contract item for this E & S measure. Payment for Diversion Dike will be included in related items of work. Optional work shown, when installed and maintained as directed by the Engineer, will be paid using the associated contract items listed here.

Contract Item (Pay Item)	Pay Unit
Embankment, LM	Cubic Yard
Embankment, CIP	Cubic Yard

MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF HIGHWAY DEVELOPMENT SESC DETAIL FOR

Diversion Dike

MDOT	04-07-2008 PLAN DATE	E&S-10-A	SHEET 1 OF 1



Use:

Refer to the Drainage Manual for additional design considerations when specifying this device.

An intercepting Ditch is a long, narrow ditch excavated into the earth on the upslope or downslope side of a drainage area. It is used to intercept storm runoff and divert it to a safe outlet location where sediment can be removed by reducing water velocity.

Installation and Maintenance:

This practice is best utilized in construction areas where runoff can be diverted to control erosion, sedimentation or flood damage. Specific locations and conditions may include:

- Above disturbed slopes to prevent runoff over the slope;
- Across unprotected slopes or at slope breaks to reduce the slope length;
- Below slopes to divert excess runoff to stabilized outlets;
- Diversion of sediment-laden water to sediment traps;
- At or near the perimeter of the construction area to keep sediment from leaving the site;

If the Intercepting Ditch (E & S-11) is used as a temporary measure on multi-year projects or remains as a permanent device, exposed areas shall be stabilized throughout the limits of the ditch.

Optional Measures:

Check Dam (E & S-37) and Sediment Trap (E & S-20) may be installed at upstream end of ditch. If Ditch is discharging water containing sediments, discharge to Sediment Trap (E & S-20) or Sediment Basin (E & S-21).

Related SESC Measures:

E & S-3 Permanent/ Temporary Seeding
E & S-10 Diversion Dike
E & S-12 Intercepting Ditch and Diversion Dike
E & S-13 Gravel Filter Berm
E & S-15 Slope Drain Surface
E & S-20 Sediment Trap
E & S-21 Sediment Basin
E & S-27 Plastic Sheets or Geotextile Cover
E & S-33 Mulch Blankets and High Velocity Mulch Blankets
E & S-37 Check Dam

Measurement and Payment:

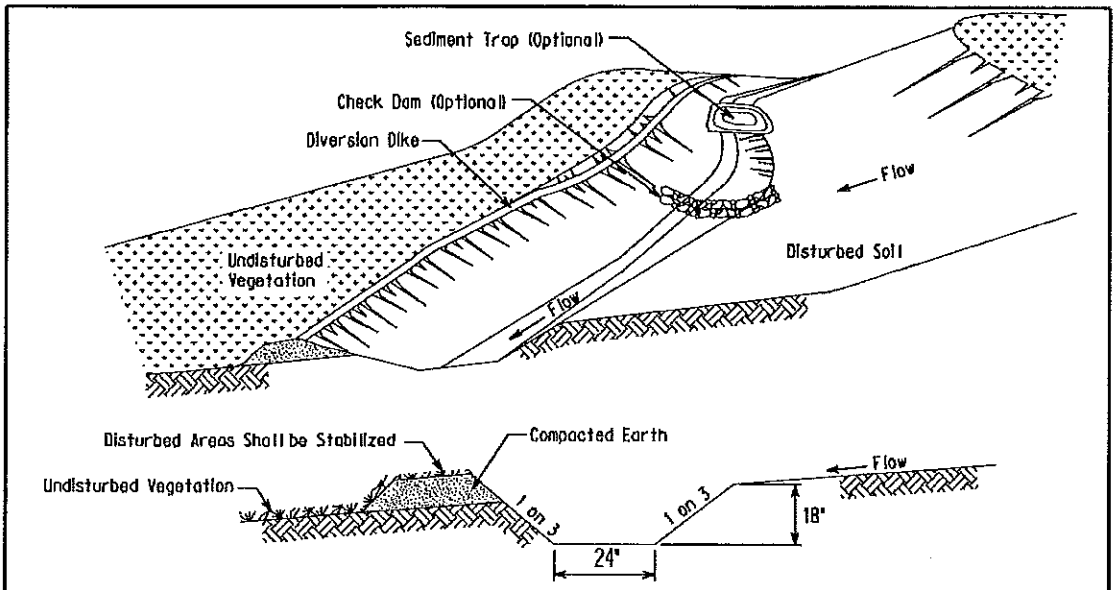
Optional work shown, when installed and maintained as directed by the Engineer, will be paid using the associated contract item listed here. Stabilizing exposed slopes for permanent application of this measure will be included in project quantities for similar work.

Contract Item (Pay Item)	Pay Unit
Ditch, Intercepting	Station
Erosion Control, Check Dam, Stone	Foot
Erosion Control, Sediment Trap	Each
Erosion Control, Sediment Basin	Each
Erosion Control, Maintenance, Sediment Removal	Cubic Yard

MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF HIGHWAY DEVELOPMENT SESC DETAIL FOR

Intercepting Ditch

MDOT	04-07-2006 PLAN DATE	E&S-11-A	SHEET 1 OF 1



Use:

Refer to the Drainage Manual for additional design considerations when specifying this device.

An intercepting ditch and diversion dike is used to intercept storm runoff by diverting it to safe outlet areas where sediments can be removed by reducing the water velocity. The ditch is excavated into the earth at the upslope or downslope side of a drainage area. The dike is created and stabilized immediately downslope of the newly created ditch.

Installation and Maintenance:

This measure is best installed in construction areas where runoff can be diverted to control erosion, sedimentation or flood damage. Specific locations and conditions may include:

- Above disturbed slopes to prevent runoff over the slope;
- Across unprotected slopes or at slope breaks to reduce slope length;
- Below slopes to divert excess runoff to stabilized outlets;
- Diversion of sediment-laden water to sediment traps;
- At or near the perimeter of the construction area to keep sediment from leaving the site;

If the intercepting ditch and diversion dike is used as a temporary measure on multi- year projects or remains as a permanent device, exposed areas shall be stabilized throughout the limits of the ditch.

If the Engineer determines that excavated soil is suitable, it may be placed and compacted on the downhill side of the ditch to create the dike.

Optional Measures:

Check Dam (E & S-37) and Sediment Trap (E & S-20) may be required at upstream end of ditch. If ditch is discharging water containing sediment, discharge to Sediment Trap (E & S-20) or Sediment Basin (E & S-21).

Related SESC Measures:

E & S-3 Permanent/Temporary Seeding
E & S-10 Diversion Dike
E & S-11 Intercepting Ditch
E & S-15 Slope Drain Surface
E & S-20 Sediment Trap
E & S-33 Mulch Blankets and High Velocity Mulch Blankets
E & S-37 Check Dam

Measurement and Payment:

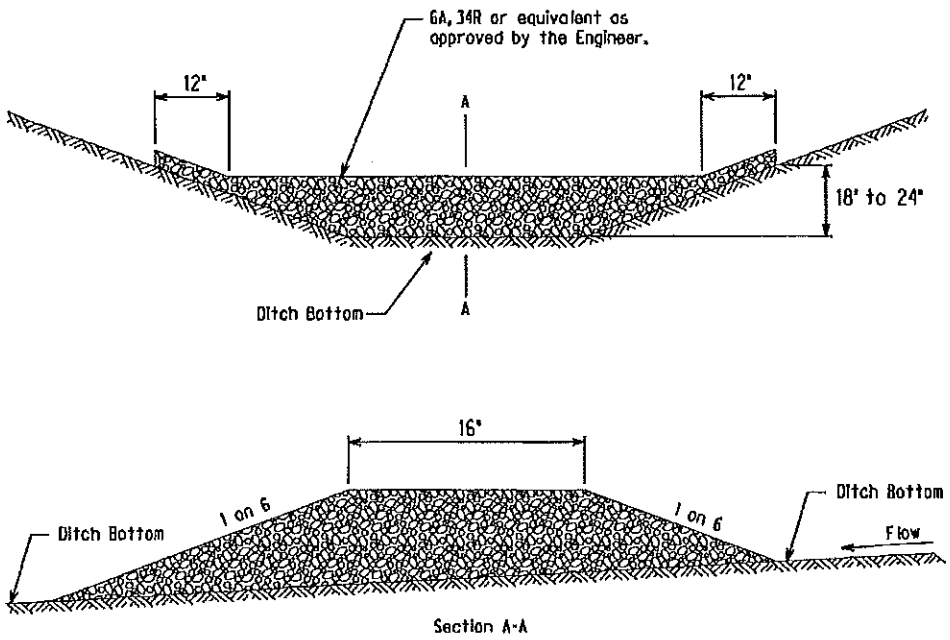
Optional work shown, when installed and maintained as directed by the Engineer, will be paid using the associated contract item listed here. Stabilizing exposed slopes for permanent application of this measure will be included in project quantities for similar work. Additional material and work required to construct the Diversion Dike will be paid as Embankment.

Contract Item (Pay Item)	Pay Unit
Erosion Control, Check Dam, Stone	Foot
Erosion Control, Sediment Trap	Each
Ditch, Intercepting	Station
Embankment, LM	Cubic Yard
Embankment, CIP	Cubic Yard

MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF HIGHWAY DEVELOPMENT SESC DETAIL FOR

Intercepting Ditch and Diversion Dike

MDOT	04-07-2006 PLAN DATE	E&S-12-A	SHEET 1 OF 1



Section A-A

Use:
Refer to the Drainage Manual for additional considerations when specifying this device.

A Gravel Filter Berm is a temporary structure to be placed wherever water flow requires filtering before leaving a construction site.

Gravel Filter Berm shall not be used in lieu of a Check Dam (E & S-37). Check Dams may provide some filtration, but the primary function is to dissipate energy to allow particle settlement.

Installation and Maintenance:
This device may require periodic maintenance to ensure adequate filtration.

Optional Measures:
Larger stone may be used as coarse aggregate to provide stable berm on steep slopes.

Related SESC Measures:
E & S-18 Dewatering with Filter Bag
E & S-20 Sediment Trap

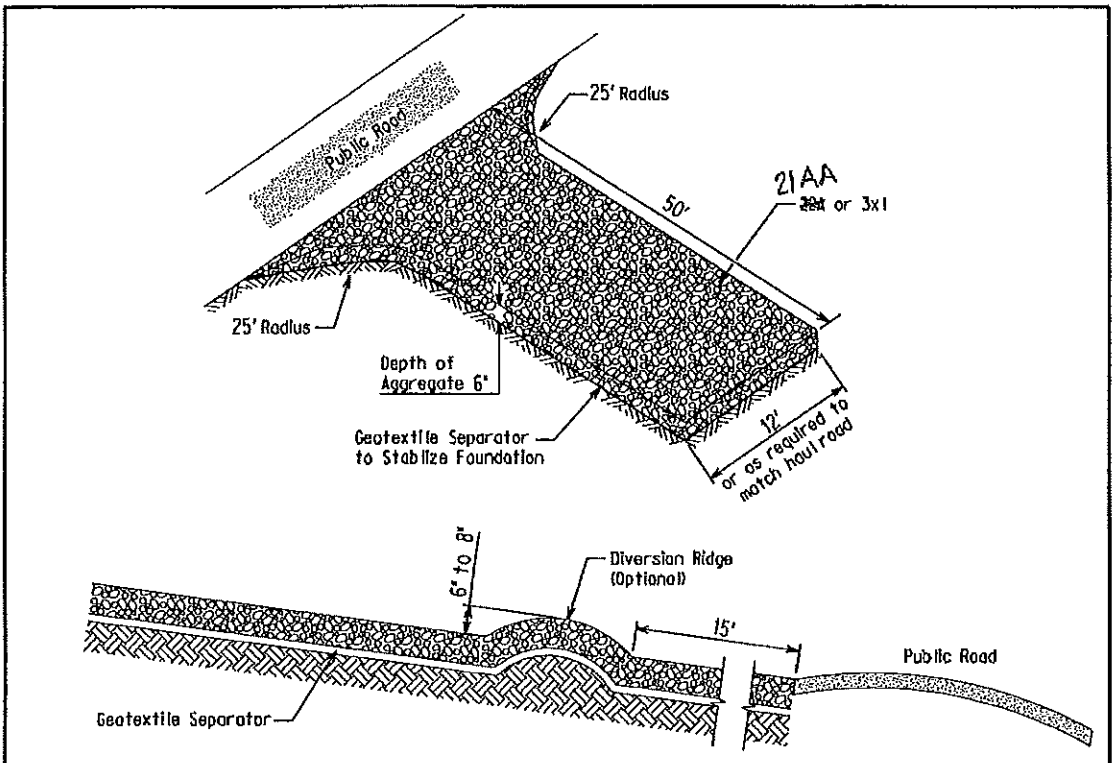
Measurement and Payment:
Payment for Gravel Filter Berm includes larger stone use to stabilize berm.

Contract Item (Pay Item)	Pay Unit
Erosion Control, Gravel Filter Berm	Foot

MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF HIGHWAY DEVELOPMENT SESC DETAIL FOR

Gravel Filter Berm

MDOT	04-07-2006 PLAN DATE	E&S-13-A	SHEET 1 OF 1



Use:
Providing a stable Gravel Access Approach, minimizes the tracking of loose materials from the construction site onto public roadways. Coarser aggregate is more effective in reducing tracking. Any materials tracked onto public roadways shall be removed as specified in the Standard Specifications for Construction, or as directed by the Engineer.

Installation and maintenance of Gravel Access Approach is effective in reducing sediment loading to inlet protection devices.

Installation and Maintenance:
The Gravel Access Approach should be located in accordance with the plans or as directed by the Engineer. All vegetation and other objectionable material shall be removed from the foundation area. Geotextile Separator must be placed beneath the aggregate to stabilize the foundation.

Replace or replenish aggregate if it is no longer preventing tracking.

Optional Measures:
A Gravel Access with Diversion Ridge is recommended where access grade exceeds 2%. This will also aid in dislodging soil or debris from tires.

Related SESC Measures:

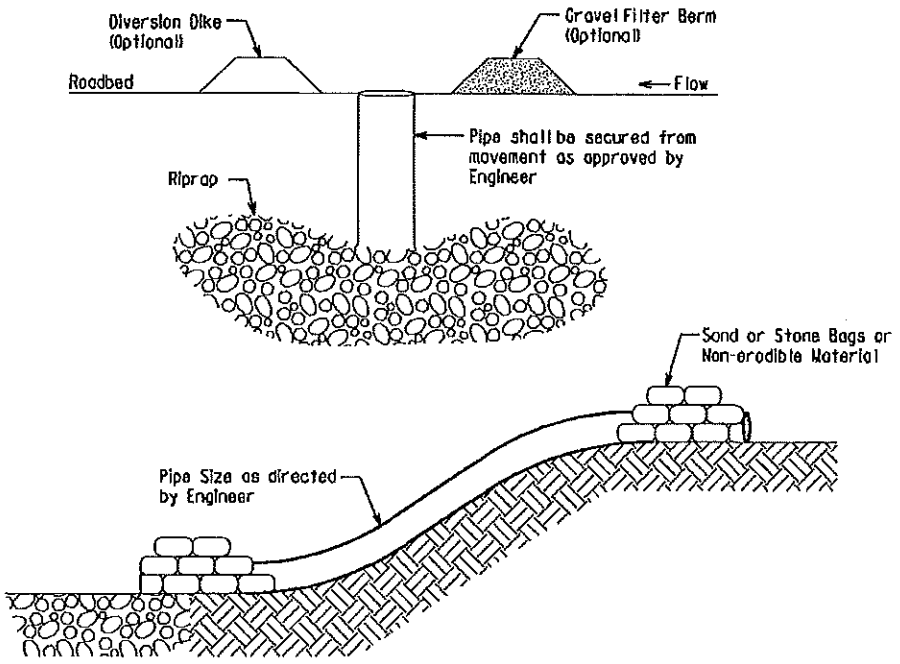
Measurement and Payment:
Optional work shown, when installed and maintained as directed by the Engineer, will be included in the item Gravel Access Approach

Contract Item (Pay Item)	Pay Unit
Erosion Control, Gravel Access Approach	Each

MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF HIGHWAY DEVELOPMENT SESC DETAIL FOR

Gravel Access Approach

MDOT	04-07-2006 PLAN DATE	E&S-14-A	SHEET 1 OF 1



Use:
Refer to the Drainage Manual for additional design considerations when specifying this device.

Slope Drain Surface is a temporary device intended to carry water down slope in a controlled manner, to prevent slope erosion and subsequent sedimentation.

Installation and Maintenance:
The pipe shall be secured to prevent movement. The material used to secure the pipe shall be approved by the Engineer. Place the Slope Drain Surface on undisturbed soil or well compacted fill. It is important to properly size the pipe and stabilize the outlet of these devices.

Material to be recommended or approved by the Engineer.

Optional Measures:
A Slope Drain Surface pipe may be used in conjunction with a Intercepting Ditch and Diversion Dike (E & S-10, 11, and 12).

A Gravel Filter Berm (E & S-13) may be used prior to entering the conduit when a bridge deck is undergoing hydrodemolition.

Related SESC Measures:
E & S-7 Riprap
E & S-10 Diversion Dike
E & S-11 Intercepting Ditch
E & S-12 Intercepting Ditch and Diversion Dike
E & S-19 Energy Dissipators
E & S-24 Sand and Stone Bags
E & S-26 Silt Fence

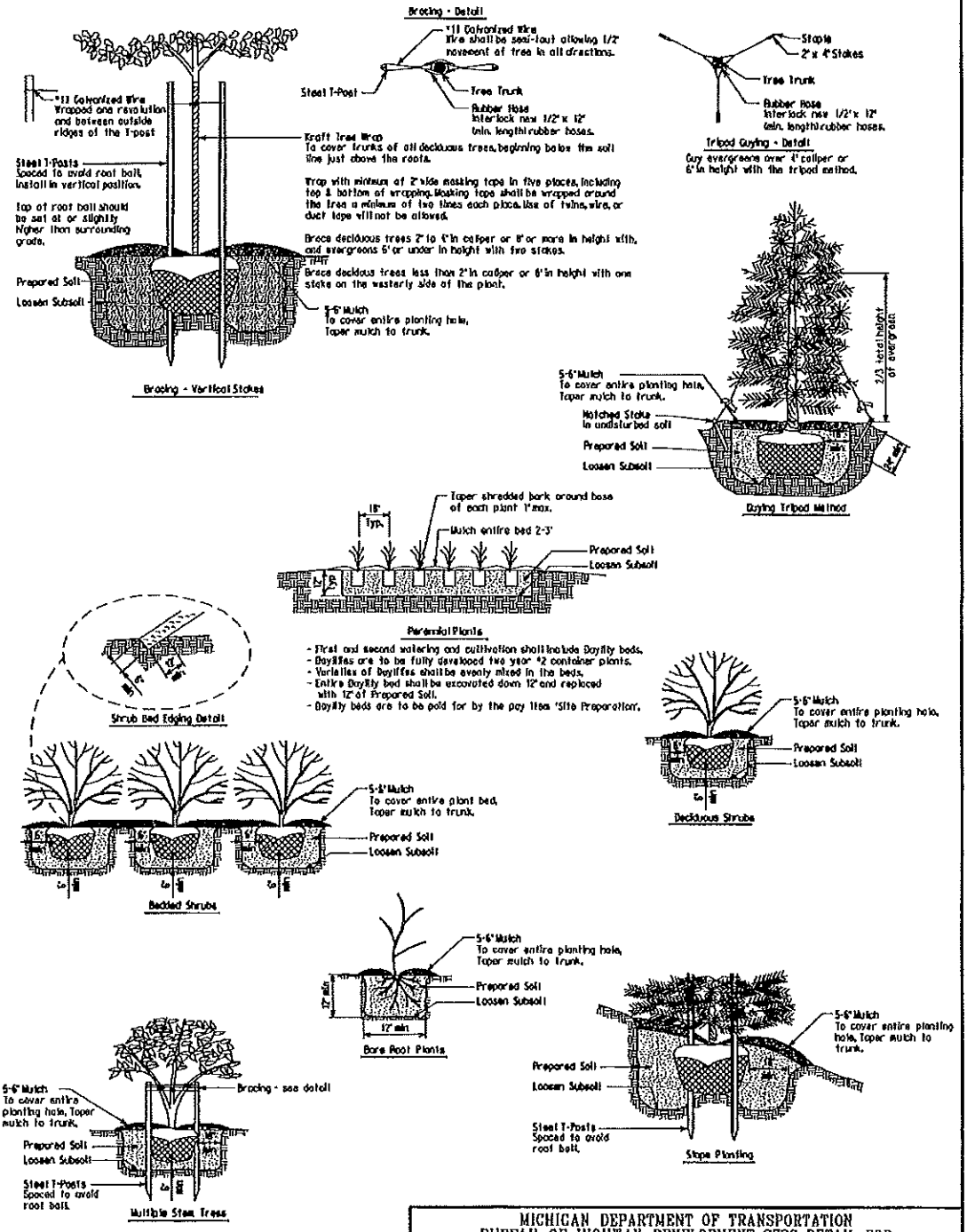
Measurement and Payment:
There is no separate contract item for this E & S measure. Payment for Slope Drain Surface will be included in related items of work. Optional work shown, when installed and maintained as directed by the Engineer, will be paid using the associated contract item listed here.

Contract Item (Pay Item)	Pay Unit
Riprap, Plain	Square Yard
Riprap, Plain, LM	Cubic Yard
Erosion Control, Gravel Filter Berm	Foot
Erosion Control, Sand Bag	Each
Erosion Control, Stone Bag	Each

MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF HIGHWAY DEVELOPMENT SESC DETAIL FOR

Slope Drain Surface

MDOT	04-07-2006 PLAN DATE	E&S-15-A	SHEET 1 OF 1



MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF HIGHWAY DEVELOPMENT SESC DETAIL FOR

Trees, Shrubs, and Perennials

MDOT	09-30-2005 PLAN DATE	E&S-16-A	SHEET 1 OF 2

Use:

Trees, shrubs, and some selected grasses and legumes can provide low maintenance, long-term erosion protection. These plants may be particularly useful where site aesthetics are important. There are many different species of plants to choose from and care must be taken in their selection. Assistance in selecting proper types of vegetation can be obtained from the Roadside Development Unit of the Design Support Area, or the Region Resource Specialist.

Woody plants are particularly adaptable for use on steep or rocky slopes where maintenance is difficult. They provide long-term erosion protection to slopes, including steep slopes (1 on 3 or greater).

Installation and Maintenance:

Planting trees, shrubs and evergreens

Specific planting requirements are as follows:

1. Dig plant pocket for deciduous and evergreen trees a minimum of 36" wider and 6" deeper than root ball unless otherwise specified.
2. Dig plant pocket for shrubs a minimum of 12" wider and 6" deeper than the root ball unless otherwise specified.
3. Loosen subsoil to a depth of 4". Loosen earth on sides of plant pocket to break any glazing caused by digging.
4. Set plant at the same or slightly higher depth than that at the nursery.
5. Fill prepared soil 1/2 the depth of the root ball, pack firmly and puddle with water.
6. Loosen and remove burlap and all lacing from upper half of the root ball.
7. Backfill remaining plant pocket with prepared soil and pack firmly. After compaction, the disturbed area should be flush with the surrounding ground.
8. Cover entire plant pocket area with 2 to 4 inches of mulch. Prune, wrap, brace and guy as specified.

Optional Measures:

Related SESC Measures:

E & S-3 Permanent/Temporary Seeding
E & S-28 Mulching and Mulch Anchoring
E & S-33 Mulch Blankets and High Velocity Mulch Blankets

Measurement and Payment:

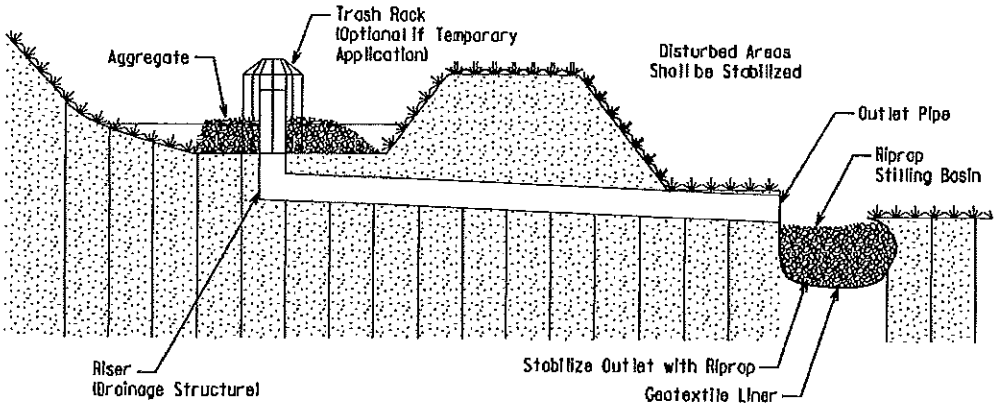
Contract Item (Pay Item)	Pay Unit
(Botanical Name)	Each

Refer to plans or contract documents for specific items as determined by the Roadside Development Unit of the Design Support Area. Refer to section 815 of the Standard Specifications for Construction for requirements for site preparation, watering and cultivating.

MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF HIGHWAY DEVELOPMENT SESC DETAIL FOR

Trees, Shrubs, and Perennials

MDOT	09-30-2005 PLAN DATE	E&S-16-A	SHEET 2 OF 2



Use:

Refer to the Drainage Manual for additional design considerations when specifying this device.

A Pipe Drop is an effective way to allow water to drop or flow very rapidly down elevation without causing erosion and sedimentation to the down slope area. In addition, they function effectively as a sediment trap. A Pipe Drop is generally a permanent soil erosion and sedimentation control device.

Installation and Maintenance:

The size of the riser and outlet pipes shall be approved by the Engineer. If high outlet velocities are anticipated, the size and quantity of Riprap will also be determined by the Engineer. Energy Dissipators (E & S-19) may be required.

This device will require consultation with the Hydraulic/Hydrology Unit of the Design Support Area prior to specifying on the plans.

Optional Measures:

Energy Dissipators (E & S-19) may be required. For additional Energy Dissipators reference Standard Plan R-85 Series (outlet headwalls with baffles).

Installation of Trash Rack is optional for temporary Pipe Drop.

Related SESC Measures:

E & S-7 Riprap
E & S-19 Energy Dissipators

Measurement and Payment:

Pipe Drop requires inclusion of the appropriate Special Provision in the contract documents. Payment includes furnishing and installing Trash Rack, when specified, and stabilization of all disturbed area.

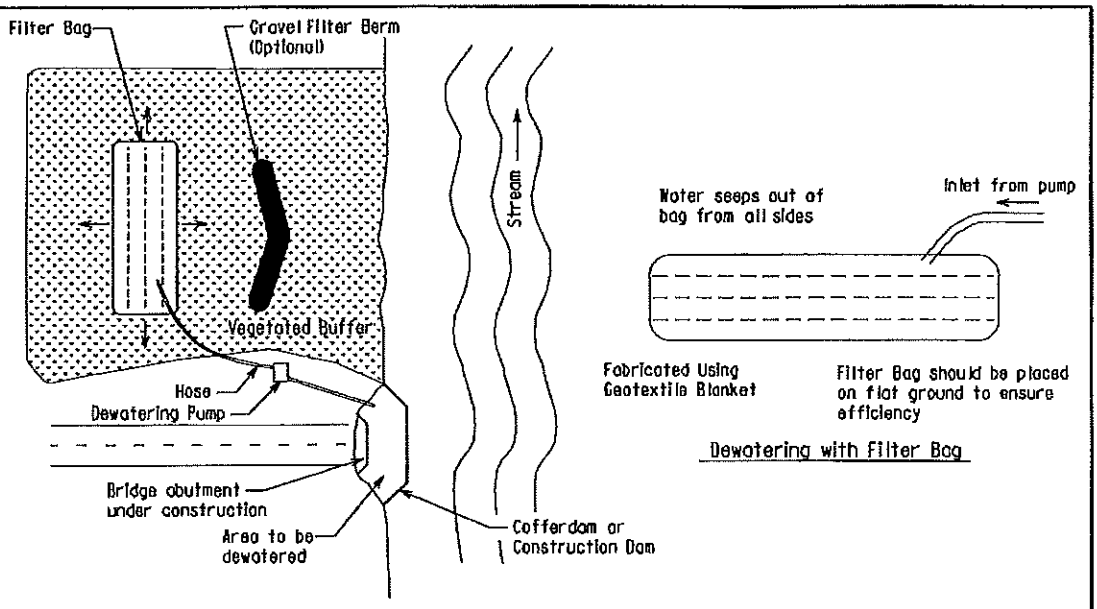
Refer to Special Provision for additional details.

Contract Item (Pay Item)	Pay Unit

MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF HIGHWAY DEVELOPMENT SESC DETAIL FOR

Pipe Drop

MDOT	04-07-2006 PLAN DATE	E&S-17-A	SHEET 1 OF 1



Use:

Dewatering operations may utilize a Filter Bag located a sufficient distance from the watercourse or wetland to allow for proper settling or filtering through natural vegetation.

Installation and Maintenance:

The Filter Bag must be of adequate size or the pumping rate must be reduced to still the water for a sufficient time to allow particles to settle.

When Dewatering with a Filter Bag on a barge, care shall be taken during the removal of the Filter Bag to ensure that sediment does not enter the watercourse.

Optional Measures:

Installation of a Gravel Filter Berm (E & S-13) may be required to provide additional sediment removal. Placement of a Sediment Basin (E & S-21) may be required if the water returning to the streams or wetland area remains turbid.

Related SESC Measures:

E & S-13 Gravel Filter Berm
E & S-20 Sediment Trap
E & S-21 Sediment Basin
E & S-34 Cofferdam
E & S-36 Construction Dam

Measurement and Payment:

Dewatering and associated E & S measures are generally not paid for separately but are included in related items of work. When a Filter Bag is used to aid in removing sediment, it will be paid for separately. Optional work shown, when installed and maintained as directed by the Engineer, will be paid using the associated contract items listed here unless otherwise specified.

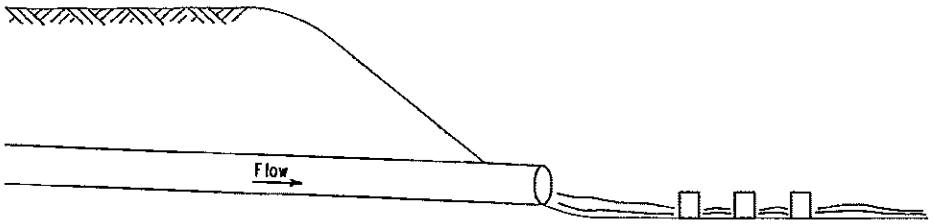
Contract Item (Pay Item)	Pay Unit
Erosion Control, Sediment Basin	Cubic Yard
Erosion Control, Maintenance, Sediment Removal	Cubic Yard
Erosion Control, Gravel Filter Berm	Foot
Erosion Control, Filter Bag	Each

PERMITS FROM THE MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY MAY BE REQUIRED.

MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF HIGHWAY DEVELOPMENT SESC DETAIL FOR

Dewatering with Filter Bag

MDOT	04-07-2006 PLAN DATE	E&S-18-A	SHEET 1 OF 1



Use:

Refer to the Drainage Manual for additional design considerations when specifying this device.

Energy Dissipators must be designed by a Hydraulic Engineer. The Hydraulic Engineer will determine the outlet velocities and the size and type of the structural device.

Energy Dissipators are structures used to control erosion at the outlet of a channel or conduit. Energy Dissipators reduce the velocity of flow and dissipate the energy. This practice applies where the discharge velocity of a pipe, box culvert, diversion, open channel or other water conveyance structure exceeds the erodible velocity of the receiving channel or disposal area.

Energy Dissipators are generally not required or recommended on natural watercourses since stream crossing structures must be designed without excessive stream velocities or potentially damaging back water.

Riprap (E & S-7) stilling basins or plunge pools work well and rapidly reduce flow velocity. They should be considered in lieu of concrete aprons or other rigid structures.

For other Energy Dissipator details, reference Standard Plan R-85 Series (outlet headwalls with baffles).

Installation and Maintenance:

Follow manufacturer's recommendations and contract documents for installation and maintenance of prefabricated or site built Energy Dissipators.

Optional Measures:

Related SESC Measures:

E & S-7 Riprap

Measurement and Payment:

Unless otherwise specified, there is no separate Pay Item for this E & S measure.

Riprap may be included as a Pay Item using one of the following contract items.

Contract Item (Pay Item)	Pay Unit
Riprap, Heavy	Square Yard
Riprap, Heavy, L.M	Cubic Yard
Riprap, Plain	Square Yard
Riprap, Plain, L.M	Cubic Yard
Riprap, Grouted	Square Yard

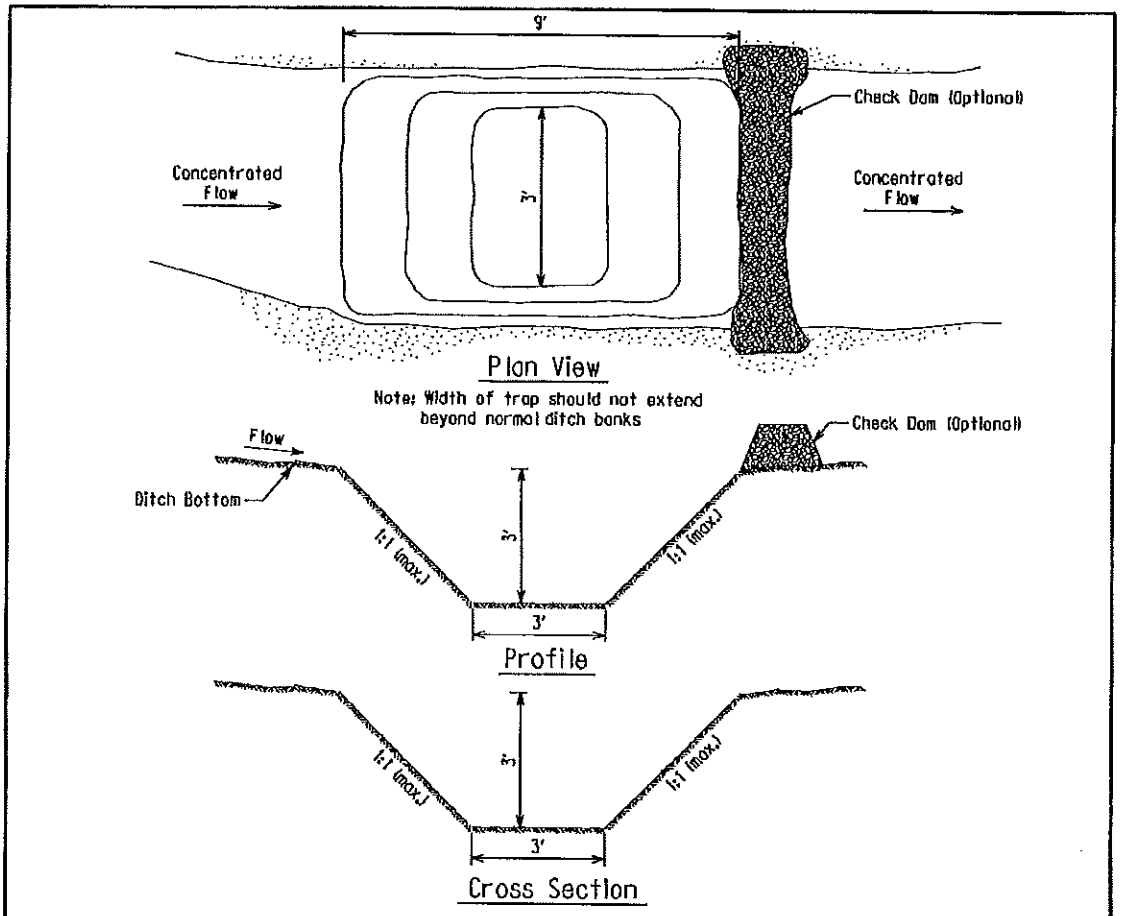
Note: Gradations and dimensions of Riprap may be modified by Special Provision

PERMITS FROM THE MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY MAY BE REQUIRED.

MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF HIGHWAY DEVELOPMENT SESC DETAIL FOR

Energy Dissipators

MDOT	04-07-2008 PLAN DATE	E&S-19-A	SHEET 1 OF 1



Use:
Refer to the Drainage Manual for additional design considerations when specifying this device.

A Sediment Trap can be used in any area where concentrated flow would result in the transport of sediments off site into a body of water or wetland area. A Sediment Trap is an effective device used to settle out sand sized particles and larger. The size of a Sediment Trap is 5 cubic yards or less.

Installation and Maintenance:
Sediment Trap dimensions are highly variable as required by project site conditions. Sediment should be removed and the Sediment Trap restored to its original design when the sediment has accumulated up to approximately 50 percent of its capacity.

Optional Measures:
A Check Dam (E & S-37) may be used in conjunction with the Sediement Trap. The Check Dam should be located immediately down slope of the Sediment Trap. Multiple traps may be required, as recommended by the Engineer.

Related SESC Measures:
E & S-37 Check Dam

Measurement and Payment:
Optional work shown, when installed and maintained as directed by the Engineer, will be paid using the associated contract item listed here.

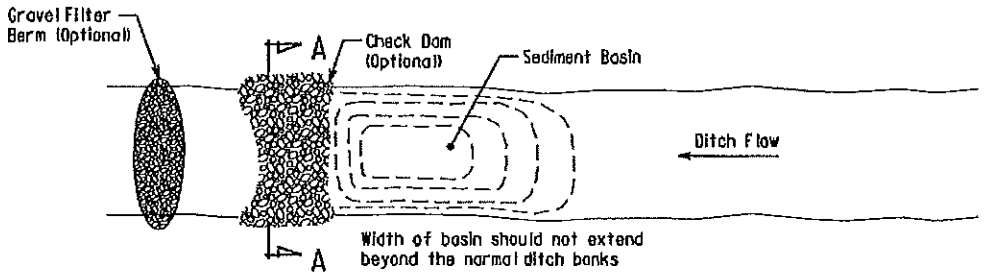
Contract Item (Pay Item)	Pay Unit
Erosion Control, Sediment Trap	Each
Erosion Control, Maintenance, Sediment Removal	Cubic Yard
Erosion Control, Check Dam, Stone	Foot

PERMITS FROM THE MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY MAY BE REQUIRED.

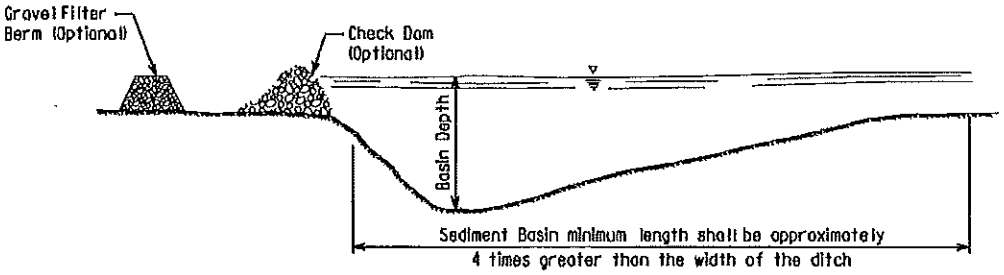
MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF HIGHWAY DEVELOPMENT SESC DETAIL FOR

Sediment Trap

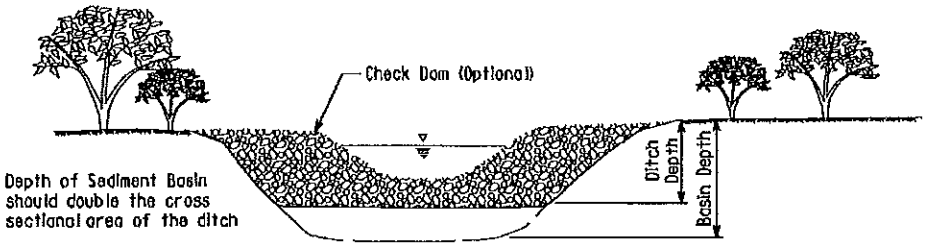
MDOT	04-07-2008 PLAN DATE	E&S-20-A	SHEET 1 OF 1



Plan View



Profile View



Section A-A

MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF HIGHWAY DEVELOPMENT SESC DETAIL FOR

Sediment Basin

MDOT	04-07-2006 PLAN DATE	E&S-21-A	SHEET 1 OF 2

Use:

Refer to the Drainage Manual for additional design considerations when specifying this device.

A Sediment Basin should be used as a last effort to collect sediments. Whenever possible, sediments shall be prevented from reaching the ditch (or watercourse if basin is permitted) by the use of Construction Dam (E & S-36), Cofferdam (E & S-34), Gravel Filter Berm (E& S-13), Sediment Trap (E & S-20), Silt Fence (E & S-26), Temporary Bypass Channel (E & S-35), Dewatering with Filter Bag (E & S-18), or Diversion Dike (E & S-10), Intercepting Ditch (E & S-11), or Intercepting Ditch and Diversion Dike (E & S-12). These devices will isolate the construction activity from the ditch (or watercourse if permitted).

NOTE: Sediment Basins are allowed in streams by permit only.

Installation and Maintenance:

A Sediment Basin is an effective device used to settle out sand sized particles and larger. Sediment Basin is greater than 5 cubic yards.

The width of the Sediment Basin should not extend beyond the ditch slope. The length of the Sediment Basin shall be approximately four times greater than the stream width.

The Basin must be periodically cleaned when it reaches approximately 50 percent of its capacity under the pay item Erosion Control, Maintenance, Sediment Removal. Upon stabilization of the construction area, the basin shall receive a final cleaning and the Check Dam removed.

Optional Measures:

A Check Dam (E & S-37), may be used and shall be located immediately downslope of the Sediment Basin.

A Gravel Filter Berm (E & S-13) may be installed downslope of the Sediment Basin and Check Dam to provide additional sediment removal.

Related SESC Measures:

E & S-10 Diversion Dike
E & S-11 Intercepting Ditch
E & S-12 Intercepting Ditch and Diversion Dike
E & S-13 Gravel Filter Berm
E & S-18 Dewatering with Filter Bag
E & S-20 Sediment Trap
E & S-24 Sand and Stone Bags
E & S-26 Silt Fence
E & S-34 Cofferdam
E & S-35 Temporary Bypass Channel
E & S-36 Construction Dam
E & S-37 Check Dam

Measurement and Payment:

Optional work shown, when installed and maintained as directed by the Engineer, will be paid using the associated contract item listed here.

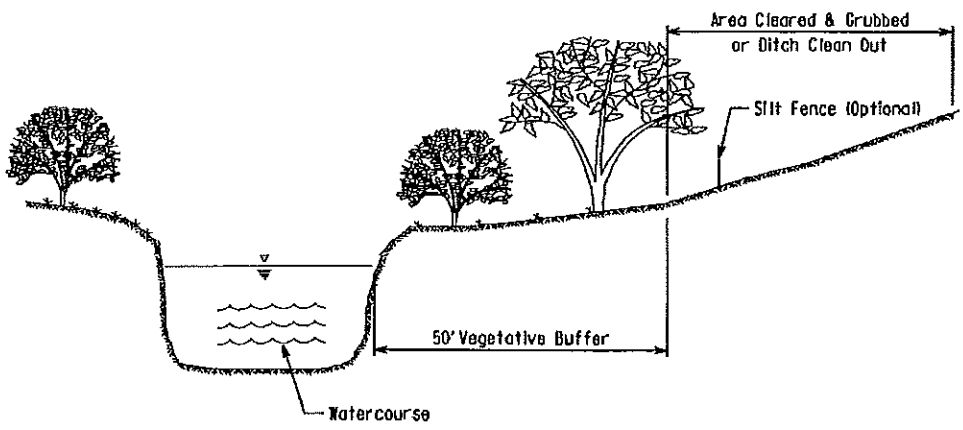
Contract Item (Pay Item)	Pay Unit
Erosion Control, Sediment Basin	Cubic Yard
Erosion Control, Maintenance, Sediment Removal	Cubic Yard
Erosion Control, Check Dam, Stone	Foot
Erosion Control, Gravel Filter Berm	Foot

PERMITS FROM THE MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY WILL BE REQUIRED.

MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF HIGHWAY DEVELOPMENT SESC DETAIL FOR

Sediment Basin

MDOT	04-07-2006 PLAN DATE	E&S-21-A	SHEET 2 OF 2



Use:

Vegetative Buffer at Watercourse is used along the top of slopes to filter sediment from runoff. Vegetative Buffer is also used during ditch clean out operations.

Installation and Maintenance:

Silt Fence, if used, should be placed down slope and immediately adjacent to the Vegetative Buffer at Watercourse to ensure that sediments do not migrate into the watercourse or wetland. If clearing and grubbing is necessary up to the waters edge, the clearing adjacent to the watercourse should be done after the up-slope area is adequately stabilized to prevent erosion and subsequent siltation.

Optional Measures:

A Silt Fence (E &S-26) or Diversion Dike (E & S-10), Intercepting Ditch (E & S-11) or Intercepting Ditch and Diversion Dike (E & S-12) can also be used at the top of the graded area to prevent runoff from flowing down the raw slope.

Related SESC Measures:

E & S-2 Grubbing Omitted
E & S-3 Permanent/Temporary Seeding
E & S-10 Diversion Dike
E & S-11 Intercepting Ditch
E & S-12 Intercepting Ditch and Diversion Dike
E & S-26 Silt Fence

Measurement and Payment:

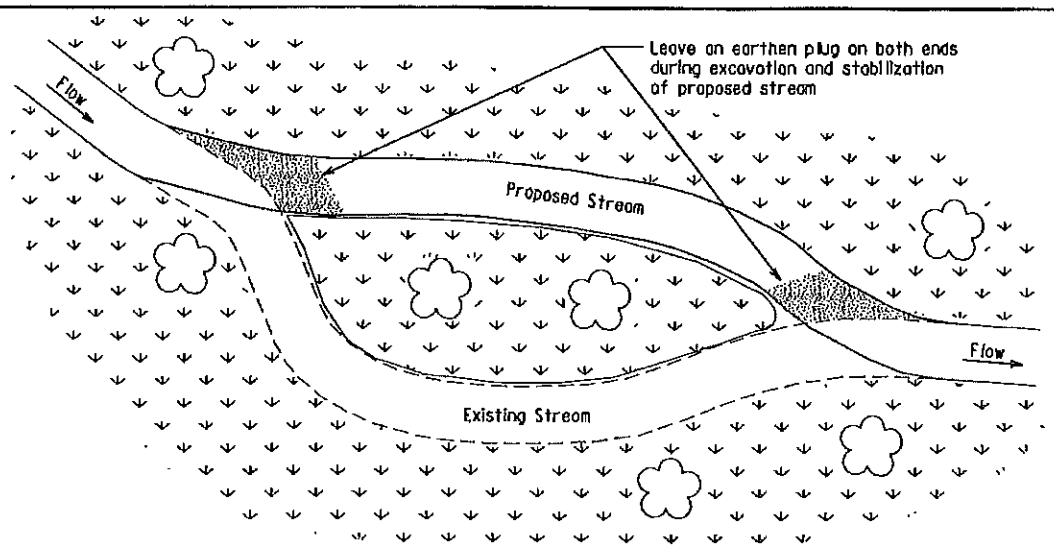
There is no separate contract item for this E & S measure. Payment for Vegetative Buffer at Watercourse will be included in related items of work. Optional work shown, when installed and maintained as directed by the Engineer, will be paid using the associated contract item listed here.

Contract Item (Pay Item)	Pay Unit
Erosion Control, Silt Fence	Foot

MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF HIGHWAY DEVELOPMENT SESC DETAIL FOR

Vegetative Buffer at Watercourse

MDOT	04-07-2006 PLAN DATE	E&S-22-A	SHEET 1 OF 1



Use:
Refer to the Drainage Manual for additional design considerations when specifying this device.

When a Stream Relocation is specified it shall be designed by an Engineer. Certain habitat structures may be incorporated into its design to mitigate for habitat impacts. These structures include, but are not limited to, rock weirs, plumbs, and others as specified by the Michigan Department of Environmental Quality (MDEQ) Permit Provisions. This device requires consultation with the Hydraulics/Hydrology Unit of the Design Support Area prior to specifying on the plans.

Installation and Maintenance:

Example of Construction Sequence and Controls:

1. Excavate new stream leaving an earthen plug at the upstream and downstream ends.
2. Dewater new stream in accordance with Dewatering with Filter Bag (E & S-18).
3. Install structures if required by MDEQ Permit Provisions and plans.
4. Place Geotextile Blanket over the entire stream bed and banks.
5. Place Stream Bed Protection.
6. Stabilize all disturbed areas.
7. When the stream is stable, remove the downstream plug, then remove the upstream plug.
8. Create a plug at the upstream and downstream end of the old channel and backfill old channel.
9. Stabilize backfill areas.

Optional Measures:

Dewatering with Filter Bag (E & S-18) may be required where vegetated area is not available for filtering.

Related SESC Measures:

E & S-3 Permanent/Temporary Seeding
E & S-7 Riprap
E & S-18 Dewatering with Filter Bag
E & S-28 Mulching and Mulch Anchoring
E & S-33 Mulch Blankets and High Velocity Mulch Blankets
E & S-37 Check Dam

Measurement and Payment:

Stream Relocation, including optional work shown, when installed and maintained as directed by the Engineer, will be paid using the associated contract item listed here.

Contract Item (Pay Item)	Pay Unit
Excavation, Channel	Cubic Yard
Riprap, Heavy	Square Yard
Riprap, Heavy, LM	Cubic Yard
Riprap, Special	By Special Provision
Erosion Control, Streambed Protection	By Special Provision
Erosion Control, Filter Bag	Each

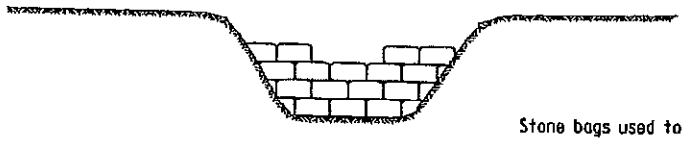
PERMITS FROM THE MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY WILL BE REQUIRED.

MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF HIGHWAY DEVELOPMENT SESC DETAIL FOR

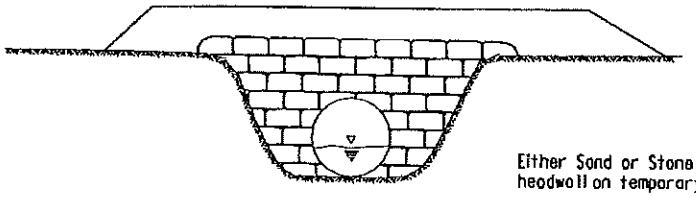
Stream Relocation

MDOT	04-07-2006 PLAN DATE	E&S-23-A	SHEET 1 OF 1

Examples showing Sand or Stone Bags



Stone bags used to create a Check Dam



Either Sand or Stone Bags used as headwall on temporary culvert crossing

Use:

Sand and Stone Bags are a useful tool in the prevention of erosion and subsequent sedimentation Sand Bags can be used to divert water around a construction area or create a Construction Dam (E & S-36) to afford a slack water area or dry construction site.

Stone Bags also work well as temporary Check Dam. Sand or Stone Bags may be used as temporary Culvert Headwalls.

Sand and Stone Bags should never be used as a filtering device since they do not allow for adequate movement of water and are subject to failure.

Installation and Maintenance:

Layers of stone or sand bags should be staggered and placed tightly together. Bottom layer of bags should be trenched in.

Optional Measures:

Related SESC Measures:

E & S-10 Diversion Dike
E & S-23 Stream Relocation
E & S-35 Temporary Bypass Channel
E & S-36 Construction Dam

Measurement and Payment:

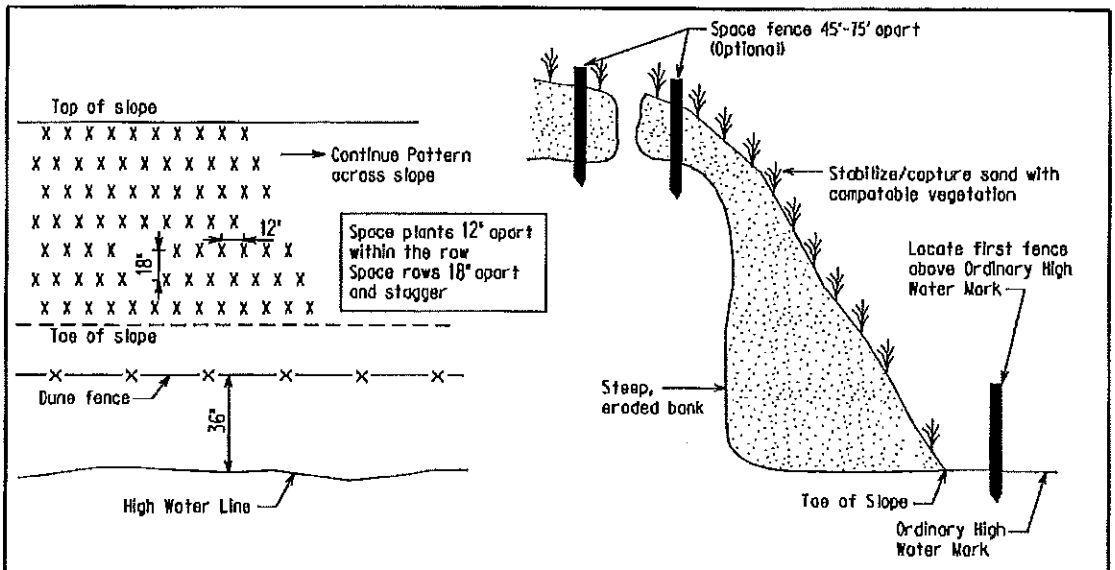
Contract Item (Pay Item)	Pay Unit
Erosion Control, Sand Bag	Each
Erosion Control, Stone Bag	Each

PERMITS FROM THE MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY MAY BE REQUIRED.

MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF HIGHWAY DEVELOPMENT SESC DETAIL FOR

Sand and Stone Bags

MDOT	04-07-2006 PLAN DATE	E&S-24-A	SHEET 1 OF 1



Use:

A Sand Fence is made of wood or plastic and is installed perpendicular to the prevailing wind. The fence traps blowing sand by reducing the wind velocity at the ground surface. Dune grass is planted to stabilize the area.

Installation and Maintenance:

These fences can be used to prevent sand from blowing onto roads or off-site areas. A Sand Fence works well for building up areas of sand where blowouts have occurred. When re-establishing a dune, a Sand Fence should be installed in spring or early summer. Install a windward Sand Fence parallel to the existing dune, generally perpendicular to the prevailing on-shore wind, above the ordinary high water mark. Support fencing material with sturdy posts. Revegetation of the dune shall be in accordance with the Standard Specifications for Construction Section 818, Dune Grass Planting and the contract documents.

Optional Measures:

Additional parallel fences may be needed.

Related SESC Measures:

Measurement and Payment:

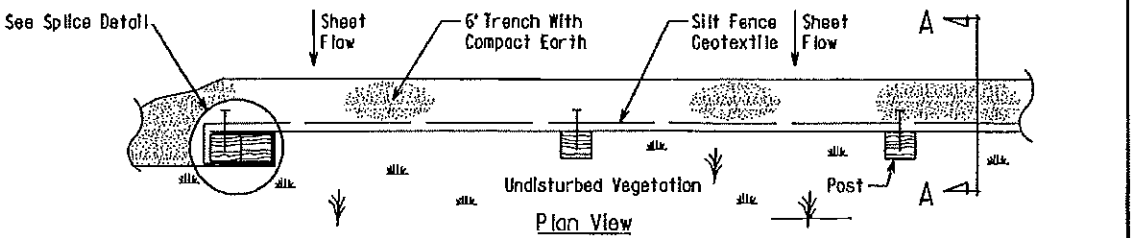
Optional work shown, when installed and maintained as directed by the Engineer, will be paid using the associated contract item listed here.

Contract Item (Pay Item)	Pay Unit
Erosion Control, Sand Fence	Foot
Dune Grass Planting	Square yard

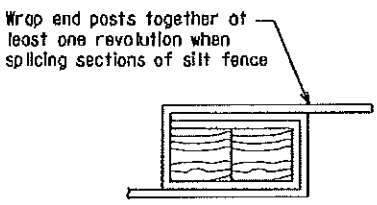
MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF HIGHWAY DEVELOPMENT SESC DETAIL FOR

Sand Fence and Dune Stabilization

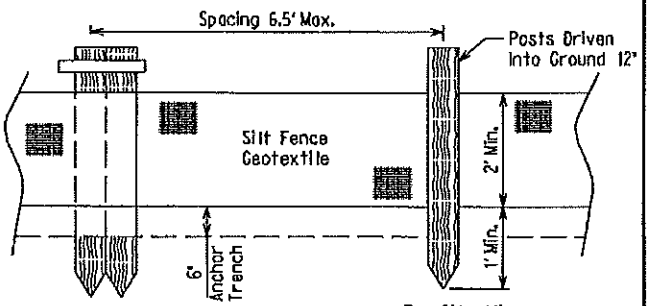
MDOT	09-30-2005 PLAN DATE	E&S-25-A	SHEET 1 OF 1



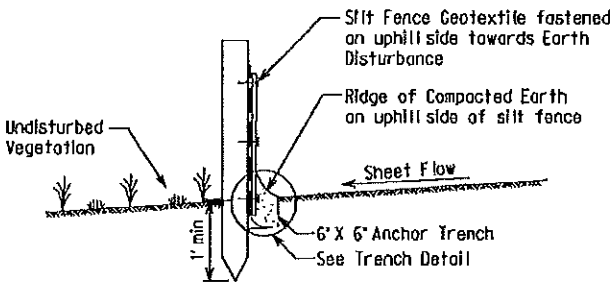
Plan View



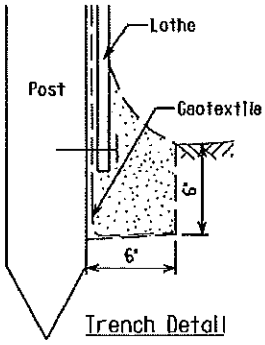
Splice Detail



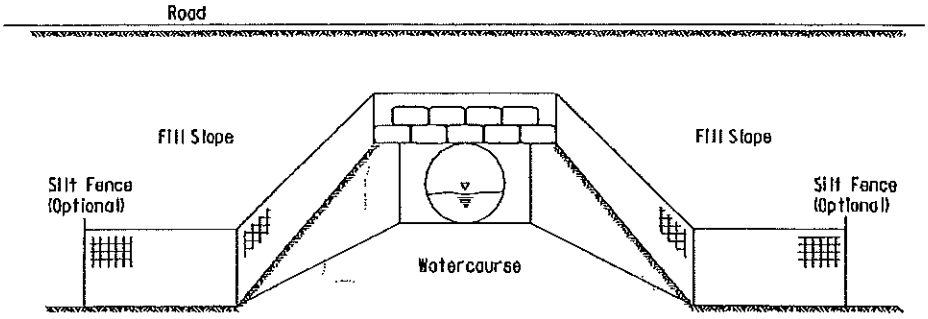
Profile View



Section A-A



Trench Detail



Culvert Extension Showing Sand/Stone Bags with optional Silt Fence

MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF HIGHWAY DEVELOPMENT SESC DETAIL FOR

Silt Fence

MDOT	09-30-2005 PLAN DATE	E&S-26-A	SHEET 1 OF 2

Use:
A Silt Fence is a permeable barrier erected adjacent to disturbed areas to capture sediment from sheet flow. It is made of woven geotextile fabric which is stretched and supported by wooden posts and trenched in at the bottom.

The Silt Fence retards the movement of sediment-laden water allowing the deposition and retention of sediment.

Do not install Silt Fence across streams or ditches where flows are concentrated.

The use of a Silt Fence should never be substituted for the application of permanent or temporary vegetative cover.

Installation and Maintenance:
It is critical to thoroughly trench in the bottom of Silt Fence as shown to maximize its performance and to prevent failure from undercutting, overtopping or collapsing. Geotextile should extend along side and bottom of trench.

Ensure that stable overflow outlets are available.

Remove all sediment from behind Silt Fence when it reaches approximately 50 percent of its capacity and make repairs promptly.

Silt Fence shall remain in place and properly maintained until the disturbed area is completely stabilized.

Optional Measures:
As an extra precautionary measure when there is a steep disturbed area adjacent to a watercourse, two rows of Silt Fence may be placed.

Sand and Stone Bags (E & S-24) may be used to provide additional support for Silt Fence. Installed at culvert extensions as shown in the detail above

Related SESC Measures:

E & S-2 Grubbing Omitted
E & S-6 Vegetative Buffer Strips
E & S-9 Benches
E & S-24 Sand and Stone Bags
E & S-28 Mulching and Mulch Anchoring
E & S-32 Surface Roughening and Scarification
E & S-33 Mulch Blankets and High Velocity Mulch Blankets.

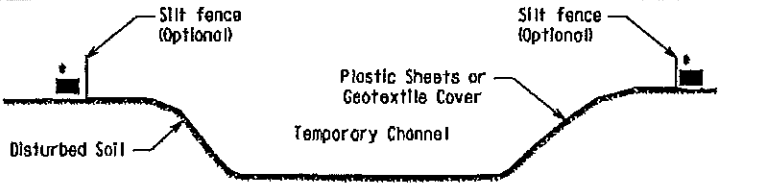
Measurement and Payment:
Optional work shown, when installed and maintained as directed by the Engineer, will be paid using the associated contract item listed here.

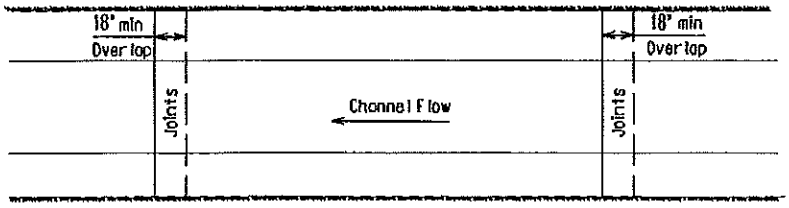
Contract Item (Pay Item)	Pay Unit
Erosion Control, Silt Fence	Foot
Erosion Control, Maintenance, Sediment Removal	Cubic Yard
Erosion Control, Sand Bag	Each
Erosion Control, Stone Bag	Each

MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF HIGHWAY DEVELOPMENT SESC DETAIL FOR

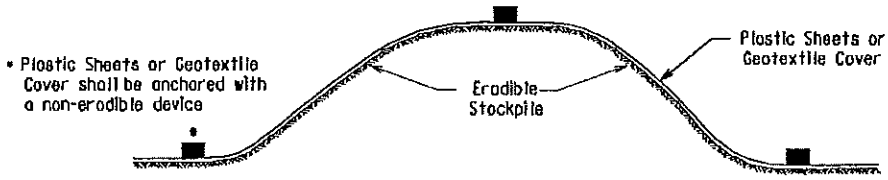
Silt Fence

MDOT	04-07-2006 PLAN DATE	E&S-26-A	SHEET 2 OF 2





Plan View



Use:

Plastic Sheets or Geotextile Cover can be used to create a liner in temporary channels or to create a temporary cover to prevent erosion from rain or wind on stockpiled materials or other small erodible areas.

Plastic Sheets or Geotextile Cover should not be used in lieu of permanent stabilization measures.

Installation and Maintenance:

When used as a temporary channel liner the plastic sheeting should be laid in a manner which will minimize the number of joints. Where two pieces of plastic must be joined they shall be overlapped a minimum of 18 inches in the downstream direction. Joints should be secured with non-erodible device as approved by the Engineer.

Plastic Sheets or Geotextile Cover shall be held down by use of Sand and Stone Bags (E & S-24) or other non-erodible device approved by the Engineer.

Optional Measures:

Silt fence may be installed on one or both sides of the temporary channel as shown.

Related SESC Measures:

E & S-3 Permanent/Temporary Seeding
E & S-24 Sand and Stone Bags
E & S-26 Silt Fence

Measurement and Payment:

Optional work shown, when installed and maintained as directed by the Engineer, will be paid using the associated contract item listed here.

Stone or Sand Bags used to anchor Plastic Sheets or Geotextile Cover as shown will be included in payment for Erosion Control, Temp. Plastic Sheets/Geotextile Cover unless specified otherwise and approved by the Engineer.

Contract Item (Pay Item)	Pay Unit
Erosion Control, Temp. Plastic Sheet/Geotextile Cover	Square Yard
Erosion Control, Sand Bag	Each
Erosion Control, Stone Bag	Each
Erosion Control, Silt Fence	Foot

PERMITS FROM THE MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY MAY BE REQUIRED.

MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF HIGHWAY DEVELOPMENT SESC DETAIL FOR

Plastic Sheets or Geotextile Cover

MDOT	04-07-2008 PLAN DATE	E&S-27-A	SHEET 1 OF 1

Use:
Mulching and Mulch Anchoring provides erosion protection and promotes growth of vegetation. This is one of the most important, effective and economical erosion control practices available.

Installation and Maintenance:

The in-place mulch shall be loose or open enough to allow some sunlight and air to penetrate to the soil. The mulch should be thick enough to shade the ground, conserve soil moisture and prevent or reduce wind and water erosion.

Mulch should be anchored.

Mulch should not be used in areas where flowing water will occur or adjacent to the shoulder of the roadway, unless approved by the Engineer.

Loose mulch material shall consist of any straw or marsh hay in an air-dry condition. Hay in an air-dry condition will be permitted only when straw mulch or marsh hay is unavailable. Mulch material shall be clean, undamaged and rot free. It shall be substantially free of weeds and other objectionable foreign matter.

Optional Measures:

When hay is permitted, herbicide application, if necessary, shall be applied as per specification. Herbicide application shall be made at the contractor's expense.

Mulching and Mulch Anchoring shall be in accordance with Michigan Department of Transportation Standard Specifications for Construction Section 816 Turf Establishment and Standard Plan R-100 Series.

Related SESC Measures:

E & S-3 Permanent/Temporary Seeding
E & S-33 Mulch Blankets and High Velocity Mulch Blankets

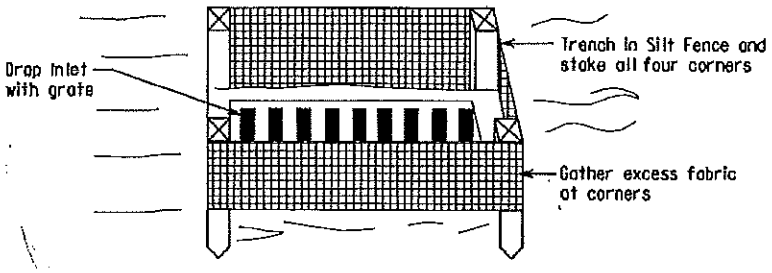
Measurement and Payment:

Contract Item (Pay Item)	Pay Unit
Mulch	Square Yard
Mulch Anchoring	Square Yard

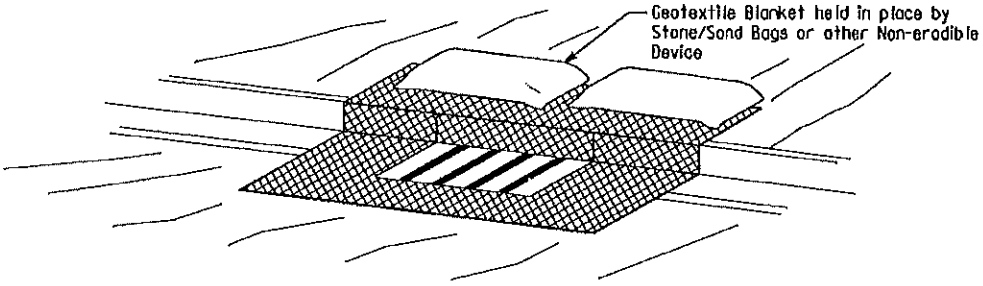
MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF HIGHWAY DEVELOPMENT SESC DETAIL FOR

Mulching and Mulch Anchoring

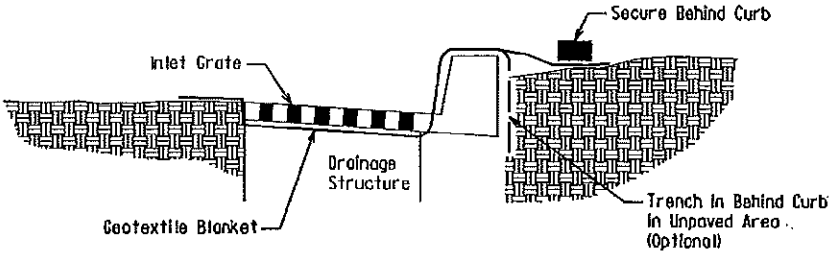
MDOT	09-30-2005 PLAN DATE	E&S-28-A	SHEET 1 OF 1



Inlet Protection in Unpaved Area



Plan View Inlet in Curb - Paved Area Behind Curb



Cross Section Inlet in Curb - Paved or Unpaved Area Behind Curb

MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF HIGHWAY DEVELOPMENT SESC DETAIL FOR

Inlet Protection Fabric Drop

MDOT	04-07-2006 PLAN DATE	E&S-29-A	SHEET 1 OF 2

Use:

Inlet Protection Fabric Drop is a temporary device used to prevent sediment from entering drainage structure inlets.

Installation and Maintenance:

Inlet Protection Fabric Drop requires frequent maintenance to function properly.

For drainage structures not located in the curb, Silt Fence (E & S-26) is installed around the outside of the drainage structure. The Silt Fence must be trenched in on all sides.

For drainage structures with covers located in the curb, a nonwoven geotextile blanket is installed between the cover and the frame of the drainage structure cover. The Geotextile Blanket must be trenched in or otherwise held in place behind the curb line.

If the inlet protection is placed prior to the installation of the cover, wire mesh shall be placed over the opening to support the Geotextile Blanket.

Care must be taken when removing fabric to prevent loss of sediment into the inlet.

Optional Measures:

For those instances where the volume of storm water may be high, a Gravel Filter Berm (E & S-13) may be installed in one corner of the Inlet Protection Fabric Drop to enable storm water to be filtered prior to entering the drainage structure.

Trench in fabric behind curb in unpaved areas if this will not result in exposing undisturbed area to accelerated erosion.

Related SESC Measures:

E & S-13 Gravel Filter Berm
E & S-31 Drop Inlet Protection Sediment Trap

Measurement and Payment:

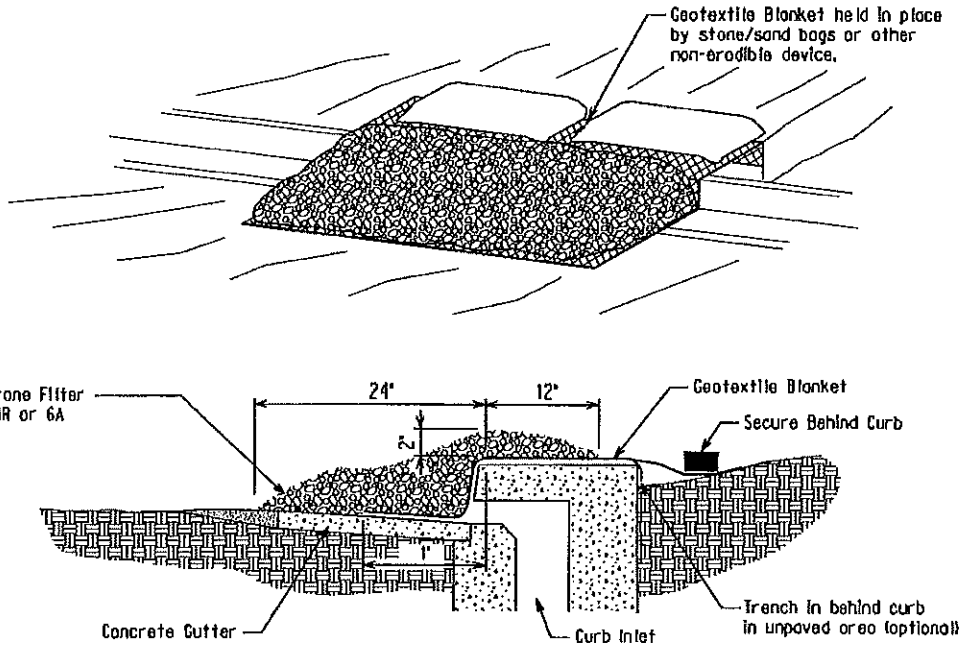
Payment for Inlet Protection Fabric Drop includes all labor and materials required to secure Geotextile Fabric as shown. Optional work shown, when installed and maintained as directed by the Engineer, will be paid using the associated contract items listed here.

Contract Item (Pay Item)	Pay Unit
Erosion Control, Inlet Protection, Fabric Drop	Each
Erosion Control, Gravel Filter Berm	Foot
Erosion Control, Silt Fence	Foot
Erosion Control, Maintenance, Sediment Removal	Cubic Yard

MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF HIGHWAY DEVELOPMENT SESC DETAIL FOR

Inlet Protection Fabric Drop

MDOT	04-07-2006 PLAN DATE	E&S-29-A	SHEET 2 OF 2



Use:

The Inlet Protection Geotextile and Stone is a recommended sedimentation control device in paved areas and some small drainage areas. Especially useful where there is no cover or inlet as in the curb inlet shown.

Installation and Maintenance:

This device can be used on storm inlets at curb openings where flows are minimal. It consists of geotextile blanket placed on top of the structure covered with clean stone such as 34R or 6A aggregate. The Geotextile Blanket must be trenched in or otherwise held in place behind the curb line.

This method of inlet protection is applicable at curb inlets, where ponding in front of the structure is not likely to cause inconvenience or damage to adjacent structures and unprotected areas.

If the device is to be placed prior to the installation of the grate, a wire mesh shall be placed over the opening to support the Geotextile Blanket and Stone.

Care must be taken when removing stone and fabric to prevent loss of sediment into the inlet.

Optional Measures:

Trench in fabric behind curb in paved areas if this will not result in exposing undisturbed area to accelerated erosion.

Related SESC Measures:

Measurement and Payment:

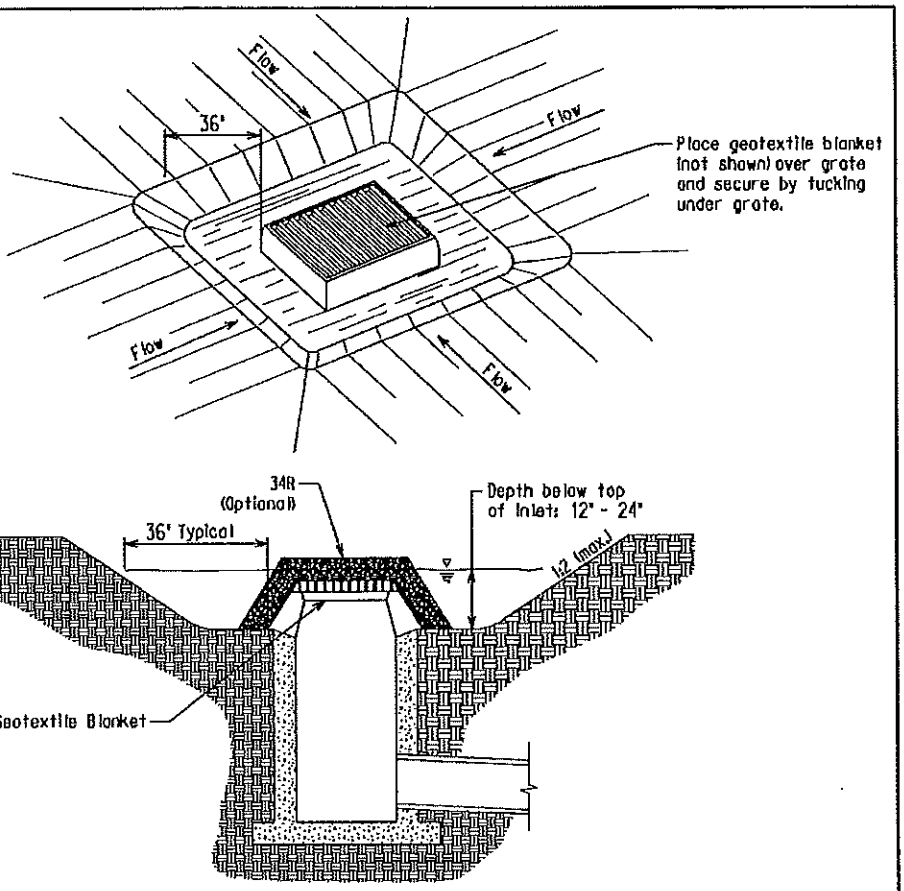
Payment for Inlet Protection Geotextile and Stone includes all labor and materials required to secure Geotextile Fabric as shown and to maintain the device as necessary.

Contract Item (Pay Item)	Pay Unit
Erosion Control, Inlet Protection, Geotextile and Stone	Each

MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF HIGHWAY DEVELOPMENT SESC DETAIL FOR

Inlet Protection Geotextile and Stone

MDOT	04-07-2006 PLAN DATE	E&S-30-A	SHEET 1 OF 1



Use:
A Inlet Protection Sediment Trap is a temporary device that can be used in areas where minimal flows are anticipated.

Installation and Maintenance
At all times the inlet shall be protected with a nonwoven geotextile blanket. The nonwoven geotextile blanket shall be placed over the inlet of the structure and tucked under the grate to hold it in place.

When the sediment has accumulated to approximately 50 percent the design depth of the trap, it should be removed and the trap restored to the original dimensions. The trap should be maintained daily as needed.

Optional Measures:
A layer of 34R aggregate may be installed over the geotextile and grate to provide additional sedimentation control. Support for the Pea Stone layer must be provided while allowing inlet to function.

Related SESC Measures:
E & S-3 Permanent/Temporary Seeding
E & S-29 Inlet Protection Fabric Drop
E & S-30 Inlet Protection Geotextile and Stone

Measurement and Payment:
Payment for Inlet Protection, Sediment Trap includes furnishing and placing Geotextile Blanket.

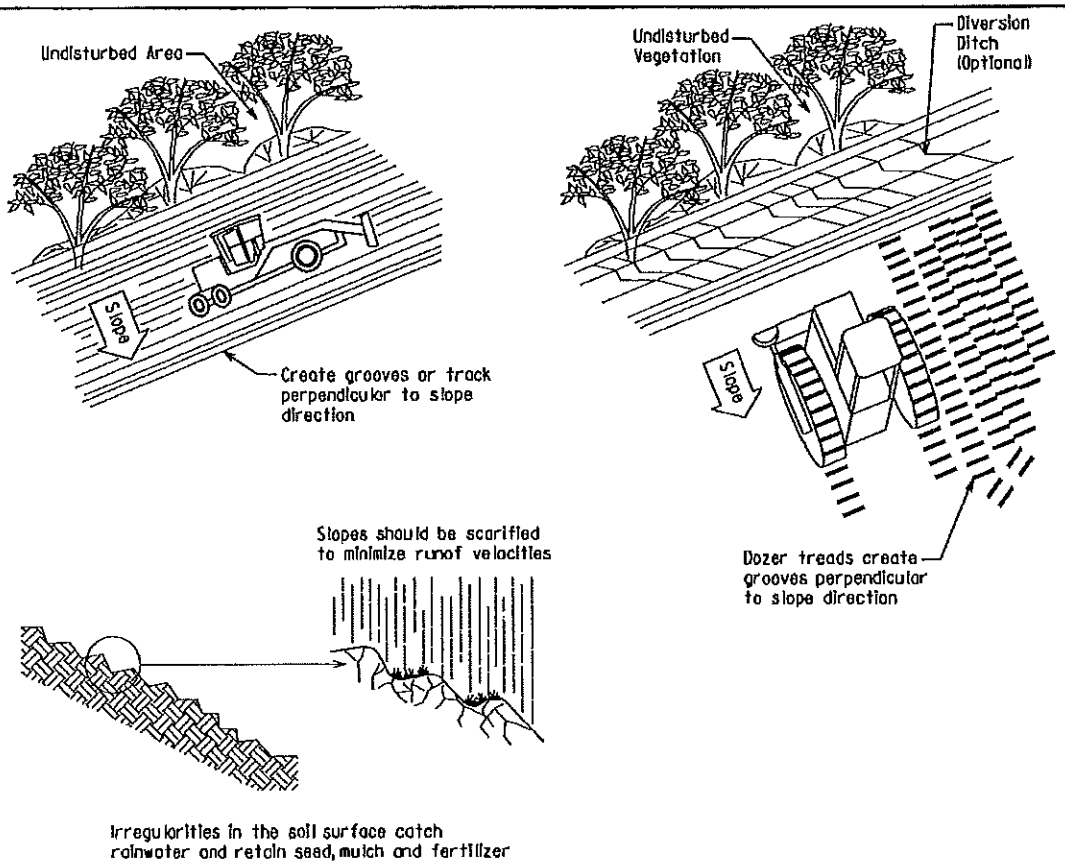
Unless otherwise specified, Class 34R aggregate placed as shown will be included in the payment for this E & S measure.

Contract Item (Pay Item)	Pay Unit
Erosion Control, Maintenance, Sediment Removal	Cubic Yard
Erosion Contol, Inlet Protection, Sediment Trap	Each

MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF HIGHWAY DEVELOPMENT SESC DETAIL FOR

Inlet Protection Sediment Trap

MDOT	04-07-2006 PLAN DATE	E&S-31-A	SHEET 1 OF 1



Use:
Surface Roughening and Scarification is accomplished by placing horizontal grooves in a slope perpendicular to the direction of runoff.

Installation and Maintenance:
This can be done by either disc harrowing, back blading, or running the treads of a dozer perpendicular to the slope.

Optional Measures:
A Diversion Ditch (E & S-10), Intercepting Ditch (E & S-11) and Intercepting Ditch and Diversion Dike (E & S-12) may be placed at the top of the slope to minimize the amount of runoff draining from the undisturbed area onto the new slope.

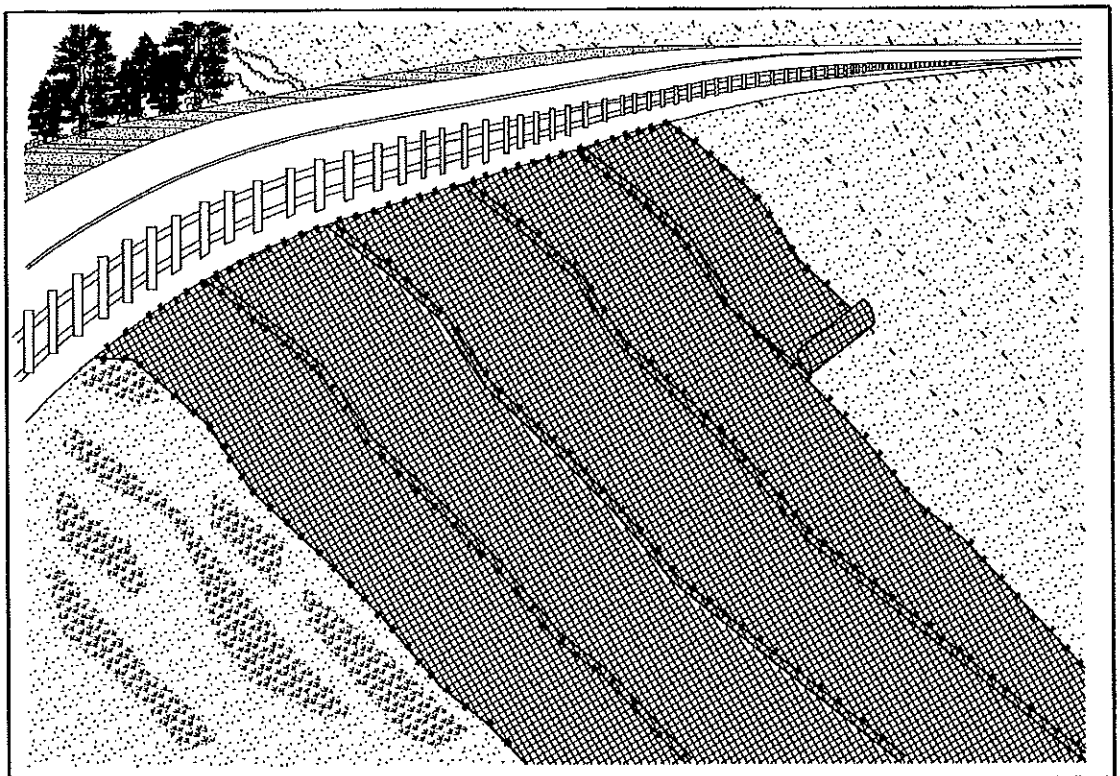
Related SESC Measures:
E & S-3 Permanent/Temporary Seeding
E & S-10 Diversion Dike
E & S-11 Intercepting Ditch
E & S-12 Intercepting Ditch and Diversion Dike
E & S-28 Mulching and Mulch Anchoring

Measurement and Payment:
There is no separate contract item for this E & S measure. Payment for Surface Roughening and Scarification will be included in related items of work. Optional work shown, when installed and maintained as directed by the Engineer, will be paid using the associated contract item listed here.

MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF HIGHWAY DEVELOPMENT SESC DETAIL FOR

Surface Roughening and Scarification

MDOT	09-30-2005 PLAN DATE	E&S-32-A	SHEET 1 OF 1



Use:

Refer to the Drainage Manual for additional design considerations when specifying this device.

Mulch Blankets and High Velocity Mulch Blankets provide an immediate and effective cover over raw erodible slopes and in ditch bottoms.

There are currently two types of mulch blankets acceptable for stabilizing slopes and ditch bottoms.

Mulch blankets have netting on one side and shall be used on slopes flatter than 1:2 along shoulders, ditch, and behind curbs. These mulch blankets shall be placed with the netting on top and the fibers in contact with the soil.

High velocity mulch blankets have netting on both sides and shall be used on 1:2 slopes or steeper and in ditch bottoms.

Installation and Maintenance:

In waterways and ditches, High Velocity Mulch Blankets shall be placed in the direction of the flow and extend 12 inches up the slope.

On backslopes, the blankets shall be placed perpendicular to the roadbed.

On foreslopes, the first strip adjacent to the road shall be laid parallel to the road. The remainder of the strips shall be placed either parallel or transverse to the road.

Install according to Standard Specifications for Construction and Standard Plan R-100 Series.

Optional Measures:

Related SESC Measures:

E & S-3 Permanent/Temporary Seeding
E & S-28 Mulching and Mulch Anchoring

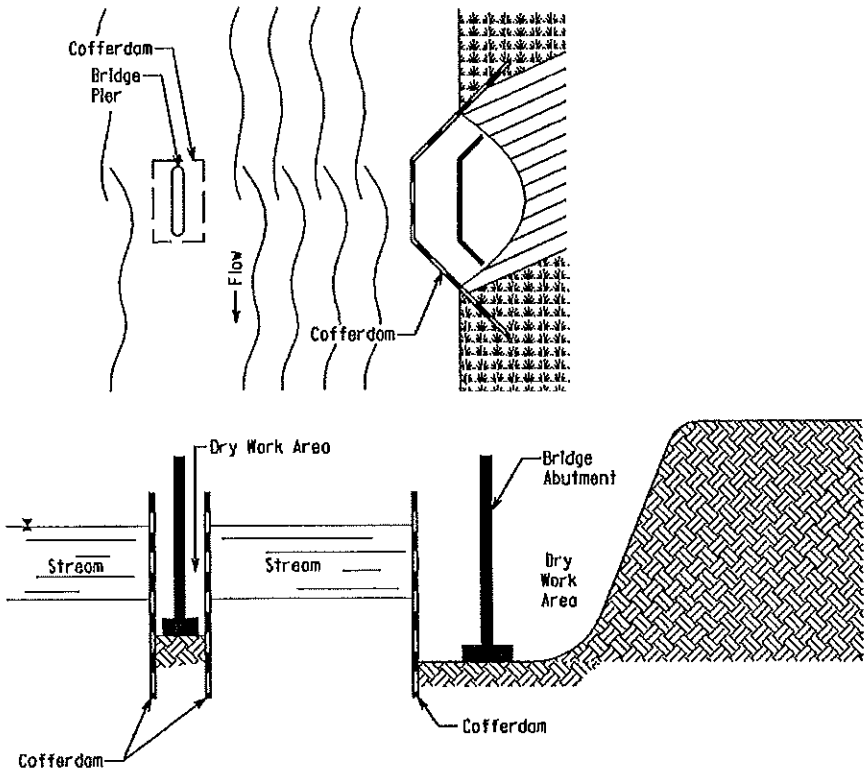
Measurement and Payment:

Contract Item (Pay Item)	Pay Unit
Mulch Blanket	Square Yard
Mulch Blanket, High Velocity	Square Yard

MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF HIGHWAY DEVELOPMENT SESC DETAIL FOR

Mulch Blankets and High Velocity Mulch Blankets

MDOT	04-07-2006 PLAN DATE	E&S-33-A	SHEET 1 OF 1



Use:

A Cofferdam is the preferred method to isolate stream flow from a construction site when a dry work condition must exist for a prolonged period of time or in a deep water condition.

A major benefit of the Cofferdam is that it results in a minimum amount of disturbance to the stream bottom during the installation and removal process.

Installation and Maintenance:

Cofferdams are generally constructed using steel sheet pile. Refer to section 704 of the Standard Specifications for Construction and the contract documents for additional information on Cofferdam design and construction.

Dewater Cofferdams in accordance with the Standard Specifications for Construction and contract documents.

Care must be taken when removing Coffordam to prevent sedimentation to the extent practicable.

Optional Measures:

Related SESC Measures:

E & S-7 Riprap
E & S-13 Gravel Filter Berm
E & S-18 Dewatering with Filter Bag
E & S-21 Sediment Basin
E & S-36 Construction Dam

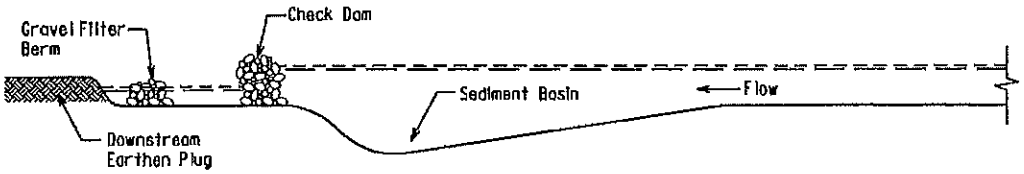
Measurement and Payment:

Contract Item (Pay Item)	Pay Unit
Cofferdam	Lump sum
Erosion Control, Filter Bag	Each

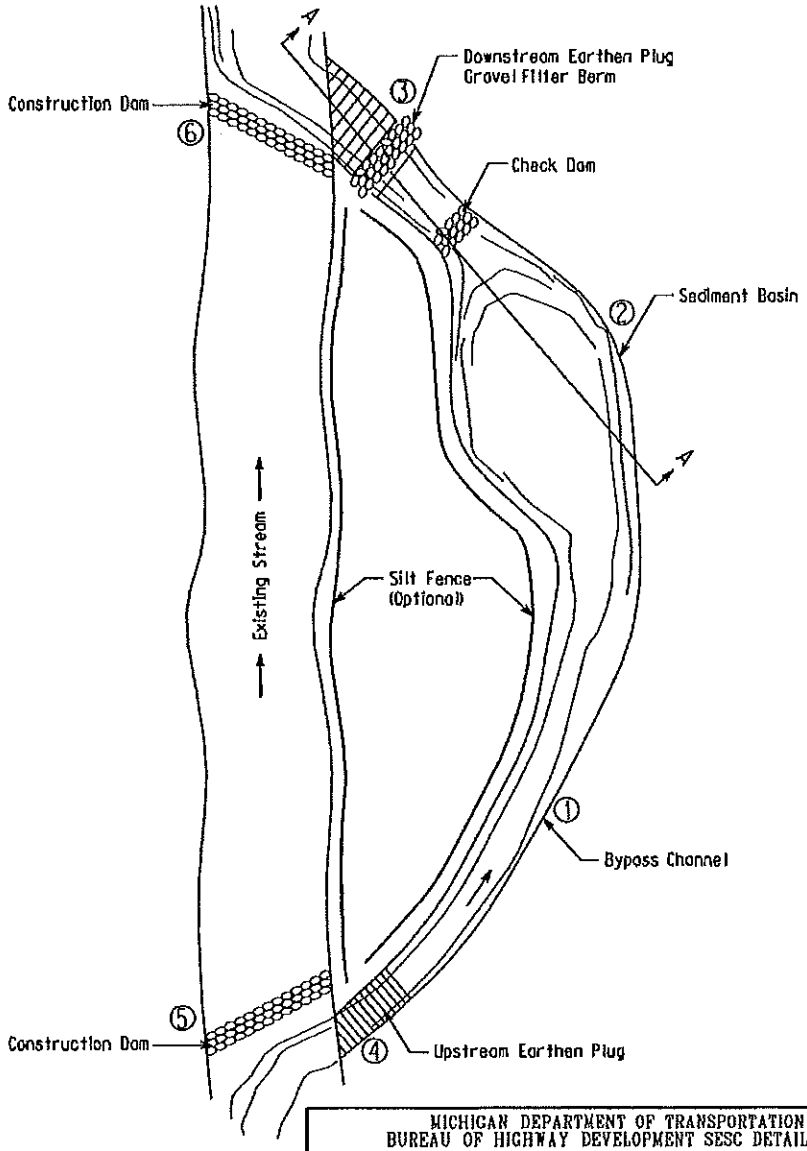
MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF HIGHWAY DEVELOPMENT SESC DETAIL FOR

Cofferdam

MDOT	04-07-2006 PLAN DATE	E&S-34-A	SHEET 1 OF 1



Section A-A



MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF HIGHWAY DEVELOPMENT SESC DETAIL FOR

Temporary Bypass Channel

MDOT	09-30-2005 PLAN DATE	E&S-35-A	SHEET 1 OF 2

Use:

A Temporary Bypass Channel is used when a dry construction site is needed. The Temporary Bypass Channel must be properly sequenced and made an integral part of the construction plans.

This device requires consultation with the Hydraulics/Hydrology Unit of Design Support Area prior to specifying on the plans.

Refer to the Drainage Manual for additional design considerations when specifying this device.

The erosion control devices shown in this detail may be used only when included in the MDEQ permit.

Installation and Maintenance:

Example Construction Sequence and Controls:

1. Dredge Bypass Channel (1), leaving an earthen plug at the upstream (4) and downstream (3) ends.
2. Construct a large Sediment Basin (E & S-21) at the downstream limits of the Bypass Channel (2), leaving sufficient distance between the outlet of the Sediment Basin and the stream to allow placement of a Check Dam (E & S-37) and Gravel Filter Berm (E & S-13). See Section A-A. Install Check Dam and Gravel Filter Berm (E & S-13).
3. As directed by the Engineer, line the Temporary Bypass Channel with Plastic Sheets (E & S-27) with joints overlapping 18 inches in the downstream direction.
4. Remove the Downstream Plug (3) and stabilize channel from the Check Dam to the stream using Geotextile Blanket and a sturdy, non-erodible material such as Riprap (E & S-7).
5. Remove the Upstream Plug (4), allowing water to pass through the Temporary Bypass Channel.
6. Install Construction Dam (E & S-36) (5) in the existing stream at the upstream end.
7. Install Construction Dam (6) at the downstream end of the natural stream.
8. Dewater site in accordance with Dewatering with Filter Bag (E & S-18).
9. When construction is complete and all areas are stabilized, the removal process shall begin with the removal of the Construction Dam (6) at the downstream end of the natural stream.
10. Remove Construction Dam (5) at the upstream end of the natural stream. This will allow the stream flow to pass through the natural streambed.
11. Place an earthen plug at the upstream (4) and downstream (3) limits of the Temporary Bypass Channel. Stabilize earthen plug with Riprap.
12. Backfill Temporary Bypass Channel. If dewatering is necessary, reference Dewatering with Filter Bag (E & S-18).
13. Stabilize all disturbed areas.

Optional Measures:

Silt Fence may be installed adjacent to existing stream and/or Bypass channel if existing vegetation is not sufficient to prevent sediment from entering watercourse.

Related SESC Measures:

E & S-3 Permanent/Temporary Seeding
E & S-7 Riprap
E & S-13 Gravel Filter Berm
E & S-18 Dewatering with Filter Bag
E & S-21 Sediment Basin
E & S-24 Sand and Stone Bags
E & S-26 Silt Fence
E & S-27 Plastic Sheets or Geotextile Cover
E & S-28 Mulching and Mulch Anchoring
E & S-33 Mulch Blankets and High Velocity Mulch Blankets
E & S-36 Construction Dam
E & S-37 Check Dam

Measurement and Payment:

Temporary Bypass Channel, including optional work shown, when installed and maintained as directed by the Engineer, will be paid using the associated contract item listed here.

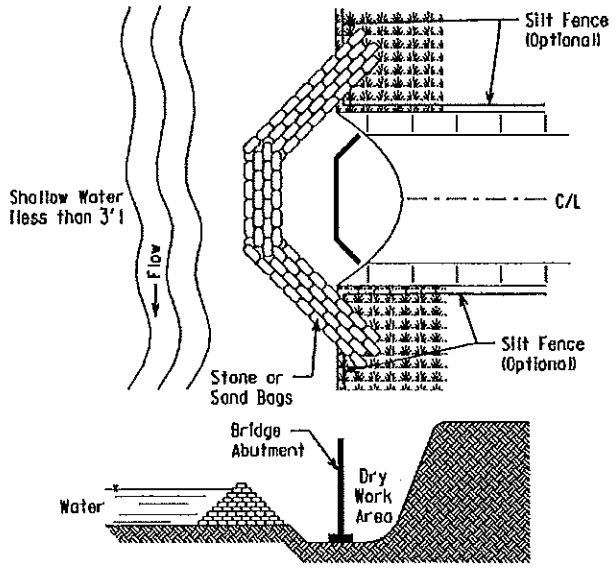
Contract Item (Pay Item)	Pay Unit
Excavation, Channel	Cubic Yard
Erosion Control, Stone Bag	Each
Erosion Control, Sand Bag	Each
Erosion Control, Sediment Basin	Cubic Yard
Erosion Control, Filter Bag	Each
Erosion Control, Check Dam, Stone	Foot
Erosion Control, Maintenance, Sediment Removal	Cubic Yard
Erosion Control, Silt Fence	Foot
Erosion Control, Temp Plastic Sheet/Geotextile Cover	Square Yard

PERMITS FROM THE MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY WILL BE REQUIRED.

MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF HIGHWAY DEVELOPMENT SESC DETAIL FOR

Temporary Bypass Channel

MDOT	04-07-2006 PLAN DATE	E&S-35-A	SHEET 2 OF 2



Use:
Refer to the Drainage Manual for additional design considerations when specifying this device.

A Construction Dam is used when a dry or slack water area is necessary to isolate construction activities from the watercourse.

Installation and Maintenance:
A Construction Dam can be created out of any non-erodible material. Sand or Stone Bags (E & S-24) is an effective device for a Construction Dam. Steel sheet piling, steel plates, or concrete barriers with a geotextile membrane may also be used to construct Construction Dams in lieu of sand and stone bags, if allowed by the Engineer.

Prior to the removal of the Construction Dam, remove sediment and stabilize all disturbed areas.

Care must be taken when removing Construction Dam to prevent sedimentation to the extent practicable.

Optional Measures:
If dewatering is necessary to create a dry work area, all dewatering operations may be carried out utilizing Dewatering with Filter Bag (E & S-18). Locate the filter bag a sufficient distance from the watercourse or wetland to allow for proper filtering through natural vegetation or Gravel Filter Berm (E & S-13).

Silt Fence (E & S-26) may be installed as shown to provide additional Erosion and Sedimentation Control.

All excavated or surplus soils, including filter bags, shall be disposed of in an upland area outside any floodplain or wetland areas. Excavated or surplus soils must be adequately stabilized with seed and mulch or mulch blankets in sufficient quantity to prevent erosion and subsequent sedimentation to any off-site areas, floodplains, wetlands, lakes, or streams.

Related SESC Measures:

E & S-13	Gravel Filter Berm
E & S-18	Dewatering with Filter Bag
E & S-24	Sand and Stone Bags
E & S-33	Mulch Blankets and High Velocity Mulch Blankets
E & S-34	Cofferdam

Measurement and Payment:
Payment for Construction Dam will be included in related items of work. Optional work shown, when installed and maintained as directed by the Engineer, will be paid using the associated contract item listed here. Stabilizing exposed slopes for permanent application of this measure will be included in project quantities for similar work.

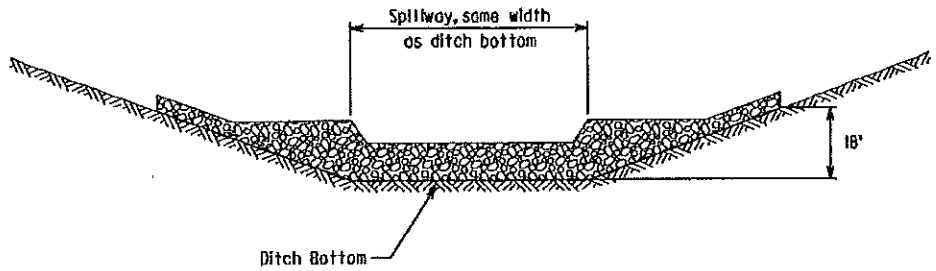
Contract Item (Pay Item)	Pay Unit
Erosion Control, Sand Bag	Each
Erosion Control, Stone Bag	Each
Erosion Control, Silt Fence	Foot

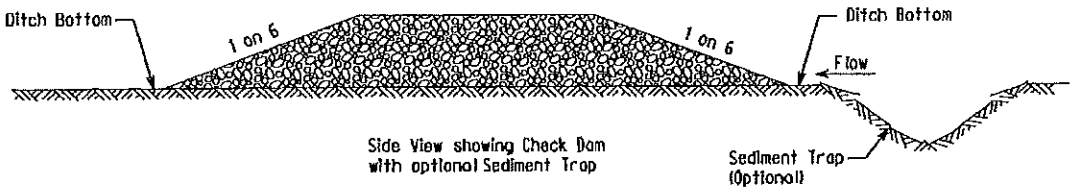
PERMITS FROM THE MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY WILL BE REQUIRED.

MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF HIGHWAY DEVELOPMENT SESC DETAIL FOR

Construction Dam

MDOT	04-07-2006 PLAN DATE	E&S-36-A	SHEET 1 OF 1





Use:

Refer to the Drainage Manual for additional design considerations when specifying this device.

Check Dams are often used in ditches to reduce flow velocity.

Check Dams are temporary and shall be completely removed after vegetation becomes established, or as directed by the Engineer.

Installation and Maintenance:

If conditions require multiple Check Dams to be placed in series, the proper spacing shall be determined based on the steepness of the ditch grade. As a general guideline, the crest elevation of the downstream Check Dam should be equal in elevation to the toe of the upstream Check Dam.

A notch should be formed in the top of the Check Dam to direct flow over the center of the dam and prevent erosion of the ditch slopes.

Stone size for Check Dam is per subsection 916.01 of the Standard Specifications for Construction.

Optional Measures:

Sediment Traps (E & S-20) may be installed directly up stream of the Check Dam to improve sediment collection.

Related SESC Measures:

E & S-7 Riprop
E & S-20 Sediment Trap

Measurement and Payment:

Optional work shown, when installed and maintained as directed by the Engineer, will be paid using the associated contract item listed here.

Contract Item (Pay Item)	Pay Unit
Erosion Control, Check Dam, Stone	Foot
Erosion Control, Sediment Trap	Each
Erosion Control, Maintenance, Sediment Removal	Cubic Yard

MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF HIGHWAY DEVELOPMENT SESC DETAIL FOR

Check Dam

MDOT	04-07-2006 PLAN DATE	E&S-37-A	SHEET 1 OF 1

APPENDIX

REFERENCE INFORMATION

Activity Name: Ditch Cleanout & Check Dam Maintenance **Activity #: 1230**

Methods:

1) Ditch Clean-Out
2) Check Dam Maintenance

Description/Purpose: Roadside Ditch Clean-Out includes the removal and disposal of debris to ensure proper drainage. Check Dam Maintenance consists of inspecting and removing accumulated sedimentation to maintain proper functioning of permanent structures.

Recommended Crew Size

5 (2 traffic regulators included)

Material

Follow SESC Manual

Average Daily Production

2000 lineal feet (gradall/excavator)
500 lineal feet (tractor/backhoe)
2000 lineal feet (grader/dozer)

Measurement

Lineal Feet Cleaned

Calculation

Lineal Feet Cleaned = (Total Hours ÷ 8) x ADP

Equipment

Qty	Code	Description
1	02/03	Pickup
3	04	Trucks (see table below)
1	12	Flashing arrow
1	26	Gradall (if available) or
1	05	Tractor/backhoe/extendahoe (alternate)
		Optional
1	32	Grader
1	05	Bulldozer
1	12	Flashing Arrow
1	38	Loader
1	67	Trailer

Equipment may vary depending on availability and operational need.

All MDOT Traffic and Safety policies shall be followed for equipment and personnel.

Additional equipment and personnel will increase the cost to perform this activity.

Recommended Work Method: Ditch Clean-Out

Caution: Check with utility companies for buried gas lines, telephone, or electric cables, etc. Call MISS DIG.

Contact your resource staff or appointed region representative if questions arise regarding storm water or soil erosion control to determine if an earth change plan, inspections, or Part 301 and Part 303 permits are required.

If required, complete MDOT forms 1126 (National Pollutant Discharge Elimination System Inspection Report) and 0408 (Work Schedule) when performing this operation (MDOT Forms Repository).

1. Review environmental, training, and safety precautions. Also see 1a: Notifications, 1b: Inspections, and 1c: SESC Plan below.
2. Establish the ditch flow line (use appropriate measuring device).
3. Determine the location where the water will outlet.
4. If spoils are left on site, remove all debris, grade properly, and prepare spoils for seeding.
5. If spoils cannot be left at the ditching site, find an appropriate use on the right-of-way (i.e. slope flattening behind guardrail, washout repair, or filling ruts from runoffs). Refer to Maintenance Advisory 2018-03 “Environmental Requirements for the Disposal of Surplus and Unsuitable Soils”.
6. Remove spoils and load into trucks with minimum interference with traffic.
7. Avoid creating a "V" bottom ditch; a 2-foot round-bottom ditch is the minimum requirement. 3 feet or wider ditches are desirable for drainage and snow storage.
8. As required, dress, mulch, and seed and/or sod slopes to prevent erosion. See sections 816 and 917 of the standard specifications.

Equipment Requirements

Crew Size	Round Trip Distance Stockpile to Dumpsite	Number of 04 Trucks Needed
4	0 - 5 miles	2
5	6 - 10 miles	3
6	11 - 15 miles	4

Recommended Work Method: Ditch Clean Out (continued)

1a. Notifications: If the operation disturbs less than five acres of earth and is to restore the ditch to original grades (match inlet and outlet grades) a National Pollutant Discharge Elimination System (NPDES) Notice of Coverage (NOC) is not required. If the project disturbs five acres or more of earth and alters the original ditch grade (new outlet or inlet grade) a NOC is required. Regardless of size of earth disturbance, notification of the municipal enforcing agency (MEA) or county enforcing agency (CEA) is required.

1b. Inspections: A certified storm water operator (SWO) will inspect the project after installation of the SESC measures and at the completion of the ditching operation. For ditching operations that create an earth disturbance 1 acre or greater a SWO will inspect the project once every seven days or within 24 hours of a precipitation event that results in a discharge from the right-of-way until the project is stabilized. NPDES Inspection Report (Form 1126) will be used to document these inspections. Any deficiencies or corrective actions will be recorded on the form and will be brought to the attention of the Contractor or maintenance staff performing the work. The SWO is responsible for ensuring that corrective actions are completed within the time allotted. A log of the inspections will be maintained on file for review and retained for a period of three years from the date of the inspection or the date corrective actions were complete, whichever is longer.

Non-emergency corrective actions will be completed by those doing the ditch clean out, or by others if necessary, within five calendar days. If the SWO determines that an emergency condition exists for a discharge to waters of the state, corrective actions will be completed by those doing the work within 24 hours of the inspection. Emergency conditions include sediment entering drainage structures or the waters of the state and erosion that affects the support of the roadbed or the safety of the public. Emergency action will be documented as such on Form 1126.

1c. SESC Plan: The following soil erosion and sedimentation control (SESC) procedure has been reviewed by the Michigan Department of Environment, Great Lakes and Energy (EGLE) and is approved for this activity. This procedure is intended to minimize soil erosion and off right-of-way sedimentation during ditch clean out activities. If this procedure is not followed, a site-specific SESC plan meeting the requirements of rule R323.1703, promulgated in accordance with Part 91 of Act 451, is required.

Every effort should be made to avoid off right-of-way disposal, however if spoils are taken to an off-right-of-way location, the Standard Specifications for Construction controls the disposal of the surplus material. The property owner or easement holder where the material is to be placed must obtain a SESC permit from the appropriate enforcing agency if the placement covers one acre or more or if the material is placed within 500 feet of the waters of the state. If excess materials will be transported off the right-of-way for disposal, notify the appointed maintenance representative or region resource staff prior to beginning the ditch clean out operation and request that they contact the enforcing agency to determine if a permit is required. If a permit is required, the permit must be obtained prior to beginning this work.

If the ditch slope is one percent or more, install sediment traps (E&S-20) in the ditch bottom, spaced approximately 300 feet apart (± 50 feet).

Maintain a vegetative buffer (E&S-6) between the lower limit of the ditch clean out operation and the outfall to the watercourse. If the vegetative buffer cannot be left in place while the disturbed area upstream stabilizes, place high velocity mulch blanket (E&S-33) on the ditch bottom a minimum of 150 feet upstream from the lower limit of the ditch clean out operation.

If the ditch carries water continuously, install a check dam (E&S-37) and sediment trap (E&S - 20) at the downstream end of the ditch.

- Begin ditching operation at the highest elevation and progress downstream.
- Remove the vegetative buffer only after the disturbed area has been stabilized. After removing the vegetative buffer, stabilize that area with high velocity mulch blanket.
- Within five days of completing the work, seed and mulch (E&S-3; E&S-28) all exposed areas resulting from the ditch cleanout activities. If the work is completed outside of the seasonal limitations for seeding, place high velocity mulch blanket over the entire disturbed area. Contact appropriate region resource staff for alternative restoration recommendations.

Recommended Work Method: Check Dam Maintenance

Contact your resource staff or appointed region representative if questions arise regarding storm water or soil erosion control and to determine if any permits are required.

1. Review environmental, training, and safety precautions.
2. Inspect check dams for piping under structure or around banks. Correct all damage. If severe erosion is evident consider other stabilization options.
3. Sedimentation should be removed when built up to one-half the height of the check dam. This allows water to flow through check dam properly in the event of large flows.
4. Spoils may be left on site. Remove all debris and grade properly.
5. As required, dress mulch and seed slopes and any spoils left on site to prevent erosion. See sections 816 and 917 of the standard specifications.
6. Inspect culverts and other structures below the check dams for damage or blockage due to displaced stones.

Clear Form

Michigan Department
of Transportation
1126 (01/19)

**NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)
AND SOIL EROSION AND SEDIMENTATION CONTROL (SESC)**

INSPECTION REPORT

Completed form to project files – cc: Construction Field Services Division.

FILE 108

INSTRUCTIONS:

1. Construction sites must be inspected every 7 days or within 24 hours after a precipitation event that results in a discharge from the site including weekend days regardless if the contractor is working or not.
2. A discharge is defined as storm water runoff that does not infiltrate into the ground and leaves the construction site or enters waters of the state after a precipitation event.
3. Engineering judgement must be used when determining if a discharge from the site has occurred.
4. Corrective actions must be made within 24 hours if sediment has entered waters of the state, left department right-of-way or if public safety may be compromised. Otherwise, corrective actions must be made within 5 calendar days.
5. Inspectors must be Certified Storm Water Operators.
6. Individuals who authorize changes to SESC measures shown on the plans must have a valid comprehensive SESC training certificate.
7. Inspections must continue until the site is stabilized and, if appropriate, the Notice of Termination has been submitted.
8. This form must be used when documenting SESC inspections.

CONTROL SECTION	JOB NUMBER	ROUTE	REPORT NUMBER	INSPECTION DATE

CONSTRUCTION ENGINEER OR MAINTENANCE COORDINATOR	STORM WATER OPERATOR NO.	COMPREHENSIVE TRAINING NO.

INSPECTOR NAME (Please print)	INSPECTOR SIGNATURE

CONTRACTOR

AMOUNT, TYPE, & DATE OF LAST PRECIPITATION RESULTING IN DISCHARGE FROM THE SITE	DATE OF LAST INSPECTION

COMPLETE THIS SECTION FOR WINTER CONSTRUCTION INSPECTIONS

WEEKLY REPORTING PERIOD	AVERAGE TEMPERATURE	HIGH TEMPERATURE

LOCATION/ STATION	TYPE OF SESC MEASURE	INSTALLATION DATE	CORRECTIVE ACTION REQUIRED (See Instruction 4)	NOTIFICATION DATE	COMPLETION DATE

ENTER REMARKS ON PAGE 2

REMARKS

SKETCHES

SAMPLE SESC Plan (Rule 1703)

(may be hand drawn)

Example: Placement of a concrete plant between Ramp C slope stake line and Ramp C right of way

Soils: Sandy loam (G) Gradient: 0.6% (F) **XXXXXX** Limits of earth change covered by this Plan (H)

(J) Start: May 15, 2020
Finish: October 20, 2020

Notes:

1. Install SESC measures prior to grading the site.
2. Strip sod and topsoil and stockpile as directed by the engineer.
3. Grade and spread gravel base on the site.
4. When project is complete:
   a. Remove concrete plant, gravel base, and gravel access approach.
   b. Spread topsoil.
   c. Seed and mulch at 3 tons per acre between November 15 and before the ground freezes.
5. Silt fence shall not be removed until vegetation is well established.
6. Nearest lake or stream is ¾ mile south of site. (K) (D)

Erosion Control Measures:

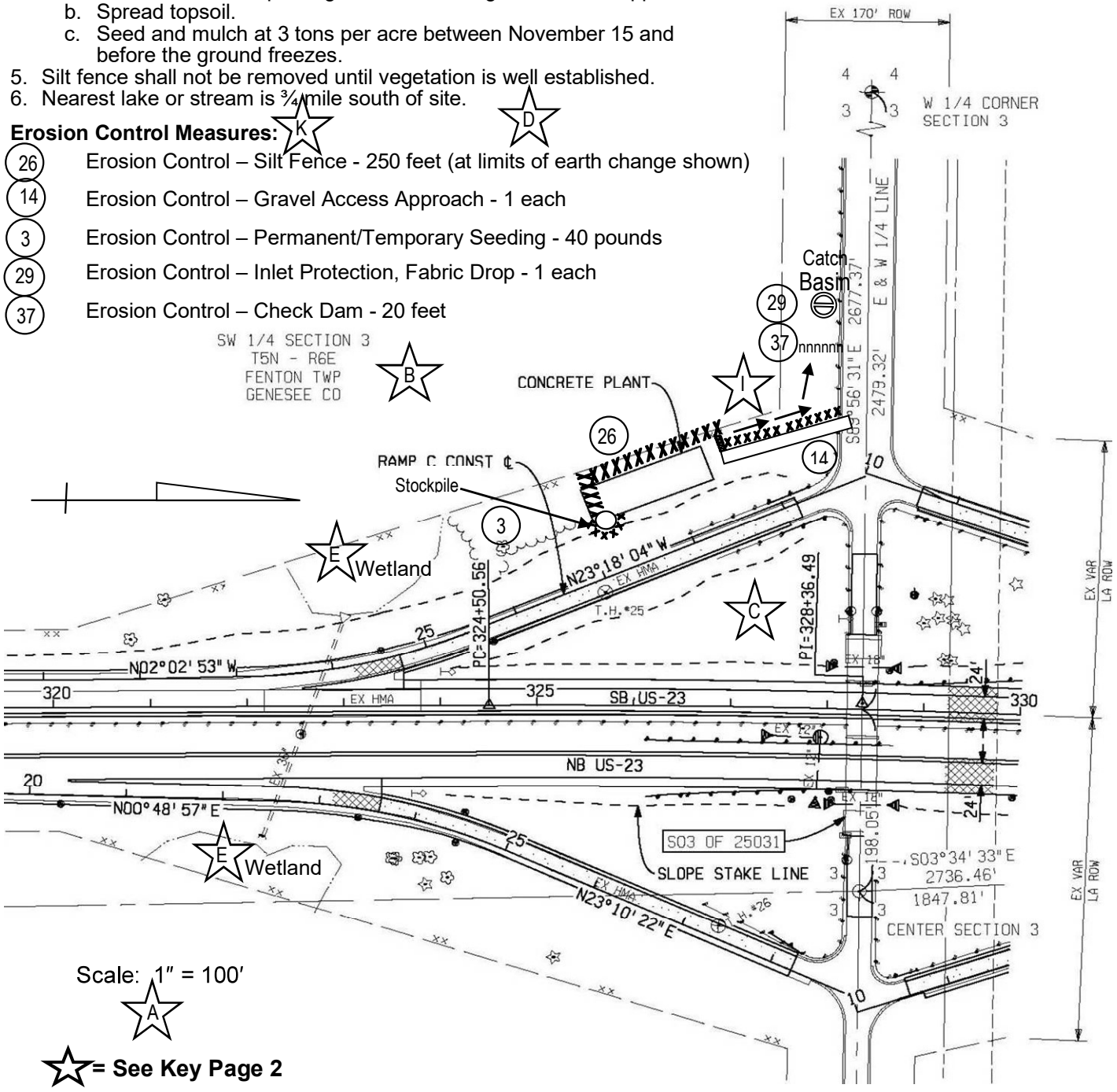
(26) Erosion Control – Silt Fence - 250 feet (at limits of earth change shown)

(14) Erosion Control – Gravel Access Approach - 1 each

(3) Erosion Control – Permanent/Temporary Seeding - 40 pounds

(29) Erosion Control – Inlet Protection, Fabric Drop - 1 each

(37) Erosion Control – Check Dam - 20 feet



(☆) = See Key Page 2

Key to SESC Plan Components



Scaled drawing.



Legal description.



Site location sketch.



Proximity to lakes and streams.



Predominant land features.



Contour intervals or slope descriptions.



Description of soil types.



Physical limits of the earth change.



Drainage and dewatering facilities.



Timing and sequence of earth change.



Description and location of control measures.



Maintenance plan (temporary and permanent).

APPENDIX XI
PERMITS

To Be Included in an Addendum