U.S. ENVIRONMENTAL PROTECTION AGENCY

UNDERGROUND INJECTION CONTROL PERMIT

CLASS I NONHAZARDOUS

Republic Services

Newton County Landfill

Permit No. IN-111-1I-0001

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

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
UNDERGROUND INJECTION CONTROL PERMIT: CLASS I NON-HAZARDOUS

Permit Number: IN-111-1I-0001

Facility Name: Newton County Landfill IW-1

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 C.F.R.),

Republic Services of Brook, Indiana

is hereby authorized to construct and operate a newly constructed Class I non-hazardous injection well located in Indiana, Newton County, T29N, R8W, Section 28, NE Quarter Section, for injection into the Mt. Simon Sandstone at depths between 3020 and 5000 feet relative to ground elevation, upon the express condition that the permittee meet the restrictions set forth herein. The injection of any hazardous waste as identified in 40 C.F.R. Part 261 is prohibited. Injection shall not commence until the operator has received authorization in accordance with Part I(J) of this permit.

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, G, and H.

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 and reissued, terminated, or modified pursuant to 40 C.F.R. §§144.39, 144.40, or 144.41. The permit will expire in one year if the permittee fails to commence construction, unless a written request for an extension of this one-year period has been approved by the Director. The permittee may request an expiration date sooner than the one-year period, provided no construction on the well has commenced. The permittee shall notify the Director at least 30 days before commencing construction of the injection well.

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

Signed and Dated: _____

DRAFT

_____

Tera L. Fong
Division 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 and Reissuance, and Termination** - The Director of the Water Division of the United States Environmental Protection Agency (EPA), hereinafter, the Director, may 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 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, Subpart B and 40 C.F.R. § 144.5, any information submitted to the 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, the EPA may make the information available to the public without further notice. If a claim is asserted, the information covered by such a claim will be disclosed by EPA only to the extent, and by means of the procedures set forth in 40 C.F.R. Part 2, Subpart B. 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 must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Safe Drinking Water Act and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or for denial of a permit renewal application; except that the permittee need not comply with the provisions of this permit 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.

2. **Penalties for Violations of Permit Conditions** - Any person who violates a permit requirement is 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. 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;

(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 the 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 and 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 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 years from the date the permit application was signed.

(c) The permittee shall retain records concerning the nature and composition of all injected fluids until three 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 expires unless the permittee delivers the records to the Director or obtains written approval from the Director to discard the records.

(e) 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. The permittee shall use the methods described in "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 take representative samples. Monitoring results shall be reported at the intervals contained in Part II(D)(1) through (3) and Attachment A of this permit.

(a) Monitoring of the nature of injected fluids shall comply with applicable analytical methods cited and described in Table I of 40 C.F.R. § 136.3 or in certain circumstances by other methods that have been approved by the Director.

(b) Sampling and analysis shall comply with the specifications of the Waste Analysis Plan required in Part II(C)(3) of this permit.

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.

(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 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 human health or the environment. See, e.g., Part

I(G)(5) of this permit. Any information shall be provided orally within 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 a USDW; and

(ii) Any noncompliance with a permit condition, or malfunction of the injection system, which may cause fluid migration into or between USDWs; and

(iii) Any failure to maintain mechanical integrity.

(2) A written submission shall also be provided within five 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 10 calendar days.

(g) **Report on Permit Review** - Within 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 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 Attachment B of this permit. Within 60 calendar days after plugging a well, 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 the reason for the difference.

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. The permittee shall plug and abandon the well in accordance with the approved plan and 40 C.F.R. § 144.52 (a)(6) 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.

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 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; or

(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 unless an authorized representative informs the permittee that it is not possible to witness the test.

2. **Periodic Mechanical Integrity Testing** - 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 upon completion of this well, and 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 upon completion of this well and at least once every 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.

   (c) The permittee may request the Director to use any other test approved by the Director in accordance with the procedures in 40 C.F.R §146.8(d).

3. **Prior Notice and Reporting** - The permittee shall notify the Director of his or her intent to demonstrate mechanical integrity at least 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 45 calendar days 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 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 psi increments.

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 Attachment C of 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 adjust the cost estimate of plugging and abandonment for inflation within 30 calendar days after each anniversary of the first estimate. The inflation factor is the result of dividing the latest published annual Oil and Gas Field Equipment Cost Index by the index for the previous year.

   (c) 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.

   (d) 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 30 calendar days after the revision specified in Part I(H)(1)(b) and (c) of this permit.

   (e) The permittee must keep on file at the facility a copy of the latest plugging and abandonment cost estimate prepared in accordance with 40 C.F.R. §144.52(a)(7), during the operating life of the facility.

2. **Insolvency** - The permittee must notify the Director within 10 business 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 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.

4. **Establishing Other Coverage** - The owner or operator must establish other financial assurance or liability coverage acceptable to the Director, within 60 calendar days of the occurrence of the events in Part I(H)(2) or (3) of this permit.

I. CORRECTIVE ACTION

1. **Compliance** - The permittee shall comply 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 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** Should upward migration of fluids through the confining zone of this permitted well be discovered within the two mile area of review due to injection activities at this facility, 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.

J. COMMENCING INJECTION

The permittee may not commence injection until:

1. Results of the formation testing and logging program as specified in the administrative record of this permit are submitted to and approved by the Director; and

2. Mechanical integrity of the well has been demonstrated in accordance with 40 C.F.R. §146.8(a)(1) and (2) and in accordance with Part I(G)(1) through (3) of this permit; and

3. Results from ambient monitoring as required in Part II(C)(4) of this permit have been submitted and approved by the Director; and

4. All required corrective action has been taken in accordance with 40 C.F.R. § 144.55 (b)(2); and

5. 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 7520-9 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 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.

6. Written authorization to commence injection has been granted by the Director.

PART II
WELL SPECIFIC CONDITIONS FOR UIC PERMITS

A. CONSTRUCTION

1. **Siting** – All Class I wells shall be sited in such a fashion that they inject into a formation which is beneath the lowermost formation containing, within one quarter mile of the well bore, an underground source of drinking water.

2. **Casing and Cementing** - 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 Attachment 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** - 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 Attachment E of this permit. Any changes shall be submitted by the permittee for the approval of the Director before installation.

4. **Wellhead Specification** - 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.

B. OPERATIONS

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 Attachment 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. Prior to performing any stimulation and /or fracturing of the well**,** the permittee is required to submit procedures to the Permits Branch for review and approval**.** A list of all products to be used for the test along with their chemical composition must also be submitted.

2. **Additional Injection Limitation** - No waste streams other than those identified in Attachment F of this permit shall be injected. Every twelfth month the permittee shall submit a certified statement attesting to compliance with this requirement.

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 Attachment 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 Attachment A of this permit.

5. **Automatic Warning and Automatic Shut-off System** - The permittee shall continuously operate and maintain an automatic warning and automatic shut-off system to stop injection in 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 Attachment A of this permit.

   A trained operator must be on site and within perceptible distance of the alarm at all times when the well is operating. The permittee must test the automatic warning and automatic shut-off system at least 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 the Director waives this requirement.

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. 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. 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; and

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

C. TESTING AND MONITORING

1. **Sampling Point** - The injection fluid samples shall be taken at the sampling location as specified in Attachment 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** - 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 the permit. A copy of the approved plan shall also be kept at the facility.

4. **Prior Notice** - The permittee shall notify the Director of his or her intent to perform any tests required by this permit at least 30 calendar days prior to such activities. The permittee shall either follow the prescribed test procedures found in Attachment G of this permit or submit written procedures for approval at least 30 calendar days prior to the testing. If the submitted procedures are not appropriate for approval, EPA will require the permittee to submit new proposed test procedures for approval, or add appropriate conditions to the submitted procedures. At the discretion of the Director, a shorter time period may be allowed.

5. **Reporting** - All reports of well tests which include logs must include an interpretation of results by a knowledgeable log analyst. Reports on ambient reservoir pressure monitoring must include an interpretation of the results by a knowledgeable pressure transient test analyst. The reports should explain all anomalies in the data and variations in the procedures. The permittee shall report the results of any tests required by this permit within 45 calendar days after the tests are completed.

6. **Ambient Monitoring** - The permittee shall monitor the pressure buildup in the injection zone initially upon completion of the well, and at least once every twelfth month thereafter, 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.

7. **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)(f) of this permit.

D. REPORTING REQUIREMENTS

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

United States Environmental Protection Agency
Attn: Underground Injection Control (WP-16J)
77 West Jackson Boulevard
Chicago, Illinois 60604-3590

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) 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;

   (b) 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.

   (c) A statement of the total volumes of the fluid injected to date, in the current calendar year, and the current month;

   (d) 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;

   (e) 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.

   (f) 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 at least every quarter the results of the injection fluid analyses specified in the Waste Analysis Plan attached to this permit. This report must include statements showing that the requirements of Part I(E)(10) and Part II(C)(3) have been met.

3. **Annual Reports** - The permittee shall report the following at least every twelfth month:

   (a) Results of ambient monitoring required by 40 C.F.R. § 146.13(d)(1) and Part II(C)(4) of this permit; and

   (b) A certified statement attesting that no waste streams other than those identified in Attachment F of this permit were injected into the well.

4. **Reports on Well Tests and Workovers** - Within 45 calendar days after the activity, the permittee shall report to the Director the results of demonstrations of mechanical integrity, any well workover, and/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. TESTING PROCEDURES (ATTACHED)

H. WASTE ANALYSIS PLAN (ATTACHED)

ATTACHMENT A
SUMMARY OF OPERATING, MONITORING AND REPORTING REQUIREMENTS

CHARACTERISTIC	LIMITATION	MINIMUM MONITORING FREQUENCY	MINIMUM REPORTING FREQUENCY
Injection Pressure	255 psig maximum*	continuous	monthly
Annulus Pressure	100 psig minimum	continuous	monthly
Annulus/Tubing Differential	100 psig minimum above operating injection pressure	continuous	monthly
Injection Rate		continuous	monthly
Cumulative Volume		continuous	monthly
Temperature**		daily**	monthly
Annulus Fluid Level		daily	monthly
pH, Eh, and Specific Gravity		daily	monthly
Annulus Fluid Loss		monthly	monthly
Chemical Composition of Injected Fluids		***	quarterly
Physical Characteristics of Injected Fluids		***	quarterly

Sampling Location: at the well head

* The maximum injection pressure was determined using the following formula:
[{fracture gradient - (0.433 psi/ft x specific gravity)} x depth] - 14.7 psi.

The maximum injection pressure is dependent upon depth, specific gravity of the injection fluid, and fracture gradient of the injection zone. The Mt. Simon Sandstone at 3020 feet was used as the depth and a specific gravity of 1.06 was used for the injection fluid plus a safety factor of 0.05. A fracture gradient of 0.57 psi/ft is used as a default value, unless a site-specific value is determined pursuant to Attachment A (1) and (2) of this permit, in which case the maximum injection pressure will be modified to reflect the specific value of the fracture gradient in this well. Such modification shall be considered a minor modification as allowed for at 40 C.F.R. § 144.41(f). The limitation on injection pressure will serve to prevent injection-formation fracturing.

** Frequency of temperature measurements will be in accordance with Section II(C)(5) of this permit. Reporting of injectate temperature will be in accordance with Section II(D)(1)(f) of this permit.

*** As specified in the Waste Analysis Plan attached to this permit.

1. **Maximum Injection Pressure (146.13)**

During construction of this well, the permittee shall determine if the maximum injection pressure as specified at Attachment A of this permit allows sufficient operational flexibility. If the calculated maximum injection pressure allows for sufficient flexibility, the permittee may opt not to proceed with additional testing and the requirements of Attachment A (1) of this permit shall be met. If the maximum injection pressure calculated prior to direct testing proves insufficient, or another need is identified that requires modifying the maximum injection pressure, the permittee shall conduct one or more of the following tests to ensure that the maximum injection pressure exerted during operation will not propagate existing or open new fractures in any part of the injection zone. In all cases, the permittee shall submit a plan, for the Director's written approval, describing the detailed procedures to be followed during any test designed to determine the fracture gradient to calculate maximum injection pressure. Modification of the maximum permitted injection pressure following a test conducted under Attachment A (1) of this permit shall follow the procedures set forth for minor permit modifications, as specified at 40 C.F.R. §144.41(f).

(a) **In-Situ Stress Tests**

The permittee shall isolate zones for testing the fracturing pressure by means of a straddle packer assembly, or other comparable means. The zones chosen for testing shall be those predicted to have the lowest fracturing value. The permittee shall use either fresh water to conduct this test or a fluid that is permissible for injection into this well as allowed by this permit. At a minimum, the permittee shall measure the test fluid for its specific gravity and viscosity during the In-Situ Stress test. The results of this test shall be submitted to the EPA as specified at Attachment A (2) of this permit. Failure to report test results shall be considered grounds to deny a requested permit modification.

(b) **Step Rate Test**

The permittee shall isolate the entire injection zone by means of a packer assembly, or other comparable means. The permittee shall inject either fresh water for this test or a fluid that is permissible for injection into this well as allowed for in this permit. At a minimum, the permittee shall measure the test fluid for its specific gravity and viscosity during the Step Rate Test. The permittee shall inject into the well at increasing rates, holding each rate step

constant. Each rate step shall span the same amount of time (at least 30 minutes per rate step is recommended). The permittee shall attempt to inject at three rates which result in a pressure higher than the injection zone fracture pressure during this test. A Cartesian plot of rate against the final stabilized pressure at each step shall be included as part of the data package submitted to the EPA. The results of this test shall be submitted to the EPA as specified at Attachment A (2) of this permit. Failure to report test results shall be considered grounds to deny a requested permit modification.

(c) **Other Test(s) Approvable by the Director**

The permittee may choose to conduct test(s) other than the two described in Parts III(A)(1)(a) and (b) of this permit. If so, the permittee shall submit a plan to conduct alternative test(s) to the Director for approval prior to conducting the test(s).

2. **Reporting Maximum Injection Pressure Determination**

The permittee shall report the results of the measurements, tests and determinations conducted in Attachment A (1) of this permit within 30 days of their completion.

ATTACHMENT B
PLUGGING AND ABANDONMENT PLAN

OMB No. 2040-0042 Approval Expires 12/31/2018

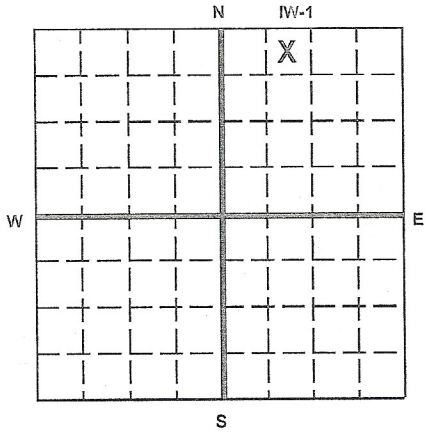
United States Environmental Protection Agency
Washington, DC 20460

EPA

PLUGGING AND ABANDONMENT PLAN

Name and Address of Facility	Name and Address of Owner/Operator
Newton County Landfill 2266 East 500 South Road, Brook, IN 47922	Newton County Landfill 2266 East 500 South Road, Brook, IN 47922

Locate Well and Outline Unit on Section Plat - 640 Acres



State	County	Permit Number
Indiana	Newton	TBD

Surface Location Description

___ 1/4 of NE 1/4 of NW 1/4 of NE 1/4 of Section 28 Township 29N Range 8W

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

Surface Location ___ ft. frm (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 2

Lease Name Newton County Landfill

WELL ACTIVITY

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

Well Number IW-1

CASING AND TUBING RECORD AFTER PLUGGING

SIZE	WT (LB/FT)	TO BE PUT IN WELL (FT)	TO BE LEFT IN WELL (FT)	HOLE SIZE
20	94	0-200 ft BGL	0-200 ft BGL	26
13 3/8	54.5	0-1510 ft BGL	0-1510 ft BGL	17 1/2
9 5/8	36	0-3,130 ft BGL	0-3,130 ft BGL	12 1/4

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 1/2"	9 5/8					
Depth to Bottom of Tubing or Drill Pipe (ft	5,000	3,130					
Sacks of Cement To Be Used (each plug)	625	1,151					
Slurry Volume To Be Pumped (cu. ft.)	737	1,359					
Calculated Top of Plug (ft.)	3,130	0					
Measured Top of Plug (if tagged ft.)	3,130	0					
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
5,000 ft BGL	3,130 ft BGL		

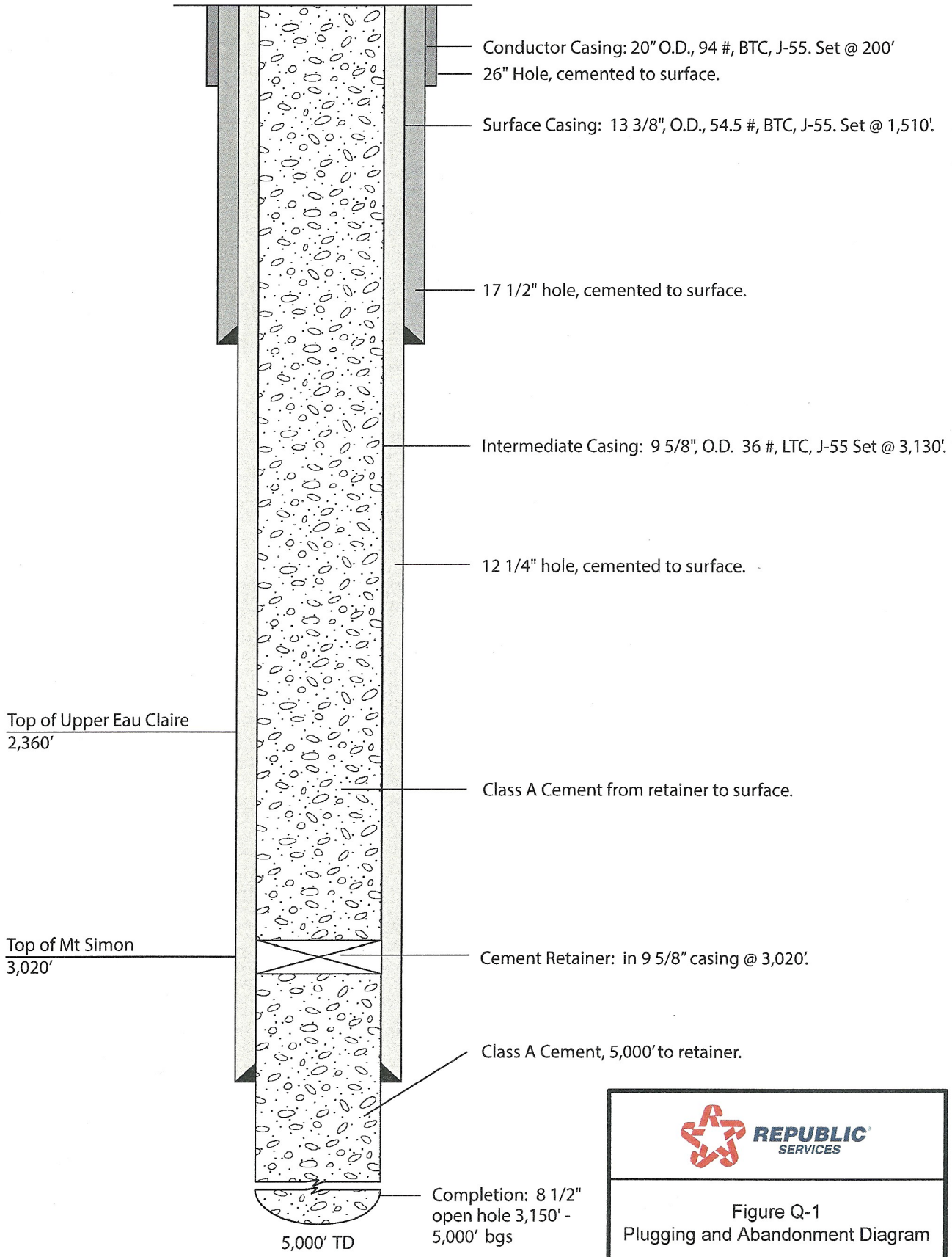
Estimated Cost to Plug Wells

$128,500 per well

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)*	Signature	Date Signed
Josh McGarry, General Manager	Josh McGarry	11/7/2019



REPUBLIC SERVICES

Figure Q-1
Plugging and Abandonment Diagram

2019 Permit Application

Scale: NTS	Date: August 2019	
2018_RNCL_Fig_Q-1.pdf	By: KRS	Checked: AAP

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

Note: Ground Level is estimated at 700' above sea level.

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 EPA Form 7520-14, Plugging and Abandonment Plan.

Response:

The following completed copy of EPA Form 7520-14, Plugging and Abandonment Plan, is submitted to satisfy this requirement. Figure Q-1 is the plugging and abandonment diagram for Newton County Landfill IW-1 and IW-2 wells. Costs associated with the plugging and abandonment of the well per the following procedures are presented in the completed plugging form.

General

When it has been determined the well can no longer operate effectively or is no longer needed, it will be plugged in a manner consistent with regulatory requirements as to eliminate the potential for uphole migration of injected fluids. The regional USEPA office will be notified, as well as the state, of the intent to plug and approval will be required. The same plugging procedure will apply to the two proposed wells as the construction details are anticipated to be nearly identical. Copies of the well plugging form for the wells are included in this attachment.

NEWTON COUNTY LANDFILL IW-1 and IW-2 PLUGGING AND ABANDONMENT PLAN

1. Notify regulatory agencies a minimum of 30 days prior to commencement of plugging operations.
2. Prepare well and location for plugging. Move in and rig up well servicing rig, pipe racks and tanks.
3. Install a test gauge on the annulus to perform a static annulus 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 and isolate from the annulus system. Monitor annular pressure for one hour.
4. Displace tubing with kill brine as needed to control wellhead pressure. Dismantle wellhead and install blow-out preventer. Displace annulus with kill brine as needed to control pressure. Brine compatibility with cement to be used will be verified.
5. Remove injection tubing and packer. If packer will not unseat, proceed with fishing

operations as needed to remove packer from hole or obtain approval to set retainer above packer and pump cement through retainer and abandoned packer.

6. Make up mechanical retainer on workstring and trip in hole. Set cement retainer at top of injection zone just above historical packer setting depth. Test cement retainer to 500 psig.
7. Move in cement and cementing equipment.
8. Displace hole below retainer with Class "A" cement. Unsting from retainer and spot 50 additional sacks (sx) on top of retainer. Cement volume has been calculated based on the following volumes:
    - 8-½" hole from 3,130 ft BGS to 5,000 ft BGS, at 0.3941 ft^3/ft = 737 ft^3
    - 9 5/8" casing (8.921" ID) from surface to 3,130 ft BGS, at 0.4341 ft^3/ft = 1,359 ft^3
    - 50 additional sacks with a yield of 1.18 $ft^3/sack$ = 59 ft^3

    Therefore the total volume of the plugs is estimated to be 2,146 ft^3, which is equivalent to 1,819 sx of Class "A" cement with a yield of 1.18 $ft^3/sack$. If wellbore fill is present, this volume may have to be reduced or squeezed into the openhole of the injection interval.
9. Once cement has been tagged on top of the retainer, spot successive, continuous balanced cement plugs in 500' intervals from top of cement retainer to surface (6 intervals required). Cement to be API Class 'A' with not more than 4% bentonite. If neat Class 'A' cement is pumped it will have the following slurry properties.
    - Water ratio – 5.2 gallons per sack
    - Slurry weight – 15.60 pounds per gallon
    - Slurry volume – 1.18 $ft^3/sack$

    An estimated 1,140 sacks, or 1,345 cubic feet, of slurry will be required above retainer.
10. Remove BOP and wellhead equipment
11. Cut off wellhead approximately 4 feet BGS and weld cap with permanent marker on casing.
12. Rig down and move out all equipment.
13. Prepare and file USEPA and Indiana Plugging Reports.

The steel plate will be inscribed with injection well identification information and the date of plugging. Federal and State representatives will have been invited to witness the plugging and sign the plug and abandonment form.

The following summarizes estimated costs ($128,500) for IW-1 (the first well to be drilled) for plugging and abandonment of the NCL IW-1 Class I Injection well. If the second proposed well, IW-2, is to be drilled, NCL will evaluate the plugging and abandonment cost prior to drilling and revise the required financial surety.

PLUGGING AND ABANDONMENT COST

A cost of closure for the minimum plugging and abandonment requirements, without testing, is presented for a single well. A summary of the major cost elements is presented below.

IW-1 Single Well Plugging Cost (December, 2018)

Workover Rig and Associated Equipment	35,000
Marker, Location Work/Welding and Clean-up	2,500
Rental Tools	3,000
Retainer, Miscellaneous Equipment, and Service	10,000
Cementing	63,000
Supervision and Report	15,000
Total	**$128,500**

ATTACHMENT C
FINANCIAL ASSURANCE MECHANISM

Republic Services has demonstrated adequate financial responsibility to properly plug and abandon the Class I non-hazardous well. If Financial Statement Coverage is used as financial mechanism to cover the cost of plugging the injection well, this coverage must be updated and submitted on an annual basis.

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 are available.

Response:

A copy of the corporate guarantee by means of a financial test is submitted to establish financial assurance per the requirements of the US EPA.

Documents specify that the use of the financial test specified by USEPA allows a guarantee in excess of the independent cost estimate for the proposed well needed for plugging documented in Attachment 2.Q of this re-application.

Materials to be forwarded to USEPA regarding financial assurance will be forwarded by NCL, or its parent company, to the following address:

Regional Administrator
US Environmental Protection Agency
Region 5 (WD-17J)
77 West Jackson Blvd.
Chicago, IL 60604-3590

With respect to continued demonstration of financial assurance, the guarantee will be maintained as required by applicable regulations. Within ninety (90) days after the close of each fiscal year, the permittee will submit updated financial assurance information if the cost of plugging and abandonment has exceeded the existing financial assurance. In such an event, the information submitted to the Director will consist of a letter regarding the change in the financial assurance requirements, verification from the appropriate institution regarding the change and a copy of the independent geologist or engineering estimate of the updated plugging and abandonment costs.

PERFORMANCE BOND

U.S. Environmental Protection Agency

Underground Injection Control

Financial Responsibility Requirement

Date bond executed: 11/20/2019

Effective date: 11/29/2019

Principal: Newton County Landfill Partnership, 2266 East 500 South Road, Brook, IN 47922

Type of organization: Partnership

State of incorporation: Indiana

Surety(ies): Evergreen National Indemnity Company, 6140 Parkland Blvd, Ste 321, Mayfield Heights, OH 44124

EPA Identification Number, name, address, and plugging and abandonment amounts(s) for each injection well guaranteed by this bond [indicate plugging and abandonment amounts for each well]:

EPA Permit #: TBD
Well Name: Newton County Landfill Well IW-1
Address: Newton County Landfill, 2266 East 500 Road, Brook, IN 47922
Plugging and Abandonment Amount: $128,500

EPA Permit #: TBD
Well Name: Newton County Landfill Well IW-2
Address: Newton County Landfill, 2266 East 500 Road, Brook, IN 47922
Plugging and Abandonment Amount: $128,500

Total penal sum of bond: $257,000.

Surety's bond number: 880319

Know All Persons By These Presents, That We, the Principal and Surety(ies) hereto are firmly bound to the U.S. Environmental Protection Agency [hereinafter called EPA], in the above penal sum for the payment of which we bind ourselves, our heirs, executors, administrators, successors, and assigns jointly and severally; provided that, where the Surety(ies) are corporations acting as co-sureties, we, the Sureties, bind ourselves in such sum "jointly and severally" only for the purpose of allowing a joint action or actions against any or all of us, and for all other purposes each Surety binds itself, jointly and severally with the Principal, for the payment of such sum only as is set forth opposite the name of such Surety, but if no limit of liability is indicated, the limit of liability shall be the full amount of the penal sum.

Whereas said Principal is required, under the Underground Injection Control Regulations, as amended, to have a permit or comply with provisions to operate under rule for each injection well identified above, and

Whereas said Principal is required to provide financial assurance for plugging and abandonment as a condition of the permit or approval to operate under rule, and

Whereas said Principal shall establish a standby trust fund as is required when a surety bond is used to provide such financial assurance;

Now, Therefore, the conditions of this obligation are such that if the Principal shall faithfully perform plugging and abandonment, whenever required to do so, of each injection well for which this bond guarantees plugging and abandonment, in accordance with the plugging and abandonment plan and other requirements of the permit or provisions for operating under rule and other requirements of the permit or provisions for operating under rule as may be amended, pursuant to all applicable laws, statutes, rules and regulations, as such laws, statutes, rules, and regulations may be amended,

Or, if the Principal shall provide alternate financial assurance as specified in subpart F of 40 CFR part 144, and obtain the EPA Regional Administrator's written approval of such assurance, within 90 days after the date of notice of cancellation is received by both the Principal and the EPA Regional Administrator(s) from the Surety(ies), then this obligation shall be null and void, otherwise it is to remain in full force and effect.

The Surety(ies) shall become liable on this bond obligation only when the Principal has failed to fulfill the conditions described above.

Upon notification by an EPA Regional Administrator that the Principal has been found in violation of the plugging and abandonment requirements of 40 CFR part 144, for an injection well which this bond guarantees performances of plugging and abandonment, the Surety(ies) shall either perform plugging and abandonment in accordance with the plugging and abandonment plan and other permit requirements or provisions for operating under rule and other requirements or place the amount for plugging and abandonment into a standby trust fund as directed by the EPA Regional Administrator.

Upon notification by an EPA Regional Administrator that the Principal has failed to provide alternate financial assurance as specified in subpart F of 40 CFR part 144, and obtain written approval of such assurance from the EPA Regional Administrator(s) during the 90 days following receipt by both the Principal and the EPA Regional Administrator(s) of a notice of cancellation of the bond, the Surety(ies) shall place funds in the amount guaranteed for the injection well(s) into the standby trust fund as directed by the EPA Regional Administrator.

The surety(ies) hereby waive(s) notification of amendments to plugging and abandonment plans, permits, applicable laws, statutes, rules, and regulations and agrees that no such amendment shall in any way alleviate its (their) obligation on this bond.

The liability of the Surety(ies) shall not be discharged by any payment or succession of payments hereunder, unless and until such payment or payments shall amount in the aggregate to the penal sum of the bond, but in no event shall the obligation of the Surety(ies) hereunder exceed the amount of said penal sum.

The Surety(ies) may cancel the bond by sending notice by certified mail to the owner or operator and to the EPA Regional Administrator(s) for the Region(s) in which the injection well(s) is (are) located, provided, however, that cancellation shall not occur during the 120 days beginning on the date of receipt of the notice of cancellation by both the Principal and the EPA Regional Administrator(s), as evidenced by the return receipts.

The principal may terminate this bond by sending written notice to the Surety(ies), provided, however, that no such notice shall become effective until the Surety(ies) receive(s) written authorization for termination of the bond by the EPA Regional Administrator(s) of the EPA Region(s) in which the bonded injection well(s) is (are) located.

Principal and Surety(ies) hereby agree to adjust the penal sum of the bond yearly so that it guarantees a new plugging and abandonment amount, provided that the penal sum does not increase by more than 20 percent in any one year, and no decrease in the penal sum takes place without the written permission of the EPA Regional Administrator (s).

In Witness Whereof, The Principal and Surety(ies) have executed this Performance Bond and have affixed their seals on the date set forth above.

The persons whose signatures appear below hereby certify that they are authorized to execute this surety bond on behalf of the Principal and Surety(ies) and that the wording on this surety bond is identical to the wording specified in 40 CFR 144.70(c) as such regulation was constituted on the date this bond was executed.

Principal. Newton County Landfill Partnership

Amber Engel, Attorney-in-Fact

Corporate Seal

Corporate Surety. Evergreen National Indemnity Company
6140 Parkland Blvd. Ste 321
Mayfield Heights, OH 44124

State of Incorporation: OH

Liability limit $257,000.00

Timothy S. Buhite, Attorney-in-Fact

Corporate Seal

Bond premium. $2,056.00

POWER OF ATTORNEY

Republic Services, Inc., a Delaware corporation having its principal place of business at 18500 N. Allied Way, Phoenix, Arizona 85054, hereby makes, constitutes and appoints USI INSURANCE SERVICES NATIONAL, INC., acting through and by any one of Debbie Lindstrom, John Drummey, Jr., Timothy S. Buhite, Kathleen M. Mitchell, Scott C. Alderman, Peggy A. Firth, Brandi Heinbaugh, Amber Engel, Jamie Stroh, Holly E. Ulfers, Katie Snider, or Roxana Palacios its true and lawful attorney to sign and seal any and all surety bonds, bid bonds, performance bonds and payment bonds at or below the monetary threshold of Five Million Dollars ($5,000,000.00) on behalf of REPUBLIC SERVICES, INC. and its subsidiaries, relating to the provision of solid waste collection, transportation, transfer, recycling, disposal and/or energy services by REPUBLIC SERVICES, INC. and its subsidiaries and affix its corporate seal to and deliver for and on behalf as surety thereon or otherwise, bonds of any of the following classes, to wit:

1. Surety bonds, bid bonds, performance bonds and payment bonds to the United States of America or agency thereof, including those required or permitted under the laws or regulations relating to Customs or Internal Revenue; license and permit bonds or other indemnity bonds under the laws, ordinances or regulations of any state, city, town, village, board, other body organization, public or private; bonds to transportation companies; lost instrument bonds; lease bonds; worker's compensation bonds; miscellaneous surety bonds; and bonds on behalf of notaries public; sheriffs, deputy sheriffs and similar public officials.

2. Surety bonds, bid bonds performance bonds and payment bonds on behalf of REPUBLIC SERVICES, INC. and its subsidiaries in connection with bids, proposals or contracts.

REPUBLIC SERVICES, INC. hereby agrees to ratify and confirm whatsoever USI INSURANCE SERVICES NATIONAL, INC. shall lawfully do pursuant to this power of attorney, and until notice or revocation has been given by REPUBLIC SERVICES, INC., the acts of said attorney shall be binding on the undersigned.

IN WITNESS WHEREOF, this Power of Attorney has been signed this, 2 day of January 2019 on behalf of REPUBLIC SERVICES, INC. by its Assistant Secretary Eileen B. Schuler.

REPUBLIC SERVICES, INC.,
a Delaware Corporation

Eileen B. Schuler

STATE OF ARIZONA

COUNTY OF MARICOPA

Subscribed and sworn to before me this 2ND day of JANUARY, 2019 by Eileen B. Schuler, Assistant Secretary.

OFFICIAL SEAL
MATTHEW NORDQUIST
Notary Public - Arizona
MARICOPA COUNTY
My Commission Expires
MAY 31, 2019

Notary Public

EVERGREEN NATIONAL INDEMNITY COMPANY

MAYFIELD HEIGHTS, OH

POWER OF ATTORNEY

POWER NO. 880319

KNOW ALL MEN BY THESE PRESENTS: That the Evergreen National Indemnity Company, a corporation in the State of Ohio does hereby nominate, constitute and appoint:

Timothy S. Buhite

its true and lawful Attorney(s)-In-Fact to make, execute, attest, seal and deliver for and on its behalf, as Surety, and as its act and deed, where required, any and all bonds, undertakings, recognizances and written obligations in the nature thereof, PROVIDED, however, that the obligation of the Company under this Power of Attorney shall not exceed Fifteen Million Dollars and 00/100 ($15,000,000.00)

This Power of Attorney is granted and is signed by facsimile pursuant to the following Resolution adopted by its Board of Directors on the 23rd day of July, 2004:

"RESOLVED, That any two officers of the Company have the authority to make, execute and deliver a Power of Attorney constituting as Attorney(s)-in-fact such persons, firms, or corporations as may be selected from time to time.
FURTHER RESOLVED, that the signatures of such officers and the Seal of the Company may be affixed to any such Power of Attorney or any certificate relating thereto by facsimile; and any such Power of Attorney or certificate bearing such facsimile signatures or facsimile seal shall be valid and binding upon the Company; and any such powers so executed and certified by facsimile signatures and facsimile seal shall be valid and binding upon the Company in the future with respect to any bond or undertaking to which it is attached."

IN WITNESS WHEREOF, the Evergreen National Indemnity Company has caused its corporate seal to be affixed hereunto, and these presents to be signed by its duly authorized officers this 1st day of June, 2017.

EVERGREEN NATIONAL INDEMNITY COMPANY

By: _____
Matthew T. Tucker, President

By: _____
David A. Canzone, CFO

Notary Public)
State of Ohio) SS:

On this 1st day of June, 2017, before the subscriber, a Notary for the State of Ohio, duly commissioned and qualified, personally came Matthew T. Tucker and David A. Canzone of the Evergreen National Indemnity Company, to me personally known to be the individuals and officers described herein, and who executed the preceding instrument and acknowledged the execution of the same and being by me duly sworn, deposed and said that they are the officers of said Company aforesaid, and that the seal affixed to the preceding instrument is the Corporate Seal of said Company, and the said Corporate Seal and signatures as officers were duly affixed and subscribed to the said instrument by the authority and direction of said Corporation, and that the resolution of said Company, referred to in the preceding instrument, is now in force.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed my official seal at Cleveland, Ohio, the day and year above written.

NOTARIAL SEAL STATE OF OHIO
PENNY M HAMM
NOTARY PUBLIC
STATE OF OHIO
Comm. Expires
04-04-2022

_____
Penny M. Hamm, Notary Public
My Commission Expires April 4, 2022

State of Ohio) SS:

I, the undersigned, Secretary of the Evergreen National Indemnity Company, a stock corporation of the State of Ohio, DO HEREBY CERTIFY that the foregoing Power of Attorney remains in full force and has not been revoked; and furthermore that the Resolution of the Board of Directors, set forth herein above, is now in force.

Signed and sealed in Mayfield Hts, Ohio this 20th day of November, 2019.

_____
Wan C. Collier, Secretary

ATTACHMENT D
CONTINGENT CORRECTIVE ACTION

2.O PLANS FOR WELL FAILURES

Outline contingency plans (proposed plans, if any, for Class II) to cope with all shut-ins or well failures, so as to prevent migration of fluids into any USDW.

Response:

The following summarizes the plan to address failure of the wells to protect the surface environment and prevent migration of injected fluids into any USDW:

Newton County Landfill
Class I Well Contingency Plan

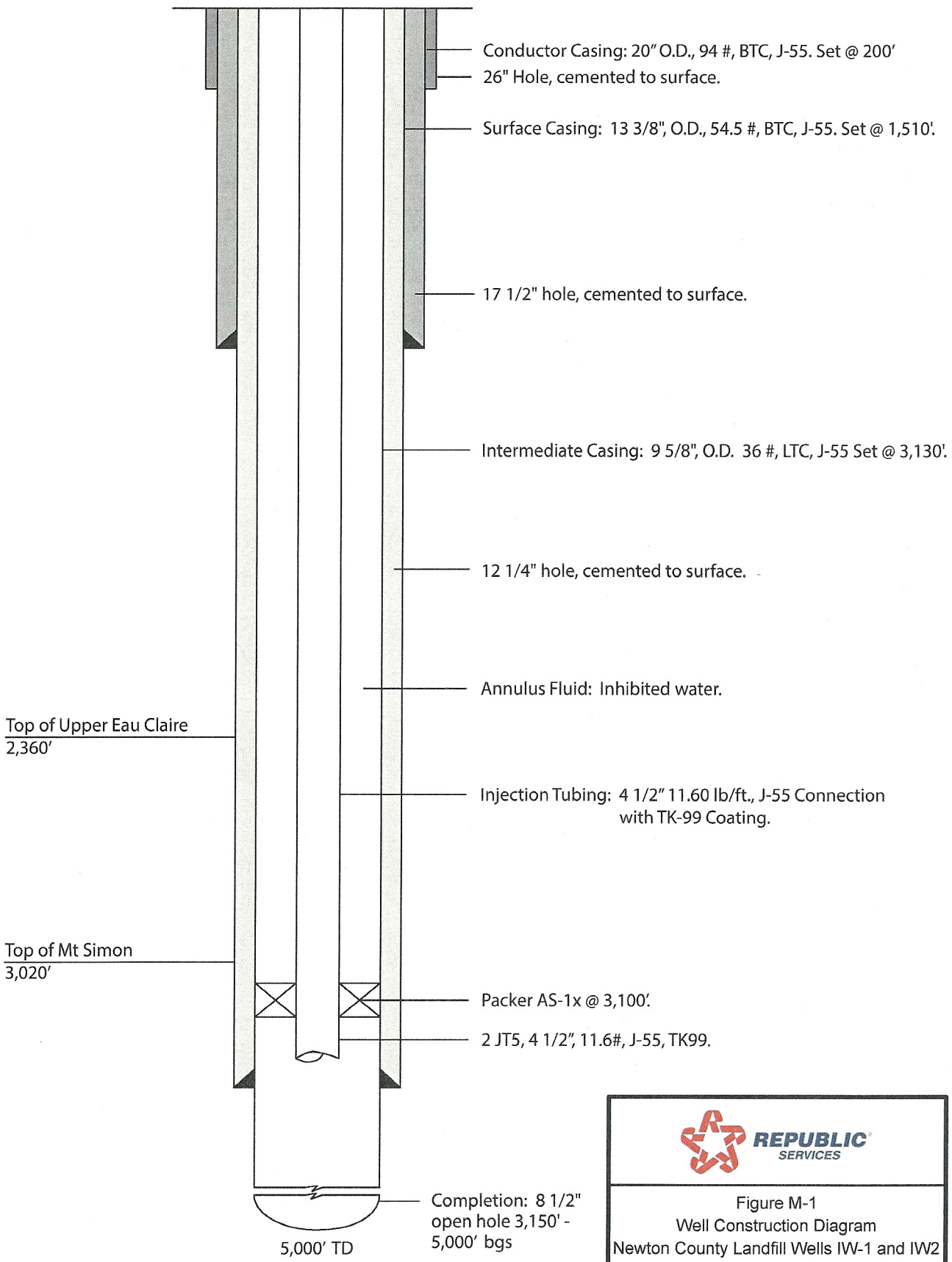
Monitoring and periodic routine investigative procedures will be performed on the injection well as required by applicable laws, permits and regulations, but not less frequently than once annually and once every five years as discussed in Attachment 2.P of this document. Pertinent data will be reported to the agencies as required. This monitoring and testing is required to ensure well integrity and safe operations.

1. If the well fails required monitoring or periodic testing standards, the well will be shut-in and the agency notified according to applicable regulations and permit conditions. After investigation into the cause for the failure, work plans will be prepared and reviewed with the regulators for repairing the problem.
2. If a workover is performed on the well, copies of all work reports and logs will be forwarded to the regulatory agencies within 45 days.
3. During the period of time required for a well workover or for shut-ins due to MIT failure, the contingency plans of the facility will include the following:
    a. If shut-in period is sufficiently brief, the fluid generated during this period of time will be held in storage at the facility.
    b. If well shut-in is required for a longer period of time, some of the fluid to be injected may be shifted to another facility.
    c. If required, fluids will be removed from the facility via licensed waste transport vehicles and managed according to applicable regulations.

ATTACHMENT E
CONSTRUCTION DETAILS

g. Packer
   i. Arrow AS-1X, 9 ⅝" x 4-½" retrievable packer, top set at 3,100 ft BGS, or deeper with 2 joints of tail pipe below packer.

h. Annular Fluid
   i. Brine or freshwater with corrosion inhibitor



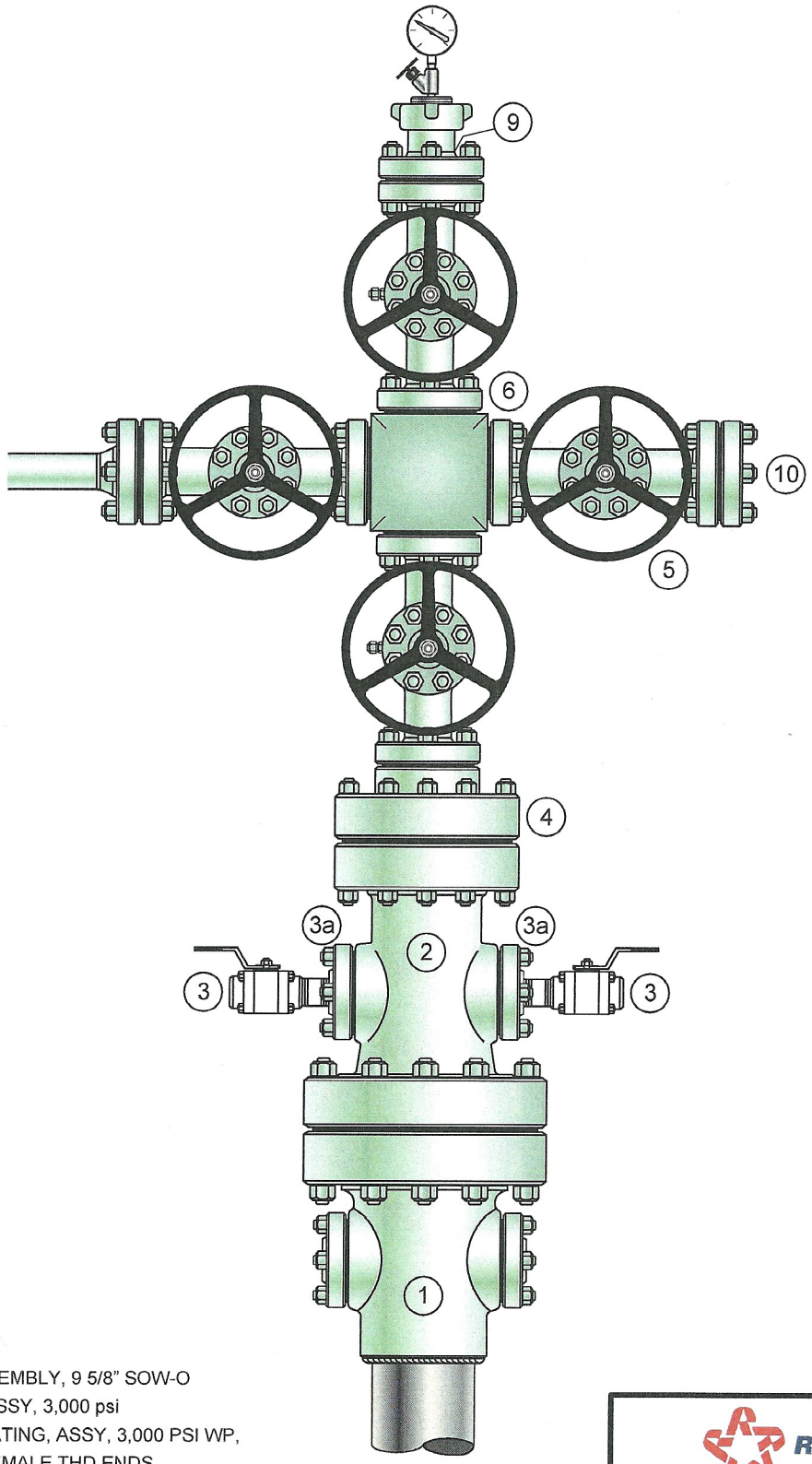
REPUBLIC SERVICES

Figure M-1
Well Construction Diagram
Newton County Landfill Wells IW-1 and IW2
2019 Permit Application

Scale: NTS	Date: August 2019	
2018_RNCL_Fig_M-1.pdf	By: KRS	Checked: AAP

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

Note: Ground Level is estimated at 700' above sea level.



1. CASING HEAD ASSEMBLY, 9 5/8" SOW-O
2. SPOOL, CASING, ASSY, 3,000 psi
3. VALVE, BALL, FLOATING, ASSY, 3,000 PSI WP, 2" API LINE PIPE FEMALE THD ENDS, LEVER OPERATED

3a. FLANGE, COMPANION, 3,000 FLANGE X 2" API LINE PIPE

4. ADAPTER FLANGE ASSEMBLY, 3,000 psi
5. GATE VALVE ASSY, 3,000 psi
6. CROSS, STUDDED, ASSEMBLY, WFT, 4-1/16" API 3,000 STUDDED RUN X 4-1/6" API 3,000 STUDDED OUTLET
7. FLANGE, BLIND, ASSY WITH TREE CAP
8. FLANGE, BLIND, ASSY

REPUBLIC SERVICES

Figure M-2
Wellhead Schematic, Newton County Landfill Wells IW-1 and IW-2
2019 Permit Application

Scale: NTS	Date: August 2019	
2018_RNCL_Fig_M-2_REV.pdf	By: WEK	Checked: AAP

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

ATTACHMENT F
SOURCE AND ANALYSIS OF WASTE

1.0 PERMIT APPLICATION AND INTRODUCTION

Through the submittal of this application, Newton County Landfill (NCL) requests authorization from the US Environmental Protection Agency (EPA) to permit two non-commercial and non-hazardous Class I injection wells to be located at the Newton County Landfill in central Newton County, in Jackson Township, near Brook, Indiana to manage non-hazardous landfill leachate generated on-site. A map identifying the facility location is included as Figure 1a; the proposed well locations are presented on Figure 1b. Completed copies of US EPA UIC 7520-6 "Underground Injection Control Permit Application" and required attachments to these forms are included in this document. Well IW-1 will be installed in the NW quarter of the NE quarter, Section 28, T29N, R8W. Well IW-2 will be installed in the SE quarter of the SE quarter, Section 28, T29N, R8W.

Note that NCL has proposed an alternate location located in the NW quarter of the NW quarter of Section 28, T28N R8W (see Figure 1b) that may be utilized for either proposed well. If this alternative well location is pursued, NCL will submit a minor modification to the UIC permit reflecting this change. Note that the Area of Review (AOR) evaluations were conducted with respect to the facility boundary and no changes will be required to account for this alternate location.

NCL will operate the proposed disposal wells for the injection of landfill leachate and landfill gas condensate, well maintenance and testing fluids, and infrequently for storm water runoff generated at the facility. The total dissolved solids (TDS) component of the landfill leachate originates from the non-hazardous landfill waste, and injectate composed of this leachate may also include small amounts of chemical additives (e.g., scaling inhibitors, biocides, etc.) required for proper system operations and maintenance. Fluids will be transferred by pipe from the collection system units to a storage tank where the leachate will be comingled prior to injection. The fluids proposed to be injected in the proposed deepwells will include treated and raw leachate, based on the operator's discretion. The proposed injection zone is the Mt. Simon Sandstone and the lower portion of the Eau Claire Formation. The upper portion of the Eau Claire Formation is the proposed confining zone. Additional "cap-rock" exists in the geologic section above the Eau Claire Formation.

Shallow aquifers in the vicinity of the wells will be protected by multiple strings of casing and cement. The injection zone includes formations from the deepest Mt. Simon Sandstone to lower Eau Claire Formation. NCL only intends to complete the Mt. Simon as the injection interval. The overlying confining zone is the upper portion of the Eau Claire Formation. Injected fluids are to be delivered to the Mt. Simon Sandstone injection interval under positive pressure flow through tubing and a packer. The well will have at least one cemented long string protective casing extending into the injection interval. The wellbore will be an openhole completion within the injection interval. The annulus area between the protective casing and injection tubing string will be filled with inhibited water. Annulus pressure will be continuously monitored to detect any leaks in the tubing or

casing and annulus pressure will be maintained at pressures of more than 100 psi above the tubing pressure.

Relevant administrative data regarding these permits are summarized as follows:

Applicant:	Newton County Landfill
State:	Indiana
County:	Newton
Mailing and Facility Address:	2266 East 500 South Road, Brook, Indiana 47922
Location of Wells:	IW-1; T29N, R8W Section 28, NWNE quarter IW-2; T29N, R8W Section 28, SESE quarter

Well Names: NCL IW-1 and IW-2

USEPA ID Nos.: To be Assigned by US EPA

Contact: Josh McGarry, General Manager
NW Indiana Post Collection
2266 East 500 South Road
Brook, Indiana 47922
(219) 224-4225

1.0 INTRODUCTION

1.A Background

The purpose of this Waste Analysis Plan (WAP) is to characterize the non-hazardous landfill leachate waste water that would be injected into the Newton County Landfill (NCL) disposal wells IW-1 and IW-2, to be located at the Newton County Landfill in Newton County, Indiana. NCL will be responsible for implementing this WAP. UIC well IW-1 is anticipated to be constructed in 2020. The second proposed well IW-2 may be drilled at a later date if required. Waste will be injected into the Mt. Simon Formation at a projected depth of approximately 3,000 feet below ground surface.

NCL intends to operate the wells consistent with Title 40 of the Code of Federal Regulations (40 CFR), Section 146.13 that requires operators of Class I underground injection wells to monitor and analyze the fluids injected into the well "to yield representative data of their characteristics." This WAP also fulfills the specifications at 40 CFR 146.68 by presenting 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 waste to be analyzed.

1.B Sources

The Newton County Landfill generates non-hazardous leachate. There is no SIC code for sanitary landfill leachate.

The waste waters produced at the landfill include water collected from leachate collection system, which originates from water infiltration through waste. Some groundwater or run-off may also be added to this leachate if necessary. Fluids generated during well maintenance or testing activities may also be reinjected into the well. The waste stream is primarily composed of inorganic, non-hazardous compounds such as chloride, sodium, and potassium, with a TDS up to approximately 40,000 mg/L, or more.

Waste water is first accumulated in each landfill cell, then piped to a leachate collection tank. Newton County Landfill will process landfill fluids prior to injection.

1.C Summary

The major components of the Newton County Landfill waste characterization and UIC monitoring program include:

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

These components are addressed in Sections 2 and 3, below.

The WAP may be reviewed and, if necessary, revised if new waste constituents or conditions are identified that may significantly alter the physical properties of the waste. Revisions to the WAP may also be required if new permit conditions are added by the Agency for cause. Any future revisions to the WAP, upon approval, will become part of the administrative record and constitute a minor modification of the permit. Compatibility issues regarding the subsurface rock matrix and well construction materials are documented in the permit application and are not addressed in this WAP.

ATTACHMENT G
TESTING PROCEDURES

Standard Annulus Pressure Test

1. Ensure the packer is set within 100 feet of the top of the injection zone. Packers not set within 100 feet of the top of the injection zone will be evaluated by EPA on a case-by-case basis. Note any approved deviations from previously reported well construction.
2. Document the test using a mechanical or digital device or a service company job record which records the value of the parameters of interest as measured during the test.
    a. Submit along with the test results a gauge calibration certificate for the mechanical or digital device used to record test parameters. All calibration (for new or recalibrated gauges) must have been performed within a year prior to the test.
    b. Place a gauge on the wellhead to measure pressure. If a recording device is used, the recording device serves to verify the data witnessed on the wellhead gauge.
    c. Use an appropriately scaled mechanical gauge which has a measurement range that is 1.2 – 2 times the maximum pressure measured or a 1 psi resolution digital gauge with sufficient full scale.
    d. Measure and document pressure using a gauge and/or a digital record and/or a chart record that can be read with sufficient accuracy to identify pressure change which would result in a failure of the test and to record accurate values during the test interval. For example, if the test pressure is 300 psig, the gauge and/or chart record should be marked in increments of 5 psi or less.
3. Verify that the tubing/casing annulus is full of liquid. No unapproved fluid or substance that may affect test outcomes are allowed. Measure and report the volume of liquid added to the annulus during pressurization (if any). If an annulus tank is pressurized with nitrogen to pressurize the well, record the liquid displaced from the tank into the well annulus.
4. Stabilize the temperature of the well and the annulus liquid, either by ceasing injection or injecting at a constant fixed rate. Ensure that the wellhead injection tubing pressure is at least 100 psi different from the annulus test pressure.
5. Pressurize the annulus to the greater of 300 psig or the maximum permitted injection pressure plus 100 psi. A positive pressure differential of greater than 100 psi should be maintained between the annulus and the injection tubing. If EPA does not approve any deviations from this criteria prior to testing, the test results might not be considered a sufficient demonstration of mechanical integrity and a new test would then be needed. A net gain or loss of more than 3% during the test indicates the well does not have mechanical integrity. Following pressurization, isolate the annular system from its pressure source and, if present, the sealpot or surge tank being sure to prevent any leaking across the shut-off valves.
6. Test for at least 60 minutes. Note the time, the annulus pressure, and the injection/tubing pressure at the start of the test and measure and note these same parameters at least every 10 minutes thereafter up to the end of the required test duration.
7. Send a report of the testing including any other data or documents available at the conclusion of the test which support the test results, such as gauge calibration certification, third-party service ticket, and/or original chart/digital recordings, to EPA per the reporting requirements of the permit.
8. If the tested well was reworked in association with the test, submit a rework record.

9. Include the certification statement and signature on the transmittal letter or on the individual MIT results form and, if submitted, the rework record to comply with the requirements of 40 CFR § 144.32(b).

Fall-Off Test

1. Injection of normal injectate at the normal rate is preferred.
2. The injection period should be at least 50% longer than the planned shutin time, or at minimum as long as operationally possible. During this time injection at a constant rate (+/- 10%) should be attempted.
3. The pressure gauge utilized for the pressure transient test shall have been calibrated no more than one year prior to the test date.
4. Place the pressure gauge downhole at approximately the top of the permitted injection zone at least one hour prior to ceasing injection.
5. Following at least one hour of pressure data collection during injection, shut-in the well as quickly as possible.
6. Collect data at a frequency of at least one data point every 10 seconds for at least the first five minutes after shut-in; between five and 30 minutes at no less than one reading every 30 seconds; and the operator can reduce frequency as required after 30 minutes.
7. End pressure measurements when pressure is relatively stable, when operational necessity dictates, when sufficient radial flow dominated data has been collected to allow evaluation of kh and extrapolation of pressure to infinite shut-in time is possible, or if boundary effects are observed.
8. The test shall include a written report by a knowledgeable well test analyst. Such report must explain any anomalies shown in the results.
9. The test report shall include an up-to-date well schematic, a copy of the dated calibration certificate for the gauge utilized, and digital pressure data on CD/flash drive/email in a spreadsheet format.
10. The test report shall include a tabulation of values for the following background parameters: EPA permit number, porosity, net thickness (ft), viscosity (cp), formation compressibility (per psi), long string casing inner diameter (in), open hole diameter (in), and Kelly bushing elevation (ft). The test report shall also include a tabulation of values for the following test specific parameters: test start date/time, test end date/time, test length (hr), depth reference (Kelly bushing or ground level), specific gravity of test fluid, test fluid compressibility (per psi), gauge depth (ft), gauge calibration date, pressure required to maintain tubing fluid to the surface (psi), final tubing fluid level (ft), final flow rate immediately prior to shutin (gpm), cumulative volume injected since last pressure equalization (gal), permeability-thickness (md-ft), skin factor, radius of investigation (ft), final measured flowing pressure (psi), final measured shut-in pressure (psi), and p* pressure (psi). Pressure gauge units (psia or psig) shall be specified.
11. The test must conclusively demonstrate its objectives and satisfy the Director to be considered a completed test.

Temperature Log

1. To conduct a static temperature log, the well must be shut in for at least 36 hours, or longer if temperature stabilization based on previous logs requires more time.
2. If the well cannot be shut in for 36 hours, shut in for as long as possible and run two logs at least six hours apart.

3. Calibrate the temperature tool in a bucket of ambient temperature water and a bucket of ice water immediately prior to conducting the test.
4. Log from the top of the well to the bottom, recording both temperature and natural gamma ray activity.
5. Record log data at least once per foot.
6. Logging speed shall not exceed 30 feet per minute. Reduce speed to 20 feet per minute in air-filled well bores.
7. The test shall include a written report by a knowledgeable log analyst. Such report must explain any anomalies shown in the results.
8. The test report shall include an up-to-date well schematic, digital logging data on CD/flash drive/email in a spreadsheet format, and a plot of the logging activity.
9. The test report shall include a tabulation of values for the following background parameters: EPA permit number, long string casing length (ft), tubing and/or tail pipe lowermost depth (ft), top of open hole or uppermost perforation (ft), well total depth (ft), plugged back total depth or top of fill depth (ft), Kelly bushing elevation (ft), depth to top of confining zone (ft), and depth to top of permitted injection zone (ft). The test report shall also include a tabulation of values for the following test specific parameters: test date, depth reference (Kelly bushing or ground level), date of last injection, temperature of last injected fluid (F), elapsed time since last injection (hr), volume injected into the well in the past year (gal), names and depths of any other injection formations used at the site, temperatures logged by the tool and thermometer during calibration (F), depth to fluid level in the tubing (ft), depth to top of receptive strata (ft), and depth to bottom of receptive strata (ft).
10. The test must conclusively demonstrate its objectives and satisfy the Director to be considered a completed test.

ATTACHMENT H
WASTE ANALYSIS PLAN

UIC WASTE ANALYSIS PLAN
Class I Non-Hazardous Deepwells

for
Newton County Landfill

Class I Deepwells IW-1 and IW-2;
EPA Permit #'s TBD

Newton County, Indiana

August 2019

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 1-2
2.0 PROCEDURES 2-1
2.A Volume Monitoring 2-1
2.B Waste Characterization 2-1
2.C Sampling and Analysis 2-2
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
3.E Re-Characterization 3-4

1.0 INTRODUCTION

1.A Background

The purpose of this Waste Analysis Plan (WAP) is to characterize the non-hazardous landfill leachate waste water that would be injected into the Newton County Landfill (NCL) disposal wells IW-1 and IW-2, to be located at the Newton County Landfill in Newton County, Indiana. NCL will be responsible for implementing this WAP. UIC well IW-1 is anticipated to be constructed in 2020. The second proposed well IW-2 may be drilled at a later date if required. Waste will be injected into the Mt. Simon Formation at a projected depth of approximately 3,000 feet below ground surface.

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The waste waters produced at the landfill include water collected from leachate collection system, which originates from water infiltration through waste. Some groundwater or run-off may also be added to this leachate if necessary. Fluids generated during well maintenance or testing activities may also be reinjected into the well. The waste stream is primarily composed of inorganic, non-hazardous compounds such as chloride, sodium, and potassium, with a TDS up to approximately 40,000 mg/L, or more.

Waste water is first accumulated in each landfill cell, then piped to a leachate collection tank. Newton County Landfill will process landfill fluids prior to injection.

1.C Summary

The major components of the Newton County Landfill waste characterization and UIC monitoring program include:

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These components are addressed in Sections 2 and 3, below.

The WAP may be reviewed and, if necessary, revised if new waste constituents or conditions are identified that may significantly alter the physical properties of the waste. Revisions to the WAP may also be required if new permit conditions are added by the Agency for cause. Any future revisions to the WAP, upon approval, will become part of the administrative record and constitute a minor modification of the permit. Compatibility issues regarding the subsurface rock matrix and well construction materials are documented in the permit application and are not addressed in this WAP.

2.0 PROCEDURES

2.A Volume Monitoring

As discussed in the text of the Permit Application, flow and pressure recorders are to be used to continuously monitor injection pressure, annulus pressure, and flow rate; totalized cumulative volumes for the well will be calculated from monitoring data. A summary of recorded data will be provided to the US EPA per applicable permit requirements. The remaining portions of this WAP address physical and chemical characterization of the waste.

2.B Waste Characterization

Waste analysis parameters were selected based on process knowledge, historical analysis, and analysis suggested by EPA Region 5 guidance. These parameters include pH, TDS, TSS, and applicable inorganic parameters. The effluent pH is generally near neutral to basic (e.g., 7.2 to approximately 8.5 for analyses performed. The total dissolved solids (TDS) concentration of the waste is also a useful indicator of fluid properties. Magnesium, potassium and sodium are among the predominant cations and chloride is the predominant anion, with bicarbonate/carbonate alkalinity also a major component. Effluent TDS can be up to 40,000 mg/L or more. Because the native brine present in the Mt. Simon contains high TDS including high cation-anion concentration, injectate will have a lower TDS concentration that natural formation waters.

Quarterly testing for pH, Eh, specific conductance and temperature will be performed. Although only a limited number of chemical constituents are expected in injectate, a relatively comprehensive analysis will also be performed on a quarterly basis. The leachate originates from a sanitary landfill, but a more comprehensive analysis will ensure the non-hazardous nature of injectate. Wastewater is not expected to be ignitable, reactive, or corrosive, but waste will be analyzed for flashpoint, reactive cyanide, and pH on a quarterly basis as a basic way to monitor the non-hazardous nature of the waste and to ensure any trends or changes are identified.

Table 2-1 of the following section lists the parameters and monitoring frequency used to characterize wastewater to be injected into the NCL disposal wells. The table also summarizes the applicable analytical method and reporting units for each. Characterization parameters were selected based on historical leachate sampling and identified for characterization needed to satisfy regulatory requirements and applicable specifications listed in typical Region 5 non-hazardous UIC permits.

2.C Sampling and Analysis

Samples will be collected quarterly via grab sample from the waste injection line or the waste storage tank during calendar days or quarters when injection of waste takes place. The waste analysis to be conducted is designed to acquire representative samples of typical injectate. NCL personnel, contractor personnel, or contracted analytical laboratory personnel will collect required on-site waste stream samples. Sampling procedures will be conducted at the direction of site representatives and in accordance with the certified or accredited analytical laboratory procedures, and will meet the minimum current standard US EPA procedures. The grab sample will be sent to an independent contract laboratory for analysis. Sufficient mixing and residence time in the system will have occurred at this sampling point for the waste to be representative of the waste stream that is being injected. The sampler's name, sampling point, and date sampled will be documented using COC methods specified in Section 3.A.

Table 2-1 presents the parameters, analytical methods, reporting unit and sample frequency for each test parameter. Sampling and analytical methods will meet or exceed the standards cited below or as presented in USEPA "Methods for the Chemical Analysis of Water and Wastes" or "Standard Methods for the Examination of Water and Wastewater".

TABLE 2-1
NEWTON COUNTY LANFILL
CLASS I WASTE SAMPLING AND ANALYSIS SUMMARY

Test Parameter	Example Test Methods*	Reporting Units	Frequency
Ignitability (flash point)	SW846 1010, SW1010A	---	Quarterly
Alkalinity	SM2320-BICARB SM2320-TOTAL	Mg/L	Quarterly
Reactive Sulfide and Cyanide	SW846 7.3.3.2/ 7.3.4.1/ 7.3.4.2	---	Quarterly
pH	USEPA 150.1	pH units	Quarterly
Eh	Measurement using oxidation-reduction potential instrumentation	Mvolts	Quarterly
Specific Gravity	Hydrometer, ASTM 2710F, D5057		Quarterly
Temperature	Thermometer	°F	Quarterly
Wellhead TDS	USEPA 160.1	mg/L	Quarterly
Wellhead TOC	USEPA	mg/L	Quarterly

Test Parameter	Example Test Methods*	Reporting Units	Frequency
	160.2		
Select Characteristic Constituents			
Benzene (D018)	USEPA 8260B/624	mg/L	Quarterly
Carbon Tetrachloride (D019),	USEPA 8260B/8021B	mg/L	Quarterly
Chlorobenzene (D021),	USEPA 8260B/8021B	mg/L	Quarterly
Chloroform (D022),	USEPA 8260B/8021B	mg/L	Quarterly
1,4-Dichlorobenzene (D027),	USEPA 8260B/8021B	mg/L	Quarterly
1,2-Dichloroethane (D028),	USEPA 8260B/8021B	mg/L	Quarterly
Dichloroethylene (D029),	USEPA 8260B/8021B	mg/L	Quarterly
Tetrachloroethylene (D039),	USEPA 8260B/8021B	mg/L	Quarterly
1,1 Trichloroethylene (D040)	USEPA 8260B/8021B	mg/L	Quarterly
Vinyl Chloride (D043)	USEPA 8260B/8021B	mg/L	Quarterly
Additional Parameters			
Potassium	USEPA 200.8/6020A	mg/L	Quarterly
Sodium	USEPA 200.8/6010B, 6020A, 3005A	mg/L	Quarterly
Chloride	USEPA 325.2/A4500	mg/L	Quarterly
Nitrate+nitrite	USEPA 200.8/6500	mg/L	Quarterly
Total inorganic nitrogen	USEPA 350.2	mg/L	Quarterly
Ammonia	USEPA 350.2	mg/L	Quarterly
Arsenic (D004)	USEPA 6000 series	mg/L (ppm)	Quarterly
Barium (D005)	USEPA 6000 series	mg/L (ppm)	Quarterly
Cadmium (D006)	USEPA 6000 series	mg/L (ppm)	Quarterly
Chromium (D007)	USEPA 6000 series	mg/L (ppm)	Quarterly
Lead (D008)	USEPA 6000 series	mg/L (ppm)	Quarterly
Additional Parameters			
Mercury (D009)	USEPA 6000 Series	mg/L (ppm)	Quarterly
Selenium (D010)	USEPA 6000 Series	mg/L (ppm)	Quarterly
Silver (D011)	USEPA 6000 Series	mg/L (ppm)	Quarterly
Endrin (D012)	USEPA	mg/L	Quarterly

Test Parameter	Example Test Methods*	Reporting Units	Frequency
	8081A/8085/8270	(ppm)	
Lindane (D013)	USEPA 8081A/8270	mg/L (ppm)	Quarterly
Methoxychlor (D014)	USEPA 8270D/8081A	mg/L (ppm)	Quarterly
Toxaphene (D015)	USEPA 8081A/8270	mg/L (ppm)	Quarterly
2,4-D (D016)	USEPA 8151A	mg/L (ppm)	Quarterly
2,4,5-TP (Silvex) (D017)	USEPA 8151A/8321/8085	mg/L (ppm)	Quarterly
Chlordane (D020)	USEPA 8081A/8270	mg/L (ppm)	Quarterly
o-Cresol (D023)	USEPA 8270C	mg/L (ppm)	Quarterly
m-cresol (D024)	USPEA 8270C	mg/L (ppm)	Quarterly
p-Cresol (D025)	USEPA 8270C	mg/L (ppm)	Quarterly
Cresol (D026)	USEPA 8270C	mg/L (ppm)	Quarterly
2,4-Dinitrotoluene (D030)	USEPA 8270C	mg/L (ppm)	Quarterly
Heptachlor (and its epoxide) (D031)	USEPA 8081A/8085/8270	mg/L (ppm)	Quarterly
Hexachlorobenzene (D032)	USEPA 8081A/8085/8270	mg/L (ppm)	Quarterly
Hexachlorobutadiene (D033)	USEPA 821B/8260B	mg/L (ppm)	Quarterly
Hexachloroethane (D034)	USEPA 8270C/D	mg/L (ppm)	Quarterly
Methyl ethyl ketone (D035)	USEPA 8260B/8261	mg/L (ppm)	Quarterly
Nitrobenzene (D036)	USEPA 8270D	mg/L (ppm)	Quarterly
Pentachlorophenol (D037)	USEPA 8270D	mg/L (ppm)	Quarterly
Pyridine (D038)	USEPA 8270D	mg/L (ppm)	Quarterly
2,4,5-Trichlorophenol (D041)	USEPA 8270D	mg/L (ppm)	Quarterly
2,4,6-Trichlorophenol (D042)	USEPA 8270D	mg/L (ppm)	Quarterly
Vinyl chloride (D043)	USEPA 8021B/8260B	mg/L (ppm)	Quarterly

Notes: *Test methods cited are examples; alternative methods with equal or better detection limits may be used

Example results of monthly effluent analyses are presented in Section H of the EPA UIC Permit Application. As shown in this Section, analyses show that inorganic constituents are the primary parameters detected, although biological oxygen demand and chemical oxygen demand are also present. In addition to parameters summarized in Section H, the waste will be sampled and analyzed for other parameters required by this WAP as shown in Table 2-1, including but not limited to pH, Eh, specific gravity, temperature, TDS and TOC, along with chloride and other inorganic and organic parameters included on the Toxicity Characteristics (TC) list to ensure injection of non-hazardous waste. Therefore, based on process knowledge and historical analytical results, the WAP parameter list provides analysis for 1) EPA recommended parameters; 2) TC compounds to ensure non-hazardous compliance, and 3) compounds typically present in injectate at significant concentrations (e.g. chloride).

NCL may be required to perform ongoing leachate analysis as part of landfill operating permits or other requirements. NCL may collect and analyze samples of injectate as described in this WAP, and share resulting data with operations to satisfy landfill operating permit requirements.

3.0 QUALITY ASSURANCE/QUALITY CONTROL

3.A General Sampling and Analytical Information

Sampling protocols outlined in this document are to be followed. NCL is responsible for obtaining data necessary to comply with this WAP, and will ensure adherence to guidelines set forth in the referenced standards listed in Section 2.C or equivalents, as appropriate. Approved sample collection vessels and preservation techniques from 40 CFR 136.3 or equivalent will be followed as applicable and 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. NCL reserves the option to choose alternate laboratories for testing provided equivalent QA/QC standards are met.

COC Form Content

Each sample taken will be accompanied by facility 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. 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:

1. Sample ID including code or name, in addition to date and time;
2. Name of sample collector; (include sampling company name if not site personnel);
3. Sample collection method;
4. Sample collection date;
5. Sample collection point; and
6. Sample presentation technique, as applicable

Sample container label will also include a COC seal. Sample chain-of-custody will be followed at all times during the sampling and subsequent 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. Standard laboratory COC forms that document the times and dates of all personnel handling the sample, along with standard labels and container seals sufficient to distinguish between samples and prevent tampering, will be acceptable.

Reporting and Records Retention

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:

1. Test description;
2. Analytical method for parameter detection;
3. Identification of analysis date and analyst;
4. Result and units; and
5. Analytical reporting limits.

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

3.B Sampling Controls

1. Equipment Blanks

   Fluid samples will be obtained directly from the sample accumulation container before being sealed in the sample container shipped to the laboratory. In this case, no equipment cleaning blanks will be required. If samples cannot be directly placed in the bottles intended for preservation and shipment, equipment blanks will be taken as deemed appropriate by NCL.

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 laboratory-provided deionized (DI) 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 NCL, 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 site representatives, one duplicate sample per selected sampling event will be taken and analyzed for the same parameters as the sampling event.

3.C Analytical Controls

1. Equipment Calibration

   The selected analytical laboratories must maintain QA/QC records of the frequency and type of instrument calibration performed at the laboratory and in the field. Any calibration of thermometers, gauges, chromatographs, spectrometers and other analytical equipment will be conducted according to appropriate instrument manufacturer specifications and manufacturer recommended frequencies or as dictated by applicable laboratory QA/QC plans that have been developed by the laboratory. Valid calibration certificates for instruments used offsite by a certified lab will be maintained at that facility. Calibration data for onsite field testing or continuous monitoring will be maintained as part of the site well records.

2. Data Reduction

   Transcription of the raw data into the reportable units is conducted by the laboratory in accordance with the selected laboratory Q/A plan. Data reduction utilized in the analysis and reporting process is presented in the reports to the US EPA for each sampling and analysis event. Data is recorded on hand written or computer work sheets that include identification data, sample data and all data required for calculations, or on computer print-outs accompanied by operator notes and summaries.

3. Data Verification

   Data verification is conducted after each sampling event by assigned laboratory personnel and includes, at a minimum, review of chain-of-custody forms, equipment calibration records and data completeness. Spot checks of raw data versus reported data are performed to review math accuracy, significant numbers and reporting units. In addition, certified laboratory standard quality assurance/quality control requirements or checklists are utilized to verify individual test methods such as blanks, standards, and for comparisons of internal lab test duplicate results. Problems with any of these items will be indicated in the analytical report presented to the agency.

4. Internal Quality Control

Per the laboratory QA/QC program, certified quality control samples from appropriate commercial sources or the US EPA, may be run periodically with sample batches. Internal quality control are addressed by disclosure of the laboratory's 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 are implemented by laboratories if the analytical or sampling methods do not achieve plan objectives or data verification identifies inconsistencies in the results. 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 as dictated by the specific situation encountered. Action levels are typically taken in accordance with any applicable standards from USEPA "Methods for the Chemical Analysis of Water and Wastes" or "Standard Methods for the Examination of Water and Wastewater". NCL 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

Reports of waste analysis to US EPA will contain a table summarizing the sampling date, units and analytical result for each of the parameters listed in table 2-1 of this document. Additionally, analytical results (i.e. data), including chain of custody forms, will be submitted to US EPA.

3.E Re-Characterization

NCL shall review the results of quarterly leachate analysis to ensure that injectate is sufficiently characterized. At the discretion of NCL, or at the written request of EPA, re-characterization efforts may be conducted should a significant change occur in the injectate composition based on quarterly analyses, or if necessitated or required by process changes or new regulations.

The waste stream will be re-characterized as deemed necessary by NCL if analyses shows a significant change in parameter concentration, particularly toxicity characteristic compound composition that might affect the non-hazardous nature of the waste. In this instance, sampling may be performed more frequently to obtain more representative

analysis of waste composition, to ensure that the overall composition of injectate is still non-hazardous. Any future revisions to the WAP, upon approval, will become part of the administrative record and constitute a minor modification of the permit upon submittal by NCL.