

**U.S. ENVIRONMENTAL PROTECTION AGENCY  
UNDERGROUND INJECTION CONTROL PERMIT  
CLASS I COMMERCIAL NONHAZARDOUS  
PERMIT NUMBER MI-119-1I-C002  
Northeastern Exploration, Inc.  
Johannesburg, Michigan**

## TABLE OF CONTENTS

<u>Section</u>	<u>Page No.</u>
AUTHORITY .....	1
PART I. GENERAL PERMIT COMPLIANCE.....	2
A. EFFECT OF PERMIT .....	2
B. PERMIT ACTIONS .....	2
1. Modifications, Revocation, Reissuance and Termination .....	2
2. Transfer .....	2
C. SEVERABILITY .....	2
D. CONFIDENTIALITY .....	3
E. DUTIES AND REQUIREMENTS .....	3
1. Duty to Comply.....	3
2. Penalties for Violations of Permit Conditions .....	3
3. Continuation of Expiring Permits .....	3
4. Need to Halt or Reduce Activity Not a Defense.....	4
5. Duty to Mitigate.....	4
6. Proper Operation and Maintenance .....	4
7. Duty to Provide Information.....	5
8. Inspection and Entry .....	5
9. Records .....	5
10. Monitoring .....	6
11. Signatory Requirements.....	7
12. Reporting Requirements .....	7
F. PLUGGING AND ABANDONMENT.....	8
1. Notice of Plugging and Abandonment.....	8
2. Plugging and Abandonment.....	8
3. Temporary Abandonment .....	9
4. Revision of Plugging and Abandonment Plan.....	9
5. Standards for Well Closure.....	9
G. MECHANICAL INTEGRITY.....	9
1. Standards.....	9
2. Periodic Mechanical Integrity Testing.....	10
3. Prior Notice and Reporting .....	10
4. Gauges.....	10
5. Loss of Mechanical Integrity .....	11
6. Mechanical Integrity Testing on Request from Director .....	11

H. FINANCIAL RESPONSIBILITY .....	11
1. Financial Responsibility.....	11
2. Insolvency .....	11
3. Notification .....	12
4. Establishing Other Coverage .....	12
I. CORRECTIVE ACTION .....	12
1. Compliance .....	12
2. Corrective Action Plan.....	12
3. Prohibition of Movement of Fluids into USDWs.....	12
PART II. WELL SPECIFIC CONDITIONS .....	13
A. CONSTRUCTION.....	13
1. Siting .....	13
2. Casing and Cementing .....	13
3. Tubing and Packer Specifications.....	13
4. Wellhead Specification .....	13
B. OPERATIONS .....	13
1. Injection Pressure Limitation .....	13
2. Additional Injection Limitation .....	13
3. Annulus Fluid and Pressure .....	13
4. Annulus/Tubing Pressure Differential .....	14
5. Automatic Warning and Automatic Shut-off System.....	14
6. Precautions to Prevent Well Blowouts .....	14
C. MONITORING .....	15
1. Sampling Point.....	15
2. Continuous Monitoring Devices .....	15
3. Waste Analysis Plan .....	15
4. Ambient Monitoring .....	15
5. Establishing Monitoring and Reporting Frequency .....	15
D. REPORTING REQUIREMENTS .....	15
1. Monthly Reports .....	16
2. Quarterly Reports.....	16
3. Annual Reports .....	17
4. Reports on Well Tests and Workovers .....	17

PART III. ATTACHMENTS.....18

A. SUMMARY OF OPERATING, MONITORING AND REPORTING REQUIREMENTS

B. PLUGGING AND ABANDONMENT PLAN

C. FINANCIAL ASSURANCE MECHANISM

D. CONTINGENT CORRECTIVE ACTION

E. CONSTRUCTION DETAILS

F. SOURCE AND ANALYSIS OF WASTE

G. LIST OF APPROVED SOURCES



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION 5  
77 WEST JACKSON BOULEVARD  
CHICAGO, IL 60604-3590

Page 1 of 18

U.S. ENVIRONMENTAL PROTECTION AGENCY UNDERGROUND INJECTION  
CONTROL PERMIT: CLASS I COMMERCIAL NON-HAZARDOUS

Permit Number: MI-119-1I-C002

Well Name: Davis #1-19

Pursuant to the provisions of the Safe Drinking Water Act, as amended 42 U.S.C. §§300f et seq., (commonly known as the SDWA) and implementing regulations promulgated by the U.S. Environmental Protection Agency (EPA) at Parts 124, 144, 146, and 147 of Title 40 of the Code of Federal Regulations (40 CFR),

**Northeastern Exploration, Inc. of Johannesburg, Michigan**

is hereby authorized to operate a commercial Class I non-hazardous injection well located in Michigan, Montmorency County, T30N, R1E, Section 19, SW Quarter Section, for injection into the Dundee Limestone at depths between 2365 feet and 2710 feet upon the express condition that the permittee meet the restrictions set forth herein.

All references to Title 40 of the Code of Federal Regulations are to all regulations that are in effect on the date that this permit becomes effective. The following attachments are incorporated into this permit: A, B, C, D, E, F, and G.

This permit shall become effective on \_\_\_\_\_, and shall remain in full force and effect during the life of the permit, unless this permit is revoked, terminated, modified or reissued pursuant to 40 C.F.R. §§144.39, 144.40 or 144.41.

This permit and authorization to inject shall expire at midnight on \_\_\_\_\_, unless terminated prior to the expiration date.

Signed and Dated \_\_\_\_\_

**DRAFT**

\_\_\_\_\_  
Tinka G. Hyde  
Director, Water Division

**PART I**  
**GENERAL PERMIT COMPLIANCE**

**A. EFFECT OF PERMIT**

The permittee is allowed to engage in underground injection in accordance with the conditions of this permit. Notwithstanding any other provisions of this permit, the permittee authorized by this permit shall not construct, operate, maintain, convert, plug, abandon, or conduct any other injection activity in a manner that allows the movement of injection, annulus or formation fluids into underground sources of drinking water (USDWs). The objective of this permit is to prevent the introduction of contaminants into USDWs if the presence of that contaminant may cause a violation of any primary drinking water regulation under 40 C.F.R. Part 141 or may otherwise adversely affect the health of persons. Any underground injection activity not specifically authorized in this permit is prohibited. For purposes of enforcement, compliance with this permit during its term constitutes compliance, with Part C of the Safe Drinking Water Act (SDWA). Such compliance does not constitute a defense to any action brought under Section 1431 of the SDWA, or any other common or statutory law other than Part C of the SDWA. Issuance of this permit does not convey property rights of any sort or any exclusive privilege; nor does it authorize any injury to persons or property, any invasion of other private rights, or any infringement of State or local law or regulations. Nothing in this permit shall be construed to relieve the permittee of any duties under applicable regulations.

**B. PERMIT ACTIONS**

1. **Modification, Revocation, Reissuance and Termination** - The Director of the Water Division of the United States Environmental Protection Agency (EPA), hereinafter, the Director, may, for cause or upon request from the permittee, modify, revoke and reissue, or terminate this permit in accordance with 40 C.F.R. §§ 144.12, 144.39, and 144.40. Also, the permit is subject to minor modifications for cause as specified in 40 C.F.R. § 144.41. The filing of a request for a permit modification, revocation and reissuance, or termination, or the notification of planned changes, or anticipated noncompliance on the part of the permittee does not stay the applicability or enforceability of any permit condition.
2. **Transfer of Permits** - This permit is not transferable to any person except in accordance with 40 C.F.R. § 144.38.

**C. SEVERABILITY**

The provisions of this permit are severable, and if any provision of this permit or the application of any provision of this permit to any circumstance is held invalid, the application of such provision to other circumstances and the remainder of this permit shall not be affected thereby.

#### D. CONFIDENTIALITY

In accordance with 40 C.F.R. Part 2 and Section 144.5, any information submitted to EPA pursuant to this permit may be claimed as confidential by the submitter. Any such claim must be asserted at the time of submission by stamping the words "confidential business information" on each page containing such information. If no claim is made at the time of submission, EPA may make the information available to the public without further notice. If a claim is asserted, the validity of the claim will be assessed in accordance with the procedures in 40 C.F.R. Part 2 (Public Information). Claims of confidentiality for the following information will be denied:

1. The name and address of the permittee; and
2. Information which deals with the existence, absence or level of contaminants in drinking water.

#### E. DUTIES AND REQUIREMENTS

1. **Duty to Comply** - The permittee shall comply with all applicable Underground Injection Control (UIC) Program regulations and conditions of this permit, except to the extent and for the duration such noncompliance is authorized by an emergency permit issued in accordance with 40 C.F.R. § 144.34. Any permit noncompliance constitutes a violation of the SDWA and is grounds for enforcement action, permit termination, revocation and reissuance, modification, or for denial of a permit renewal application.
2. **Penalties for Violations of Permit Conditions** - Any person who violates a permit requirement may be subject to civil penalties, fines and other enforcement action under the SDWA. Any person who willfully violates permit conditions may be subject to criminal prosecution.
3. **Continuation of Expiring Permits**
  - (a) **Duty to Reapply** - If the permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the permittee must submit a complete application for a new permit at least 180 calendar days before this permit expires.
  - (b) **Permit Extensions** - The conditions of an expired permit may continue in force in accordance with 5 U.S.C. 558(c) and 40 C.F.R. § 144.37.
  - (c) **Effect** - Permits continued under 5 U.S.C. 558(c) and 40 C.F.R. § 144.37 remain fully effective and enforceable.
  - (d) **Enforcement** - When the permittee is not in compliance with the conditions of the expiring or expired permit, the Director may choose to do any or all of the following:

- (1) Initiate enforcement action based upon the permit which has been continued;
  - (2) Issue a notice of intent to deny the new permit in which case, the owner or operator would then be required to cease the activities authorized by the continued permit or be subject to enforcement action for operation without a permit;
  - (3) Issue a new permit under 40 C.F.R. Part 124 with appropriate conditions; or
  - (4) Take other actions authorized by the UIC regulations.
- (e) **State Continuation** - An EPA-issued permit does not continue in force beyond its expiration date under Federal law if at that time a State has primary enforcement responsibility under the SDWA. A State authorized to administer the UIC program may continue either EPA or State-issued permits until the effective date of the new permits, if State law allows. Otherwise, the facility or activity is operating without a permit from the time of expiration of the old permit to the effective date of the State-issued new permit. Furthermore, if the State does not continue EPA permit upon obtaining primary enforcement responsibility, the permittee must obtain a new State permit or be authorized to inject by State rule. Failure to do so while continuing to operate the well constitutes unauthorized injection and is a violation subject to enforcement action.
4. **Need to Halt or Reduce Activity Not a Defense** - It shall not be a defense for the permittee in an enforcement action to claim that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.
  5. **Duty to Mitigate** - The permittee shall take all timely and reasonable steps necessary to minimize or correct any adverse impact on the environment resulting from noncompliance with this permit.
  6. **Proper Operation and Maintenance** - The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control and related appurtenances which are installed or used by the permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance includes effective performance, adequate funding, adequate operator staffing and training, and adequate laboratory and process controls, including appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems only when necessary to achieve compliance with the conditions of this permit.
  7. **Duty to Provide Information** - The permittee shall furnish to the Director, within a time specified, any information which the Director may request to determine whether cause exists for modifying, revoking and reissuing, or

terminating this permit, or to determine compliance with this permit. The permittee shall also furnish to the Director, upon request, copies of records required to be kept by this permit.

8. **Inspection and Entry** - The permittee shall allow the Director or an authorized representative, upon the presentation of credentials and other documents as may be required by law to:

- (a) Enter, at reasonable times, upon the permittee's premises where a regulated facility or activity is located or conducted, or where records are kept under the conditions of this permit;
- (b) Have access to and copy, at reasonable times, any records that are kept under the conditions of this permit;
- (c) Inspect, at reasonable times, any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and
- (d) Sample or monitor, at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by the SDWA, any substances or parameters at any facilities, equipment or operations regulated or required under this permit.

9. **Records**

- (a) The permittee shall retain records of all monitoring information, including all calibration and maintenance records and all original chart recordings for continuous monitoring instrumentation and copies of all reports required by this permit for a period of at least three (3) years from the date of the sample, measurement or report, unless these materials are submitted to the Director as part of reporting requirements under this permit.
- (b) The permittee shall maintain records of all data required to complete the permit application form for this permit and any supplemental information submitted under 40 C.F.R. §§ 144.27, 144.28, and 144.31 for a period of at least three (3) years from the date the application was signed.
- (c) The permittee shall retain records concerning the nature and composition of all injected fluids until three (3) years after the completion of plugging and abandonment of this injection well.
- (d) The retention period specified in Part I(E)(9)(a) through (c) of this permit may be extended by request of the Director at any time. The permittee shall continue to retain records after the retention period specified in Part I(E)(9)(a) through (c) of this permit or any requested extension thereof

- (e) expires unless the permittee delivers the records to the Director or obtains written approval from the Director to discard the records.
  - (f) Records of monitoring information shall include:
    - (1) The date, exact place, and time of sampling or measurements;
    - (2) The name(s) of individual(s) who performed the sampling or measurements;
    - (3) A precise description of both sampling methodology and the handling of samples;
    - (4) The date(s) analyses were performed;
    - (5) The name(s) of individual(s) who performed the analyses;
    - (6) The analytical techniques or methods used; and
    - (7) The results of such analyses.
10. **Monitoring** - Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity. Sampling and analysis shall comply with the specifications of the Waste Analysis Plan required by Part II (C)(3) of this permit. Monitoring results shall be reported at the intervals contained in Part II (D)(1) through (3) and Part III (A) of this permit.
- (1) Sampling methods – The permittee shall use the methods described in EPA’s “Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods” (SW-846, available on EPA’s website) or equivalent methods approved by the Director to sample the injected fluids.
  - (2) Analytical methods – The permittee shall use applicable analytical methods described in Table I of 40 CFR 136.3 or in certain circumstances by other methods that have been approved by the Director to monitor the nature of the injected fluids.
11. **Signatory Requirements** - All reports or other information, required to be submitted by this permit or requested by the Director shall be signed and certified in accordance with 40 C.F.R. § 144.32.
12. **Reporting Requirements**
- (a) **Planned Changes** - The permittee shall give written notice to the Director, as soon as possible, of any planned physical alterations or additions to the permitted facility other than minor repair/replacement maintenance activities.

- (b) **Anticipated Noncompliance** - The permittee shall give advance notice to the Director of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.
- (c) **Compliance Schedules** - Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit shall be submitted by the permittee no later than thirty (30) calendar days following each schedule date.
- (d) **Twenty-four Hour Reporting**
- (1) The permittee shall report to the Director any permit noncompliance which may endanger health or the environment. See, e.g. Part I(G)(5) of this permit. Any information shall be provided orally within twenty-four (24) hours from the time the permittee becomes aware of the circumstances. Such reports shall include, but not be limited to the following information:
- (i) Any monitoring or other information which indicates that any contaminant may cause an endangerment to an USDW; and
- (ii) Any noncompliance with a permit condition, or malfunction of the injection system, which may cause fluid migration into or between USDW; and
- (iii) Any failure to maintain mechanical integrity.
- (2) A written submission shall also be provided within five (5) working days of the time the permittee becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and, if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate and prevent recurrence of the noncompliance.
- (e) **Other Noncompliance** - The permittee shall report all other instances of noncompliance not otherwise reported at the time monitoring reports are submitted. The reports shall contain the information listed in Part I(E)(12)(d)(2) of this permit.
- (f) **Other Information** - When the permittee becomes aware of failure to submit any relevant facts in the permit application or that incorrect information was submitted in a permit application or in any report to the Director, the permittee shall submit such facts or corrected information within ten (10) calendar days.

- (g) **Report on Permit Review** - Within thirty (30) calendar days of receipt of this permit, the permittee shall certify to the Director that he or she has read and is personally familiar with all terms and conditions of this permit.

## F. **PLUGGING AND ABANDONMENT**

1. **Notice of Plugging and Abandonment** - The permittee shall notify the Director at least sixty (60) calendar days before conversion or abandonment of the well. At the discretion of the Director, a shorter notice period may be allowed.
2. **Plugging and Abandonment** - The permittee must receive the approval of the Director before plugging the well and shall plug and abandon the well consistent with 40 C.F.R. § 144.52(a)(6) and 146.10, as provided for in the Plugging and Abandonment Plan contained in Part III(B) of this permit. Within sixty (60) calendar days after plugging a well, or at the time of the next quarterly report (whichever is shorter), the permittee shall submit a Plugging and Abandonment report to the Director. The report shall be certified as accurate by the permittee and by the person who performed the plugging operation (if other than the permittee), and shall consist of either:
  - (a) A statement that the well was plugged in accordance with the Plugging and Abandonment Plan previously approved by the Director; or
  - (b) If the actual plugging differed from the approved plan, a statement defining the actual plugging and explaining why the Director should approve such deviation. If the Director determines that a deviation from a previously approved plan may endanger underground sources of drinking water, the permittee shall replug the well as required by the Director.
3. **Temporary Abandonment** - If the permittee ceases injection into the well for more than 24 consecutive months, the well is considered to be in temporary abandoned status. Within 30 days after the end of the 24th consecutive month of temporary abandonment, the permittee shall plug and abandon the well unless the permittee:
  - (a) Provides notice to the Director within 30 days of the end of the 24th consecutive month of temporary abandonment, and
  - (b) Describes actions or procedures, satisfactory to the Director, that the owner or operator will take to ensure that the well will not endanger USDWs during the period of temporary abandonment. These actions and procedures shall include compliance with the technical requirements applicable to active injection wells unless waived by the Director.

During any periods of temporary abandonment or disuse, the well shall be tested to ensure that it maintains mechanical integrity. Internal mechanical integrity (Part G(2)(a)) shall be tested annually. External mechanical integrity (Part G(2)(b)) shall be tested every two years. If the well loses mechanical integrity

prior to the next test due date, the well must either be plugged or repaired and retested within 30 days of losing mechanical integrity. The permittee shall continue to comply with the conditions of this permit, including all monitoring and reporting requirements according to the frequencies outlined in the permit.

4. **Revision of Plugging and Abandonment Plan** - If the permittee finds it necessary to change a Plugging and Abandonment Plan, a revised plan shall be submitted to the Director for approval at the time of the next monthly report.
5. **Standards for Well Closure** - Prior to plugging and abandoning the well:
  - (a) The permittee shall observe and record the reservoir pressure decay for a time specified by the Director and shall report this information to the Director.
  - (b) The permittee shall conduct appropriate mechanical integrity testing to ensure the integrity of that portion of the long string casing and cement that will be left in the ground after closure. Testing methods must include:
    - (1) Pressure tests with liquid;
    - (2) Noise, temperature, or oxygen activation logs; and
    - (3) Any other test required by the Director.
  - (c) Prior to well closure, the well shall be flushed with a buffer fluid.

#### G. **MECHANICAL INTEGRITY**

1. **Standards** - The injection well must have and maintain mechanical integrity consistent with 40 C.F.R. § 146.8(a)(1) and (2). Mechanical integrity demonstrations must be witnessed by an authorized representative of the Director. Mechanical integrity testing may also be conducted without an EPA authorized representative when it is not possible for the UIC Branch to resolve scheduling conflicts with both EPA contract inspectors and the regional technical staff. In order to ensure that unwitnessed test will be properly conducted, the permittee will be required to submit test procedures to the UIC Branch for review and wait for written approval from the UIC Branch prior to testing.
2. **Periodic Mechanical Integrity Testing [§146.8]** - The permittee shall conduct the mechanical integrity testing as follows:
  - (a) Long string casing, injection tubing and annular seal shall be tested by means of an approved pressure test in accordance with 40 C.F.R. §146.8(b)(2). This test shall be performed at least once every twelfth month beginning with the date of the last approved demonstration and whenever there has been a well workover in which tubing is removed from

the well, the packer is reset, or when loss of mechanical integrity becomes suspected during operation;

- (b) An approved temperature, noise, oxygen activation, or other approved log shall be run at least once every sixty (60) months from the date of the last approved demonstration to test for movement of fluid along the bore hole. The Director may require such tests whenever the well is worked over. The permittee must submit logging procedures to the Director for approval before running logs for the purpose of meeting this requirement;
  - (c) The permittee may request the Director to use any other test approved by the Director in accordance with the procedures in 146.8(d).
3. **Prior Notice and Reporting** - The permittee shall notify the Director of his or her intent to demonstrate mechanical integrity for periodically scheduled test events at least thirty (30) calendar days prior to such demonstration. At the discretion of the Director a shorter time period may be allowed. Reports of mechanical integrity demonstrations which include logs must include an interpretation of results by a knowledgeable log analyst. The permittee shall report the results of a mechanical integrity demonstration within forty-five (45) calendar days or with the next quarterly report after completion thereof.
  4. **Gauges** - The permittee shall calibrate all gauges used in mechanical integrity demonstrations to an accuracy of not less than one-half (0.5) percent of full scale, prior to each required test of mechanical integrity. A copy of the calibration certificate shall be submitted to the Director or his or her representative at the time of demonstration and every time the gauge is calibrated. The gauge shall be marked in no greater than five (5) psi increments. The Densitometer shall be calibrated using an air check or liquid check every twelve (12) months in accordance with manufacturers' recommendation.
  5. **Loss of Mechanical Integrity** - If the permittee or the Director finds that the well fails to demonstrate mechanical integrity during a test, or fails to maintain mechanical integrity during operation, or that a loss of mechanical integrity as defined by 40 C.F.R. § 146.8(a)(1) and (2) is suspected during operation, the permittee shall halt the operation immediately and follow the reporting requirements as directed in Part I(E)(12) of this permit. The permittee shall not resume operation until mechanical integrity is demonstrated and the Director gives approval to recommence injection.
  6. **Mechanical Integrity Testing on Request From Director** - The permittee shall demonstrate mechanical integrity at any time upon written notice from the Director.

## H. FINANCIAL RESPONSIBILITY

1. **Financial Responsibility** - The permittee shall maintain financial responsibility and resources to close, plug, and abandon the underground injection operation in a manner consistent with 40 C.F.R. § 144.52 (a)(7). The approved financial assurance mechanism is found in the administrative record for this permit.
  - (a) The permittee must maintain a written cost estimate, in current dollars, for the Plugging and Abandonment Plan as specified in 40 C.F.R. § 146.10. The plugging and abandonment cost estimate at any point in the life of the facility operation must equal the maximum cost of plugging and abandonment at that time.
  - (b) The permittee must revise the plugging and abandonment cost estimate whenever a change in the Plugging and Abandonment Plan increases the cost of plugging and abandonment. For required annual updates of the cost estimate, an inflation factor will be applied to the previous estimate or an independent estimate may be used to establish the current Plugging and Abandonment cost.
  - (c) If the revised plugging and abandonment estimate exceeds the current amount of the financial assurance mechanism, the permittee shall submit a revised mechanism to cover the increased cost within thirty (30) calendar days after the revision specified in Part I(H)(1)(b) of this permit.
2. **Insolvency** - The permittee must notify the Director within ten (10) calendar days of any of the following events:
  - (a) The bankruptcy of the trustee or issuing institution of the financial mechanism; or
  - (b) Suspension or revocation of the authority of the trustee institution to act as trustee; or
  - (c) The institution issuing the financial mechanism losing its authority to issue such an instrument.
3. **Notification** - The permittee must notify the Director by certified mail of the commencement of voluntary or involuntary proceedings under Title 11 (Bankruptcy), U.S. Code naming the owner or operator as debtor, within ten (10) calendar days after the commencement of the proceeding. A guarantor of a corporate guarantee must make such a notification if he or she is named as debtor, as required under the terms of the guarantee.
4. **Establishing Other Coverage** - The owner or operator must establish other financial assurance or liability coverage acceptable to the Director, within sixty

(60) calendar days of the occurrence of the events in Part I(H)(2) or (H)(3) of this permit.

## I. **CORRECTIVE ACTION**

1. **Compliance** - The permittee shall comply with the plan for contingency corrective action which is found in Part III (D) of this permit and with 40 C.F.R. §§144.55 and 146.7.
2. **Corrective Action Plan** - The permittee shall file a Corrective Action Plan for approval by the Director within thirty (30) days of a written determination by the Director that improperly plugged, completed, or abandoned wells, or wells for which plugging or completion information is unavailable, are present in the area of review and penetrate the confining zone of the permitted well, as defined in the administrative record for this permit.
3. **Prohibition of Movement of Fluids into USDWs (§144.12)** - Should upward migration of fluids through the confining zone of this permitted well be discovered within the two mile area of review, and should this migration of fluids cause the introduction of any contaminant into a USDW pursuant to 40 C.F.R. §144.12, the permittee shall immediately cease injection into this well until the situation has been corrected and reauthorization to inject has been given by the Director.

**PART II**  
**WELL SPECIFIC CONDITIONS FOR UIC PERMITS**

**A. CONSTRUCTION**

1. **Siting [§146.12(a)]** - The injection well shall inject only into the formation and depths listed on the cover page of this permit. At no time shall injection occur into a formation which is or is above the lowermost formation containing, within one quarter mile of the well bore, an underground source of drinking water.
2. **Casing and Cementing [§146.12(b)]** - Notwithstanding any other provisions of this permit, the permittee shall case and cement the well in such a manner so as to prevent the movement of fluids into or between USDWs for the expected life of the well. The casing and cement used in the construction of this well are shown in Part III(E) of this permit and in the administrative record for this permit. Any change shall be submitted for approval by the Director before installation.
3. **Tubing and Packer Specifications [§146.12(c)]** - The permittee shall inject only through tubing with a packer set within the long string casing at a point within or below the confining zone. The tubing and packer used in the well are represented in engineering drawings contained in Part III(E) of this permit. Any change shall be submitted for approval by the Director before installation.
4. **Wellhead Specification [§144.51(i)(4)]** - The permittee shall install and maintain a female coupling and valve on the wellhead, to be used for independent injection pressure readings. Further, the permittee shall install a sampling port for waste sampling consistent with the permittee's waste sampling procedures, if applicable.
5. **Site Security** – In order to prevent any illegal dumping into the injection well, the operator must construct a fence with a padlocked gate around the facility to preclude access of unauthorized personnel.

**B. OPERATIONS [§146.13]**

1. **Injection Pressure Limitation** - Except during stimulation, the permittee shall not cause or permit the injection pressure at the wellhead to exceed the maximum limitation which is specified in Part III(A) of this permit. In no case shall injection pressure initiate fractures or propagate existing fractures in the confining zone or cause the movement of injection or formation fluids into a USDW.
2. **Additional Injection Limitation** - No waste streams other than those identified in Part III(F) of this permit shall be injected. The permittee shall submit a certified statement attesting to compliance with this requirement at the time of the annual report.
3. **Annulus Fluid and Pressure** - The permittee shall fill the annulus between the tubing and the long string casing with a fluid approved by the Director and identified in the administrative record of this permit. Any change in the annulus

fluid, except during workovers or times of annulus maintenance, shall be submitted by the permittee for the approval of the Director before replacement. Except during workovers, the permittee shall maintain a positive pressure on the annulus as specified in Part III(A) of this permit.

4. **Annulus/Tubing Pressure Differential** - Except during workovers or times of annulus maintenance, the permittee shall maintain, over the entire length of the tubing, a pressure differential between the tubing and annulus as specified in Part III(A) of this permit.
5. **Automatic Warning and Automatic Shut-off System** - The permittee shall continuously operate and maintain an automatic warning and shut-off system to stop injection within fifteen (15) minutes of any of the following situations:
  - (a) Pressure changes in the annulus or annulus/tubing differential signifying or identifying possible deficiencies in mechanical integrity; or
  - (b) Injection pressure, annulus pressure, or annulus/tubing differential pressure reaches the pressure limits as specified in Part III(A) of this permit.

The permittee must test the automatic warning and automatic shut-off system at least once every twelfth month. This test must involve subjecting the system to simulated failure conditions and must be witnessed by the Director or his or her representative, unless alternative arrangements are approved by the Director. Unless a trained operator is present on site property who is able to perceive shut-down alarms and is able to respond to the well controls or the wellhead within fifteen (15) minutes of a compliance alarm condition at all times when the well is operating, the special permit conditions related to the remote monitoring of the well in Part (H) of this permit shall apply.

6. **Precautions to Prevent Well Blowouts** - In order to prevent the migration of fluids into underground sources of drinking water, the permittee shall maintain on the well at all times, a pressure which will prevent the return of the injection fluid to the surface. If there is gas formation in the injection zone near the well bore, such gas must be prevented from entering the casing or tubing. The well bore must be filled with a high specific gravity fluid during workovers to maintain a positive (downward) gradient and/or a plug shall be installed which can resist the pressure differential. If the potential for blowout exists, a blowout preventer must be kept in proper operational status during workovers. In cases where the injected wastes have the potential to react with the injection formation to generate gases, the permittee shall follow the procedures below to assure that a backflow or blowout does not occur:
  - 1) Limit the temperature, pH or acidity of the injected waste prior to a workover; and

- 2) Develop procedures necessary to assure that pressure imbalances do not occur.

### C. MONITORING

1. **Sampling Point** - The injection fluid samples shall be taken at the sampling location as specified in Part III(A) of this permit.
2. **Continuous Monitoring Devices** - The permittee shall maintain continuous monitoring devices and use them to monitor injection pressure, flow rate, and the pressure on the annulus between the tubing and the long string of casing. If the well is equipped with a fluid level indicator, the permittee shall monitor the fluid level daily. The monitoring results shall be submitted to the Director as specified in Part II(D) of this permit. The permittee shall maintain for EPA's inspection at the facility an appropriately scaled, continuous record of these monitoring results as well as original copies of any digitally recorded information pertaining to these operations.
3. **Waste Analysis Plan [§144.52(a)(5)]** - The permittee shall comply with the written Waste Analysis Plan which describes the procedures used to monitor the nature of injected fluids and the procedures which will be carried out to comply with Part I(E)(10) of permit. A copy of the approved plan shall also be kept at the facility.
4. **Ambient Monitoring [146.13(d)(1)]** - The permittee shall monitor the pressure buildup in the injection zone at least once every twelfth month from the last approved demonstration, including at a minimum, a shut down of the well for a time sufficient to conduct a valid observation of the pressure fall-off curve. From this observation, the permittee shall submit a report including at least a calculation of pressure build-up in the injection zone, injection zone transmissivity, and wellbore skin factor.
5. **Temperature Monitoring** - The permittee shall monitor injectate temperature at least once daily on each day during which injection occurs. If injection occurs during more than one eight-hour period in a day, temperature must be recorded at least once every six hours. The monitoring results shall be submitted to the Director as specified in Part II(D)(1)(g) of this permit.

### D. REPORTING REQUIREMENTS [§146.13(c)]

The permittee shall submit all required reports to the Director at:

**United States Environmental Protection Agency  
77 West Jackson Boulevard (WU-16J)  
Chicago, Illinois 60604-3590  
ATTN: UIC Branch**

1. **Monthly Reports** - The permittee shall submit monthly reports of the following information no later than the end of the month following the reporting period:
  - (a) Waste analysis results per the approved waste analysis plan. Laboratory reports must be submitted with the first monthly monitoring report following their receipt by the operator;
  - (b) A tabulation of maximum injection pressure, a daily measurement of annulus tank fluid level, and minimum differential between simultaneous measurements of injection pressure and annulus pressure for each day of the month;
  - (c) Appropriately scaled graphs showing injection pressure and flow rate and annulus tank fluid level. One graph must include, at a minimum, daily maximum injection pressure and daily average flow rate, on a single, monthly chart;
  - (d) A statement of the total volumes of the fluid injected to date, in the current calendar year, and the current month;
  - (e) A tabulation of the dates, amounts and types of liquid added to or removed from the annulus system during the month, and the cumulative additions and cumulative subtractions for the current month and each of the past 12 months;
  - (f) Any noncompliance with conditions of this permit, including but not limited to:
    - (1) Any event that exceeds operating parameters for annulus pressure or injection pressure or annulus/tubing differential as specified in the permit; or
    - (2) Any event which triggers an alarm or shutdown device required in Part II(B)(5) of this permit.
  - (g) The monthly average of the measured values of injectate temperature. If temperature measurements are recorded when the well is not injecting, those measurements will not be included in calculating the monthly average. Records of all temperature measurements must be maintained in accordance with Part I(E)(9)(a) of this permit
2. **Quarterly Reports** - The permittee shall report the following at least every Quarter (quarterly reporting periods shall begin on the first day of January, April, July, and October of each year).
  - (a) Results of the injection fluid analyses specified in Parts III (A) and (G) of this permit, if applicable. Laboratory reports must be submitted with the

first monthly monitoring report following the close of the quarterly reporting period.

- (b) Part III (A) of this permit specifies the method for determining reporting of sampling and analysis more frequent than quarterly.

- 3. **Reports on Well Tests and Workovers** - Within forty-five (45) calendar days or within the next quarterly report after the activity, the permittee shall report to the Director the results of demonstrations of mechanical integrity, any well workover, or results of other tests required by this permit.

**PART III  
ATTACHMENTS**

These attachments include, but are not limited to, permit conditions and plans concerning operating procedures, monitoring and reporting, as required by 40 C.F.R. Parts 144 and 146. The permittee shall comply with these conditions and adhere to these plans as approved by the Director, as follows:

- A. SUMMARY OF OPERATING, MONITORING AND REPORTING REQUIREMENTS (ATTACHED)**
- B. PLUGGING AND ABANDONMENT PLAN (ATTACHED)**
- C. FINANCIAL ASSURANCE MECHANISM (ATTACHED)**
- D. CONTINGENT CORRECTIVE ACTION (ATTACHED)**
- E. CONSTRUCTION DETAILS (ATTACHED)**
- F. SOURCE AND ANALYSIS OF WASTE (ATTACHED)**
- G. LIST OF APPROVED SOURCES (ATTACHED)**

**ATTACHMENT A**  
**SUMMARY OF OPERATING, MONITORING AND REPORTING REQUIREMENTS**

<b>CHARACTERISTICS</b>	<b>LIMITATION</b>	<b>MINIMUM MONITORING FREQUENCY</b>	<b>MINIMUM REPORTING FREQUENCY</b>
Injection Pressure*	546 psig maximum	continuous	monthly
Annulus Pressure	100 psig minimum	continuous	monthly
Annulus/Injection Pressure Differential	100 psig above operating injection pressure	continuous	monthly
Specific Gravity		monthly	monthly
Flow Rate		continuous	monthly
Temperature		daily	monthly
Sight Glass Level		daily (during injection) weekly (during no injection)	monthly
Cumulative Volume		continuous	monthly
Annulus Fluid Loss		monthly	monthly
Chemical Composition of Injected Fluids**		**	***
Physical Characteristics of Injected Fluids**		**	***

**Sampling location:** For new Class I sources, at the site of generation. For approved Class I or any Class II sources, at the site of generation, at the loading pad, the storage tanks, or at the wellhead.

\* The limitation on injection pressure will serve to prevent injection-formation fracturing. This limitation was calculated using the following formula:  $[(0.80 \text{ psi/ft} - (0.433 \text{ psi/ft})(\text{specific gravity})) \times \text{depth}] - 14.7 \text{ psi}$ . The maximum injection pressure is dependent upon the depth and specific gravity of the injected fluid. The fracture gradient is 0.80 psi/ft. The Dundee Limestone at 2365 feet was used as the depth and a specific gravity of 1.30 was used for the injected fluid.

\*\* As specified in the Part III (F) of this permit (Waste Analysis Plan, Pages F-25 to F-29).

\*\*\* All required analytical results will be submitted by the end of the month following the sampling period, as specified in Part III (G) of this permit.

**PROPOSED NEW WASTE "SOURCE" INFORMATION**

The information shown in Subparts A through F of this Attachment must be submitted by the permittee initially for each proposed new waste "source" pursuant to Part II (B)(2) of this permit. These requirements do not apply to existing wastes generated by the on-site plant operations at the facility and otherwise documented in this permit and the applicable permit application. The permittee may incorporate the information into a form of its own, provided that all information is included, and that the same form is used for all proposed "sources". The permittee, by submitting appropriate knowledge of waste, shall specify that there are no hazardous wastes as defined at 40 C.F.R. §§ 261.30-33 present in each proposed "source". Appropriate knowledge of waste may consist of any or all of the following three categories: (1) knowledge of the waste generation process, (2) detailed record-keeping, or (3) waste analysis data. The permittee must receive written authorization from EPA prior to injecting waste from this "source". Authorization shall consist of a final modified permit, which shall list this "source" as an approved "source" in Part III (G) of this permit.

**A. Permittee Information**

1. Owner/Operator Name
2. Owner/Operator Address (Street, City, State, Zip Code)
3. Facility contact name and telephone number
4. Well Location (Township, Range, Section, Quarter Section, footage NSL, EWL)
5. EPA UIC Permit Number
6. State Permit Number (if applicable)
7. Well Name

**B. Waste Transporter Information**

1. Transporter name
2. Transporter Address (Street, City, State, Zip Code)
3. Transporter Contact Name
4. Transporter Contact phone number
5. EPA Identification numbers (if applicable)

For proposed new Class I non-hazardous waste "sources", reporting of quarterly sampling and analysis shall be required, as specified in Part II (D)(2) of this Permit. Certain waste "sources" may require more stringent and/or frequent sampling and analysis. Upon receiving the modified permit, the permittee shall be authorized to inject this waste, subject to the conditions of this permit and the permittee's approved Waste Analysis Plan.

**C. New Class I Non-Hazardous Waste Approvals**

1. The following information will be provided as part of a written request to EPA for all proposed new Class I waste sources:
  - a. "Source" Identification number
  - b. Generator Name
  - c. Generator Address (Street, City, State, Zip Code)
  - d. Generator Contact Name and telephone number
  - e. EPA Identification numbers (if applicable)

2. Each new Class I waste stream will be analyzed initially for the following parameters:
  - a. Total Dissolved Solids
  - b. Total Suspended Solids
  - c. pH
  - d. Specific Gravity
  - e. Conductivity
  - f. Chloride
  - g. Sulfate
  - h. Bicarbonate
  - i. Calcium
  - j. Potassium
  - k. Sodium
  - l. Corrosivity (if applicable, based on process knowledge)
  - m. Reactivity (if applicable, based on process knowledge)
  - n. Ignitability (if applicable, based on process knowledge)
  - o. Toxicity (if applicable, based on process knowledge)
  - p. Any appropriate analytical results necessary to identify waste constituents which may indicate a listed hazardous waste as defined at 40 C.F.R. §§ 261.31, 261.32, or 261.3

All new Class I waste sources will be tested to demonstrate the absence of applicable hazardous waste characteristics as part of the approval process; under 40 C.F.R. §261, Subpart C, there are four hazardous characteristics for which waste may be tested, on a case-by-case basis: Corrosivity (D001), Ignitability (D002), Reactivity (D003), and Toxicity.

The test for toxicity shall follow the Toxicity Characteristic Leaching Procedure and should include all appropriate constituents (which are listed at 40 CFR §261.24). The permittee may rely on the generator's waste knowledge consistent with 40 CFR §262.11 and all appropriate knowledge of waste to reduce the number constituents tested. Any testing conducted to evaluate toxicity shall follow the Toxicity Characteristic Leaching Procedure and should include all appropriate constituents based on each individual "Source" (which are listed at 40 C.F.R. § 261.24). If the permittee decides to rely on the generator's waste knowledge to test for fewer than the complete toxicity parameter list found at 40 CFR §261.24, the permittee must submit an explanatory statement which is consistent with 40 C.F.R. § 262.11 along with the request for approval of the new source to justify why those parameters were not tested for. If the permittee decides not to analyze any new proposed source for corrosivity, reactivity and/or ignitability, then the permittee must submit an explanatory statement consistent with 40 C.F.R. § 262.11 to justify the waiver.

D. New Class II Waste Approvals

1. The following information will be provided as part of a written request to EPA for all proposed new Class II waste sources:
  - a. "Source" Identification Number (a unique number assigned to the waste generator)
  - b. County and Sampled Well Location (Township, Range and Section)
  - c. Geologic Formation
  - d. Oilfield Name
  
2. Each new Class II waste stream will be analyzed initially and annually for the following parameters:
  - a. Sodium
  - b. Calcium
  - c. Barium
  - d. Total Iron
  - e. Chloride
  - f. Sulfate
  - g. Carbonate
  - h. Bicarbonate
  - i. Sulfide
  - j. Total Dissolved Solids
  - k. pH
  - l. Resistivity (ohm-meters @ reported temperature)
  - m. Specific Gravity

E. Sampling and Analysis Description

1. The following information must be specified for each sampling event:
  - a. Sample collector, title, and employer
  - b. Sample collection method and preservation technique
  - c. Sample collection point
  
2. The following information must be specified for each parameter:
  - a. Analytical method for parameter detection/quantification
  - b. Analytical method accuracy
  - c. Upper and lower analytical method quantification limits

F. Quality Assurance and Quality Control (QA/QC)

The following requirements are specified in the QA/QC portion of the permittee's waste analysis plan. Description of the QA/QC Protocol followed:

1. Equipment cleaning blanks (if any)
2. Trip blanks (if any)
3. Sample duplicates (if any)
4. Chain of custody
5. Equipment calibration
6. Data reduction and validation
7. A letter from the permittee which describes how the waste was determined to be nonhazardous

G. Historical background of facility

Historical background of the facility, including a detailed description of the process involved in generating the waste, how it is collected and stored. Indicate whether the proposed waste "source" is a one-time "source". The description should identify any periodic changes in facility operations which would be expected to alter the composition of the waste stream. The purpose of this information shall be to assure that the monitoring frequency applied to each "source" accounts for changes in the nature of the waste due to changes in facility operations. If a change in operations causes a change in the waste stream, the permittee must require monitoring which is representative of ongoing operations. Monitoring data supplied by the facility must be representative of the waste being generated for the entire period between sampling events.

H. Periodic Monitoring of Approved "Sources"

1. Currently Approved Class I Non-Hazardous Wastes

a. **Fingerprint Analysis**

All wastes that require fingerprint analysis as specified in Part III (G) of this permit shall, at a minimum, be subject to tests for the following:

1. pH
2. Total Dissolved Solids
3. Total Suspended Solids
4. Specific Gravity
5. Any other analyses deemed appropriate for characterizing the injected waste.

b. **Additional Analysis**

Each approved Class I waste source requires a source-specific suite of additional analyses, citing the Toxic Characteristic List, per 40 C.F.R. Part 261.24, as specified in the Waste Analysis Plan (Part III (F) and in the List of Presently Approved Sources (Part III (G)).

2. Currently Approved Class II Wastes

All currently approved Class II oilfield brine wastes shall be monitored annually at a minimum for the following parameters:

- a. Sodium
- b. Calcium
- c. Barium
- d. Total Iron
- e. Chloride
- f. Sulfate
- g. Carbonate
- h. Bicarbonate
- i. Sulfide
- j. Total Dissolved Solids
- k. pH
- l. Resistivity (ohm-meters @ 75°F)
- m. Specific Gravity

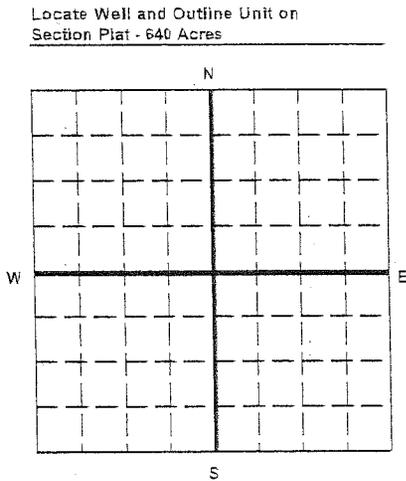
**ATTACHMENT B  
PLUGGING AND ABANDONMENT PLAN**



United States Environmental Protection Agency  
Washington, DC 20460

**PLUGGING AND ABANDONMENT PLAN**

<b>Name and Address of Facility</b> Northeastern Exploration, Inc. 1190 Highway M-32, Johannesburg, Michigan 49751	<b>Name and Address of Owner/Operator</b> Northeastern Exploration, Inc. 1190 Highway M-32, Johannesburg, Michigan 49751
--	--



State Michigan	County Montmorency	Permit Number MI-119-11-C002
-------------------	-----------------------	---------------------------------

Surface Location Description  
 1/4 of  1/4 of  1/4 of SW 1/4 of Section 19 Township 30N Range 1E

Locate well in two directions from nearest lines of quarter section and drilling unit

Surface Location 700 ft. frm (N/S) S Line of quarter section  
 and 593 ft. from (E/W) E Line of quarter section.

TYPE OF AUTHORIZATION <input checked="" type="checkbox"/> Individual Permit <input type="checkbox"/> Area Permit <input type="checkbox"/> Rule Number of Wells <u>1</u>	WELL ACTIVITY <input checked="" type="checkbox"/> CLASS I <input type="checkbox"/> CLASS II <input type="checkbox"/> Brine Disposal <input type="checkbox"/> Enhanced Recovery <input type="checkbox"/> Hydrocarbon Storage <input type="checkbox"/> CLASS III
Lease Name	Well Number <u>Davis #1-19</u>

CASING AND TUBING RECORD AFTER PLUGGING				
SIZE	WT (LB/FT)	TO BE PUT IN WELL (FT)	TO BE LEFT IN WELL (FT)	HOLE SIZE
16"	10.375 wall	--	82	driven
11 3/4"	42#	--	950	14 3/4"
8 5/8"	32#	--	2375	10 5/8"

METHOD OF EMPLACEMENT OF CEMENT PLUGS

- The Balance Method
- The Dump Bailer Method
- The Two-Plug Method
- Other

CEMENTING TO PLUG AND ABANDON DATA:							
	PLUG #1	PLUG #2	PLUG #3	PLUG #4	PLUG #5	PLUG #6	PLUG #7
Size of Hole or Pipe in which Plug Will Be Placed (inches):	10 5/8"	8 5/8"	8 5/8"				
Depth to Bottom of Tubing or Drill Pipe (ft.)	3004 TD	2375	2300				
Sacks of Cement To Be Used (each plug)	250	17	508				
Slurry Volume To Be Pumped (cu. ft.)	387	26	787				
Calculated Top of Plug (ft.)	2375	2300	surface				
Measured Top of Plug (if tagged ft.)	--	--	--				
Slurry Wt. (Lb./Gal.)	14.1	14.1	14.1				
Type Cement or Other Material (Class III)	A, 4%ben	A, 4%ben	A, 4%ben				

LIST ALL OPEN HOLE AND/OR PERFORATED INTERVALS AND INTERVALS WHERE CASING WILL BE VARIED (if any)

From	To	From	To

Estimated Cost to Plug Wells  
 Estimated cost of workover rig, cement and equipment to plug well \$30,900.

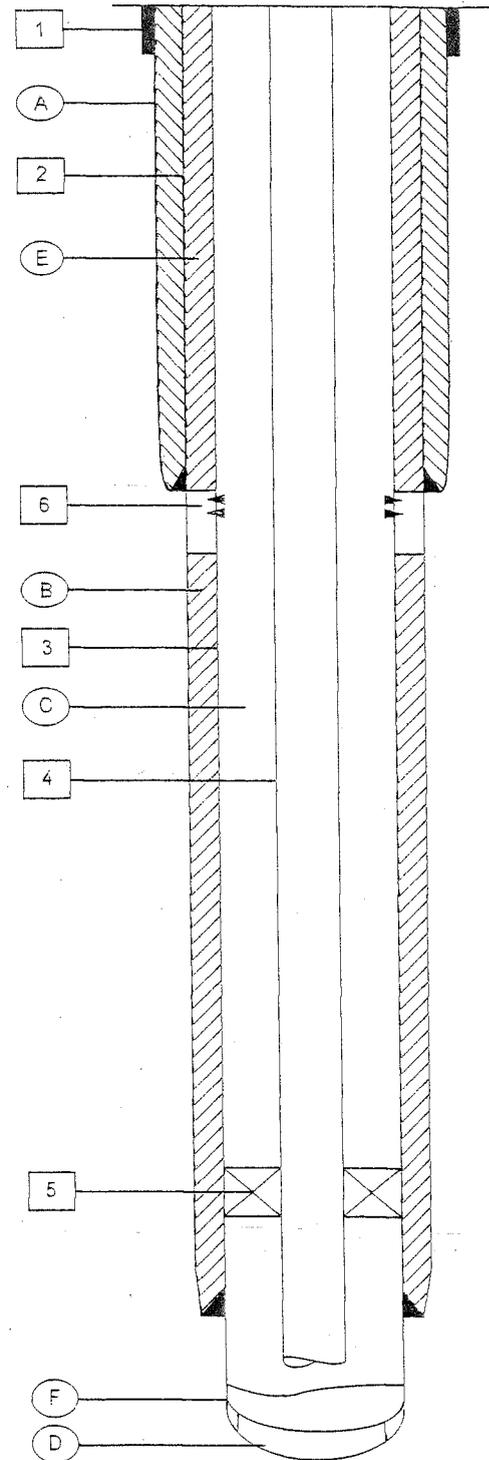
**Certification**

I certify under the penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. (Ref. 40 CFR 144.32)

Name and Official Title (Please type or print) Paul Husted, Site Operations Manager	Signature 	Date Signed 06/10/2015
--	---------------	---------------------------

- CEMENT, VOLUMES, FLUIDS and HOLE SIZE
- TUBULARS and COMPONENTS
- A 14 3/4" Hole, Cemented to Surface w/800 sacks
- B 10 5/8" Hole, Cemented to 1080' w/ 450 sacks
- C Annulus Fluid: Fresh water with National CI-PAC Inhibitor
- D Original Completion: Open Hole, Top of 8 5/8" stub @ 3004'
- E 8 5/8" x 11 3/4" Casing Annulus Cemented from 946' to surface
- F Wellbore fill @ 2,718' (2006 Workover)
- 1 Surface Casing: 16". Set @ 82', Driven below drift
- 2 Intermediate Casing: 11 3/4", 42 lb/ft, N-40, Set @ 942'
- 3 Long String Casing: 8 5/8", 24 lb/ft, J-55, Set @ 2375'
- 4 Injection Tubing: 4 1/2", 10.5 lb/ft, J-55, Internally lined, Seal-tite Tail Pipe at 2,376'
- 5 Packer: 8 5/8" x 4 1/2" Liner Hanger, Internally lined, Seal-tite Compression Set @ 2337'
- 6 Perforations, Squeezed @ 914-916'

NOTE: Based on 9/92 workover reports,  
5/97 workover results  
11/05 workover results and  
7/06 workover results.



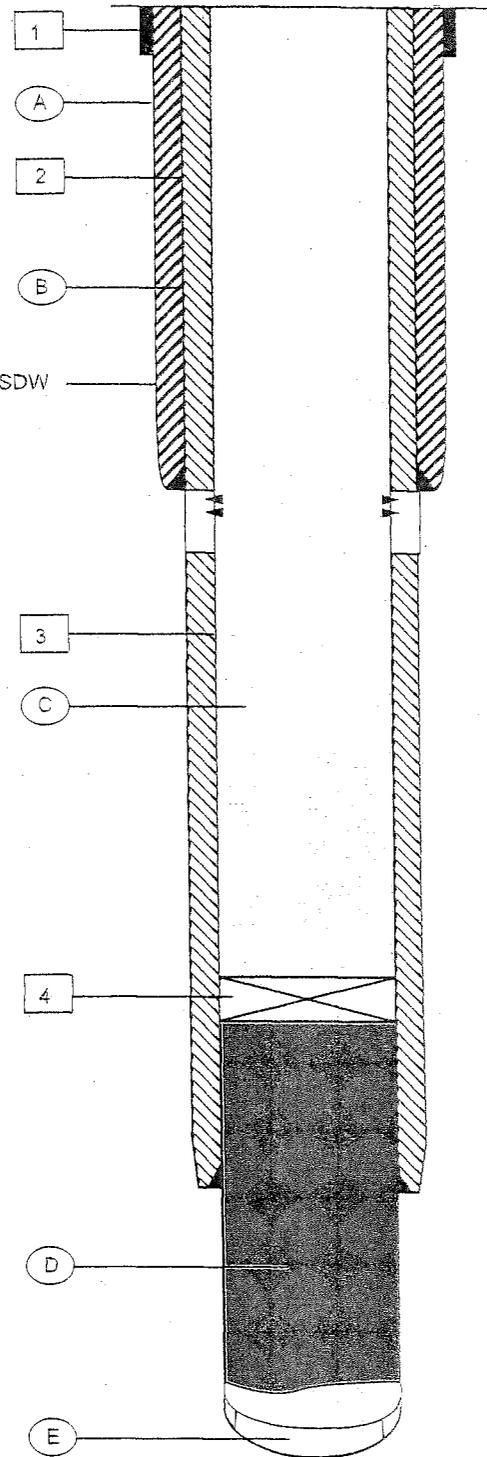
3004' TD on 8 5/8" Casing Stub

<b>Northeastern Exploration, Inc.</b> Johannesburg, Michigan		
Figure M-1 Well Schematic Davis No.1-19		
2015 Northeastern Permit Renewal		
Scale: NTS	Date: June 2015	
NE_PR_Fig_M_01.ai	By: JLM	Checked: KC
<b>Petrotek</b>		
5535 South Zang Street, Suite 200 Littleton, Colorado 80127 USA 303-290-8414 www.petrotek.com		

- CEMENT, VOLUMES, FLUIDS and HOLE SIZE
- TUBULARS and COMPONENTS
- A 12 1/4" Hole, Cemented to Surface with 244 sacks
- B 8 1/2" Hole, Cemented to Surface with 295 sacks
- C 550 Sacks Cement, 2355' to surface
- D 300 Sacks Cement to 2355'
- E Wellbore Fill on Top of Plugged Back 8 5/8" Casing Stub

- 1 Surface Casing: 13 3/8, Driven to refusal as deep as 175'
- 2 Intermediate Casing: 9 5/8, 36 lb/ft., K-55 or J-55, Set @ 870'
- 3 Long String Casing: 7, 26 lb/ft., J-55 or K-55, Set @ 2,355'
- 4 Mechanical Plug: Set @ 2,325' on top of cement retainer or original packer

+/- 820' Lowermost USDW  
Base of Drift



3004' TD Casing Stub

<b>Northeastern Exploration, Inc.</b> Johannesburg, Michigan		
Figure Q-1 Plugging and Abandonment Well Schematic		
2015 Northeastern Permit Renewal		
Scale: NTS	Date: June 2015	
NE_PF_Fig_Q_01.ai	By: JLM	Checked: KC
		5935 South Zamp Street, Suite 200 Littleton, Colorado 80127 USA 303-290-8414 www.petrotek.com

## 2.Q PLUGGING AND ABANDONMENT PLAN

Submit a plan for plugging and abandonment of the well including (1) describe the type, number, and placement (including the elevation of the top and bottom) of plugs to be used; (2) describe the type, grade, and quantity of cement to be used; and (3) describe the method to be used to place plugs, including the method used to place the well in a state of static equilibrium prior to placement of the plugs. Also, for a Class III well that underlies or is in an exempted aquifer, demonstrate adequate protection of USDWs. Submit this information on USEPA Form 7520-14, Plugging and Abandonment Plan.

### RESPONSE

The following completed copy of US EPA Form 7520-14, Plugging and Abandonment Plan, are submitted to satisfy this requirement. The modifications made to this form are to provide consistency with all available and current information. The plan for the well is also summarized in graphical form (Figure Q-1) in this response. Costs associated with the plugging and abandonment of the well per the following procedures is presented in the completed plugging forms and in Response 2.R of this document.

The following is the proposed plan for plugging and abandonment of the Davis No. 1-19 non-hazardous Class I Well.

1. Install a test gauge on the annulus to perform a static pressure test. Ensure that the annulus is fluid filled and that the well has been shut-in for a minimum of 24 hours. Pressurize annulus to approximately 500 psig and isolate from the annulus system. Monitor annular pressure for one hour. The test will be successful if the pressure change is less than 3 percent of the starting pressure.
2. Prepare well and location for plugging. Remove wellhouse, well monitoring equipment and wellhead injection piping.
3. Move in and rig-up workover rig, mud pump, circulating pit and pipe racks as necessary. Flush well with approximately 100 bbl fresh water.
4. Remove wellhead and release slips.
5. Cut (or string shot) tubing immediately above injection packer. Displace annular fluid from well into injection formation with fresh water.
6. Pull and lay down the injection tubing.
7. Pump approximately 267 sacks of Class A cement with 4% bentonite (14.1 ppg, 1.55 cf/sx yield).
8. Pump 8 5/8" solid top plug to land at top of existing packer at approximately 2300'.
9. Stage cement remainder of casing to surface in approximately 500 foot stages using the balanced plug method. Pump approximately 508 sacks of

Class A cement with 4% bentonite (14.1 ppg, 1.55 cf/sx yield).

10. Cut off wellhead approximately 3 feet BGL and weld cap with permanent marker on casing.
11. Rig down and move out pulling unit and equipment.
12. Submit required plugging records to USEPA and MDEQ.

### Post-Closure Care Requirements

Northeastern will provide notification of closure to USEPA, Region 5, the MDEQ and the local zoning authorities. Included with the notification will be information regarding the nature of the injected waste stream, identification of the depths of the injection and confining zones, well schematics and plugging records. Northeastern will retain, for a period of three years following the well closure, records reflecting the nature, composition and volume of all injected fluids. At the discretion of the director of USEPA, Region 5, Northeastern will then deliver the records to the director at the conclusion of the retention period, or dispose of such records upon written approval of the director.

# Petrotek

Petrotek Engineering Corporation 5935 South Zang Street, Suite 200 Littleton, Colorado 80127 USA (303) 290-9414 FAX (303) 290-9580

June 10, 2015

Mr. Paul Husted  
Site Operations Manager  
Northeastern Exploration, Inc.  
1190 Highway M-32  
Johannesburg, MI 49751

**RE: 2015 Plugging and Abandonment Cost Update for Class I Well  
Northeastern Exploration, Inc. Disposal Well No. 1-19 Johannesburg, Michigan**

Dear Mr. Husted:

As requested, Petrotek has completed an annual review of the plugging and abandonment procedures and associated costs for the closure of the currently operating Northeastern Exploration Class I Non-Hazardous injection well at Johannesburg, Michigan in Montmorency County. This well has been used since 1998 as a Devonian (Dundee) injector with an openhole completion from approximately 2,375' to 3,004' BGL. It is located in reasonably close proximity to oilfield contractor service companies in the northern Michigan Basin. Approved procedures in the previously approved permits and permit applications remain consistent with current regulations.

A copy of an updated EPA Form 7520-14 is provided in the permit renewal application that summarizes the plugging plan. The current financial assurance amount maintained for this well is \$33,000 and this amount is sufficient based on satisfying minimum federal requirements for plugging that do not include budget for any additional integrity testing or the decommissioning of any related surface facilities. As of June 10, 2015 the line item budgeting is as follows:

\$ 14,300	Cement
\$ 5,200	Rig or Pulling Unit
\$ 500	Welder
\$ 5,900	Cement Retainer and Top Plug
\$ 5,000	Miscellaneous
\$ 30,900	Total

The total plugging cost estimate for the proposed well is now currently estimated to be \$30,900.

As always, if you have any questions or require further information regarding any issues related to the wells, feel free to contact any of us at Petrotek.

Sincerely,



Petrotek Engineering Corporation  
Ken Cooper, PE

**ATTACHMENT C**  
**FINANCIAL ASSURANCE MECHANISM**

## 2.R NECESSARY RESOURCES

Submit evidence such as a surety bond or financial statement to verify that the resources necessary to close, plug, or abandon the well is available.

### RESPONSE

With respect to financial assurance, a Surety Bond is currently maintained as required by applicable regulations. Included as documentation for this Response are copies of an independent plugging cost estimate for the Northeastern Exploration, Inc. Well No. 1-19, and a copy of the bonding mechanism that has been secured for the required financial assurance amounts per applicable regulations. The conformance bond is committed to the State of Michigan Department of Environmental Quality, Director of Mineral Wells.

Updated materials to be forwarded to USEPA regarding financial assurance will be forwarded by Northeastern Exploration, Inc. to the following address:

US Environmental Protection Agency  
Region 5 UIC Branch, DI Section  
77 West Jackson Blvd.  
Chicago, IL 60604-3590

With respect to continued demonstration of financial assurance, the bond will be maintained as required by applicable regulations. Within ninety (90) days after the close of each fiscal year, the permittee will obtain verification that the amount used for financial assurance is sufficient to address updated plugging and abandonment costs and will submit updated financial assurance information to the US EPA if the cost of plugging and abandonment has exceeded the existing financial assurance or if the financial assurance mechanism is altered. Costs will be updated for inflation annually based on the most recently available US Bureau of Labor Statistics data from the Producer Price Index for support activities for oil and gas operations (PCU213112213112) or suitable equivalent such as obtaining quotations for required services. In the event that costs exceed existing financial assurance, the information submitted to the Director will consist of a letter from the permittee regarding the change in the financial assurance requirements, verification from the appropriate financial institution regarding the increased financial assurance and a copy of the independent geologist or engineering estimate of the updated plugging and abandonment costs.



RICK SNYDER  
GOVERNOR

STATE OF MICHIGAN  
DEPARTMENT OF ENVIRONMENTAL QUALITY  
LANSING

MI-119-11-C002  
Page C-2 of 5

DAN WYANT  
DIRECTOR

June 21, 2013

Mr. Michael Ascone  
Northeastern Exploration, Inc.  
1190 M-32  
Johannesburg, Michigan 49751

Dear Mr. Ascone:

SUBJECT: CONFORMANCE BONDING

Thank you for submitting Surety Bond No. 1084643 issued by Lexon Insurance Company in the amount of \$33,000 for the Davis 1-9 mineral well, Permit Number M00439.

The attached Trust Agreement between Northeastern Exploration, Inc. and the Department of Environmental Quality (DEQ) dated July 17, 1997, is hereby terminated and released.

In addition, the DEQ has released Surety Bond No. 3SE 621 544-00 issued by American Manufacturers Mutual Insurance Company in the amount of \$5,000. A copy of that release is also attached.

If you have any questions, please contact me by phone at 517-335-6766, by e-mail at [pettitj@michigan.gov](mailto:pettitj@michigan.gov), or by mail at Department of Environmental Quality, Office of Oil, Gas, and Minerals, P.O. Box 30256, Lansing, Michigan 48909.

Sincerely,

Joe Pettit  
Permitting and Technical Services Section  
Office of Oil, Gas, and Minerals

Attachments

cc: Bond File



MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY - OFFICE OF GEOLOGICAL SURVEY

**BOND FOR CONFORMANCE**

By authority of Part 615, Supervisor of Wells, Act 451 PA 1994, as amended. Non-submission and/or falsification of this information may result in fines and/or imprisonment.

OIL AND GAS OPERATIONS BOND	
Bond number	1084643
<input checked="" type="checkbox"/> Single	<input type="checkbox"/> Blanket
\$ 33,000.00	Davis 1-19
Well name and number	S. _____ Attach initial well list

Northeastern Exploration, Inc.

(name and address of Principal)

1190 M-32, Charlestown, MI

in the State of MI as Principal and

Lexon Insurance Company, 900 S. Frontage Rd. Suite 250, Woodridge, IL 60517

(name and address of Surety)

a corporation organized and existing under the laws of the State of \_\_\_\_\_ and duly authorized to transact business in the State of Michigan, as Surety, are held and firmly bound unto the State of Michigan in the penal sum of

Thirty Three Thousand\*\*\*

Dollars.

The Principal named is about to commence and prosecute to final completion well(s) and operations authorized by permits issued or to be issued under Part 615, Act 451 PA 1994, as amended.

"Final completion" means the time when locating, drilling, deepening, converting, operating, producing, reworking, plugging, and proper site restoration have been performed on a well in a manner approved by the supervisor, including the filing of the mandatory records, and when the conformance bond has been released.

When the Principal complies with the provisions of the applicable provisions of Part 615, Act 451 PA 1994, as amended, in the final completion of the well(s), the Surety's obligations can be terminated otherwise this obligation remains in full force and effect. The Surety's liability herein is co-extensive with that of the Principal and the State of Michigan has the same remedies against the Surety as against the Principal.

This bond is executed and accepted subject to the following condition: The liability of this bond is set forth in R 324.211, R 324.213, R 324.214, and R 324.215 of the rules promulgated under section 61505 of Part 615, Supervisor of Wells, Act 451 PA 1994, as amended (See reverse side of bond)

The Surety, by execution of the bond, accepts the liability covered by prior bond(s) \_\_\_\_\_

3SE62154400/ American Manufacturers Mutual Insurance Company

(number(s) and company)

and gives notice to the Supervisor of Wells of the need for terminating the prior bond(s) as listed herein with such termination to be effective as of the time that this bond becomes effective.

Signed, sealed and dated the 11th day of June 2013

Northeastern Exploration, Inc.

(Principal)

Lexon Insurance Company

(Surety)

By \_\_\_\_\_

(Signature)

By \_\_\_\_\_

(Signature)

Craig Sherman, Attorney-in-Fact

(Name and title)

(Name and title)

When the Principal or Surety executes this bond by an agent, power of attorney or other evidence of authority must accompany the bond.

DEQ USE ONLY		
Permit number	Issue date	
Type of well	Current true vertical depth	Purpose of bond

EQP 7200-3 (rev. 1/2005)

MAIL TO:  
OFFICE OF GEOLOGICAL SURVEY  
MICHIGAN DEPT OF ENVIRONMENTAL QUALITY  
PO BOX 30256  
LANSING, MI 48909-7756



POWER OF ATTORNEY

LX - 123031

Lexon Insurance Company

KNOW ALL MEN BY THESE PRESENTS, that LEXON INSURANCE COMPANY, a Texas Corporation, with its principal office in Louisville, Kentucky, does hereby constitute and appoint:

Ted Sherman, Craig Sherman, Judy Blaige, Karen Genoff \*\*\*\*\*

\*\*\*\*\*

its true and lawful Attorney(s)-In-Fact to make, execute, seal and deliver for, and on its behalf as surety, any and all bonds, undertakings or other writings obligatory in nature of a bond.

This authority is made under and by the authority of a resolution which was passed by the Board of Directors of LEXON INSURANCE COMPANY on the 1st day of July, 2003 as follows:

Resolved, that the President of the Company is hereby authorized to appoint and empower any representative of the Company or other person or persons as Attorney-In-Fact to execute on behalf of the Company any bonds, undertakings, policies, contracts of indemnity or other writings obligatory in nature of a bond not to exceed \$2,500,000.00, Two-million five hundred thousand dollars, which the Company might execute through its duly elected officers, and affix the seal of the Company thereto. Any said execution of such documents by an Attorney-In-Fact shall be as binding upon the Company as if they had been duly executed and acknowledged by the regularly elected officers of the Company. Any Attorney-In-Fact, so appointed, may be removed for good cause and the authority so granted may be revoked as specified in the Power of Attorney.

Resolved, that the signature of the President and the seal of the Company may be affixed by facsimile on any power of attorney granted, and the signature of the Assistant Secretary, and the seal of the Company may be affixed by facsimile to any certificate of any such power and any such power or certificate bearing such facsimile signature and seal shall be valid and binding on the Company. Any such power so executed and sealed and certificate so executed and sealed shall, with respect to any bond of undertaking to which it is attached, continue to be valid and binding on the Company.

IN WITNESS THEREOF, LEXON INSURANCE COMPANY has caused this instrument to be signed by its President, and its Corporate Seal to be affixed this 21st day of September, 2009.



LEXON INSURANCE COMPANY

BY *David E. Campbell*

David E. Campbell  
President

ACKNOWLEDGEMENT

On this 21st day of September, 2009, before me, personally came David E. Campbell to me known, who being duly sworn, did depose and say that he is the President of LEXON INSURANCE COMPANY, the corporation described in and which executed the above instrument: that he executed said instrument on behalf of the corporation by authority of his office under the By-laws of said corporation.

"OFFICIAL SEAL"  
MAUREEN K. AYE  
Notary Public, State of Illinois  
My Commission Expires 09/21/13

*Maureen K. Aye*

Maureen K. Aye  
Notary Public

CERTIFICATE

I, the undersigned, Assistant Secretary of LEXON INSURANCE COMPANY, A Texas Insurance Company, DO HEREBY CERTIFY that the original Power of Attorney of which the foregoing is a true and correct copy, is in full force and effect and has not been revoked and the resolutions as set forth are now in force.

Signed and Sealed at Woodridge, Illinois this 11th Day of June, 2013



*Philip G. Lauer*

Philip G. Lauer  
Assistant Secretary

"WARNING: Any person who knowingly and with intent to defraud any insurance company or other person, files an application for insurance or statement of claim containing any materially false information, or conceals for the purpose of misleading, information concerning any fact material thereto, commits a fraudulent insurance act, which is a crime and subjects such person to criminal and civil penalties."

**ATTACHMENT D**  
**CONTINGENT CORRECTIVE ACTION**

## 2.C CORRECTIVE ACTION PLAN AND WELL DATA

Submit a tabulation of data reasonably available from public records or otherwise known to the applicant on all well within the area of review, including those on the map required in Attachment B, which penetrate the proposed injection zone. Such data shall include the following:

### **Class I**

A description of each well's type, construction, date drilled, location, depth, record of plugging and/or completion, and any additional information the Director may require. In the case of new injection well, include the corrective action proposed to be taken by the applicant under 40 CFR 144.55.

## **RESPONSE**

### **Corrective Action**

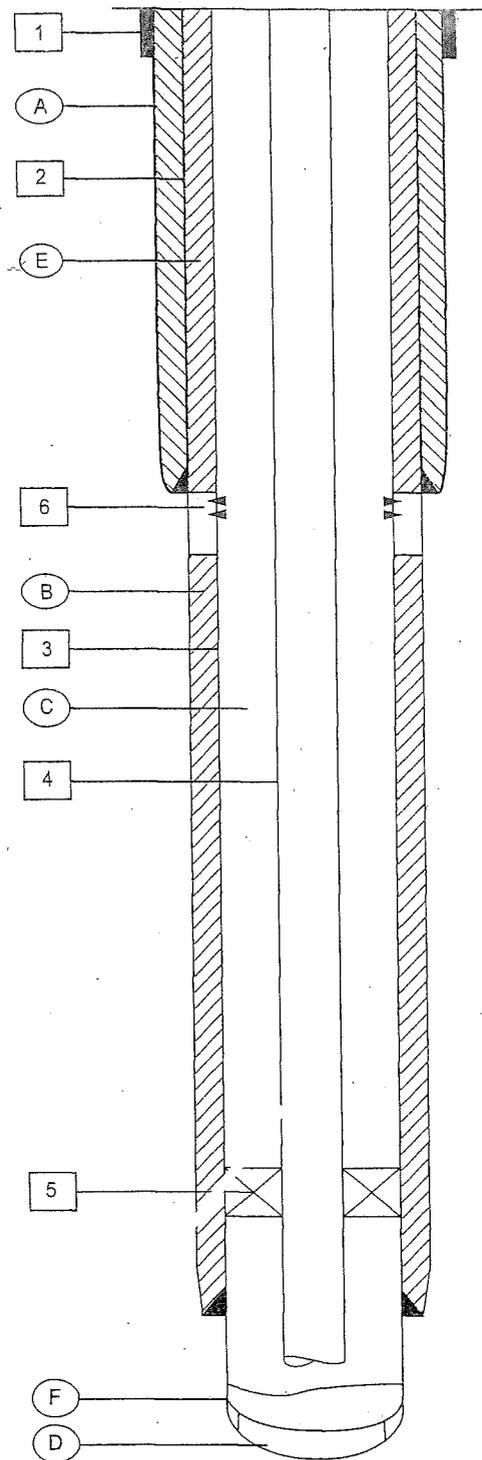
A corrective action plan is not required for any of the artificial penetrations within the Davis No. 1-19 well AOR. This is because, based on calculations, there is no cone-of-influence, and there are no artificial penetrations to the injection zone within the area of review that could potentially allow injection activities to impact the USDW. If a corrective action plan for any neighboring well becomes necessary in the future, it will be developed according to appropriate regulatory standards and guidelines.

The corrective action plan that would be proposed by Northeastern, should the potential for fluid migration that could endanger the USDW develop via any future well, will include the following:

1. Northeastern Exploration, Inc. injection well will be shut-in.
2. The USEPA, Region 5 UIC Section and the MDEQ will be notified.
3. Following well shut-in, waste will be shipped to alternative permitted facilities for off-site treatment and/or disposal as necessary.
4. A contingency plan will be prepared as follows:
  - a. Locate well and identify present operator or owner, if any.
  - b. Identify mode of failure.
  - c. Prepare remedial plan outlining course of action.
  - d. The remedial plan will be submitted to the USEPA, Region 5 and MDEQ for approval.
  - e. Upon authorization, the remediation plan will be implemented.

**ATTACHMENT E**  
**CONSTRUCTION DETAILS**

- CEMENT, VOLUMES, FLUIDS and HOLE SIZE
- TUBULARS and COMPONENTS
- (A) 14 3/4" Hole, Cemented to Surface w/800 sacks
- (B) 10 5/8" Hole, Cemented to 1080' w/ 450 sacks
- (C) Annulus Fluid: Fresh water with National CI-PAC Inhibitor
- (D) Original Completion: Open Hole, Top of 8 5/8" stub @ 3004'
- (E) 8 5/8" x 11 3/4" Casing Annulus Cemented from 946' to surface
- (F) Wellbore fill @ 2,718' (2006 Workover)
- 1 Surface Casing: 16". Set @ 82', Driven below drift
- 2 Intermediate Casing: 11 3/4", 42 lb/ft, N-40, Set @ 942'
- 3 Long String Casing: 8 5/8", 24 lb/ft, J-55, Set @ 2375'
- 4 Injection Tubing: 4 1/2", 10.5 lb/ft, J-55, Internally lined, Seal-tite Tail Pipe at 2,376'
- 5 Packer: 8 5/8" x 4 1/2" Liner Hanger, Internally lined, Seal-tite Compression Set @ 2337'
- 6 Perforations, Squeezed @ 914-916'



3004' TD on 8 5/8" Casing Stub

NOTE: Based on 9/92 workover reports,  
5/97 workover results  
11/05 workover results and  
7/06 workover results.

**Northeastern Exploration, Inc.**  
Johannesburg, Michigan

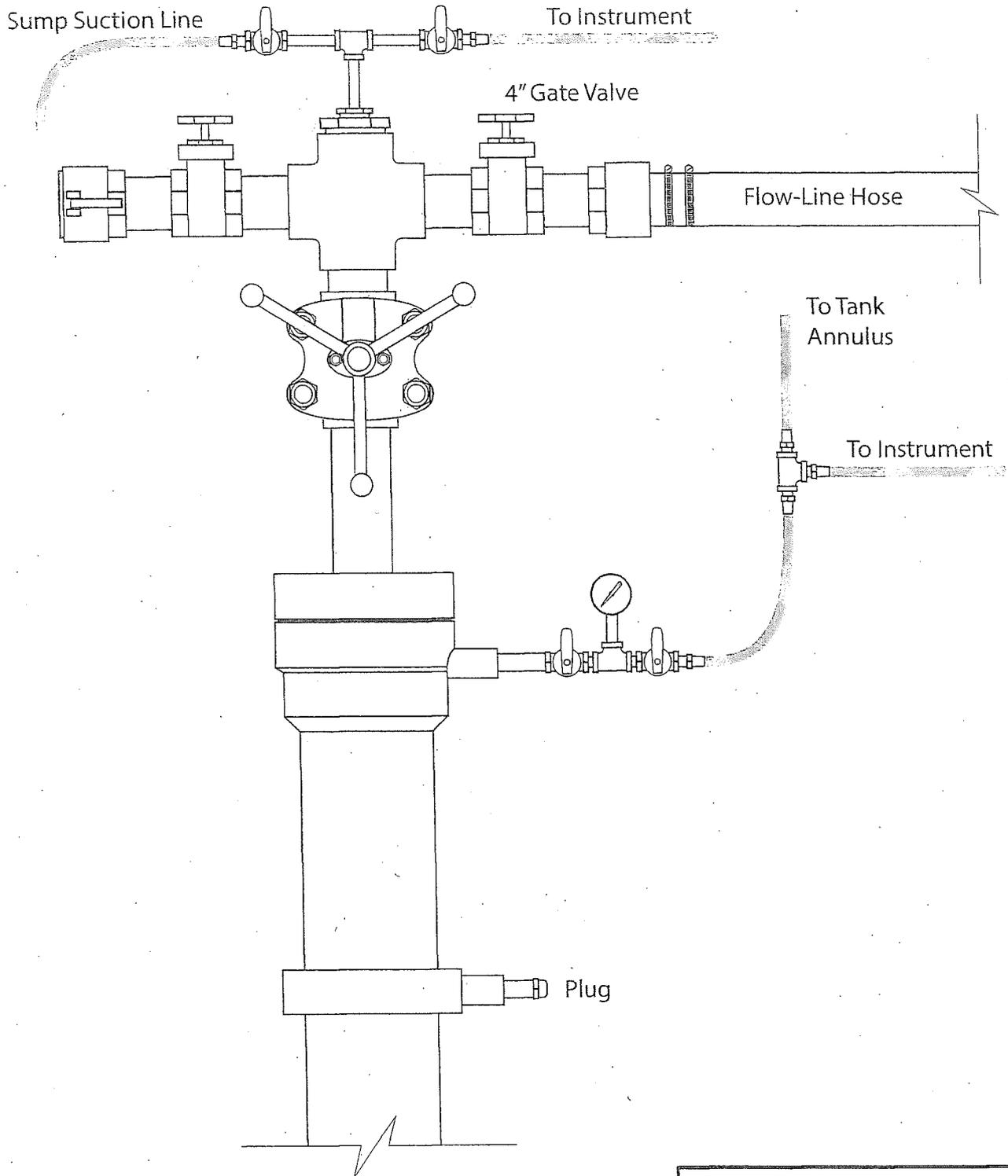
Figure M-1  
Well Schematic Davis No. 1-19

2015 Northeastern Permit Renewal

Scale: NTS	Date: June 2015	
NE_PR_Fig_M_01.ai	By: JLM	Checked: KC

**Petrotek**

5935 South Zang Street, Suite 200  
Littleton, Colorado 80127 USA  
303-290-9414  
www.petrotek.com



Northeastern Exploration, Inc.  
Johannesburg, Michigan

Figure M-2  
Wellhead Schematic Davis Well No. 1-19  
2015 Northeastern Permit Renewal

Scale: NTS

Date: June 2015

NE\_PR\_Fig\_M\_02.ai

By: JLM

Checked: CW

**Petrotek**

5925 South Zang Street, Suite 200  
Littleton, Colorado 80127 USA  
303.290.9414  
www.petrotek.com

**ATTACHMENT F**  
**SOURCE AND ANALYSIS OF WASTE**

# WASTE ANALYSIS PLAN

## UIC Permit Application Renewal

Northeastern Exploration, Inc.  
Class I Non-Hazardous Deepwell  
USEPA Permit # MI-119-1I-C002  
MDEQ Permit # M-439

June 12, 2015

Johannesburg, Michigan Facility  
Davis No. 1-19  
T30N, R1E Section 19  
Montmorency County

Prepared By:

***Petrotek***

Petrotek Engineering Corporation  
5935 South Zang Street, Suite 200  
Littleton, Colorado 80127  
Phone: (303) 290-9414  
Fax: (303) 290-9580

## TABLE OF CONTENTS

1.0 Introduction .....	1-1
1.A Background.....	1-1
1.B Sources.....	1-1
1.C Summary .....	1-4
1.D Waste Compatibility.....	1-4
2.0 Procedures .....	2-1
2.A Volume Monitoring .....	2-1
2.B Waste Characterization .....	2-1
2.C Generator Certification and Continuing Operations.....	2-14
2.D Sampling and Analysis .....	2-17
3.0 Quality Assurance/Quality Control .....	3-1
3.A General Sampling and Analytical Information.....	3-1
3.B Sampling Controls .....	3-2
3.C Analytical Controls.....	3-3
3.D Actions.....	3-4

## 1.0 INTRODUCTION

### 1.A Background

The purpose of this Waste Analysis Plan (WAP) is to describe the characterization of waste water that is injected into the Northeastern Exploration, Inc. (Northeastern) Davis No. 1-19 well at the Johannesburg, Michigan facility. Northeastern is responsible for ensuring this WAP is implemented. The well is currently permitted to operate as a non-hazardous commercial Class I industrial disposal well (USEPA #MI-119-1I-C002, MDEQ #M-439), and is also authorized to accept Class II fluids. This Waste Analysis Plan will be implemented for ongoing characterization of approved offsite waste streams and when future minor permit modification requests are approved to add additional offsite waste streams. "Off-site wastes" are to be considered waste fluids that are brought to the facility in transports and disposed of by Northeastern in return for compensation.

The Northeastern well is permitted to inject waste waters from off-site generators, as well as other fluids that may be necessary for Davis No. 1-19 well testing, stimulation, workover, onsite facility storm water management, or injection as buffer fluids. Commercial off-site non-hazardous waste streams (Class I waste) and wastes from the upstream oil and gas industry (Class II waste) as defined by the Subtitle C exploration and production exemption from RCRA may be added to the permit by minor permit modification request.

Northeastern will operate the well under this Waste Analysis Plan in accordance with Title 40 of the Code of Federal Regulations (40 CFR), Section 146.13 which requires operators of Class I wells to monitor and analyze the fluids injected into the well "to yield representative data of their characteristics." This Waste Analysis Plan also fulfills the specifications of 40 CFR 146.68 by presenting the parameters for which the waste will be analyzed, methods that will be used to test for these parameters, and methods that will be used to obtain representative samples of the wastes that are analyzed.

### 1.B Sources

Waste water currently injected into Davis No. 1-19 under this Waste Analysis Plan includes, but is not limited to, the following offsite sources: storm-water run-off from a variety of facilities and industrial sites that may be first stored in lagoons or containment areas; run-off or contaminated waters from construction sites; wash water from truck and car washes; non-hazardous pit water from oilfield wash pits; reclaimed water associated with the removal of underground storage tanks; non-hazardous leachate from landfills; certain liquids generated as by-products of industrial processes; water from groundwater purging or remediation operations; wash water from county and/or state road salt, transportation yard and equipment maintenance facilities; water from oilfield wash, drilling or production pits, well completion fluid and used treatment and stimulation fluids; cooling tower blow-down; gas plant dehydration waters and pipeline pigging waste water; and brine

Northeastern Exploration, Inc.  
UIC Waste Analysis Plan  
June 2015

produced from crude oil, natural gas production and gas storage wells.

Listings of currently approved Class I and Class II waste sources follow.

**Table WAP-1 Approved Class I Waste Sources**

ID Number	Name and Location
#1-CL1	City Environmental Services of Waters Landfill, Frederic, MI
#2-CL1	Power Wash, Gaylord, MI
#3-CL1	Montmorency/Oscoda County Landfill, Atlanta, MI
#4-CL1	Elk Run Landfill, Onaway, MI
#5-CL1	Cedar Ridge RDF, East Jordan, MI
#6-CL1	Upper Peninsula Rubber Company, Escanaba, MI
#7-CL1	USEPA/Earth Tech Antrim Ironworks Mancelona Tar Lake Superfund Site, Mancelona, MI
#8-CL1	Northern A-1 Services, Kalkaska, MI
#9-CL1	Pollard Carwash, Lake City, MI
#10-CL1	Johnson Oil, Lake City, MI
#11-CL1	Hayes Lemmerz International – Cadillac, Inc., Cadillac, MI
#12-CL1	Lamina, Inc., Bellaire, MI
#13-CL1	Antrim County Road Commission, Mancelona, MI
#14-CL1	Forward Corporation, Standish, MI
#15-CL1	Martin Marietta Magnesia Specialties, Manistee, MI
#16-CL1	MCA Target Oil Tools, Kalkaska, MI
#17-CL1	Marathon Ashland Petroleum, L.L.C., Bay City, MI
#18-CL1	Dura Automotive Systems, Inc., Mancelona, MI
#19-CL1	Antrim County Road Commission, Kewadin, MI
#20-CL1	Antrim County Road Commission, Central Lake, MI
#21-CL1	Georgia Pacific Corporation, Milan, MI
#22-CL1	Waste Management, Inc., Glen's Landfill, Maple City, MI
#23-CL1	Roscommon County Nine Mile Hill Landfill, Roscommon, MI
#24-CL1	Sparks Pickle Company, Ithaca, MI
#25-CL1	Crompton Uniroyal Chemical, Ltd., Elmira, Ontario, Canada
#26-CL1	General Chemical, Manistee, MI
#27-CL1	Team Packer Services, Kalkaska, MI
#28-CL1	Waste Management, Inc., Frederic, MI
#29-CL1	General Chemical, Manistee, MI
#30-CL1	Michigan Ethanol, Caro, MI
#31-CL1	MDEQ/ Hoskins Class I Plugging Project, Mio, MI
#32-CL1	Great Lakes Chemical, Filer, MI
#33-CL1	Top Rank Disposal, Inc. (WMI), Transfer Station, Charlevoix, Michigan
#34-CL1	CMS Energy Company Bay Harbor Plant
#35-CL1	Kaiser Pickle Farm aka Mathews Pickles Company, Carson City Plant
#36-CL1	Kaiser Pickle Farm aka Mathews Pickles Company, Pinconning, Michigan Plant
#37-CL1	Cherry Blossom, LLC of Williamsburg, Michigan
#38-CL1	Swanson Pickle Company, Inc. Ravenna, Michigan
#39-CL1	Morton Salt Company, Manistee, Michigan
#40-CL1	Otsego County Road Commission, Gaylord, Michigan
#41-CL1	Odawa Casino Resort, Petoskey, Michigan

Northeastern Exploration, Inc.  
 UIC Waste Analysis Plan  
 June 2015

**Table WAP-2 Approved Class II Produced Brine Sources**

ID Number	Formation	Michigan County
#1-CL2	Antrim	Montmorency
#2-CL2	Antrim	Otesgo
#3-CL2	Niagaran	Presque Isle
#4-CL2	Niagaran	Alpena
#5-CL2	Niagaran	Otesgo
#6-CL2	Niagaran	Montmorency
#7-CL2	Antrim	Alpena
#8-CL2	Antrim	Alcona
#9-CL2	Antrim	Crawford
#10-CL2	Antrim	Antrim
#11-CL2	Prairie du Chien	Oscoda
#12-CL2	Niagaran	Kalkaska
#13-CL2	Niagaran	Grand Traverse
#14-CL2	Niagaran	Benzie
#15-CL2	Richfield	Missaukee
#16-CL2	Prairie du Chien	Arenac
#17-CL2	Niagaran	St. Clair
#18-CL2	Lucas/Richfield	Oscoda
#19-CL2	Richfield	Oscoda
#20-CL2	Niagaran	Cheyboygan
#21-CL2	Collingwood	Kalkaska
#22-CL2	Dundee	Gladwin
#23-CL2	Collingwood	Crawford

Northeastern will require any off-site waste generator to certify the non-hazardous nature of each Class I waste stream proposed for shipment to the disposal well site and will submit a minor modification request to USEPA summarizing information regarding each new proposed waste source approval. This generator certification will be obtained as documentation that there are no hazardous wastes as defined at 40 CFR § 261.30-33 present in each proposed "source" and will be based on appropriate knowledge of the waste that may consist of any or all of the following three categories: (1) knowledge of the waste generation process, (2) detailed record-keeping, or (3) waste analysis data. USEPA will review pre-approval waste characterization data and approve waste sources on a case-by-case basis, assigning specific analytical suites, parameters, and frequencies for subsequent periodic sampling and testing based upon data and requests submitted by Northeastern. Northeastern may request specific analytical suites or frequencies as appropriate for each waste source (see Section 2.B.1, below) for USEPA approval. Unless otherwise specified, quarterly analysis is and will be prescribed for each Class I source, including a standard waste fingerprint in addition to more comprehensive analysis as may be appropriate for each individual source approval based on waste process knowledge. EPA will issue an approval letter for each waste source that adds the waste to the approved source list as a minor modification to the applicable Part of the permit. Upon

inclusion by minor modification into the effective permit, new sources with associated testing requirements will be considered approved.

### **1.C Monitoring Program Summary**

Portions of the Northeastern waste characterization and monitoring program related to the acceptance and injection of off-site fluids include:

- Volume Monitoring
- Generator Certification
- Sampling and Analysis
- Quality Assurance/Quality Control

Relevant components of this program are addressed in Sections 2 and 3 of this document.

Volume monitoring is not addressed in this Waste Analysis Plan (WAP) but is addressed in the body of the permit renewal application. The accepted WAP that forms a part of the administrative record for the permit presents the detailed summary of requirements necessary for compliance with waste analysis obligations under the Davis No. 1-19 UIC permit. The WAP may be reviewed and, if necessary, revised. Revisions to the WAP, upon acceptance by USEPA, will become part of the administrative record and constitute a major modification of the permit.

### **1.D Waste Compatibility**

Compatibility information will be collected when deemed necessary by Northeastern based on waste specific process or characterization data. Compatibility problems affecting safe operation of the well and containment of wastes has not been identified during more than 18 years of Class I operation. No waste confinement related compatibility problems between the waste and the injection or confining zone lithologies, or with the well construction materials, have happened and none are anticipated during continued operations.

The history of non-hazardous injection at Northeastern and at other facilities in the state of Michigan has clearly demonstrated that a wide variety of aqueous industrial and oilfield wastes are suitable for injection into the Dundee. However, minor issues that could develop include the potential for corrosion due to low pH or high pH, solids deposition or scale development. If such wastes are encountered on a regular basis, periodic metal thickness monitoring via coupons or non-invasive electrical or magnetic monitoring may be implemented. Tubing, packer and valve construction will typically include coatings or linings that serve to minimize equipment degradation. The most recent tubing and packer have been successfully used for almost a decade without developing any integrity issues. All

Northeastern Exploration, Inc.  
UIC Waste Analysis Plan  
June 2015

surface equipment is able to be inspected regularly to evaluate condition. Replaceable equipment is used to manage wear-and-tear on the system so replacements can be completed when needed. Well performance issues affected by well flow rate capacity and maintenance may be addressed by settling and filtration of the waste prior to injection, as determined necessary by Northeastern or by the use of intermittent wellbore stimulations. No waste treatment is anticipated. Northeastern is not likely to accept waste with greater than 5% suspended solids or wastes that cannot pass a 500 micron filter test, due to possibility of fouling the surface facilities and injection formation, thus increasing operating cost by causing more well maintenance.

## 2.0 PROCEDURES

### **2.A Waste Unloading, Transfer, and Volume Monitoring**

Offloading of waste source fluids into the Davis No. 1-19 facilities from offsite sources will only be conducted with a trained operator physically present on site, and offloading will be documented in an offsite waste related log sheet that will be maintained on the site. At a minimum, offsite waste log sheet entries are to include operator identification, date, time, generator identification, approximate volume, and applicable waste source identification number from the UIC permit. For most Class I fluid transports, each tank truck will have a single manifest. For Unified Source Manifests (multiple trucks from the same source) or Class II waste, the same data typically included on a manifest will be included on load tickets or equivalent paperwork documenting waste included in each waste delivery. The offsite waste log sheet(s), load tickets, and/or manifests will be considered part of the site monitoring records regarding the injection well.

Class I and Class II fluids will be brought to the facility in various size tank truck transports. At this time, no facilities for handling drums or barrels of waste are anticipated, only bulk deliveries are to be accepted. Class I and Class II wastes will initially be off-loaded into separate tanks, but one set of flow lines and injection apparatus and a single suction tank will be used to inject both types of waste into the single injection well at the facility.

As discussed in the main text of the permit renewal request, a data recorder has been and will continue to be used to continuously monitor injection pressure, annulus pressure, flow rate and totalized cumulative volumes. A summary of recorded data will be provided to the EPA and/or MDEQ per applicable permit requirements. Daily volume accepted from off-site sources will be recorded and the total monthly volume of off-site waste accepted will be calculated based on the data maintained in the site records; total monthly volume will be provided in monthly well reports submitted to EPA.

### **2.B Waste Characterization**

#### **2.B.1 Class I Wastes**

##### Currently Approved Class I Wastes

All currently approved Class I wastes will be monitored quarterly, annually, and/or one-time as specified in Table WAP-3 of this document. Currently approved Class I wastes will be analyzed for the following "fingerprint" parameters:

- pH,
- Flashpoint or Ignitability (if applicable based on process knowledge),
- Total Suspended Solids (TSS),

- Total Dissolved Solids (TDS),
- Specific Gravity, and
- Any other analyses deemed appropriate in the waste approval request for characterizing the injected waste.

Northeastern has reviewed historical approval requests and sampling results and has requested minor modification of analytical requirements. For example, with specific gravity, total dissolved solids and total suspended solids included in all Class I analyte lists, it is proposed that conductivity be removed from historical analysis lists for Class I waste fingerprinting since it adds no additional characterization value. Conversion of conductivity to resistivity and estimation of total dissolved solids, salinity, or specific gravity (density) from resistivity can be valuable, but since these parameters are analyzed directly it is proposed that conductivity (and related temperature readings) be eliminated as a sampling and analysis requirement unless specifically proposed for an individual Class I source. Some new testing parameters have been added to certain sources, with some tests deleted for other sources.

In addition to basic fingerprint analyses, Class I waste sources will be required to perform additional one-time (for one-time, non-recurring projects that last for less than one calendar quarter) or quarterly analysis for sources managed over a longer-term in the well, with analytical suites specified by the Northeastern waste approval request. Quarterly analyses will include analytes listed in this WAP or as listed in future approval requests based on constituents that contribute significantly to fluid composition and applicable parameters, if any, from the Toxicity Characteristic List (see 40 CFR Part 261.24) based on process knowledge, caveated by footnote to state that:

- <sup>1</sup> Non-hazardous waste fluid sampling parameters and frequencies shall be determined on a case specific basis, with some sources to be tested at a lesser frequency such as annually. In addition, single source may require different analytical parameters to be tested at different frequencies (i.e. a landfill leachate may require Toxic Characteristic list testing on an annual basis, whereas a limited subset of parameters including fingerprint analysis of the same source might be tested on a quarterly basis”.

The EPA approvals are general, and by inclusion of this footnote mean that the approved analytical suites for both fingerprinting and additional sampling/analysis are specified in Table WAP-3 included here or in future Northeastern approval requests. Northeastern has reviewed historical approval requests and sampling results and requests minor modification of analytical requirements as noted in the following table. Some include additional characterization, others eliminate some tests. To summarize and update analytical parameters and frequencies to be required in the future for each Class I waste stream, Table WAP-3 presents the analysis to be required for each currently approved (as of June 2015) waste stream unless altered by a future modified WAP or other permit modification:

**Table WAP-3 Approved Waste Streams and Associated Sampling Frequency and Analytical Requirements**

ID Number	Name and Location	QUARTERLY ANALYTICAL SUITE
#1-CL1	City Environmental Services of Waters Landfill, Frederic, MI	<b>Fingerprint:</b> pH, TDS, TSS, Specific Gravity  <b>Additional Analysis<sup>1</sup></b> Arsenic, Barium, Chromium, 2-Butanone (aka MEK)
#2-CL1	Power Wash, Gaylord, MI	<b>Fingerprint:</b> pH, TDS, TSS, Specific Gravity  <b>Additional Analysis<sup>1</sup></b> Chromium, Lead, Mercury, BTEX, Ignitability
#3-CL1	Montmorency/Oscoda County Landfill, Atlanta, MI	<b>Fingerprint:</b> pH, TDS, TSS, Specific Gravity  <b>Additional Analysis<sup>1</sup></b> Arsenic, Barium, Chromium, Benzene
#4-CL1	Elk Run Landfill, Onaway, MI	<b>Fingerprint:</b> pH, TDS, TSS, Specific Gravity  <b>Additional Analysis<sup>1</sup></b> Chloride, Arsenic, Barium, Chromium, Copper, Zinc
#5-CL1	Cedar Ridge RDF, East Jordan, MI	<b>Fingerprint:</b> pH, TDS, TSS, Specific Gravity  <b>Additional Analysis<sup>1</sup></b> TDS, Arsenic, Barium, Chromium
#6-CL1	Upper Peninsula Rubber Company, Escanaba, MI	<b>Fingerprint:</b> pH, TDS, TSS, Specific Gravity  <b>Additional Analysis<sup>1</sup></b> Barium, Cadmium, Chromium, Benzene, Methyl Ethyl Ketone (aka 2-Butanone), Cyanide and Sulfide Reactivity
#7-CL1	USEPA/Earth Tech Antrim Ironworks Mancelona Tar Lake Superfund Site, Mancelona, MI	<b>Fingerprint:</b> pH, TDS, TSS, Specific Gravity  <b>Additional Analysis<sup>1</sup></b> Barium, Cadmium, Selenium, Benzene, Toluene, Ethylbenzene, Xylene, Tetrachloroethylene, 1,2-Dichlorobenzene, Methylene Chloride, Ignitability

Northeastern Exploration, Inc.  
UIC Waste Analysis Plan  
June 2015

ID Number	Name and Location	QUARTERLY ANALYTICAL SUITE
#8-CL1	Northern A-1 Services, Kalkaska, MI	<p><b>Fingerprint:</b> pH, TDS, TSS, Specific Gravity</p> <p><b>Additional Analysis<sup>1</sup></b> Ignitability, Reactive Sulfide, Reactive Cyanide, Arsenic, Barium, Cadmium, Chromium (total), Copper, Lead, Mercury, Selenium, Silver, Zinc, Sulfate, Bicarbonate, Chloride, Calcium, Magnesium, Sodium</p>
#9-CL1	Pollard Carwash, Lake City, MI	<p><b>Fingerprint:</b> pH, TDS, TSS, Specific Gravity</p> <p><b>Additional Analysis<sup>1</sup></b> Ignitability, Iron, Calcium, Sodium, Arsenic, Barium, Cadmium, Chromium (total), Copper, Lead, Mercury, Selenium, Silver, Zinc, Chloride, Sulfate, Benzene</p>
#10-CL1	Johnson Oil, Lake City, MI	<p><b>Fingerprint:</b> pH, TDS, TSS, Specific Gravity</p> <p><b>Additional Analysis<sup>1</sup></b> Flashpoint, Reactive Cyanide, Reactive Sulfide, Arsenic, Barium, Cadmium, Chromium (total), Lead, Mercury, Selenium, Silver, Benzene, Carbon Tetrachloride, Methyl Ethyl Ketone</p>
#11-CL1	Hayes Lemmerz International – Cadillac, Inc., Cadillac, MI	<p><b>Fingerprint:</b> pH, TDS, TSS, Specific Gravity</p> <p><b>Additional Analysis<sup>1</sup></b> Ignitability, Reactive Cyanide, Reactive Sulfide, Arsenic, Barium, Cadmium, Chromium, Copper, Mercury, Lead, Selenium, Silver, Zn, Total Organic Halogens, Benzene, Carbon Tetrachloride, MEK (aka 2-Butanone)</p>
#12-CL1	Lamina, Inc., Bellaire, MI	<p><b>Fingerprint:</b> pH, TDS, TSS, Specific Gravity</p> <p><b>Additional Analysis<sup>1</sup></b> Flashpoint, Reactive Cyanide, Reactive Sulfide Lead, Benzene, Arsenic, Barium, Cadmium, Chromium (total), Copper, Mercury, Selenium, Silver, Zinc</p>
#13-CL1	Antrim County Road Commission, Mancelona, MI	<p><b>Fingerprint:</b> pH, TDS, TSS, Specific Gravity</p> <p><b>Additional Analysis<sup>1</sup></b> Benzene, Carbon Tetrachloride, Methyl Ethyl Ketone, Pentachlorophenol, Arsenic, Barium, Cadmium, Chromium, Copper, Lead, Mercury, Selenium, Silver, Zinc, Calcium, Sodium, Bicarbonate, Chloride, Sulfate</p>

ID Number	Name and Location	QUARTERLY ANALYTICAL SUITE
#14-CL1	Forward Corporation, Standish, MI	<b>Fingerprint:</b> pH, TDS, TSS, Specific Gravity  <b>Additional Analysis<sup>1</sup></b> Flashpoint, Benzene, Toluene, Ethylbenzene, Xylene, Isopropyl benzene, Trimethyl Benzene, Napthalene
#15-CL1	Martin Marietta Magnesia Specialties, Manistee, MI	<b>Fingerprint:</b> pH, TDS, TSS, Specific Gravity  <b>Additional Analysis<sup>1</sup></b> Flashpoint/Ignitability, Total Alkalinity, Ammonia Nitrogen, Calcium, Magnesium, Sodium, Potassium, Bromide, Chloride, Sulfur, Lithium, Boron, Iron
#16-CL1	MCA Target Oil Tools, Kalkaska, MI	<b>Fingerprint:</b> pH, TDS, TSS, Specific Gravity  <b>Additional Analysis<sup>1</sup></b> Ignitability, Benzene, Toluene, Tetrachloroethane, Arsenic, Cadmium, Chromium, Copper, Lead, Zinc
#17-CL1	Marathon Ashland Petroleum, L.L.C., Bay City, MI	<b>Fingerprint:</b> pH, TDS, TSS, Specific Gravity  <b>Additional Analysis<sup>1</sup></b> Ignitability/Flashpoint, Benzene, Toluene, Ethylbenzene, Xylene, Barium, Cadmium, Copper, Lead, Mercury, Selenium, Zinc
#18-CL1	Dura Automotive Systems, Inc., Mancelona, MI	<b>Fingerprint:</b> pH, TDS, TSS, Specific Gravity  <b>Additional Analysis<sup>1</sup></b> Ignitability/Flashpoint, Acetone, Benzene, Ethylbenzene, Toluene, Xylene, Arsenic, Barium, Cadmium, Chromium, Copper, Lead, Mercury, Selenium, Silver, Zinc
#19-CL1	Antrim County Road Commission, Kewadin, MI	<b>Fingerprint:</b> pH, TDS, TSS, Specific Gravity  <b>Additional Analysis<sup>1</sup></b> Benzene, Chloride, Arsenic, Barium, Cadmium, Chromium, Copper, Lead, Mercury, Selenium, Silver, Zinc, Calcium, Sodium, Bicarbonate, Chloride, Sulfate
#20-CL1	Antrim County Road Commission, Central Lake, MI	<b>Fingerprint:</b> pH, TDS, TSS, Specific Gravity  <b>Additional Analysis<sup>1</sup></b> Benzene, Chloride, Arsenic, Barium, Cadmium, Chromium, Copper, Lead, Mercury, Selenium, Silver, Zinc, Calcium, Potassium, Sodium, Bicarbonate, Chloride, Sulfate

Northeastern Exploration, Inc.  
UIC Waste Analysis Plan  
June 2015

ID Number	Name and Location	QUARTERLY ANALYTICAL SUITE
#21-CL1	Georgia Pacific Corporation, Milan, MI	<p><b>One time event. If additional waste accepted:</b></p> <p><b>Fingerprint:</b> pH, TDS, TSS, Specific Gravity</p> <p><b>Additional Analysis<sup>1</sup></b> Benzene, Barium</p>
#22-CL1	Waste Management, Inc., Glen's Landfill, Maple City, MI	<p><b>Fingerprint:</b> pH, TDS, TSS, Specific Gravity</p> <p><b>Additional Analysis<sup>1</sup></b> Ignitability, Sodium, Chloride, Benzene, Toluene, Ethylbenzene, Xylene</p>
#23-CL1	Roscommon County Nine Mile Hill Landfill, Roscommon, MI	<p><b>Fingerprint:</b> pH, TDS, TSS, Specific Gravity</p> <p><b>Additional Analysis<sup>1</sup></b> Benzene, Toluene, Ethylbenzene, Xylene, Arsenic, Chloride</p>
#24-CL1	Sparks Pickle Company, Ithaca, MI	<p><b>Fingerprint:</b> pH, TDS, TSS, Specific Gravity</p> <p><b>Additional Analysis<sup>1</sup></b> Chloride, Calcium, Potassium, Sodium</p>
#25-CL1	Crompton Uniroyal Chemical, Ltd., Elmira, Ontario, Canada	<p><b>Fingerprint:</b> pH, TSS, Specific Gravity</p> <p><b>Additional Analysis<sup>1</sup></b> TDS, Chlorides, Total Cresol, Chromium, Barium, Calcium, Magnesium</p>
#26-CL1	General Chemical, Manistee, MI	<p><b>One time event. If additional waste accepted:</b></p> <p><b>Fingerprint:</b> pH, TDS, TSS, Specific Gravity</p> <p><b>Additional Analysis<sup>1</sup></b> Chloride, Arsenic, Barium, Cadmium, Chromium, Copper, Calcium, Iron, Lead, Magnesium, Mercury, Potassium, Selenium, Silver, Zinc, Reactive Cyanide, Benzene, Sulfate, Sulfide, Ethylbenzene, Toluene, Xylene</p>

Northeastern Exploration, Inc.  
UIC Waste Analysis Plan  
June 2015

ID Number	Name and Location	QUARTERLY ANALYTICAL SUITE
#27-CL 1	Team Packer Services, Kalkaska, MI	<p><b>One time event. If additional waste accepted:</b></p> <p><b>Fingerprint:</b> pH, TDS, TSS, Specific Gravity</p> <p><b>Additional Analysis<sup>1</sup></b> Sodium, Chloride, Alkalinity Carbonate, Alkalinity Bicarbonate, Sulfide, Sulfate, Magnesium, Calcium, Potassium, Arsenic, Barium, Cadmium, Chromium, Lead, Mercury, Selenium, Silver, Benzene, Toluene, Ethylbenzene, Xylenes, TOC</p>
#28-CL 1	Waste Management, Inc., Frederic, MI	<p><b>Fingerprint:</b> pH, TDS, TSS, Specific Gravity</p> <p><b>Additional Analysis<sup>1</sup></b> Ignitability, Organic Carbon Total, Bicarbonate, Chloride, Sulfate, Sulfide, Mercury, Reactive Cyanide, Reactive Sulfide, Arsenic, Barium, Cadmium, Chromium, Copper, Iron, Lead, Manganese, Zinc, Potassium, Sodium, Benzene, Ethyl Benzene, Toluene, Xylenes</p>
#29-CL1	General Chemical, Manistee, MI	<p><b>One time event. If additional waste accepted:</b></p> <p><b>Fingerprint:</b> pH, TDS, TSS, Specific Gravity</p> <p><b>Additional Analysis<sup>1</sup></b> Flashpoint, Alkalinity Bicarbonate, Alkalinity Carbonate, Sulfate, TOC, Sulfide, Chloride, Benzene, Toluene, Ethylbenzene, Xylene (total), Arsenic, Chromium, Lead, Mercury, Reactive Cyanide</p>
#30-CL1	Michigan Ethanol, Caro, MI	<p><b>Fingerprint:</b> pH, TDS, TSS, Specific Gravity</p> <p><b>Additional Analysis<sup>1</sup></b> Flashpoint, Alkalinity Bicarbonate, Alkalinity Carbonate, TOC, Sulfate, Sulfide, Chloride, Benzene, Toluene, Ethylbenzene, Xylene (total), Arsenic, Chromium, Lead, Mercury, Reactive Cyanide, Sodium</p>
#31-CL1	MDEQ/ Hoskins Class I Plugging Project, Mio, MI	<p><b>One time event. If additional waste accepted:</b></p> <p><b>Fingerprint:</b> pH, TDS, TSS, Specific Gravity</p> <p><b>Additional Analysis<sup>1</sup></b> Chloride, Benzene, Toluene, Ethylbenzene, Xylene (total), Arsenic, Chromium, Lead, Mercury</p>

ID Number	Name and Location	QUARTERLY ANALYTICAL SUITE
#32-CL1	Great Lakes Chemical, Filer, MI	<p><b>One time event. If additional waste accepted:</b></p> <p><b>Fingerprint:</b> pH, TDS, TSS, Specific Gravity</p> <p><b>Additional Analysis<sup>1</sup></b> Chloride, Sulfate, Alkalinity Bicarbonate, Alkalinity Carbonate, Sulfide, Total Phenols, Flashpoint, Reactive Cyanide and Sulfate</p>
#33-CL1	Top Rank Disposal, Inc. (WMI), Transfer Station, Charlevoix, Michigan	<p><b>Fingerprint:</b> pH, TDS, TSS, Specific Gravity</p> <p><b>Additional Analysis<sup>1</sup></b> Arsenic, Chromium, Lead, Mercury</p>
#34-CL1	CMS Energy Company Bay Harbor Plant	<p><b>Fingerprint:</b> pH, TDS, TSS, Specific Gravity</p> <p><b>Additional Analysis<sup>1</sup></b> Flashpoint, Chloride, Sulfide, Sulfate, Alkalinity Carbonate, Alkalinity Bicarbonate, Calcium, Potassium, Sodium, TOC, COD, Aluminum, Arsenic, Barium, Chromium, Iron, Lead, Mercury, Selenium, Calcium, Magnesium, Sodium</p>
#35-CL1	Kaiser Pickle Farm aka Mathews Pickles Company, Carson City Plant	<p><b>Fingerprint:</b> pH, TDS, TSS, Specific Gravity</p> <p><b>Additional Analysis<sup>1</sup></b> Chloride, Sulfate, Alkalinity Bicarbonate, Calcium, Potassium, Sodium, BOD</p>
#36-CL1	Kaiser Pickle Farm aka Mathews Pickles Company, Pinconning, Michigan Plant	<p><b>Fingerprint:</b> pH, TDS, TSS, Specific Gravity</p> <p><b>Additional Analysis<sup>1</sup></b> Chloride, Sulfate, Alkalinity Bicarbonate, Calcium, Potassium, Sodium, BOD</p>
#37-CL1	Cherry Blossom, LLC of Williamsburg, Michigan	<p><b>Fingerprint:</b> pH, TDS, TSS, Specific Gravity</p> <p><b>Additional Analysis<sup>1</sup></b> Chloride, Sulfate, Alkalinity Carbonate, Barium, Calcium, Potassium, Sodium, BOD</p>
#38-CL1	Swanson Pickle Company, Inc. Ravenna, Michigan	<p><b>Fingerprint:</b> pH, TDS, TSS, Specific Gravity</p> <p><b>Additional Analysis<sup>1</sup></b> Chloride, Sulfate, Alkalinity Bicarbonate, Calcium, Copper, Iron, Potassium, Sodium, Zinc</p>

ID Number	Name and Location	QUARTERLY ANALYTICAL SUITE
#39-CL1	Morton Salt Company, Manistee, Michigan	<b>Fingerprint:</b> pH, TDS, TSS, Specific Gravity  <b>Additional Analysis<sup>1</sup></b> Flashpoint, Chloride, Bromide, Fluoride, Sulfate, Alkalinity Carbonate, Calcium, Potassium, Sodium, Silica (As SiO <sub>2</sub> ), Arsenic, Barium, Boron, Iron, Lithium, Mercury, Magnesium, Strontium
#40-CL1	Otsego County Road Commission, Gaylord, Michigan	<b>Fingerprint:</b> pH, TDS, TSS, Specific Gravity  <b>Additional Analyses<sup>1</sup></b> Benzene, Toluene, Ethyl Benzene, Xylenes, Alkalinity Bicarbonate, Chloride, Sulfide, Sulfate, Calcium, Chromium, Potassium, Lead, Sodium, Chloride
#41-CL1	Odawa Casino Resort, Petoskey, Michigan	<b>Fingerprint:</b> pH, TDS, TSS, Specific Gravity  <b>Additional Analyses<sup>1</sup></b> Alkalinity Bicarbonate, Chloride, Sulfate, Silica, Barium, Calcium, Magnesium, Manganese, Potassium, Sodium

### New Class I Waste Approvals

The following information will be provided as part of a written request to USEPA for all proposed new Class I waste sources:

- 1) "Source" Identification number
- 2) Generator Name
- 3) Generator Address (Street, City, State, Zip Code)
- 4) Generator Contact Name and telephone number
- 5) USEPA Identification numbers (if applicable)

Each new Class I waste stream be analyzed initially for the following:

- Total Dissolved Solids
- Total Suspended Solids
- pH
- Specific Gravity
- Conductivity
- Chloride
- Sulfate
- Bicarbonate
- Calcium

- Potassium
- Sodium
- Corrosivity, if applicable based on process knowledge
- Reactivity, if applicable based on process knowledge
- Ignitability, if applicable based on process knowledge
- Toxicity, as applicable based on process knowledge
- Any appropriate analytical results necessary to identify waste constituents which may indicate a listed hazardous waste as defined at 40 CFR §§ 261.31, 261.32, or 261.33

All new Class I waste sources will be tested to demonstrate the absence of applicable hazardous characteristics as part of the approval process. Under 40 CFR Part 261, Subpart C there are four hazardous characteristics for which waste may be tested: (D001) corrosivity, (D002) ignitability, (D003) reactivity, and (4) toxicity. Testing for these characteristics will be performed on a case-by-case basis, and justification for the exclusion will be included in the waste source approval request. If generator waste knowledge is used as a basis to test for fewer than the complete list of potential hazardous characteristics, an explanatory statement consistent with 40 CFR §262.11 will be provided as part of the approval request for the new source to justify not testing for certain parameters.

The waste source approval request may include an abbreviated TCLP listing, and will justify any exclusions. That is, when applicable, testing will follow the Toxicity Characteristic Leaching Procedure (TCLP) and will include appropriate toxicity parameters defined at 40 CFR 261.24 that based on process knowledge have the potential for causing a specific waste source to be classified as hazardous. Such testing data will be accompanied by an explanatory statement that justifies the testing suite selected pursuant to 40 CFR 262.11 in lieu of analytical results for any such parameters not tested. Further, analysis will include any parameters identified by the generator and Northeastern, based on process knowledge, that may cause the source to include a suspected listed waste. Northeastern will identify these parameters and the related process knowledge, and include analyses for potential listed waste parameters in the waste approval request. Subsequent testing and certifications would not be required to repeat this test parameter justification after approval was granted except in situations where new information becomes available regarding changes to the approved waste source. Ignitability or flashpoint may be accepted interchangeably if applicable. Totals (adjusted) toxicity analysis rather than TCLP may be accepted, as appropriate.

As previously indicated, Northeastern requires any off-site waste generator to certify the non-hazardous nature of each Class I waste stream being shipped to the Northeastern disposal well site, including identification of the physical source of the waste stream and any other information deemed necessary to meet permit provisions and demonstrate the non-hazardous nature of the waste. These data will be submitted to the agencies (US EPA

and MDEQ as applicable) as a part of a request for agency addition of the waste as an approved fluid source suitable for injection under this permit. The attached forms at the end of Section 2.C, or a suitable equivalent containing similar information, will be completed for new Class 1 sources, noting that the form may be updated or revised as deemed appropriate by the permittee. A letter, on generator company letterhead, that indicates the non-hazardous nature of the waste will be maintained by Northeastern in a file pertaining to each new source approval.

As appropriate, a new waste stream approval request may add or remove specific fingerprint cations/anions or other parameters on a case-by-case basis. For example, BTEX and/or total organic carbon (TOC) may be added to the characterization list in limited cases justified by the nature of the process that generates the waste. The approval request will include the proposed fingerprint analytical suite as well as sampling and analysis frequency, likely on a quarterly basis, depending on the waste source for which approval is sought.

Each initial source approval request will provide a proposed a list of analytical parameters and testing frequency (e.g. quarterly, bi-annual or annual). The proposed list for periodic composition monitoring will include fingerprint analysis, as well as other parameters deemed important to verify continued compliance and characterization of the waste stream. USEPA approval of future waste streams will include approval of the waste source-specific testing protocol, monitoring frequency (monthly, quarterly, etc) and parameter listing for the specified sampling frequency (i.e. fingerprint, TCLP and subsets thereof, additional parameters as necessary).

A sample form is provided on the following pages showing an example Class I non-hazardous generator waste manifest form (or suitable equivalent subject to permittee discretion) that will be required for each incoming load. An alternate form supplied by the generator or required by the state in which the waste originated may also be substituted.

## 2.B.2 Class II Wastes

### Currently Approved Class II Wastes

Currently approved oilfield wastes shall be monitored annually at a minimum for the following parameters:

- Sodium
- Calcium
- Barium
- Total Iron
- Chloride
- Sulfate

- Carbonate
- Bicarbonate
- Sulfide
- Total Dissolved Solids
- pH
- Resistivity (ohm-meters @ reported temperature) and
- Specific Gravity

Currently approved Class II produced brine wastes are to be sampled annually by source at either the generator site or from the transport tank prior to offloading at the Northeastern facility. Additionally, Class II waste will be sampled annually by taking a single grab sample from the combined Class II source waste tank. Individual source related samples are only to be collected and analyzed if waste from an approved source is accepted during a calendar year; samples are not required from approved sources that are not accepted for disposal during a calendar year.

Loads of Class II brine brought to the well will require identification of the following:

- Geologic formation (of source well completion)
- Field (where applicable)
- County
- Well or central production facility name
- Location (T-R-S)
- Operator name

No updates of any future operator name or status changes for the source sampled for each Class II produced brine approval will be required under the permit. Brine from drilling, completion or workover activities will require no pre-approval and annual testing of the Class II reception ("in") tank shall provide data regarding composition. Note that oilfield brines are RCRA exempt and are to be represented by generators as qualified upstream E&P wastes, so no analysis is required to screen characteristic, TCLP or listed waste related compounds for the purpose of identifying hazardous waste. The applicable exemption will be specified in the waste source approval request. However, Northeastern may include other additional parameters required for currently approved waste streams, as well as any other constituents indicated by the generator as constituting a major portion of the waste stream.

### **New Class II Wastes**

Initial approval of RCRA exempt upstream E&P brine produced from wells will require identification of the following:

- 1) "Source" Identification number
- 2) County and Sampled Well Location (Township, Range, and Section)
- 3) Geologic Formation
- 4) Oilfield Name (if available)

Well or central production facility (CPF) identification with current operator, when available, will also be supplied. No updates of any future operator name or status changes for the source sampled for each Class II produced brine approval will be required under the permit. Brine from drilling, completion or workover activities will require no pre-approval and annual testing of the Class II reception ("in") tank shall provide data regarding composition. Note that oilfield brines are RCRA exempt and are to be represented by generators as qualified upstream E&P wastes, so no analysis is required to screen characteristic, TCLP or listed waste related compounds for the purpose of identifying hazardous waste. The applicable exemption will be specified in the waste source approval request. However, Northeastern may include other additional parameters required for currently approved waste streams, as well as any other constituents indicated by the generator as constituting a major portion of the waste stream.

The analytical parameters, sampled initially and annually, at a minimum will include:

- Sodium
- Calcium
- Barium
- Total Iron
- Chloride
- Sulfate
- Carbonate
- Bicarbonate
- Sulfide
- Total Dissolved Solids
- pH
- Resistivity (ohm-meters @ reported temperature) and
- Specific Gravity

## 2.C Generator Certification and Continuing Operations

As discussed above, Class I wastes will initially be tested for applicable general parameters and, as appropriate, for hazardous characteristics. For short-term or single Class I waste loads, this testing along with generator certification will be used to characterize the injectate. No continual or periodic testing will be required for short term or single-load Class I wastes, but EPA approval of the generator source will be obtained. No renewed or updated generator certification will be required unless the physical process generating the waste has changed

In the case of ongoing periodic injection of waste streams from an individual approved source, monitoring will be performed per the waste-stream specific approval requirements. If a source is not managed at the Northeastern well during a test sample calendar period, no sample or analysis will be required for that approved waste stream. For the purpose of this Waste Analysis Plan, the first quarter shall be considered the first three calendar months of the year, and the remaining quarters shall be considered subsequent divisions of the year into three month segments.

**Northeastern Exploration, Inc.**  
1190 Highway M-32  
Johannesburg, Michigan 49751  
Class I Non-Hazardous Deepwell Davis No. 1 (MDEQ Permit M-439)  
Permit #MI-119-11-C002; T30N, R1E, Section 19

## Sample Generator Qualification Form

### WASTE

Date of Form Submittal:

NE Part III (G) Source ID #:

Source of Waste:

Description/Type of Waste:

Anticipated Disposal Volume (gallons):

One-time disposal volume or anticipated load frequency:

What methods or techniques have been used to classify the waste?

(If testing, attach results; If process knowledge, attach details)

General parameters (if applicable):

Sp. Gravity: \_\_\_\_\_ TDS: \_\_\_\_\_ TSS: \_\_\_\_\_ pH: \_\_\_\_\_ Flashpoint: \_\_\_\_\_

Additional analytical parameters and frequency of periodic testing of the source:

### GENERATOR

Company Identification Number (if any):

US EPA and/or State Identification Numbers (if any):

Generator Name:

Generator Contact Name and Title:

Generator Contact Telephone:

Generator Mailing Address:

Physical Waste Location Generator Address:

Summary of waste generation, collection and storage process:

Analytical parameters and frequency of evaluation for hazardous characteristics:

Note: Suitable equivalent form may be substituted without notice at the discretion of Northeastern.

**Northeastern Exploration, Inc.**  
1190 Highway M-32  
Johannesburg, Michigan 49751  
Class I Non-Hazardous Deepwell Davis No. 1 (MDEQ Permit M-439)  
Permit #MI-119-1I-C002; T30N, R1E, Section 19

### Sample Non-Hazardous Class I Waste Manifest

#### WASTE

NE Part III (G) Source ID #:  
Source of Waste:  
Type of Waste:  
Proper Shipping Name of Waste (if any):  
Volume (gallons): \_\_\_\_\_

Date / Time Picked up at Generator Location: \_\_\_\_\_ / \_\_\_\_\_  
Date / Time Arrived at Disposal Facility: \_\_\_\_\_ / \_\_\_\_\_

#### GENERATOR

Company Identification Number (if any):  
US EPA and/or State Identification Numbers (if any):  
Generator Name:  
Generator Contact Name and Title:  
Generator Shipping Address:  
Authorized Generator Signature: \_\_\_\_\_ Date: \_\_\_\_\_  
Name and Title (type or print): \_\_\_\_\_

#### TRANSPORTER

US EPA State and/or DOT Identification Numbers (if any):  
Transporter Name:  
Transporter Address:  
Vehicle and Driver Identification:  
Transporter Driver Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Note: Suitable equivalent form may be substituted without notice at the discretion of Northeastern.

## 2.D Sampling and Analysis Methods

Northeastern, the generator, or contracted analytical laboratory personnel will collect necessary waste stream samples. All sampling procedures will be conducted at the direction of the selected, certified analytical laboratory and in accordance with acceptable US EPA procedures. The following will be specified for each sampling event:

- Sample collector, title, date, and employer
- Sample collection method and preservation technique
- Sample collection point

The above will be documented on chain-of-custody paperwork. Samples will be collected with the grab method.

Initial characterization samples will be collected at the point of generation for new sources, and results of testing submitted as part of the approval process. Subsequent to approval, samples of offsite wastes may be collected at the point of generation, or at the Northeastern facility from transport tanks prior to unloading wastes into the storage or injection facilities.

The table included below summarizes the analytical method for typical parameters that may be included in the initial waste sampling for a particular waste source. The Table is NOT exhaustive, as additional parameters may be specified in EPA's approval. Any additional parameters will be analyzed using methods specified in SW-846 or another source if mandated by EPA's approval. Subsequent monthly or quarterly sampling will likely be a subset of these methods and the analytical parameters will be or have been specified in the waste-specific EPA approval.

Analytical methods for each parameter, detection/quantification limit, analytical method accuracy and upper and lower analytical method quantification limits will be specified along with all analytical results.

Northeastern Exploration, Inc.  
UIC Waste Analysis Plan  
June 2015

### EXAMPLE ANALYTICAL METHODS

Test Parameter	Test Method	Units
Total Dissolved Solids, TDS	EPA 160.1, 160.3, A2540	mg/L
Total Suspended Solids, TSS	EPA 160.2, A2540	mg/L
Specific Gravity	Hydrometer, ASTM 2710 F, D5057	-
pH	EPA 150.1	pH units
Total Organic Carbon, TOC	415.1, 415.2	mg/L
Specific Conductance	120.1, SW9050	-
Sodium	EPA 6010B, 6020A, 3005A	mg/L
Calcium	EPA 6010B, 6020A, 3005A	mg/L
Magnesium	EPA 6010B, 6020A, 3005A	mg/L
Bicarbonate	EPA 310.1, A2320	mg/L
Sulfate	EPA 300.0, SW9056	mg/L
Chloride	EPA 325.3, A4500	mg/L
Ammonia (NH <sub>3</sub> ), as N	EPA 350.2	mg/L
BTEX	EPA 5030/8020	ug/l
Iron (Fe)	EPA 200.7	mg/L
Mercury (Hg)	EPA 7470	mg/L
Arsenic (As)	EPA 6010B, 6020A, 3005A	mg/L
Barium (Ba)	EPA 6010B, 6020A, 3005A	mg/L
Cadmium (Cd)	EPA 6010B, 6020A, 3005A	mg/L
Chromium (Cr)	EPA 6010B, 6020A, 3005A	mg/L
Lead (Pb)	EPA 6010B, 6020A, 3005A	mg/L
Selenium (Se)	EPA 6010B, 6020A, 3005A	mg/L
Silver (Ag)	EPA 6010B, 6020A, 3005A	mg/L
Ignitability (D001), Flashpoint	SW-846, 1010; SW1010A	-
Corrosivity (D002), pH	SW-846, 1110, 9045, A4500H	pH units
Reactivity (D003) Cyanide and/or Sulfide	SW-846 7.3.3.2/7.3.4.1/7.3.4.2	-
Applicable TCLP metals, semi-volatile organics, volatile organics, herbicides, pesticides	Per 40 CFR 261 Appendix III	mg/L or ug/L

Notes: Northeastern reserves the right to select use of the cited method or method with equal or greater detection limit

### **3.0 QUALITY ASSURANCE/QUALITY CONTROL**

---

#### **3.A General Sampling and Analytical Information**

Sampling protocols outlined in this document are to be followed. Northeastern will adhere to guidelines set forth in the referenced standards listed in Section 2.C or equivalents, as appropriate. The sampling protocol will be followed by properly trained personnel conducting the sample collection and analysis. Northeastern will adhere to guidelines set forth in "Test Methods for Evaluating Solid Waste", SW-846 and "Methods for Chemical Analysis of Water and Wastes", EPA 600/4-79/020 as appropriate. Approved sample preservation techniques from 40 CFR 136.3 will be followed as appropriate. These will include preservation in plastic or glass sample containers provided by the laboratory and storage in a sample refrigerator or cooler for shipment to the laboratory. Northeastern may use different laboratories in Michigan to provide analysis services for waste characterization. Northeastern reserves the option to choose alternate laboratories for testing provided equivalent QA/QC standards are met.

Each sample taken will be accompanied by a Northeastern or contract laboratory Chain of Custody (COC) form that provides a record of sample handling starting with sample acquisition, documenting the process up to laboratory analysis. Chain-of-custody will be used to document the handling and control necessary to identify and trace a sample from collection through to final analytical results. Samples taken are to be logged in the field using the COC, sealed, and delivered to the laboratory with a COC form. The COC form shall provide the following items collected by the sampler:

#### **Labeling**

1. Northeastern Waste Source Sample ID # including code or name, date and time;
2. Name of sample collector; (include sampling company name if not Northeastern);
3. Sample collection method;
4. Sample collection point

Analytical reports and regulatory submittals regarding the nature and composition of injected fluids are to be maintained in the well files until authorization is obtained from US EPA, in writing, to discard the records. All laboratory reports submitted to US EPA will include, at a minimum, the following:

## Reporting

1. Test description or identification;
2. Sample preservation technique, as appropriate;
3. Analytical method for parameter detection/quantification;
4. Analytical method accuracy and quantification limits; and
5. Result and units.

The following are QA/QC parameters which will be followed to ensure the adequacy of the sampling and analytical techniques for wellhead sampling and analysis described in this plan.

### 3.B Sampling Controls

#### 1. Equipment Blanks

If possible, samples will be obtained directly from the sample tap or valve being used to access the tank or containment vessel and not be transferred to any secondary container or device before being stored in the sample container to be shipped to the laboratory. In this case, no equipment blanks will be required. If samples cannot be directly placed in the containers intended for preservation and shipment, equipment blanks will be taken as deemed appropriate by Northeastern for the purpose of detecting potential cross contamination due to improper decontamination of sampling equipment. After sampling, any secondary container or sampling device used will be decontaminated according to the sampling plan protocol. The sampling device will then be rinsed with deionized water and the rinsate collected in a sample container for transport to the laboratory for analysis of, at a minimum, the same parameters chosen in the sampling plan above.

#### 2. Trip Blanks

If the laboratory analysis is ever suspect because it contains anomalous parameters, trip blanks will be collected to assess in-transit contamination. The trip blank will consist of sample containers filled and sealed at the laboratory with Type II reagent grade water that accompany the sample containers used throughout the sampling event. The sample containers shall be handled in the same manner as the samples. The trip blank(s) will be sent to the laboratory for analysis of, at a minimum, the same parameters specified in the sampling plan above. A minimum of one (1) trip blank per sampling event will be utilized, when deemed necessary. At the discretion of Northeastern, trip blanks may be submitted with any sample to verify representativeness of the sampling program.

### 3. Sample Duplicates

On advance written request of US EPA, duplicate samples will be taken to further assess the QA/QC program of the laboratory conducting the analysis. Such samples will be drawn from the same site from which primary samples will be taken consecutively from the same sampling tap or sample location to ensure representativeness. The duplicate will be labeled with a sample number that will not conflict with the other samples, but will not be discernable to the laboratory as a duplicate sample. Upon the request of US EPA or at the discretion of Northeastern representatives, one duplicate sample per selected sampling event will be taken and analyzed for the same parameters as the sampling event. If requested by EPA or MDEQ, one duplicate sample per sampling event will be taken and analyzed for the same parameters listed in the sampling plan.

### 4. Sample Chain-of-Custody Protocol

Sample chain-of-custody will be followed at all times during the sampling and subsequent analysis. A COC will be used to document the handling and control necessary to identify and trace a sample from collection to final analytical results.

#### **3.C Analytical Controls**

##### 1. Equipment Calibration

Selected laboratories will maintain QA/QC data in accordance with that laboratory's Q/A plan regarding the frequency and type of instrument calibration performed at the laboratory and in the field. Any calibration of thermometers, gauges, chromatographs, spectrometers and other meters and analytical equipment will be conducted according to appropriate instrument manufacturer specifications and manufacturer recommended frequencies or as dictated by applicable laboratory Q/A plans.

##### 2. Data Reduction

The process of transcription of the raw data into the reportable units will be conducted by the laboratory in accordance with that laboratory's Q/A plan. Data reduction utilized in the analysis and reporting process will be presented in the reports to the US EPA for each sampling event and parameter tested by the specific laboratory used at the time.

##### 3. Data Verification

Data verification will be conducted in accordance with the selected laboratory's Q/A plan after each sampling event by assigned laboratory personnel. Typical procedures will include review of chain-of-custody forms, equipment calibration records and data

completeness. Spot checks of raw data versus reported data may be performed to review math accuracy, significant numbers and reporting units. In addition, certified laboratory standard quality assurance/quality control checklists will be utilized per the selected laboratory's Q/A plan for individual test methods such as blanks, standards, and comparisons of internal lab test duplicate results. Problems with any of these items will be indicated in the report to the agency.

#### 4. Internal Quality Control

Certified quality control samples may be run periodically in accordance with the selected laboratory's Q/A plan, with sample batches obtained from appropriate commercial sources, or appropriate regulatory entities. Internal quality control will be addressed as required by the selected laboratory Q/A plan and will typically include disclosure of the use of blanks, blind standards, matrix spikes and matrix spike duplicates, preparation of reagents, and laboratory duplicate or replicate analyses.

### 3.D Actions

#### 1. Corrective Actions

Corrective actions will be implemented by laboratories if the analytical or sampling method does not achieve laboratory standards or Northeastern objectives. Actions may entail re-sampling the waste stream and/or re-analyzing the fluid for a particular parameter, re-calibrating an analytical device, or other appropriate actions. Action levels will typically be taken in accordance with any applicable standards from USEPA "Methods for the Chemical Analysis of Water and Wastes", or SW 846, or "Standard Methods for the Examination of Water and Wastewater". Northeastern representatives may, at their discretion, require re-sampling and retesting to confirm results that fall outside the historical range of expected analytical results, or outside equipment calibration curves.

#### 2. Reports to US EPA, Region 5 and MDEQ

Reports to US EPA and MDEQ will contain results, data and sampling descriptions regarding the accuracy, completeness and repeatability of the reported analytical results. The report will contain a table that specifies the type of sample (blank, waste, etc.), sampling date, sampling location, analytical method, method detection limit and analytical result. The results of analyses and all accompanying data, including chain-of-custody forms, will be reported to US EPA with the next operating report submitted to the agency after the receipt of the final sample analysis report from the laboratory. This submittal to the agency will typically be within sixty (60) days of the sampling event, unless prior arrangements have been made with the agency due to conditions beyond the control of the operator that prohibit such reporting.

**ATTACHMENT G**  
**LIST OF PRESENTLY APPROVED SOURCES**

## ATTACHMENT G

## CLASS I

## List of Presently Approved Sources

There are presently 41 approved sources of Class I wastes and 24 sources of Class II wastes for disposal into the Davis 1-19 injection well, as identified below by identification number, name, location, as well as sampling frequency and analytical parameters. Future sources, as approved by the Director, will be added to this Part III (G) of the permit.

## CLASS I NON-HAZARDOUS WASTE FLUIDS

Source ID Number	Source Name	Location (Address)	Waste Analysis Parameters	Waste Sampling Frequency
1-CL1	City Environmental Services of Waters Landfill	11375 Sherman Rd. Frederic, MI 49733	Toxicity Characteristic List (see 40 CFR § 261.24)	Quarterly
1-CL1	City Environmental Services of Waters Landfill	11375 Sherman Rd. Frederic, MI 49733	Fingerprint <sup>3</sup>	Quarterly
2-CL1	Wiz Wash (formerly Power Wash)	2016 S. Otsego Gaylord, MI 49735	Toxicity Characteristic List (see 40 CFR § 261.24)	Quarterly
2-CL1	Wiz Wash (formerly Power Wash)	2016 S. Otsego Gaylord, MI 49735	Fingerprint <sup>1</sup>	Quarterly
3-CL1	Montmorency/Oscoda Joint Sanitary Landfill	6999 County Road 847 P.O. Box 415 Atlanta, MI 49709	Toxicity Characteristic List (see 40 CFR § 261.24)	Quarterly
3-CL1	Montmorency/Oscoda Joint Sanitary Landfill	6999 County Road 847 P.O. Box 415 Atlanta, MI 49709	Fingerprint <sup>1</sup>	Quarterly
4-CL1	Elk Run Landfill	20667 5 Mile Hwy. Onaway, MI 49765	Toxicity Characteristic List (see 40 CFR § 261.24)	Quarterly
4-CL1	Elk Run Landfill	20667 5 Mile Hwy. Onaway, MI 49765	Fingerprint <sup>1</sup>	Quarterly

<sup>1</sup> Class I minimum Fingerprinting analytical parameters are specified in Part III (A) of this permit.

Source ID Number	Source Name	Location (Address)	Waste Analysis Parameters	Waste Sampling Frequency
5-CL1	Cedar Ridge RDF	11633 Saunders Road East Jordan, MI 49727	Toxicity Characteristic List (see 40 CFR § 261.24)	Quarterly
5-CL1	Cedar Ridge RDF	11633 Saunders Road East Jordan, MI 49727	Fingerprint <sup>1</sup>	Quarterly
6-CL1	UP Rubber Company	2101 N 19th Street Escanaba, MI 49829	Toxicity Characteristic List (see 40 CFR § 261.24)	Quarterly
6-CL1	UP Rubber Company	2101 N 19th Street Escanaba, MI 49829	Fingerprint <sup>1</sup>	Quarterly
7-CL1	U.S. EPA/EarthTech Antrim Ironworks Mancelona Tar Lakes Superfund Site	1010 Elder Road Mancelona, MI 49659	Toxicity Characteristic List (see 40 CFR § 261.24)	Quarterly
7-CL1	U.S. EPA/EarthTech Antrim Ironworks Mancelona Tar Lakes Superfund Site	1010 Elder Road Mancelona, MI 49659	Fingerprint <sup>1</sup>	Quarterly
8-CL1	Northern A-1 Services, Inc.	2305 US Hwy 131 N Kalkaska, MI 49646	Toxicity Characteristic List (see 40 CFR § 261.24)	Quarterly
8-CL1	Northern A-1 Services, Inc.	2305 US Hwy 131 N Kalkaska, MI 49646	Fingerprint <sup>1</sup>	Quarterly
9-CL1	Pollard's Car Wash, Inc.	5779 M 68 Indian River, MI 49749	Toxicity Characteristic List (see 40 CFR § 261.24)	Quarterly
9-CL1	Pollard's Car Wash, Inc.	5779 M 68 Indian River, MI 49749	Fingerprint <sup>1</sup>	Quarterly
10-CL1	Johnson Oil Company	5507 W Houghton Lake Rd. Lake City, MI 49651	Toxicity Characteristic List (see 40 CFR § 261.24)	Quarterly
10-CL1	Johnson Oil Company	5507 W Houghton Lake Rd. Lake City, MI 49651	Fingerprint <sup>1</sup>	Quarterly

Source ID Number	Source Name	Location (Address)	Waste Analysis Parameters	Waste Sampling Frequency
11-CL1	Hayes Lemmerz/ CMI-Cast Parts, Inc.	30333 Southfield Rd. Southfield, MI 48076	Toxicity Characteristic List (see 40 CFR § 261.24)	Quarterly
11-CL1	Hayes Lemmerz/ CMI-Cast Parts, Inc.	30333 Southfield Rd. Southfield, MI 48076	Fingerprint <sup>1</sup>	Quarterly
12-CL1	Lamina, Inc.	3650 S. Derenzy Rd. Bellaire, MI 49615	Toxicity Characteristic List (see 40 CFR § 261.24)	Quarterly
12-CL1	Lamina, Inc.	3650 S. Derenzy Rd. Bellaire, MI 49615	Fingerprint <sup>1</sup>	Quarterly
13-CL1	Antrim County Road Commission	319 East Lincoln Street P.O. Box 308 Mancelona, MI 49659	Toxicity Characteristic List (see 40 CFR § 261.24)	Quarterly
13-CL1	Antrim County Road Commission	319 East Lincoln Street P.O. Box 308 Mancelona, MI 49659	Fingerprint <sup>1</sup>	Quarterly
14-CL1	Forward Corporation	2804 S. Otsego Ave. Gaylord, MI 49735	Toxicity Characteristic List (see 40 CFR § 261.24)	Quarterly
14-CL1	Forward Corporation	2804 S. Otsego Ave. Gaylord, MI 49735	Fingerprint <sup>1</sup>	Quarterly
15-CL1	Martin Marietta Magnesia Specialties	1800 Eastlake Road Manistee, Michigan	Toxicity Characteristic List (see 40 CFR § 261.24)	Quarterly
15-CL1	Martin Marietta Magnesia Specialties	1800 Eastlake Road Manistee, Michigan	Fingerprint <sup>1</sup>	Quarterly
16-CL1	MCA/Target Oil Tools	3540 US Hwy 131 N Kalkaska, MI 49646	Toxicity Characteristic List (see 40 CFR § 261.24)	Quarterly
16-CL1	MCA/Target Oil Tools	3540 US Hwy 131 N Kalkaska, MI 49646	Fingerprint <sup>1</sup>	Quarterly

Source ID Number	Source Name	Location (Address)	Waste Analysis Parameters	Waste Sampling Frequency
17-CL1	Marathon Ashland Petroleum, L.L.C.	13544 S. West Bay Shore Dr Traverse City, MI 49684	Toxicity Characteristic List (see 40 CFR § 261.24)	Quarterly
17-CL1	Marathon Ashland Petroleum, L.L.C.	13544 S. West Bay Shore Dr Traverse City, MI 49684	Fingerprint <sup>1</sup>	Quarterly
18-CL1	Dura Automotive Systems, Inc.	Mancelona, Michigan	Toxicity Characteristic List (see 40 CFR § 261.24)	Quarterly
18-CL1	Dura Automotive Systems, Inc.	Mancelona, Michigan	Fingerprint <sup>1</sup>	Quarterly
19-CL1	Antrim County Road Commission	Kewadin, Michigan	Toxicity Characteristic List (see 40 CFR § 261.24)	Quarterly
19-CL1	Antrim County Road Commission	Kewadin, Michigan	Fingerprint <sup>1</sup>	Quarterly
20-CL1	Antrim County Road Commission	Central Lake, Michigan	Toxicity Characteristic List (see 40 CFR § 261.24)	Quarterly
20-CL1	Antrim County Road Commission	Central Lake, Michigan	Fingerprint <sup>1</sup>	Quarterly
21-CL1	Georgia Pacific Corporation	951 County Street Milan, Michigan 48160	Toxicity Characteristic List (see 40 CFR § 261.24)	Quarterly
21-CL1	Georgia Pacific Corporation	951 County Street Milan, Michigan 48160	Fingerprint <sup>1</sup>	Quarterly
22-CL1	Glen's Landfill	518 East Traverse Hwy Maple City, MI 49664	Toxicity Characteristic List (see 40 CFR § 261.24)	Quarterly
22-CL1	Glen's Landfill	518 East Traverse Hwy Maple City, MI 49664	Fingerprint <sup>1</sup>	Quarterly
23-CL1	Roscommon County, Nine Mile Hill Landfill	Nine Mile Road Roscommon, MI 48653	Toxicity Characteristic List (see 40 CFR § 261.24)	Quarterly

Source ID Number	Source Name	Location (Address)	Waste Analysis Parameters	Waste Sampling Frequency
23-CL1	Roscommon County, Nine Mile Hill Landfill	Nine Mile Road Roscommon, MI 48653	Fingerprint <sup>1</sup>	Quarterly
24-CL1	Sparks Pickle Company	5661 West Filmore Ithaca, MI 48847	Toxicity Characteristic List (see 40 CFR § 261.24)	Quarterly
24-CL1	Sparks Pickle Company	5661 West Filmore Ithaca, MI 48847	Fingerprint <sup>1</sup>	Quarterly
25-CL1	Crompton/Uniroyal Chemical, Ltd.	25 Erb Street Elmira, Ontario, N383A3 Canada	Toxicity Characteristic List (see 40 CFR § 261.24)	Quarterly
25-CL1	Crompton/Uniroyal Chemical, Ltd.	25 Erb Street Elmira, Ontario, N383A3 Canada	Fingerprint <sup>1</sup>	Quarterly
26-CL1	General Chemical	1501 Main Street Manistee, Michigan 49660	Toxicity Characteristic List (see 40 CFR § 261.24)	One time
26-CL1	General Chemical	1501 Main Street Manistee, Michigan 49660	Fingerprint <sup>1</sup>	One time
27-CL1	Team Packer Service	202 S. Chestnut Kalkaska, Michigan 49646	Toxicity Characteristic List (see 40 CFR § 261.24)	One time
27-CL1	Team Packer Service	202 S. Chestnut Kalkaska, Michigan 49646	Fingerprint <sup>1</sup>	One time
28-CL1	Waste Management, Inc. (Waste Fleet Truck Wash)	11375 Sherman Road Frederic, Michigan 49733	Toxicity Characteristic List (see 40 CFR § 261.24)	One time
28-CL1	Waste Management, Inc. (Waste Fleet Truck Wash)	11375 Sherman Road Frederic, Michigan 49733	Fingerprint <sup>1</sup>	One time
29-CL1	General Chemical	1501 Main Street, Manistee, Michigan 49660	Toxicity Characteristic List (see 40 CFR § 261.24)	One time
29-CL1	General Chemical	1501 Main Street, Manistee, Michigan 49660	Fingerprint <sup>1</sup>	One time

Source ID Number	Source Name	Location (Address)	Waste Analysis Parameters	Waste Sampling Frequency
30-CL1	Michigan Ethanol, LLC	1551 Empire Drive Caro, Michigan 48723	Toxicity Characteristic List (see 40 CFR § 261.24)	One time
30-CL1	Michigan Ethanol, LLC	1551 Empire Drive Caro, Michigan 48723	Fingerprint <sup>1</sup>	One time
31-CL1	Formerly Hoskins Manufacturing ( <i>well P&amp;A by MDEQ</i> )	Hoskins Manufacturing 830 East Kittle Road, Mio, Michigan 48933	Toxicity Characteristic List (see 40 CFR § 261.24)	One time
31-CL1	Formerly Hoskins Manufacturing ( <i>well P&amp;A by MDEQ</i> )	Hoskins Manufacturing 830 East Kittle Road, Mio, Michigan 48933	Fingerprint <sup>1</sup>	One time
32-CL1	Great Lakes Chemical Corp. (GLCC)	Formerly Manistee Drop Forge property, Filer City, Michigan 48647	Toxicity Characteristic List (see 40 CFR § 261.24)	One time
32-CL1	Great Lakes Chemical Corp. (GLCC)	Formerly Manistee Drop Forge property, Filer City, Michigan 48647	Fingerprint <sup>1</sup>	One time
33-CL1	Top Rank Disposal, Inc.	15890 Bells Bay Road, Charlevoix, Michigan 49720	Toxicity Characteristic List (see 40 CFR § 261.24)	Quarterly
33-CL1	Top Rank Disposal, Inc.	15890 Bells Bay Road, Charlevoix, Michigan 49720	Fingerprint <sup>1</sup>	Quarterly
34-CL1	CMS Energy Company (Bay Harbor Wastewater Treatment Plant)	4588 US 31 Petoskey, Michigan 49770	Toxicity Characteristic List (see 40 CFR § 261.24)	Quarterly
34-CL1	CMS Energy Company (Bay Harbor Wastewater Treatment Plant)	4588 US 31 Petoskey, Michigan 49770	Fingerprint <sup>1</sup>	Quarterly
35-CL1	Mathews Pickles Co. (Carson City Plant)	1474 W. Cody Estey Rd. Pinconning, MI 48650	Toxicity Characteristic List (see 40 CFR § 261.24)	Quarterly
35-CL1	Mathews Pickles Co. (Carson City Plant)	1474 W. Cody Estey Rd. Pinconning, MI 48650	Fingerprint <sup>1</sup>	Quarterly

Source ID Number	Source Name	Location (Address)	Waste Analysis Parameters	Waste Sampling Frequency
36-CL1	Mathews Pickles Co. (Pinconning Plant)	1474 W. Cody Estey Rd. Pinconning, MI 48650	Toxicity Characteristic List (see 40 CFR § 261.24)	Quarterly
36-CL1	Mathews Pickles Co. (Pinconning Plant)	1474 W. Cody Estey Rd. Pinconning, MI 48650	Fingerprint <sup>1</sup>	Quarterly
37-CL1	Cherry Blossom, LLC (Williamsburg Plant)	Cherry Blossom, LLC 8365 Park Road Williamsburg, MI 49690	Toxicity Characteristic List (see 40 CFR § 261.24)	Quarterly
37-CL1	Cherry Blossom, LLC (Williamsburg Plant)	Cherry Blossom, LLC 8365 Park Road Williamsburg, MI 49690	Fingerprint <sup>1</sup>	Quarterly
38-CL1	Swanson Pickle Co. (Ravenna Plant)	Swanson Pickle Co. 11561 Heights Road Ravenna, MI 49541	Toxicity Characteristic List (see 40 CFR § 261.24)	Quarterly
38-CL1	Swanson Pickle Co. (Ravenna Plant)	Swanson Pickle Co. 11561 Heights Road Ravenna, MI 49541	Fingerprint <sup>1</sup>	Quarterly
39-CL1	Morton Salt Company	180 Sixth Street Manistee, MI 49660	Toxicity Characteristic List (see 40 CFR § 261.24)	Quarterly
39-CL1	Morton Salt Company	180 Sixth Street Manistee, MI 49660	Fingerprint <sup>1</sup>	Quarterly
40-CL1	Otsego County Road Commission	P.O. Box 357 Gaylord, MI	Toxicity Characteristic List (see 40 CFR § 261.24)	Quarterly
40-CL1	Otsego County Road Commission	P.O. Box 357 Gaylord, MI	Fingerprint <sup>1</sup>	Quarterly
41-CL1	Odawa Casino Resort	1760 Lears Road Petoskey, MI 49770	Toxicity Characteristic List (see 40 CFR § 261.24)	Quarterly
41-CL1	Odawa Casino Resort	1760 Lears Road Petoskey, MI 49770	Fingerprint <sup>1</sup>	Quarterly

**ATTACHMENT G****CLASS II****List of Presently Approved Sources**

Presently approved sources of Class II waste for disposal into the Davis 1-19 injection well are identified below by identification number, name, location, as well as sampling frequency and analytical parameters. Future "sources", as approved by the Director, will be added to this Part III (G) of the permit.

**CLASS II NON-HAZARDOUS WASTE FLUIDS**

Class II (oilfield brine) wastes shall be analyzed for the parameters specified in Part III (A) of this permit

<b>Source ID Number</b>	<b>Source Name</b>	<b>County and Sampled Well Location (Township-Range-Section)</b>	<b>Geologic Formation</b>	<b>Waste Sampling Frequency</b>
1-CL2	Montmorency County Antrim	Montmorency County, Michigan	Antrim	Annual
2-CL2	Otsego County Antrim	Otsego County, Michigan	Antrim	Annual
3-CL2	Presque Isle Co. Niagaran	Presque Isle County, Michigan	Niagaran	Annual
4-CL2	Alpena County Niagaran	Alpena County, Michigan	Niagaran	Annual
5-CL2	Otesgo County Niagaran	Otesgo County, Michigan T29N Through T33N, R4W Through R1W, All Section	Niagaran	Annual
6-CL2	Montmorency County Niagaran	Montmorency County, Michigan T29N through T33N,R1E Through R5E, All Sections	Niagaran	Annual
7-CL2	Alpena County Antrim	Alpena County, Michigan T29N through 33N, R5E Through R9E, All Sections	Antrim	Annual
8-CL2	Alcona County Antrim	Alcona County, Michigan T25N through T29N, R5E Through 9E, All Sections	Antrim	Annual
9-CL2	Crawford County Antrim	Crawford County, Michigan T25N Through T29N,R4W Through R1W, All Sections	Antrim	Annual
10-CL2	Antrim County	Antrim County, Michigan T29N Through T32N, R9W Through R5W, All Sections	Antrim	Annual

Source ID Number	Source Name	County and Sampled Well Location (Township-Range-Section)	Geologic Formation	Waste Sampling Frequency
11-CL2	Oscoda County Prairie du Chien	Oscoda County, Michigan T25N Through T29N, R1E Through R4E, All Sections	Prairie du Chien	Annual
12-CL2	Kalkaska County Niagaran	Kalkaska County, Michigan T25N Through T29N, R8W Through R5W, All Sections	Niagaran	Annual
13-CL2	Grand Traverse County Niagaran	Grand Traverse County, Michigan T25N Through 29N, R12W Through R9W, All Sections	Niagaran	Annual
14-CL2	Benzie County Niagaran	Benzie County, Michigan T25N, R13W, Section 31	Niagaran	Annual
15-CL2	Missaukee County Richfield	Missaukee County, Michigan T23N, R5W, Section 11	Richfield	Annual
16-CL2	Arenac County Prarie du Chien (Howard Energy Co., Inc.)	Arenac County, Michigan T20N, R6E, Section 23, NW 1/4, SW 1/4, SE 1/4	Prarie du Chien	Annual
17-CL2	St. Clair County Niagaran	St. Clair County, Michigan, T15N, R15E, Section 5 SE1/4,NE1/4,NE1/4	Niagaran	Annual
18-CL2	Oscoda County Richfield	Oscoda County, Michigan, T25N, R2E, Section 23 SW1/4,NE1/4,SW1/4	Richfield	Annual
19-CL2	Oscoda County Church Lake Field	Oscoda County, Michigan, T25N, R2E, Section 16 NE1/4,SW1/4,NE1/4	Richfield	Annual
20-CL2	Cheboygan County Niagaran	Cheboygan County, Michigan T33N, R1E, Section 28 NW1/4, NW1/4, SE1/4	Niagaran	Annual
21-CL2	Kalkaska County Collingwood	Kalkaska County, Michigan T25N, R6W, Section 36 SW 1/4, NE 1/4, SE 1/4 Leased to: Encana Oil & Gas USA, Inc. Well: State Garfield 1-25 HD1	Collingwood	Annual

Source ID Number	Source Name	County and Sampled Well Location (Township-Range-Section)	Geologic Formation	Waste Sampling Frequency
22-CL2	Gladwin County Dundee	Gladwin County, Michigan T18N, R1W, CN¼, SE¼, SE¼ Leased to: Aaron Elek III Well: Schranz W1-3	Dundee	Annual
23-CL2	Crawford County Collingwood	Kalkaska County, Michigan T25N, R4W, Section 11 NE 1/4, NW 1/4, SE 1/4 Leased to: Encana Oil & Gas USA, Inc. Well: State Beaver Creek 1-23 HD1	Collingwood	Annual
24-CL2	Crawford County Niagaran	Crawford County, Michigan T28N, R3W, Section 6, SE 1/4, SE 1/4, NE 1/4 Leased to: Northern A-1 Services Well: State Maple Forest 2-6	Niagaran	Annual