

OHIO ENVIRONMENTAL PROTECTION AGENCY

OHIO E.P.A.

DIVISION OF DRINKING AND GROUND WATERS

SEP -2 2008

STANDARD DIRECTOR'S JOURNAL

UNDERGROUND INJECTION CONTROL 5 X 25 PERMIT TO OPERATE:
CLASS V Experimental Technology Well

Ohio Permit No.: UIC 05-07-01-PTO-V
US EPA ID No.: N/A
API No.: 34-013-2-0586

Date of Issuance: September 2, 2008
Effective Date: September 3, 2008
Date of Expiration: December 31, 2009
(or until Part II (B) (3) of the PTO is satisfied)

Name of Applicant: FirstEnergy Generation Corporation
MRCSP - FEGENCO No. 1

Mailing Address: 76 South Main Street
Akron, Ohio 44308

Facility Location: R. E. Burger Plant
57246 Ferry Landing Road
Shadyside, Ohio 43947

County: Belmont **Township:** Mead

Section: Section 35

Latitude/Longitude: 39° 54' 45.73"N / 80° 45' 51.32"W

Injection Intervals: Oriskany Sandstone from 5923 to 5954 feet bgl;
Salina Formation from 6734 to 7048 feet bgl; and,
"Clinton" Sandstone from 8207 to 8274 feet bgl.

Injection Zone: Oriskany Sandstone through "Clinton" Sandstone from 5923 feet to 8274 feet bgl

Confining Zone: Ohio Shale, undifferentiated, and Onondaga Limestone from 1850 feet to 5923 feet bgl

By: John Lassiter Date: 9-2-08

Pursuant to the Underground Injection Control rules of the Ohio Environmental Protection Agency codified at Chapter 3745-34 of the Ohio Administrative Code, the applicant

(permittee) indicated above is hereby authorized to operate a Class V Experimental Technology injection well for injection of Carbon Dioxide (CO₂) as a supercritical fluid in the above referenced injection intervals at the above location. The applicant (permittee) must meet all restrictions set forth within this permit to operate.

All references to Chapter 3745-34 of the Ohio Administrative Code (OAC) are to all rules that are in effect on the date that this permit is effective. The following attachments are incorporated into this permit:

- A. Closure cost estimates & financial assurance;
- B. Source and analysis of injectate;
- C. Well construction;
- D. Operation, monitoring and reporting requirements;
- E. Contingent corrective action; and
- F. Quality assurance acknowledgment

This permit shall become effective on 09/02/08 and shall remain in full force and effect during the life of the permit, unless 1) the statutory provisions of Section 3004(f), (g) or (m) of the Resource Conservation and Recovery Act ban or otherwise condition the authorizations in this permit; 2) the Agency promulgates rules pursuant to these sections which withdraw or otherwise condition the authorization in this permit; or 3) this permit is otherwise revoked, terminated, modified or reissued pursuant to OAC Rules 3745-34-23 and 3745-34-24. Nothing in this permit shall be construed to relieve the permittee of any duties under applicable state and federal law or regulations.

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

A handwritten signature in black ink, appearing to read "Chris Korleski", is written over a horizontal line.

Chris Korleski, Director
Ohio Environmental Protection Agency

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ATTACHMENTS

- A. CLOSURE COST ESTIMATES & FINANCIAL ASSURANCE
- B. SOURCE AND ANALYSIS OF INJECTATE
- C. WELL CONSTRUCTION
- D. OPERATION, MONITORING AND REPORTING REQUIREMENTS
- E. CONTINGENT CORRECTIVE ACTION
- F. QUALITY ASSURANCE ACKNOWLEDGMENT

PART I

GENERAL PERMIT COMPLIANCE

A. EFFECT OF PERMIT

The permittee is authorized to engage in operation of a Class V 5X25 (experimental technology) underground injection well 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 (USDW). Any underground injection activity not specifically authorized in this permit is prohibited. Compliance with this permit during its term constitutes compliance for purposes of enforcement with Sections 6111.043 and 6111.044 of the Ohio Revised Code (ORC). Such compliance does not constitute a defense to any action brought under ORC Sections 6109.31, 6109.32 or 6109.33 or any other common or statutory law other than ORC Sections 6111.043 and 6111.044. 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. Nothing in this permit shall be constructed to relieve the permittee of any duties under applicable state and federal law, regulations, or permits.

B. PERMIT ACTIONS

1. Modification, Revocation, Reissuance and Termination. The Director may, for cause or upon request from the permittee, modify, revoke and reissue, or terminate this permit in accordance with OAC Rules 3745-34-07, 3745-34-23, and 3745-34-24. Also, the permit is subject to minor modifications for cause as specified in OAC Rule 3745-34-25. 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 conditions.
2. Transfer of Permits. This permit may be transferred to a new owner or operator only if it is modified, or revoked and reissued, pursuant to OAC Rule 3745-34-22(A), 3745-34-23 or 3745-34-24, as applicable.

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 any other circumstances and the remainder of this permit shall not be affected thereby.

D. CONFIDENTIALITY

In accordance with OAC Rule 3745-34-03 any information submitted to the Ohio 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 Ohio EPA may make the information available to the public without further notice. If a claim is asserted, documentation for the claim must be tendered and the validity of the claim will be assessed in accordance with the procedures in OAC Rule 3745-34-03. If the documentation for the claim of confidentiality is not received, the Ohio EPA may deny the claim without further inquiry. 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 receiving water and amounts or contents of the fluids injected.

E. DUTIES AND REQUIREMENTS

1. Duty to Comply. The permittee shall comply with all applicable UIC regulations and conditions of this permit, except to the extent and for the duration such noncompliance is authorized by an emergency permit issued in accordance with OAC Rule 3745-34-19. Any permit noncompliance constitutes a violation of ORC Chapter 6111 and is grounds for enforcement action, permit termination, revocation and reissuance, modification, or denial of a permit renewal application. Such noncompliance also may be grounds for enforcement action under other applicable state and federal law.
2. Penalties for Violations of Permit Conditions. Any person who violates a permit requirement is subject to injunctive relief, civil penalties, fines, and/or other enforcement action under ORC Chapter 6111. Any person who knowingly or recklessly violates permit conditions may be subject to criminal prosecution.
3. Need to Halt or Reduce Activity Not a Defense. It shall not be a defense, for a permittee in an enforcement action, that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit or any order issued by the Director or a court of appropriate jurisdiction.
4. Duty to Mitigate. The permittee shall take all reasonable steps to minimize or correct any adverse impact on the environment resulting from noncompliance with

this permit. This may include accelerated or additional monitoring or testing or both. If such is performed, the data collected shall be submitted to Ohio EPA in a written report within 90 days of completion of all related activities.

5. 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.
6. 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. To determine compliance with this permit, or to issue a new permit the permittee also shall furnish to the Director, upon request, copies of records required to be kept by this permit or applicable state or federal law.
7. 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 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 ORC Chapter 6111 and OAC Chapter 3745-34, any substances or parameters at any location.
8. Records.
 - a. The permittee shall retain copies of records of all monitoring information, including all calibration and maintenance records and all original recordings for continuous monitoring instrumentation and copies of all reports required by this permit for a period of at least three (3) years from the date of the sample, measurement or report, or for the duration of the permitted life of the well,

- whichever is longer. This period may be extended by the request of the Director.
- b. The permittee shall maintain copies of records of all data required to complete the permit application form for this permit and any supplemental information submitted under ORC Rule 3745-34-16 for a period of at least three (3) years from the date the application was signed or for the duration of the permitted life of the well, whichever is longer. This period may be extended by request of the Director.
 - c. The permittee shall retain copies of records concerning the nature and composition of all injected fluids for three (3) years after the completion of well closure which has been carried out in accordance with the approved closure plan.
 - d. The permittee shall continue to retain such copies of records after the retention period specified by paragraphs (a) to (c) above, unless he or she delivers the records to the Director or obtains written approval from the Director to discard the records. At least 90 days notice shall be provided prior to delivery of the records to the Director. The records shall be in a form acceptable to the Director.
 - e. Records of monitoring information shall include:
 - i. The date, exact place, and time of sampling or measurements;
 - ii. The name(s) of the individual(s) who performed the sampling or measurements;
 - iii. A precise description of both sampling methodology and the handling and custody of samples;
 - iv. The date(s) analyses or measurements were performed;
 - v. The name(s) of the individual(s) who performed the analyses or measurements and the laboratory that performed the analyses or measurements;
 - vi. The analytical techniques or methods used; and
 - vii. All results of such analyses.
10. Monitoring. Samples and measurements taken for the purpose of any required monitoring shall be representative of the monitored activity. The permittee shall perform all monitoring required by OAC Rule 3745-34-13 (E) and any other monitoring required by applicable rule or this permit. Monitoring results shall be reported in a format acceptable to the Director and as set forth in Part I (E)(12) of this permit.
- a. The method used to obtain a representative sample of any fluid to be analyzed and the procedure for analysis of the sample shall comply with the method cited and described in Table I of 40 CFR Part 136.3 and/or Appendix I and III of 40 CFR Part 261 or an equivalent method approved by the Administrator of the U.S. EPA .

- b. The monitoring information shall include conditions of quality assurance for each type of measurement required for reporting by the operator. Reference to established, published criteria shall be made whenever possible.

11. Signatory Requirements. All applications, reports or other information, required to be submitted by this permit, requested by the Director or submitted to the Director, shall be signed and certified in accordance with OAC Rule 3745-34-17. Within thirty (30) days of the effective date of this permit, the permittee shall designate the duly authorized representative for all submissions required under this permit, in written form to the Director, in compliance with OAC Rule 3745-34-17 (B).

12. Reporting Requirements.

- a. Planned Changes. The permittee shall give written notice to the Director, as soon as possible, of any planned physical alternations 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 in writing no later than thirty (30) days following each schedule date.
- d. Twenty-four (24) Hour Reporting.
 - i. The permittee shall report to the Director any noncompliance which may endanger health or the environment. All available information shall be provided orally within twenty-four (24) hours from the time the permittee becomes aware of such noncompliance. The following events shall be reported orally within twenty-four (24) hours:
 - 1. Any monitoring or other information which indicates that any contaminant may cause an endangerment to an underground source of drinking water; or
 - 2. Any noncompliance with a permit condition, or malfunction of the injection system, which may cause fluid migration into or between underground sources of drinking water;
 - 3. Any failure to maintain mechanical integrity; or
 - 4. Any release of carbon dioxide to the atmosphere.
 - ii A written submission also shall be provided within five (5) business days of the time the permittee becomes aware of instances of noncompliance . The written submission shall contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and

times; the anticipated time it is expected to continue; whether the noncompliance has or has not been corrected; 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 permit condition 12(d) (ii) above.
- 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 and corrected information in writing within ten (10) days.
- g. Monthly operating reports shall be submitted as required in Part II of this permit.
- h. Within thirty (30) days of receipt of this permit, the person designated as responsible for submission of reports pursuant to OAC Rule 3745-34-17 shall certify to the Director that he or she has read and is personally familiar with all terms and conditions of this permit. The Director shall be notified within ten (10) business days, in writing, if the designee or position is changed.

F. PLUGGING AND ABANDONMENT

1. Plan for Plugging and Abandonment. At least thirty (30) days before the well installed pursuant to this permit is taken out of service, the permittee shall submit a plan for the plugging and abandonment of the well per OAC Rule 3745-34-13(F) to the Ohio EPA. The required plan shall specify procedures and contain such other provisions as are necessary to ensure that no movement of fluids into an underground source of drinking water is allowed. After review and acceptance of this plan by Ohio EPA, that plan shall become a condition of this permit.
2. Temporary Disuse. A permittee who wishes to cease injection for longer than twelve (12) months may keep the well open only if the permittee:
 - a. Has received written authorization from the Director; and
 - b. Has submitted a plan to the Director, for approval, that the owner or operator will follow to ensure that the well will not endanger USDWs during the period of temporary disuse. These actions and procedures shall include compliance with the technical requirements applicable to active injection wells unless waived by the Director in writing.
3. Closure Report. The permittee shall submit a closure report to the Director within thirty (30) days after abandoning the well. The report shall be certified

as accurate by the permittee and by the person who performed the closure operation (if other than the owner or operator). Such report shall consist of the results of activities conducted by the permittee and either:

- a. A statement that the well was closed in accordance with the then effective Well Closure Plan; or
- b. Where actual closure differed from the then effective Well Closure Plan, a written statement specifying the differences between the plan and the actual closure.

4. Standards for Well Closure. Prior to closing the well, the permittee shall:

- a. Conduct appropriate mechanical integrity testing of the well 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 may include:
 - i. Pressure tests with liquid or gas;
 - ii. Radioactive tracer surveys;
 - iii. Noise, temperature, oxygen activation, pipe evaluation or cement bond logs;
 - iv. Any other test required by the Director.

5. Financial Responsibility for Closure. The owner or operator shall comply with closure financial assurance requirements of OAC Chapter 3745-34. The obligation to maintain financial responsibility for closure survives the termination of this permit or cessation of injection.

G. MECHANICAL INTEGRITY

1. Standards. Each injection well shall maintain mechanical integrity as defined by OAC Rule 3745-34-34. The Director or his authorized representative shall be present during the test for demonstration of mechanical integrity, unless the Director or his authorized representative waives this requirement before the test occurs.
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 OAC Rule 3745-34-34 (b)(2). This test shall be performed upon completion of the well prior to injection, prior to injection into each of the subsequent proposed injection intervals listed on the cover page of this permit, 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 or other approved log shall be run in accordance with OAC Rule 3745-34-34(C) prior to beginning injection and at completion of the experimental permit 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 Administrator of the U.S. EPA in accordance with the procedures in OAC Rule 3745-34-34(D).
3. Prior Notice and Report. The permittee shall notify the Director of intent to demonstrate mechanical integrity at least thirty (30) calendar days prior to such demonstration. For those tests required in Part I(G)(2) (a, b and c) above, the permittee shall submit the planned test procedures to the Director for approval at the time of notification. At the discretion of the Director a shorter time period may be allowed. Plans for pressure testing of the long string casing, injection tubing and annular seal shall specify the planned test pressure. Reports of mechanical integrity demonstrations which include well logs shall include an interpretation of results by a knowledgeable log analyst. Such reports shall be submitted in accordance with the reporting requirements established in Part II (D) of this permit.
 3. Gauges. The permittee shall calibrate all gauges used in mechanical integrity demonstrations to within one-half (0.5) percent of full scale prior to each required test of mechanical integrity or, barring any damage to the gauge, every six (6) months. A copy of the calibration certificate shall be submitted to the Director or his or her representative at the time of demonstration and every time the gauge is calibrated. The gauge shall be marked in no greater than five (5) psi increments.
 4. 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 OAC Rule 3745-34-34 is indicated 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.
 5. Mechanical Integrity Testing on Requires From Director. The permittee shall demonstrate mechanical integrity at any time upon written request from the Director.

H. FINANCIAL RESPONSIBILITY

1. Financial Responsibility. The permittee shall comply with the closure financial responsibility requirements of OAC Chapter 3745-34.
 - a. The permittee shall maintain written cost estimates, in current dollars, for the Closure Plan as specified in OAC Chapter 3745-34. The closure cost estimate shall equal the maximum cost of closure at any point in the life of the facility operation.
 - b. The permittee shall adjust the cost estimate of closure for inflation annually. This annually adjusted closure cost shall be submitted with the annual financial assurance to the Director in accordance with requirements set forth in OAC Rules 3745-55-42 as applicable.
 - c. The permittee shall revise the closure cost estimate whenever a change in the Closure Plan increases the cost of closure. The revised cost estimates shall be adjusted for inflation as specified above in condition I (1) (b).
 - d. If the revised closure estimates exceed the current amount of the financial assurance mechanism, the permittee shall submit a revised mechanism to cover the increased cost within thirty (30) business days after the revision specified in permit conditions I (1) (b) and (c) above.
 - e. The permittee shall keep on file at the facility a copy of the latest closure cost estimate prepared in accordance with OAC Rules 3745-34-09(B) (9) and 3745-34-62 during the operating life of the facility. Said estimate shall be available for inspection in accordance with the procedures in permit condition Part I (E) (8) (b) of this permit.
2. Insolvency. In the event of:
 - a. The bankruptcy of the trustee or issuing institution of the financial mechanism (not applicable to permittees using a financial statement); 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, the permittee shall notify the Director, in writing, within ten (10) business days.

The owner or operator shall establish other financial assurance or liability coverage acceptable to the Director, within sixty (60) days after such an event.

An owner or operator shall also notify the Director by certified mail of the commencement of voluntary or involuntary proceedings under Title 11 (Bankruptcy). U.S. Code naming the owner or operator as debtor, within ten (10) business days after the commencement of the proceeding. A guarantor of a

corporate guarantee shall make such a notification if named as debtor, as required under the terms of the guarantee.

I. CORRECTIVE ACTION

The permittee shall cease injection and shut-in the well if the permittee or Ohio EPA determines that continued operation thereof may be causing the upward migration of fluid through the well bore of any improperly closed or abandoned well within the area of review and shall take such steps necessary to close the well bore(s) to prevent the upward fluid movement. Any operation of the well which may cause the upward fluid migration from an improperly closed or abandoned well will be considered a violation of this permit.

PART II

WELL SPECIFIC CONDITIONS FOR CLASS V 5X25 EXPERIMENTAL TECHNOLOGY PERMIT

A. CONSTRUCTION

1. Siting. The injection well shall directly place injectate only into the injection intervals as defined on the cover page of this permit. At no time shall injection occur directly into any formation(s) above the injection intervals.
2. Casing and Cementing. Notwithstanding any other provisions of this permit, the permittee shall maintain casing and cement in the well in such a manner as to prevent the movement of fluids into or between underground sources of drinking water. The casing and cement used in the construction of the well at the time of permit issuance are shown in Attachment C of this permit. Notification of any planned changes shall be submitted by the permittee for the approval of the Director before installation.
3. Tubing and Packer Specifications. Injection shall take place only through approved tubing and packer set at a point immediately above or within one hundred (100) feet of the top perforation of the injection interval. Tubing and packer specifications shall be as represented in engineering drawings contained in Attachment C of this permit unless altered due to an Agency approved well workover. Notification of any planned changes shall be submitted by the permittee for the approval of the Director before installation.
4. Wellhead Specifications. A quarter-inch (1/4") female coupling shall be maintained on the wellhead, to be used for independent injection pressure readings.

B. OPERATIONS

1. Injection Interval. Injection shall be limited to the injection intervals identified on the cover page of this permit.
2. Injection Pressure Limitation. Injection pressure at the wellhead shall not exceed a maximum limitation which is specified in Attachment D of this permit and shall be calculated so as to assure that the pressure in the injection zone during injection does not initiate new fractures or propagate existing fractures in the injection zone. In no case shall injection pressure initiate fractures, or propagate existing fractures in the confining zone, or cause the movement of injection or formation fluids into an underground source of drinking water.

Bottom-hole pressure shall be limited so that the maximum bottom-hole pressure specified in Attachment D is never exceeded, calculated with a fracture gradient of 0.75 psi/foot. The injection pressure shall be limited so that a maximum surface injection pressure is not exceeded. The maximum surface injection pressure shall be adjusted downward if the fluid specific gravity increases above 0.94, in accordance with the calculation set forth in Attachment D of this permit. Regardless of the fluid specific gravity, a fracture gradient of 0.75 psi/ft shall not be exceeded under any circumstance.

3. Additional Injection Limitation. No substances other than those meeting the following limitations shall be injected. The permittee shall submit a certified statement attesting to compliance with this requirement upon expiration of the permit. The permittee shall limit injection to a maximum of 3,000 tons of carbon dioxide over the duration of this permit. The volume limit may be adjusted with the Director's approval.
4. Annulus Fluid and Pressure. Except during workovers, the annulus between the injection tubing and the long string casing shall be filled with an inert, non-reactive fluid. 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 shall be submitted by the permittee for the approval of the Director before replacement.
5. Annulus/Tubing Pressure Differential. The pressure on the annulus shall be at least fifty (50) psig higher than injection pressure at all times throughout the injection tubing length, for the purpose of leak detection.
6. Automatic Warning and Shut-Off System.
 - a. The permittee shall continuously operate and maintain an automatic warning and shut-off system which shall stop injection in the following situation:
 - I. Injection pressure measured at either the wellhead or bottom-hole pressure reaches the pressure limits specified in Attachment D of this permit.
 - II. When injection/annulus pressure differential falls below fifty (50) psig.
 - b. The permittee shall test the automatic warning and shut-off system at least once every twelfth month. This test must involve subjecting the system to simulated failure conditions and shall be witnessed by the Director or his or her representative. The permittee shall notify the Director of their intent to test the automatic warning and shut-off system at least thirty (30) calendar days prior to such a demonstration. At the discretion of the Director a shorter time period may be allowed. The permittee shall submit the planned automatic warning

and shut-off system test procedures to the Director for approval at the time of notification.

- c. If an automatic alarm or shutdown is triggered, the owner or operator shall investigate immediately and identify as expeditiously as possible the cause of the alarm to shutoff. If, upon such investigation, the well appears to be lacking mechanical integrity, or otherwise indicates that the well may be lacking mechanical integrity, the owner or operator shall:

- i. Immediately cease injection of waste fluids unless authorized by the Director to continue or resume injection; and
- ii. Take all necessary steps to determine the presence or absence of a leak; and,
- iii. Notify the Director within twenty-four hours after alarm or shutdown in accordance with Part I (E) (12) of this permit.

7. Precautions to Prevent Well Blowouts. The permittee shall, at all times, maintain a pressure at the wellhead which will prevent the return of the injection fluid to the surface. If there is gas formation in the injection zone near the well bore, such gas must be prevented from entering the casing or tubing. The well bore must be filled with a high specific gravity fluid during workovers to maintain a positive (downward) gradient and/or a plug shall be installed which can resist the pressure differential. A blowout preventer shall be kept in proper operational status during workovers.

The permittee shall follow the procedure below to assure that a backflow or blowout does not occur:

- a) Limit the temperature, pH or acidity of the injectate; and,
- b) Develop procedures necessary to assure that pressure imbalances do not occur.

C. MONITORING

1. Monitoring Requirements [OAC Rule 3745-34-38(B)]. Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity. The permittee shall perform all monitoring required by OAC Rule 3745-34-38 and any other monitoring required by applicable rule or this permit. The method used to obtain a representative sample of any fluid to be analyzed and the procedure for analysis of the sample shall be the one described in Appendix I and III of 40 CFR Part 261 or an equivalent method approved by the Director.
2. Injection Fluid Analysis (OAC Rule 3745-34-38). The injected fluids shall be analyzed no less frequently than quarterly for parameters which include, at a minimum, those listed below. A final list of parameters is included in the approved Waste Analysis Plan.

- | | |
|---------------------------------------|---------------------------------------|
| i. pH | vi. Carbon dioxide (CO ₂) |
| ii. Specific Gravity | vii. Particulate matter |
| iii. Temperature | viii. Fluoride |
| iv. Sulfur dioxide (SO ₂) | ix. Mercury |
| v. Nitrogen oxide (NO _x) | |

Results of the most recent analysis shall be submitted with each quarterly report. The report shall include statements demonstrating that the permittee is in compliance with the requirements of Part I (E) (10), Part II(C)(4) and Part II(D)(1) of this permit.

3. Waste Analysis Plan [OAC Rule 3745-34-57)].

- a. The permittee shall develop a written Waste Analysis Plan which describes the procedures which he or she will carry out to comply with permit conditions (C)(1) and (C)(2) above. A copy of the plan shall be kept at the facility and be available for inspection. The sampling and analyses shall be performed in a manner consistent with the Ohio EPA Quality Assurance Plan requirements. At a minimum, the plan must specify:
 - i. The parameters for which the waste will be analyzed and the rationale for the selection of these parameters;
 - ii. The test methods which will be used to test for these parameters; and
 - iii. The sampling method which will be used to obtain a representative sample of the waste to be analyzed, the frequency of sampling and analysis for each parameter.

The injectate sampling location shall be at the pumphouse associated with the well. The permittee shall identify the types of tests and methods used to generate the monitoring data. The monitoring program shall conform to the one described in an approved Waste Analysis Plan. The permittee shall abide by the Quality Assurance Form (Attachment F) of this permit. This form shall be completed and submitted to the Director within thirty (30) days of the effective date of this permit.

The permittee shall assure that the Waste Analysis Plan (WAP) remains accurate and the analyses of any fluid sampled remain representative.

- b. Should process or operating changes occur that may significantly alter the characteristics of the composite waste stream injected, the permittee shall again demonstrate to the satisfaction of the Director that the compatibility standards are met. Should the results of well testing or composite waste stream

(injectate) analyses, required by this permit or Chapter 3745-34 of the OAC, indicate that waste compatibility standards have not been adequately addressed, the Director may:

- i. Restrict certain incompatible wastes from being injected; or
 - ii. Require the permittee to make appropriate changes in well construction materials; or
 - iii. Require the permittee to conduct additional waste compatibility studies.
4. Continuous Monitoring and Recording Devices. Continuous monitoring and recording devices shall be maintained and operated to monitor surface injection pressure, flow rate, the pressure in the annulus between the tubing and the long string of casing, and the temperature of the injectate. Continuous monitoring devices shall be maintained and operated to monitor the injected volume and the specific gravity of the injectate. The total injected volume for the well shall be recorded at least daily.

D. REPORTING REQUIREMENTS [OAC Rules 3745-34-28 and 3745-34-38]

Specific reporting requirements of this permit in no way relieve the permittee of other applicable reporting requirements specified in any action of Ohio EPA or a court of appropriate authority.

1. Monthly Reports. The permittee shall submit monthly reports to the Director containing all of the information listed below and in format acceptable to the Director. The permittee shall refer to guidance prepared by Ohio EPA in development of monthly reports.
 - a. A summary containing a description of the following events:
 - i. Any non-compliance with conditions of the permit including but not limited to events that violate maximum or minimum limits for surface injection pressure, bottom-hole pressure or annulus/injection differential pressure. Report the date, the nature and cause of the non-compliance and the response taken;
 - ii. Any non-operating period. Report the date, duration and cause of the non-operating period;
 - iii. Any procedures conducted at the injection well other than routine procedures. Report the date and the reason for the non-routine operating procedures;
 - iv. Any annulus fluid addition to or removal from the annulus system. Report the date, the time and cause for the addition or removal, the volume of fluid added or removed and specify fluid addition or removal;

- v. Any periodic mechanical integrity testing. Report the date, the reason for the testing and the type of test(s);
 - vi. Any well workover. Report the date, the reason for the workover and the work completed;
 - vii. Any other testing of the injection well required by the Director. Report the date, the reason for testing and the type of test(s).
- b. A graph showing, in contrasting symbols or colors, for each day of the month:
- i. Maximum surface injection pressure;
 - ii. Maximum bottom-hole pressure;
 - iii. Minimum annulus/injection differential pressure.

The permitted maximum surface injection pressure and bottom-hole pressure and the permitted minimum annulus/injection differential pressure should be demarcated on the graph.

- c. A graph showing injectate temperature ($^{\circ}$ F), annular fluid volume (gallons) and sight glass level (inches) for each day of the month. Measurements for these three parameters shall be collected concurrently at a designated time each day. The data also shall be presented in tabular form.
 - d. Daily maximum, minimum and average injectate specific gravity.
 - e. The monthly maximum, minimum and average values for surface injection pressure, annulus pressure, flow rate in gallons per minute and volume. For each maximum and minimum flow rate reported, list the surface injection pressure and annulus pressure occurring during the time the well was operating at this maximum or minimum rate.
 - f. The total volume of fluid injected into this well for the month and to date.
 - g. The combined monthly average flow rate to be calculated as specified in Attachment D of this permit.
 - h. Results of injection fluid analyses, specified in Part II(C)(2) of the permit, completed during the month.
2. Quarterly Reports. The permittee shall report the results of injectate analyses as stipulated in Part II(C)(2)(b) of this permit within fifteen (15) days after the end of the quarter.
3. Reports on Well Tests and Workovers. Within 30 calendar days after the activity the permittee shall submit to the Director the field results of demonstrations of mechanical integrity, any well workover or results of other tests required by this permit. A formal written report and interpretation of demonstrations of mechanical integrity (excluding annulus pressure tests), any well workover, or results of other tests required by this permit or otherwise required by the Director shall be submitted to the Director within 45 calendar days after completion of the activity.

4. The Permittee shall submit all required reports to:

Ohio Environmental Protection Agency
Division of Drinking and Ground Waters
Underground Injection Control Unit
50 W. Town Street, Suite 700
P.O. Box 1049
Columbus, Ohio 43216-1049

5. The Permittee shall adhere to the reporting requirements specified in Attachment D and Part II of this permit for reporting under permit condition Part II(D) above.

FirstEnergy Generation Corp.
Akron, Ohio
FEGENCO No. 1

ATTACHMENT A

Closure Cost Estimate
& Financial Assurance

RECEIVED
DDAGW

May 5, 2008

2008 MAY -6 AM 8:47

Mr. Chuck Lowe
Division of Drinking and Ground Waters
Ohio EPA
Lazarus Government Center
122 South Front Street
Columbus, OH 43215

Re: Financial assurance documentation for R.E. Burger CO₂ Injection Test

Dear Mr. Lowe,

Please consider the attached documentation as demonstration of financial assurance for closure of the Class V UIC Well (FEGENCO well) proposed under the Midwest Regional Carbon Sequestration Partnership. The well is located at First Energy's R.E. Burger Plant in Shadyside, Ohio.

The documentation includes a copy of the Notice of Financial Award from the U.S. Department of Energy. Note that the award extends through September 30, 2009; we expect the injection test, pending a final permit, to be completed during calendar 2008.

Project closeout, including closure of well in accordance with UIC requirements is part of the project scope of work and is included in the awarded funding. We have estimated that closure costs will be \$75,000 to \$100,000 and include:

- No injection casing will be removed from the FEGENCO 1 well since it was cemented to surface.
- If well conditions suggest a need, inject brine to displace injected CO₂ away from the well. Remove all injection tubing and packers from the well.
- Install a Portland cement plug from the injection casing shoe to ground surface. Calculated volume, sacks of cement, and proposed cement interval are as follows:
 - Cement interval: 5 ft to 8,343 ft
 - Volume: 683 cubic feet
 - Sacks of cement: 580 sacks of Class A cement (15.6 ppg).
- Excavate a shallow hole around the wellhead. Cut off the wellhead and all casing at or slightly below ground surface and remove.
- Weld a steel plate across to top of the injection casing. This plate may be vented as needed or required by state inspector.
- Install an aboveground well location marker.
- The well site will be backfilled and the location restored as directed by First Energy.

Mr. Chuck Lowe, cont'd
May 5, 2008
Page two

We have also included a copy of the well diagram as currently constructed.

If you need any additional information, please feel free to contact me at 614/424-4901 or balld@battelle.org.

Sincerely,

A handwritten signature in cursive script that reads "David A. Ball". The signature is fluid and written in black ink.

David A. Ball
Program Manager
Energy Systems

NOTICE OF FINANCIAL ASSISTANCE AWARD

(7/05)
Under the authority of Public Law 95-91 DOE Organization Act, as amended by PL 109-58 Energy Policy Act 2005

1 PROJECT TITLE <u>Midwest Carbon Sequestration Regional Partnership (MCSR) - Phase II</u>	2 INSTRUMENT TYPE <input type="checkbox"/> GRANT <input checked="" type="checkbox"/> COOPERATIVE AGREEMENT															
3 RECIPIENT (Name, address, zip code) <u>Battelle Memorial Institute</u> <u>505 King Avenue</u> <u>Columbus, OH 43201-2696</u>	4 INSTRUMENT NO <u>DE-FC26-05NT42589</u>	5 AMENDMENT NO <u>A008</u>														
	6 BUDGET PERIOD (2 of 2) FROM <u>10/1/07</u> THRU <u>9/30/09</u>	7 PROJECT PERIOD FROM <u>10/1/05</u> THRU <u>9/30/09</u>														
8 RECIPIENT PROJECT DIRECTOR (Name, phone and E-mail) <u>David Ball</u> <u>ballid@battelle.org</u> <u>(614) 424-4901</u>	10 TYPE OF AWARD <input type="checkbox"/> NEW <input checked="" type="checkbox"/> CONTINUATION <input type="checkbox"/> RENEWAL <input type="checkbox"/> REVISION <input type="checkbox"/> INCREMENTAL FUNDING															
9 RECIPIENT BUSINESS OFFICER (Name, phone and E-mail) <u>Ules Jackson</u> <u>jacksonu@battelle.org</u> <u>(614) 424-5447</u>																
11 DOE PROJECT OFFICER (Name, address, phone and E-mail) <u>National Energy Technology Laboratory</u> <u>ATTN: Lynn Brickett</u> <u>Lynn.Brickett@netl.doe.gov</u> <u>626 Cochran's Mill Road, P. O. Box 10940</u> <u>Pittsburgh, PA 15236-0940</u> <u>(412) 386-6574</u>	12 ADMINISTERED FOR DOE BY (Name, address, phone and E-mail) <u>National Energy Technology Laboratory</u> <u>ATTN: Jane H. Weaver</u> <u>Jane.Weaver@netl.doe.gov</u> <u>626 Cochran's Mill Road, P. O. Box 10940</u> <u>Pittsburgh, PA 15236-0940</u> <u>(412) 386-4422</u> fax: <u>(412) 386-6137</u>															
13 RECIPIENT TYPE <input type="checkbox"/> STATE GOVT <input type="checkbox"/> INDIAN TRIBAL GOVT <input type="checkbox"/> HOSPITAL <input type="checkbox"/> FOR PROFIT ORGANIZATION <input type="checkbox"/> INDIVIDUAL <input type="checkbox"/> LOCAL GOVT <input type="checkbox"/> INSTITUTION OF HIGHER EDUCATION <input checked="" type="checkbox"/> OTHER NONPROFIT ORGANIZATION <input type="checkbox"/> CORPORATION <input type="checkbox"/> PARTNERSHIP <input type="checkbox"/> SOLE PROPRIETOR <input type="checkbox"/> OTHER (Specify) _____																
14 ACCOUNTING AND APPROPRIATIONS DATA <u>150 / 2007 / 31 / 220311 / 61000000 / 25500 / 1610251 / \$4,037,589</u>		15 EMPLOYER ID NUMBER a <u>TIN 31-4379427</u> b <u>DUNS 00-790-1598</u>														
16 BUDGET AND FUNDING INFORMATION <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="width:50%;">a CURRENT BUDGET PERIOD INFORMATION (Budget Period 2)</th> <th style="width:50%;">b CUMULATIVE DOE OBLIGATIONS</th> </tr> </thead> <tbody> <tr> <td>(1) DOE Funds Obligated This Action \$ <u>4,037,589.00</u></td> <td>(1) This Budget Period \$ <u>4,037,589.00</u> [Total of lines a (1) and a (3)]</td> </tr> <tr> <td>(2) DOE Funds Authorized for Carry Over \$ <u>274,091.00</u></td> <td>(2) Prior Budget Periods \$ <u>6,678,186.00</u></td> </tr> <tr> <td>(3) DOE Funds Previously Obligated in this Budget Period \$ <u>0.00</u></td> <td>(3) Project Period to Date \$ <u>10,715,775.00</u> [Total of lines b (1) and b (2)]</td> </tr> <tr> <td>(4) DOE Share of Total Approved Budget \$ <u>10,780,086.00</u></td> <td></td> </tr> <tr> <td>(5) Recipient Share of Total Approved Budget \$ <u>4,556,423.00</u></td> <td></td> </tr> <tr> <td>(6) Total Approved Budget \$ <u>15,336,509.00</u></td> <td></td> </tr> </tbody> </table>			a CURRENT BUDGET PERIOD INFORMATION (Budget Period 2)	b CUMULATIVE DOE OBLIGATIONS	(1) DOE Funds Obligated This Action \$ <u>4,037,589.00</u>	(1) This Budget Period \$ <u>4,037,589.00</u> [Total of lines a (1) and a (3)]	(2) DOE Funds Authorized for Carry Over \$ <u>274,091.00</u>	(2) Prior Budget Periods \$ <u>6,678,186.00</u>	(3) DOE Funds Previously Obligated in this Budget Period \$ <u>0.00</u>	(3) Project Period to Date \$ <u>10,715,775.00</u> [Total of lines b (1) and b (2)]	(4) DOE Share of Total Approved Budget \$ <u>10,780,086.00</u>		(5) Recipient Share of Total Approved Budget \$ <u>4,556,423.00</u>		(6) Total Approved Budget \$ <u>15,336,509.00</u>	
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17 TOTAL ESTIMATED COST OF PROJECT, INCLUDING DOE FUNDS TO FFRDC <u>\$23,745,399 (DOE \$17,458,272, Battelle \$6,287,127)</u> (This is the current estimated cost of the project. It is not a promise to award nor an authorization to expend funds in this amount.)																
18 AWARD AGREEMENT TERMS AND CONDITIONS This award/agreement consists of this form plus the following: a Special terms and conditions _____ (Date) _____ b Applicable program regulations (specify) _____ c DOE Assistance Regulations, 10 CFR Part 600 at http://ecfr.gpoaccess.gov or, if the award is a grant to a Federal Demonstration Partnership (FDP) institution, the FDP Terms & Conditions and the DOE FDP Agency Specific Requirements at http://www.nsf.gov/awards/managing/fed_dem_part.jsp d Application/proposal as approved by DOE e National Policy Assurances to Be incorporated as Award Terms in effect on date of award at http://grants.pr.doe.gov																
19 REMARKS <u>See attached pages.</u>																
20 EVIDENCE OF RECIPIENT ACCEPTANCE <u>Ules P. Jackson</u> <u>10/5/07</u> (Signature of Authorized Recipient Official) (Date) <u>ULES P. JACKSON</u> <u>CONTRACTING OFFICER</u> _____ (Title)	21 AWARDED BY <u>Martin J. Byrnes</u> <u>9/26/07</u> (Signature) (Date) <u>Martin J. Byrnes</u> (Name) <u>Contracting Officer</u> (Title)															

FirstEnergy Generation Corp.
Akron, Ohio
FEGENCO No. 1

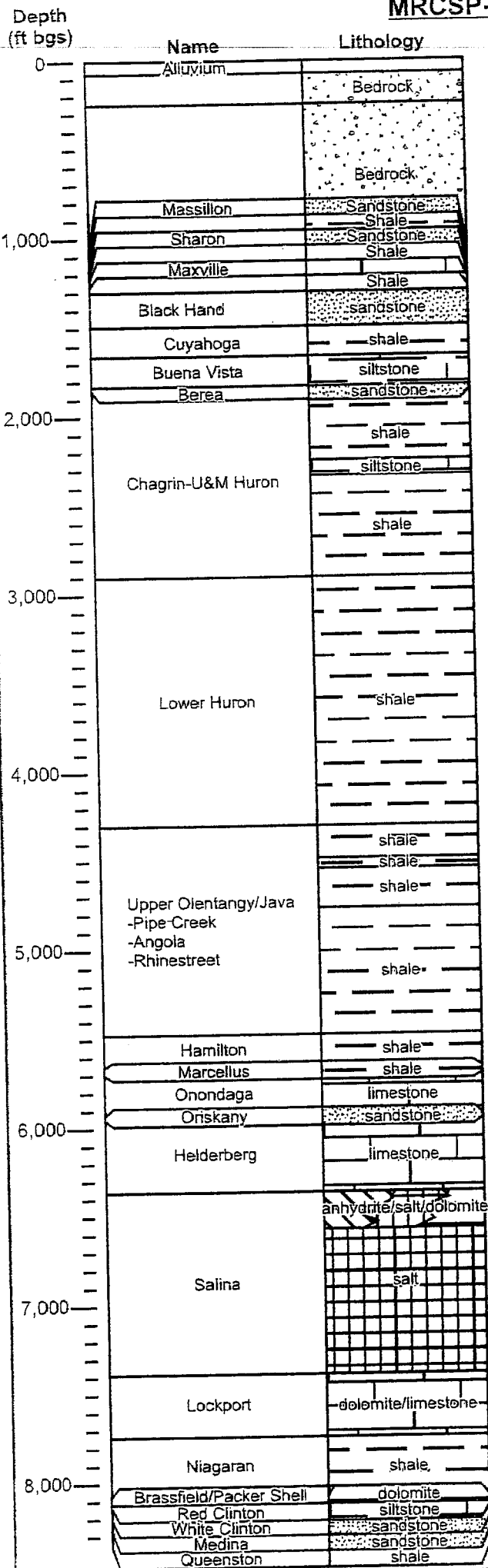
ATTACHMENT B

Source & Analysis of Injectate

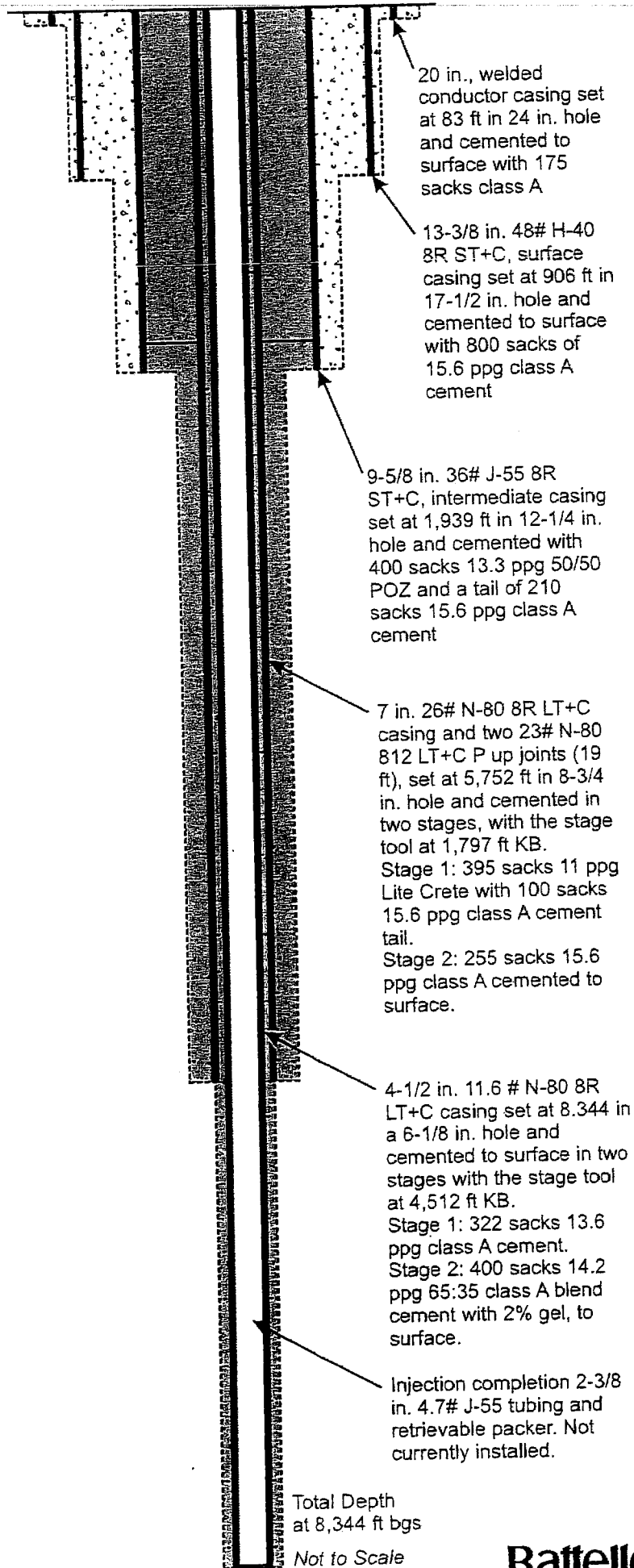
FirstEnergy Generation Corp.
Akron, Ohio
FEGENCO No. 1

ATTACHMENT C
WELL CONSTRUCTION

MRCSP-FEGENCO No. 1 Well



Current Well Installation



ATTACHMENT D

OPERATION, MONITORING AND REPORTING REQUIREMENTS

OPERATING, MONITORING AND REPORTING REQUIREMENTS

<u>Characteristic</u>	<u>LIMITATION</u> <u>Maximum</u>	<u>MINIMUM</u> <u>MONITORING</u> <u>REQUIREMENTS</u> <u>Frequency</u>	<u>MINIMUM</u> <u>REPORTING</u> <u>REQUIREMENTS</u> <u>Frequency</u>
* Injection Pressure	2006 psig (Oriskany) 2284 psig (Salina) 2790 psig (Clinton)	continuous	monthly
* Bottom-hole Pressure	4442 psig (Oriskany) 5050 psig (Salina) 6155 psig (Clinton)	continuous	monthly
** Injection Rate	99 gpm	continuous	monthly
*** Annulus Pressure		continuous	monthly
Differential Pressure (Tubing/Annulus)	50 psi minimum	continuous	monthly
+ Specific Gravity		continuous	monthly
Cumulative Volume		daily	monthly
Concurrent Measurements of:			
Annulus Sight Glass Level		daily	monthly
Annular Fluid Volume		daily	monthly
Injectate Temperature		daily	monthly
++ Chemical Composition of Injected Fluid		quarterly	quarterly

* Injection Pressure: The maximum allowable surface injection pressure (MASIP) shall be calculated using the following formula:

$$\text{MASIP} = \text{Depth} \times [0.75 - (0.433 \times (\text{SpG} + \text{Safety factor}))] - \text{friction factor}$$

Where:

0.75 = applied fracture gradient in psi/ft
0.05 = safety factor
25 = friction factor, using 2 3/8" O.D. tubing and proposed average injection rate (4.1 gpm)
0.89 = fluid specific gravity

Depth of the proposed Injection Zone(s) (top):

5923' = depth to the top of the Oriskany Fm. injection interval in feet;
6734' = depth to the top of the Salina Fm. injection interval in feet; or,
8207' = depth to the top of the Clinton Fm. injection interval in feet.

*Bottom-hole Pressure: The maximum allowable bottom-hole pressure (BHP_{max}) shall be calculated using the following formula:

$$BHP_{max} = (0.75) \times (\text{depth})$$

FirstEnergy proposes to inject approximately 1,000 tons of supercritical CO₂ into each injection zone. Each injection interval tested shall be limited to the maximum calculated injection pressures.

**Injection Rate: The monthly average injection rate shall not exceed 99 gallons per minute. The rate shall be calculated utilizing the total volume of fluid injected for a given month divided by the total number of minutes within that month.

***Annulus Pressure Requirement: The pressure on the annulus shall be maintained continuously at least 50 psi higher than the injection pressure throughout the entire length of the tubing.

+Specific Gravity: Specific gravity of the injectate shall be monitored continuously and the data recorded at a frequency approved by the Director. A daily maximum, minimum and average shall be reported monthly.

++Quarterly Waste Analysis: Chemical analysis of the injectate shall be conducted quarterly for, at a minimum, the waste constituents listed in Part II (C) (2) of this permit or in accordance with the Waste Analysis Plan approved by the Director.

1. Maximum Injection Pressure

- (a) Prior to injection in this well, the permittee shall determine if the maximum injection pressure as specified in Part II (B) and Attachment D of this permit allows sufficient operational flexibility. If sufficient flexibility is allowed by the maximum injection pressure, the permittee may opt not to proceed with additional testing and the requirements of Attachment D. 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 where testing is to be performed, the permittee shall submit a plan for the Director's approval which describes the detailed procedures to be followed during the test designed to determine maximum injection pressure. Modification of the maximum permitted injection pressure following a test conducted under Attachment D of this permit shall follow the procedures as specified in ORC Rule 3745-34-27(B).

(1) In-Situ Stress Tests

The permittee shall isolate zones for testing the fracture pressure by means of a straddle packer assembly, or other comparable means. The zones selected 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 Ohio EPA as specified in Part II (D) and Attachment D of this permit. Failure to report test results shall be considered grounds to deny a permit modification.

(2) Step Rate Test

The permittee shall isolate the entire injection interval 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 the length of each rate step constant. Each rate step shall span the same amount of time (at least thirty (30) minutes per rate step is recommended). The permittee shall attempt to inject at three (3) rates which result in a pressure higher than the injection zone fracture pressure during this test. All measured times, rates, and pressures and a Cartesian plot of the rate against the final stabilized pressure at each step shall be included as a part of the data package submitted to Ohio EPA. The results of this test shall be submitted to Ohio EPA as specified in Part II (D) and Attachment D of this permit. Failure to report the test results shall be considered grounds to deny a requested permit modification.

(3) Other Test(s) Approvable by the Director

The permittee may choose to conduct test(s) other than those described in Attachment D (1) and (2) 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).

(b) Reporting Maximum Injection Pressure Determination

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

2. Injection Fluid

The injectate is limited to CO₂, as a supercritical fluid, with the chemical composition indicated in Attachment B of this permit.

3. Special Completion and Operating Conditions for the "Clinton" Sandstone Injection Interval

- (a) Prior to perforating the "Clinton" Sandstone injection interval, the cement bond log shall be re-run with the protection casing pressurized to equal the cementing pressure. The cement bond log should be run over the entire casing length.
- (b) The injection rate shall be limited to a maximum rate of fifty (50) gallons per minute. The calculated maximum allowable surface injection pressure may not be exceeded at any time. The packer assembly should be placed within one hundred (100) feet of the top perforation and the tail pipe placed at the perforated interval.
- (c) At the conclusion of injection into the "Clinton" injection interval, a radio-active tracer or other approved test shall be run to demonstrate which zone(s) received the CO₂.
- (d) Upon conclusion of the demonstration project, a cement bond log shall be run to demonstrate cement integrity. Additional tests may be run to ascertain the casing integrity.

FirstEnergy Generation Corp.
Akron, Ohio
FEGENCO No. 1

ATTACHMENT E
CONTINGENT CORRECTIVE ACTION

ATTACHMENT E

CORRECTIVE ACTION

[OAC Rules 3745-34-07 and 3745-34-30]

A. Protection of USDW

Should upward fluid migration occur through the wellbore of any previously unknown, improperly plugged or unplugged well in the ¼ mile radius area of review due to injection of fluids in this well, injection will be shut-in until proper plugging can be accomplished. Any flowage from such undiscovered wells will be considered noncompliance with this permit. Should any problem develop in the casing of the injection well, the injection well shall be shut-in until such repairs can be made to remedy the situation.

B. Required Action

No corrective action is required at this time.

FirstEnergy Generation Corp.
Akron, Ohio
FEGENCO No. 1

ATTACHMENT F
QUALITY ASSURANCE ACKNOWLEDGMENT

ATTACHMENT F

Quality Assurance Acknowledgment

I hereby affirm that all chemical data submitted for Injection Well Permit Number UIC 05-07-01-PTO-V is of known quality and was obtained from samples using methods prescribed in the Ohio EPA Quality Assurance Plan and the "Waste Analysis Plan" developed. I also acknowledge the right of Ohio EPA to inspect the sampling protocols, calibration records, analytic records and methods, and relevant quality assurance and quality control information for the monitoring operations required by this permit or Chapter 3745-34 of the OAC.

Date

Authorized Agent Signature

For