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



# UNDERGROUND INJECTION CONTROL MINOR PERMIT MODIFICATION: CLASS III

**Permit Number: MI-101-3G-A001**

**Project Name: Preuss Road Brine Field**

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 (CFR), Morton Salt, Inc. of Manistee, Michigan is authorized to operate nine injection wells located in Michigan, Manistee County, in a permit area limited to that described in Part III(D) of this permit. Injection shall be limited to the Salina Group between 2800 and 4800 feet, upon the express condition that the permittee meet the restrictions set forth herein. The names and locations of wells authorized under this permit and a map of the permit area are provided in Part III(D) of this permit. Additional injection wells may be constructed and operated within the permit area provided that the permittee notifies the Director prior to construction and all permit requirements are met. Injection shall not commence into any newly drilled or converted well until the operator has received authorization in accordance with Part I(E)(11) of this permit.

All references to 40 code of Federal Regulations are to all regulations that are in effect on the date that this permit is effective.

This permit is a minor modification of an existing area permit which was signed on October 24, 1990. This permit shall become effective on NOV 5 and shall remain in full force and effect during the operating life of the field, unless this permit is otherwise revoked, terminated, modified or reissued pursuant to 40 CFR 144.39, 144.40 and 144.41. This permit shall also remain in effect upon delegation of primary enforcement responsibility to the State of Michigan, unless the state chooses to adopt this permit as a state permit. This permit will be reviewed at least every five (5) years from the effective date specified above.

Signed and Dated: Nov. 5, 2010

Ken 2. Hey
For

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. The underground injection activity, otherwise authorized by this permit or rule, shall not allow the movement of fluid containing any contaminant into underground sources of drinking water, if the presence of that contaminant may cause a violation of any Primary Drinking Water Regulation found in 40 CFR Part 142 or may otherwise adversely affect the health of persons. Any underground injection activity not specifically authorized in this permit or otherwise authorized by permit or rule is prohibited. 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. Compliance with the terms of this permit does not constitute a defense to any action brought under Section 1431 of the Safe Drinking Water Act (SDWA), or any other law governing protection of public health or the environment.

### B. PERMIT ACTIONS

This permit may be modified, revoked and reissued, or terminated for cause as specified in 40 CFR 144.39, 144.40, and 144.41. The filing of a request for a permit modification, revocation and reissuance, 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.

### 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 CFR Part 2 and Section 144.5, any information submitted to the USEPA 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, USEPA 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 CFR 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 conditions of this permit, except to the extent and for the duration such noncompliance is authorized by an emergency permit pursuant to 40 CFR 144.34. Any permit noncompliance constitutes a violation of the SDWA and is grounds for enforcement action, permit termination, revocation and reissuance or modification.

2. Penalties for Violations of Permit Conditions - Any person who operates these wells in violation of permit conditions is subject to civil penalties, fines, and other enforcement action under the SDWA and may be subject to such actions under the Resource Conservation and Recovery Act. Any person who willfully violates a permit condition 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 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 CFR 144.37.

(c) Effect. Permits continued under 5 U.S.C. 558 (c) and 40 CFR 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:

(i) Initiate enforcement action based upon the permit which has been continued;

(ii) Issue a notice of intent to deny the new permit. If the permit is denied, 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;

(iii) Issue a new permit under 40 CFR Part 124 with appropriate conditions; or

(iv) Take other actions authorized by Underground Injection Control regulations.

(e) State Continuation - A USEPA 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 USEPA 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 the USEPA permit upon obtaining primary enforcement responsibility, the permittee must obtain a new State permit or be authorized to inject by State rule or he will be injecting without authorization.

4. Need to Halt or Reduce Activity not a Defense - It shall not be a defense for a permittee in an enforcement action to state 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 reasonable steps 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 the permit.

7. Duty to Provide Information - The permittee shall furnish to the Director, within thirty (30) days, 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 by this permit to be retained.

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 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 must be retained under the conditions of this permit;

   (c) Inspect at reasonable times any facilities, equipment (including monitoring 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 strip chart recordings for continuous monitoring instrumentation, and copies of all records required by this permit, for a period of at least three (3) years from the date of the sample, measurement or report. The permittee shall also maintain records of all data required to complete this permit application and any supplemental information submitted under 40 CFR 144.27, 144.28 and 144.31. These periods may be extended by request of the Director at any time by written notice to the permittee.

   (b) 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 the last operating injection well covered under this permit. Such plugging and abandonment shall be conducted in accordance with the plugging and abandonment plan, contained in Part III(B) of this permit. The owner or operator shall

continue to retain the records after the three (3) year retention period unless he delivers the records to the Regional Administrator or obtains written approval from the Regional Administrator to discard the records.

(c) Records of monitoring information shall include:

(i) The date, exact place, and the time of sampling or measurements;

(ii) The individual(s) who performed the sampling or measurements;

(iii) A precise description of both sampling methodology and the handling of samples;

(iv) The date(s) analyses were performed;

(v) The individual(s) who performed the analyses;

(vi) The analytical techniques or methods used; and,

(vii) The results of such analyses.

10. Notification Requirements

(a) Planned Changes - The permittee shall notify and obtain the Director's approval at least thirty (30) days prior to any planned physical alterations or additions to the permitted facility, or changes in the injection fluids. Within ten (10) days prior to injection, an analysis of new injection fluids shall be submitted to the Director in accordance with Parts II(B)(2) and II(B)(3) of this permit.

(b) Anticipated Noncompliance - The permittee shall give at least thirty (30) days advance notice to the Director for his/her approval of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.

(c) Transfer of Permits - This permit is not transferrable to any person except after notice is sent to the Director at least thirty (30) days prior to transfer and the requirements of 40 CFR §144.38 have been met. The Director may require modification or revocation of the permit to change the name of the permittee and incorporate such other requirements as may be necessary under the SDWA.

(d) Compliance Schedules - Reports of compliance or non-compliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit shall be submitted to the Director no later than thirty (30) days following each schedule date.

(e) Twenty-Four (24) Hour Reporting

(i) The permittee shall report to the Director any noncompliance which may endanger health or the environment. This information shall be provided orally within twenty-four (24) hour from the time the permittee becomes aware of the circumstances, and shall include the following information:

(a) Any monitoring or other information which indicates that any contaminant may cause an endangerment to an underground source of drinking water; or,

(b) Any noncompliance with a permit condition or malfunction of the injection system which may cause fluid migration into or between underground sources of drinking water.

(ii) A written submission shall also be provided as soon as possible but no later than five (5) days from 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.

(f) Other Noncompliance - All other instances of noncompliance shall also be reported by the permittee in accordance with Part I(E)(10)(e)(i) and (ii) of this permit.

(g) Other Information - If or when the permittee becomes aware that the permittee failed to submit any relevant facts in the permit application, or submitted incorrect information in a permit application or in any report to the Director, the permittee shall promptly submit such facts or corrected information in accordance with 40 CFR 144.51 (1)(8).

(h) Report on Permit Review - Within thirty (30) days of receipt of the final issued permit, the permittee shall report to the Director that the permittee has read and is personally familiar with all terms and conditions of this permit.

11. Commencing Injection - The permittee shall not commence injection into any newly drilled or converted well until:

(a) Formation data and injection fluid analysis have been submitted in accordance with Part II(A)(5) and II(B)(2), respectively;

(b) A report on any logs and tests required under Part II(A)(4) of this permit has been submitted.

(c) Mechanical integrity of the well has been demonstrated in accordance with Part I(E)(19);

(d) Any required corrective action has been performed in accordance with Parts I(E)(18) and III(C); and,

(e) Construction is complete and the permittee has submitted to the Director, by certified mail with return receipt requested, a notice of completion of construction using EPA Form 7520-10, a plugging and abandonment plan, a copy of the State permit and either:

(i) The Director has inspected or otherwise reviewed the new injection well and finds it is in compliance with the conditions of the permit; or,

(ii) The permittee has not received, within thirteen (13) days of the date of the Director's receipt of the report required above, notice from the Director of his or her intent to inspect or otherwise review the new injection well, in which case prior inspection or review is waived and the permittee may commence injection.

12. Signatory Requirements - All reports or other information requested by the Director shall be signed and certified according to 40 CFR 144.32.

13. Notice of Plugging and Abandonment - The permittee shall notify the Director at least forty-five (45) working days before conversion or abandonment of any injection well covered under this permit.

14. Plugging and Abandonment. The permittee shall plug and abandon any well covered under this permit consistent with 40 CFR 146.10, as provided for in the plugging and abandonment plan contained in Part III(B) of this permit. Within sixty (60) working days after plugging a well, or at the time of the next quarterly report (whichever is shorter), the permittee shall submit a report to the Director. The report shall be certified as accurate by the person who performed the plugging operation, and shall consist of either:

    (a) A statement that the well was plugged in accordance with the plan previously submitted to 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. Any deviation from a previously approved plan which may endanger underground sources of drinking water is cause for the Director to require the operator to replug the well.

15. Inactive Wells. After cessation of injection for two (2) years the permittee shall plug and abandon a well in accordance with the plan and 40 CFR 144.52 (a)(6) unless the permittee has:

    (a) Provided notice to the Director; and

    (b) Described actions or procedures, which are deemed satisfactory by the Director, that the permittee will take to ensure that the well will not endanger underground sources of drinking water during the period of temporary abandonment. These actions and procedures shall include compliance with the technical requirements applicable to active injection wells unless waived, in writing, by the Director.

16. Financial Responsibility - The permittee shall maintain financial responsibility and resources to plug and abandon the underground injection wells in accordance with 40 CFR 144.52(a)(7) as provided in Attachment R of the administrative record corresponding to this permit action which is hereby incorporated by reference as if it appeared fully set forth herein. The permittee shall not substitute an alternative demonstration of financial responsibility from that which the Director has approved, unless the permittee has previously submitted evidence of that alternative demonstration to the Director and the Director has notified the permittee in writing that the alternative demonstration of financial responsibility is acceptable. The financial responsibility mechanism shall be updated periodically, upon request of the Director, except when

Financial Statement Coverage is used as the financial mechanism; this coverage must be updated on an annual basis. If additional wells are to be constructed under the conditions of this permit, the permittee shall increase the amount of financial assurance prior to beginning construction, to cover the additional cost of plugging and abandonment.

17. Insolvency

(a) In the event of the bankruptcy of the trustee or issuing institution of the financial mechanism, or a suspension or revocation of the authority of the trustee institution to act as trustee or the institution issuing the financial mechanism to issue such an instrument, the permittee must submit an alternative demonstration of financial responsibility acceptable to the Director within sixty (60) days after such event. Failure to do so will result in the termination of this permit pursuant to 40 CFR 144.40(a)(1).

(b) An owner or operator must also 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) business 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.

18. Corrective Action

The permittee shall shut-in injection wells whenever the permittee or USEPA determines that operation thereof may be causing upward fluid migration through the well bore of any improperly plugged or unplugged well in the area of review and shall take such steps as the permittee can to properly plug the offending well(s). Any operation of wells which may cause upward fluid migration from an improperly plugged or unplugged well will be considered a violation of this permit. If the permittee or USEPA determines that a permitted well is not in compliance with 40 CFR 146.8, the permittee will immediately shut-in the well until such time as appropriate repairs can be effected and written approval to resume injection is given by the Director. In addition the permittee shall not commence injection under this permit until any and all corrective action has been taken in accordance with any plan contained in Part III(C) of this permit and in accordance with 40 CFR 144.55.

19. **Mechanical Integrity (MI)** - The permittee must establish and shall maintain mechanical integrity of any well covered under this area permit in accordance with 40 CFR 146.8. The mechanical integrity demonstration consists of two parts: Part I demonstrates no significant leaks in the casing, tubing, or packer and Part II demonstrates no significant fluid movement into an underground source of drinking water (USDW) through vertical channels adjacent to the wellbore. The permittee is required to pass both parts of the mechanical integrity demonstration in accordance with Part I(E)(19)(a) and (b) of this permit and thereafter once every sixty (60) months from the date of the last approved demonstration.

(a) Pursuant to 40 CFR 146.8(a)(1), the permittee shall, within six (6) months of the permit's effective date, demonstrate the first Part of MI for all existing wells which were not previously tested and approved by the EPA by using the Water-Brine Interface Method or another approved method. For newly drilled wells the permittee shall demonstrate the first part of MI by using the standard annulus pressure test or another approved method. On January 10, 1992, final approval of the Water-Brine Interface Method was announced in the Federal Register at 1109 et seq FR 57, No. 7. The procedures for using this method are listed in Attachment E of this permit along with conditions and limitations on the running of these tests.

(b) Pursuant to 40 CFR 146.8(a)(2), prior to commencing injection, the permittee shall demonstrate the second part of MI by running a noise, temperature or oxygen activation log. A descriptive report interpreting the results of such logs and tests shall be prepared by a knowledgeable log analyst and submitted to the Director. However, should the nature of the casing preclude the use of a noise, temperature or oxygen activation log, then pursuant to 40 CFR 146.8(c)(3), cementing records may be used to demonstrate the presence of adequate cement to prevent fluid migration behind the outermost casing and the wellbore.

(c) The permittee shall cause all gauges used in mechanical integrity demonstrations to be calibrated to an accuracy of not less than one-half percent (0.5%) of full scale. A copy of the calibration certificate shall be submitted to the Director or his/her representative at the time of demonstration.

(d) The permittee shall cease injection in a well if a loss of mechanical integrity occurs or is discovered during a test, or a loss of mechanical integrity as defined by 40 CFR 146.8 becomes evident during operation. Operations shall not resume until the Director gives approval to recommence.

(e) The permittee shall notify the Director of the loss of mechanical integrity, in accordance with the reporting procedures in Part I (E)(10)(e) and II (B)(3)(b) of this permit.

(f) The permittee shall report the results of a satisfactory mechanical integrity demonstration as provided in Part II (B)(3)(b) of this permit.

20. Restriction on Injected Substances. The permittee shall be restricted to the injection of those fluids listed on Page A-2 of 2. No fluids other than those from sources noted in the administrative record and approved by the Director shall be injected. The permittee shall submit, each year, a certified statement attesting to compliance with this requirement.

21. Construction, Conversion, operation and plugging abandonment within the Permit Area - The permittee may construct, operate, convert, or plug and abandon wells within the permit area, provided that all permit conditions are met and:

(a) The permittee notifies the Director at such times as specified in the permit, and,

(b) Any additional wells are:

(i) Described and identified by location;

(ii) Located within the same well field, facility site, reservoir project, or similar unit in the same State, and injecting in the same formation; and,

(iii) Operated by the permittee.

PART II

WELL SPECIFIC CONDITIONS FOR UNDERGROUND INJECTION CONTROL PERMITS

A. CONSTRUCTION REQUIREMENTS

1. Siting - Notwithstanding any other provision of this permit, injection wells shall inject only into a formation which is separated from any USDW by a confining zone that is free of known, open faults or fractures within the area of the review.

2. Casing and Cementing - Injection wells shall be cased and cemented to prevent the movement of fluids into or between underground sources of drinking water. The casing and cement used in the construction of the wells shall be as contained in Attachments L and M of the administrative record corresponding to this permit action which are hereby incorporated by reference as if they appeared fully set forth herein.

3. Wellhead Specifications - A female coupling and valve shall be installed on each wellhead, to be used for independent injection pressure readings.

4. Logs and Tests - Upon approval by the Director of the surface casing and cementation records for all newly drilled or converted wells covered under this permit, any logs and tests noted in Part III of this permit shall be performed, unless already provided. Prior to commencement of injection, the permittee shall submit to the Director for approval a descriptive report prepared by a knowledgeable log analyst interpreting the results of those logs and tests, along with the notice of completion required in Part I(E)(11) of this permit.

5. Formation Data - If not already provided, the permittee shall determine or calculate the following information concerning the injection formation and submit it to the Director for review and approval, prior to operation:

   (a) Formation fluid pressure;

   (b) Fracture pressure; and,

   (c) Physical and chemical characteristics of the formation fluids.

6. Prohibition of Unauthorized Injection: Any underground injection, except as authorized by permit or rule issued under the UIC program, is prohibited. The construction, including drilling or conversion, of any well required to have a permit is prohibited until the permit has been issued and is effective.

B. OPERATING, MONITORING AND REPORTING REQUIREMENTS

1. Operating Requirements

Beginning on the effective date of this permit, the permittee is authorized to operate the injection wells, subject to the limitations and monitoring requirements set forth herein. Except during stimulation, injection pressure at the wellhead shall not exceed a maximum which shall be calculated so as to assure that the pressure in the injection zone during injection does not initiate new fractures or propagate existing fractures in the injection zone. In no case, shall injection pressure initiate fractures in the confining zone or cause the movement of injection or formation fluids into an underground source of drinking water. The injection pressure and injected fluid shall be limited and monitored as specified in Parts I(E)(20) and III(A) of this permit.

2. Monitoring Requirements

(a) Samples and measurements, taken for the purpose of monitoring as required in Part II(B)(3), shall be representative of the monitored activity. Grab samples shall be used to obtain a representative sample of the fluid to be analyzed. Part III(A) of this permit describes the sampling location and required parameters for injection fluid analysis. The permittee shall identify the types of tests and methods used to generate the monitoring data. The monitoring program shall conform to the one described in Part III(A) of this permit.

(b) Analytical Methods - Monitoring of the nature of injected fluids shall comply with applicable analytical methods cited and described in Table I of 40 CFR Section 136.3 or in Appendix III of 40 CFR Part 261 or by other methods that have been approved by the Director.

(c) Injection Fluid Analysis - The nature of the injection fluids shall be monitored as specified in Part III(A) of this permit. An initial analysis of the injection fluid is contained in Attachment H of the administrative record corresponding to this permit action which is hereby incorporated by reference as if it appeared fully set forth herein. Whenever the injection fluid is modified

to the extent that the analysis required by 40 CFR 146.34(a)(7)(iii) is incorrect or incomplete a new analysis shall be provided to the Director at the time of the next quarterly report. The Director may, by written notice require the permittee to sample and analyze the injection fluid at any time.

(d) Injection Pressure and Cumulative Volume - The injection pressure shall be monitored semi-monthly and shall be reported quarterly as specified in Part III(A) of this permit. The injected and produced fluid volumes shall be monitored daily and shall be reported quarterly. All Class III wells may be monitored on a field or project basis rather than an individual well basis by manifold monitoring. Manifold monitoring may be used in cases of facilities consisting of more than one injection well, operating with a common manifold. Separate monitoring systems for each well are not required provided the owner/operator demonstrates that manifold is comparable to individual well monitoring. All gauges used in monitoring shall be calibrated according to Part I(19)(c) of this permit.

3. Reporting Requirements - Copies of the monitoring results and all other reports shall be submitted to the Director at the following address:

U.S. Environmental Protection Agency
Region V
77 West Jackson Boulevard
Chicago, Illinois 60604
Attn: UIC Section, Enforcement Unit (WU-16J)

(a) Quarterly Reports - The permittee shall submit the results of the injection fluid analyses specified in permit conditions in Part (II)(B)(2)(c) and in Attachment A, no later than the 10th day of the month following the end of the reporting period. Monitoring results shall be recorded on a form which has been signed and certified according to 40 CFR 144.32. Forms shall be submitted at the end of each quarter and shall be postmarked no later than the 10th day of the month following the reporting period. For all new wells, the first report shall be sent no later than the 10th day of the month following the quarter in which injection commences, and for existing wells, the first report shall be sent no later than the 10th day of the month following the first quarter of the final issued permit. This report shall include monthly average, maximum and minimum values for injection pressure, injected and produced volumes and also the specific gravity of the injected fluids.

(b) Reports on Well Test, Workovers, and Plugging and Abandonment - The applicant shall provide the Director with the following reports and test results within sixty (60) days of completion of the activity:

(i) Mechanical integrity tests, except tests which the well fails in which case twenty-four (24) hour reporting under Part I(10)(e) is applicable;

(ii) Logging or other test data;

(iii) Well workovers (using EPA Form 7520-12); and

(iv) Plugging and abandonment.

# PART III

## SPECIAL CONDITIONS

These special conditions include, but are not limited to plans for maintaining correct operations procedures, monitoring conditions and reporting, as required by 40 CFR Parts 144 and 146. These plans are described in detail in the permittee's application for a permit, and the permittee is required to adhere to these plans as approved by the Director, as follows:

A. OPERATING, MONITORING AND REPORTING REQUIREMENTS (ATTACHED)

B. PLUGGING AND ABANDONMENT PLAN (ATTACHED)

C. CORRECTIVE ACTION PLAN (ATTACHED)

D. PERMITTED WELLS AND MAP OF PERMIT AREA (ATTACHED)

E. ADDITIONAL REQUIREMENTS (ATTACHED)

## OPERATING, MONITORING AND REPORTING REQUIREMENTS

| LIMITATION | MINIMUM MONITORING REQUIREMENTS | | MINIMUM REPORTING REQUIREMENTS |
|---|---|---|---|
| **Characteristic** | **Freq.** | **Type** | **Freq** |
| *Injection Pressure 661psig (MAXIMUM) | semi-monthly | | quarterly |
| Cumulative Injected Volume | daily | | quarterly |
| Cumulative Produced Volume | daily | | quarterly |
| Specific Gravity | monthly | grab | quarterly |
| **Chemical Composition of Injected Fluid | quarterly | grab | quarterly |

**SAMPLING LOCATION:** The sampling shall be at a single wellhead for each Manifold system.

*The limitation on wellhead pressure serves to prevent confining-formation fracturing. This limitation was calculated using the following formula: [{0.8 psi/ft - 0.433 psi/ft)(specific gravity)} x depth] - 14.7 psi]. The maximum wellhead pressure is dependent upon depth and specific gravity of the injected fluid. The Salina Group at 2800 feet was used as the depth and a specific gravity of 1.29 was used for the injected fluid.

**Chemical composition analysis shall include, but not be limited to, the following: Sodium, Calcium, Magnesium, Total Iron, Chloride, Sulfate, Carbonate, Bicarbonate, Sulfide, Total Dissolved Solids, pH, Resistivity (ohm-meters @ 75°F).

The permittee shall submit, each year, a certified statement attesting to compliance with the requirement of Part I (E) (20) of the permit.

## Composition of Injected Fluids

The injection fluid is a combination of the following fluids having a total volume equal to the quantity needed to produce brine at the rates required by salt production.

1. Depleted solution mining production fluid from which the salt content has been mostly removed. This fluid is recycled to the wells as part of the closed loop solution mining process.

2. Condensate water removed from the solution mining well brine by the evaporation process during production of salt.

3. Wash down water used in the salt production areas to clean up equipment.

4. Dust collection water used in scrubbing salt dust from collected air.

5. Reject salt product rebrining fluids.

6. Overflow collection points from the brine processing operation.

7. Boiler blowdown.

8. Well water used to make up the difference between the above volumes and required volume of injection fluid.

9. Fluids used to remove calcium carbonate scale in various parts of the solution mining and refining system.

10. Manufacturing area floor sweepings.

11. Sodium silicate to protect the interior surface of the pipeline from various forms of corrosion.

OMB No. 2040-0042 Approval Expires 12/31/2011

EPA

United States Environmental Protection Agency
Washington, DC 20460

# PLUGGING AND ABANDONMENT PLAN

| Name and Address of Facility | Name and Address of Owner/Operator |
|---|---|
| MORTON SALT, INC. OF MANISTEE, MICHIGAN<br>180 SIXTH STREET, MANISTEE, MI 49660 | MORTON SALT, INC OF MANISTEE, MICHIGAN<br>180 SIXTH STREET, MANISTEE, MI 49660 |

Locate Well and Outline Unit on Section Plat - 640 Acres

N

SEE ATTACHED MAP
SUPPLEMENT INFORMATION
PAGE #2 FOR WELL
LOCATIONS

W E

S

| State | County | Permit Number |
|---|---|---|
| MICHIGAN | MANISTEE | MI-101-3G-A001 |

Surface Location Description

___ 1/4 of ___ 1/4 of ___ 1/4 of ___ 1/4 of Section 24 Township 21N Range 17W

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

Surface Location ___ ft. (m N/S) ___ Line of quarter section
and ___ ft. from (E/W) ___ Line of quarter section.

TYPE OF AUTHORIZATION

- ☐ Individual Permit
- ☑ Area Permit
- ☐ Rule

Number of Wells 9 Plus add'l Class III wells permitted in future years

Lease Name

WELL ACTIVITY

- ☐ CLASS I
- ☐ CLASS II
  - ☐ Brine Disposal
  - ☐ Enhanced Recovery
  - ☐ Hydrocarbon Storage
- ☑ CLASS III

Well Number 8, 11, 12, 13, 14, 15, 16, 17, 18

CASING AND TUBING RECORD AFTER PLUGGING

| SIZE | WT (LB/FT) | TO BE PUT IN WELL (FT) | TO BE LEFT IN WELL (FT) | HOLE SIZE |
|---|---|---|---|---|
| 8 5/8 | 24 TO 32 | | 3000 TO 4000 | 11 1/2 |
| 11 3/4 | 42 | | 700 | 14 3/4 |
| | | | | |
| | | | | |

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 (inche | 8 5/8 | 8 5/8 | | | | | |
| Depth to Bottom of Tubing or Drill Pipe (ft | 2800 | 2780 | | | | | |
| Sacks of Cement To Be Used (each plug) | 6 | 506 | | | | | |
| Slurry Volume To Be Pumped (cu. ft.) | 7 | 951 | | | | | |
| Calculated Top of Plug (ft.) | 2730 | Surface | | | | | |
| Measured Top of Plug (if tagged ft.) | | | | | | | |
| Slurry Wt. (LB./Gal.) | 15.6 | 15.6 | | | | | |
| Type Cement or Other Material (Class III) | Class A | Class A | | | | | |

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

$30,000 PER WELL

Certification

I hereby 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) | Signature | Date Signed |
|---|---|---|
| MARK ROBBKES, CEO | | 10/20/10 |

EPA Form 5520-14 (Rev. 11-08)

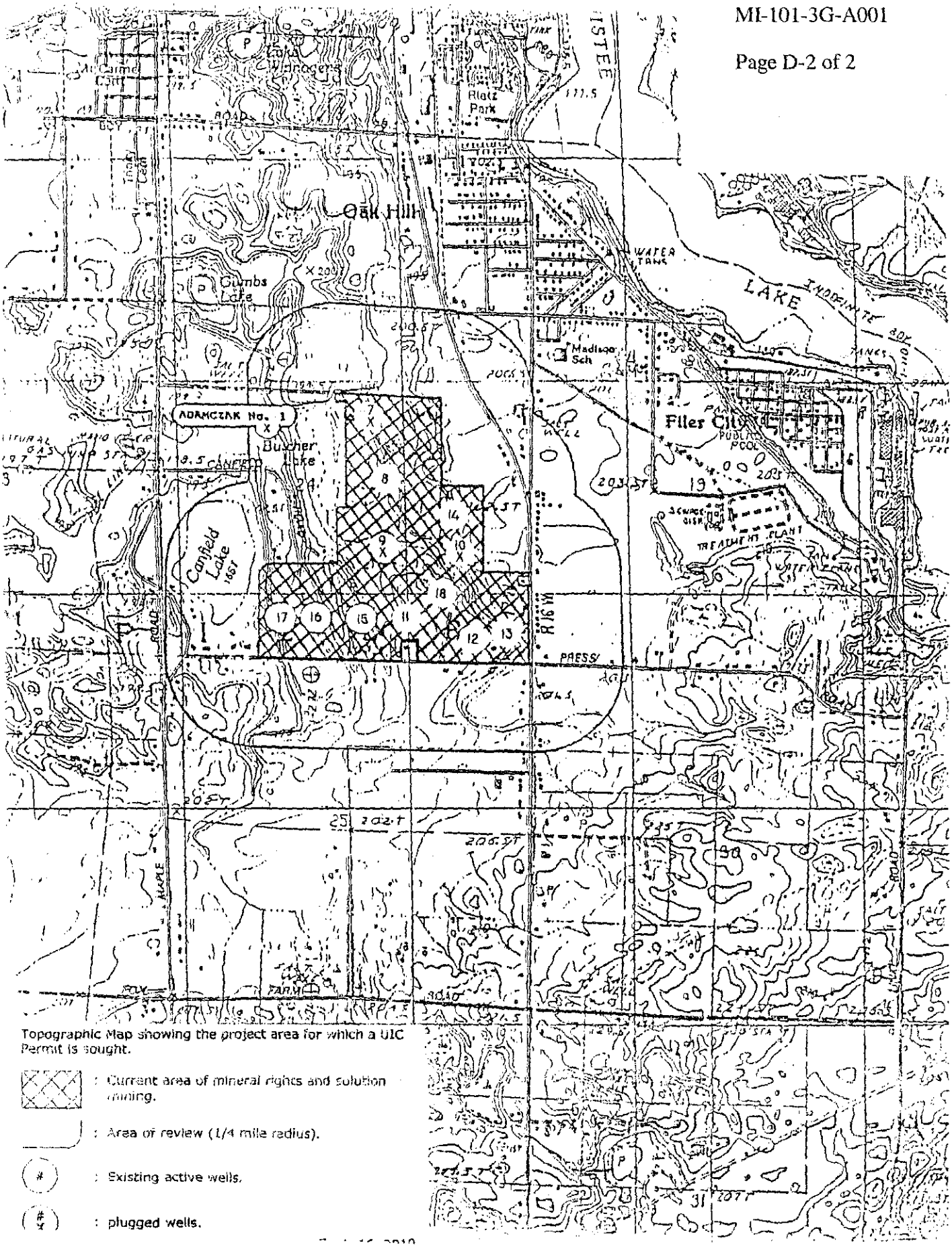
# CORRECTIVE ACTION PLAN

NO corrective action required at this time.

**Names and Location of Wells Authorized Under This Permit**

| Well Name | Surface Location |
|---|---|
| Well #8 | NW/4-NW/4-SE/4 of Section 24-T21N-17W |
| Well #11 | NE/4-SW/4-SE/4 of Section 24-T21N-R17W |
| Well #12 | SW/4-SE/4-SE/4 of Section 24-T21N-R17W |
| Well #13 | SE/4-SE/4-SE/4 of Section 24-T21N-R17W |
| Well #14 | NW/4-NE/4-SE/4 of Section 24-T21N-R17W |
| Well #15 | SW/4-SW/4-SE/4 of Section 24-T21N-R17W |
| Well #16 | SE/4-SE/4-SW/4 of Section 24-T21N-R17W |
| Well #17 | SW/4-SE/4-SW/4 of Section 24-T21N-R17W |
| Well #18 | NW/4-SE/4-SE/4 of Section 24-T21N-R17W |

The solution mining injection wells will be limited to the following area: One acre on the NE corner of the SE/4 of the NW/4 of section 24; 1.3 acres on the SE corner of the NE/4 of the NE/4 of the SW/4 of section 24; 3.2 acres on the E side of the SE/4 of the NE/4 of the SW/4 of section 24; the entire SE/4 of the SW/4 of section 24; the entire SW/4 of the NE/4 of section 24; the entire NW/4 of the SE/4 of section 24; the W/2 of the NE/4 of the SE/4 of section 24; the entire SW/4 of the SE/4 of section 24 less 1.2 acres in the SE/4 of the SW/4 of the SE/4 of section 24; the entire SE/4 of the SE/4 of section 24 less 0.5acres in the NE/4 of the SE/4 of the SE/4 of section 24; a 50 feet wide right of the way along the south edge of the SE/4 of the NE/4 of the SE/4 of section 24. All land is in T21N-R17W and section 24.




Topographic Map showing the project area for which a UIC Permit is sought.

: Current area of mineral rights and solution mining.

: Area of review (1/4 mile radius).

: Existing active wells.

: plugged wells.

## WATER-BRINE INTERFACE METHOD

Procedures for conducting the Water-Brine Interface Mechanical Integrity test.

The procedure to run the Water-Brine Interface is as follows:

1. Withdraw fluid from the test well until the specific gravity of the fluid is constant and record the value.

2. Measure the wellhead pressure.

3. Withdraw fluid from a reference well until the specific gravity of withdrawn fluids is constant. Shut-in the reference well and take a pressure reading. If there is only one well in the system the tubing is the reference well and the casing tubing annulus is the test well.

4. Inject fresh water in the test well in sufficient quantity to fill all but the bottom 50 feet of the well. To achieve this, inject fresh water until the wellhead pressure increases by the amount calculated using the following formula:

Pressure increase = (D-50) X (SG1-SG2) X k where:

D = depth of the well.
SG1 = the specific gravity of the cavern brine.
SG2 = the specific gravity of the injected fluid (water), and
K = 0.4331 psi/ft a conversion constant
(pressure gradient for fresh water).

Determine the net pressure change during the injection in the reference well. Add this pressure change to the calculated pressure increase for the test well to obtain the final pressure necessary for proper placement of the interface.

5. In order to maintain a sharp interface, inject the fresh water at a rate which will not cause the interface to move downward at a rate of greater than 20 feet per minute.

6. Wait a minimum of 36 hours for the test and reference wells to come to temperature equilibrium.

7. At the conclusion of the 36 hours, the pressure of both wells must be checked against the original pressures to assure no significant movement of the interface. If pressure differences can be explained by the wells coming to temperature equilibrium then the test may proceed. If

pressure differences cannot be explained by the wells coming to temperature equilibrium then the operator must bleed a minimum of one casing volume from both wells and start the test again at step 1.

8. Simultaneously measure the wellhead pressures for both the test well and reference well at one minute intervals for a minimum of 10 readings. (Use a deadweight gauge or similar device with a sensitivity of 0.1 psi or better). Calculate the average pressure at the test well and the reference well and the difference between them.

9. Wait eight hours.

10. Repeat step seven.

11. Calculate the net pressure change at the test well as follows:

NPC = P(start) - P(end)
where:
NPC = Net Pressure Change.
Pstart = average pressure of test well at the beginning of the test minus average pressure of reference well at the start of the test.

Pend = average pressure of the test well at the conclusion of the test minus the average pressure of the reference well at the conclusion of the test.

12. If the calculations indicate a net pressure change of greater than 0.05 psi/hr, the well has failed to demonstrate mechanical integrity.

Limitations and conditions of the test. The following limitations and conditions are placed on the use of Water-Brine Interface Method Mechanical Integrity Test.

1. A reference well must be used.

2. Verification that there is no salt crystallization inside the casing must be included with the test results.

3. The test well must be filled with a lower specific gravity fluid to within fifty feet of the bottom of the casing.

4. The test and reference wells must reach temperature equilibrium prior to initiation of the test.

5. Deadweight gauges (or similar device) with a minimum sensitivity of 0.1 psi must be used.

6. Wellhead pressures for the reference well and the test well must be read simultaneously.