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April 1, 2014

Ms. Christine Stora
Compliance Project Manager
California Energy Commission
1516 Ninth Street
Sacramento, CA 95814-5512

Subject: Lodi Energy Center Project (08-AFC-10C)
Petition to Amend #4

Dear Ms. Stora:

Attached please find the Northern California Power Agency's Amendment #4, Wastewater Discharge Permitting Request.

If you have any questions about this matter, please contact me at (916) 286-0249 or Mr. Jerry Salamy at (916) 286-0207.

Sincerely,

CH2M HILL

A handwritten signature in black ink, appearing to read "Sarah Madams".

Sarah Madams
AFC Project Manager

Attachment

cc: M. Debortoli, NCPA
V. Venethongkham, NCPA

Petition to Amend

Wastewater Discharge Permitting Request Amendment No. 4

CEC License for the
Lodi Energy Center
Lodi, California
(08-AFC-10)

Submitted to
California Energy Commission

Submitted by
Northern California Power Agency

With Technical Assistance by



April 2014

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Acronyms and Abbreviations

AFC	application for certification
CCR	California Code of Regulations
CEC	California Energy Commission
EPA	U.S. Environmental Protection Agency
LEC	Lodi Energy Center
LORS	laws, ordinances, regulations, and standards
MW	megawatt(s)
NCPA	Northern California Power Agency
STIG	STIG Combustion Turbine Project #2
WPCF	Water Pollution Control Facility

Executive Summary

Northern California Power Agency (NCPA) petitions the California Energy Commission (CEC) to amend the certification for Lodi Energy Center (LEC) (08-AFC-10). This Petition to Amend is intended to address a minor wastewater discharge permitting issue associated with the wastewater underground injection wells and discharge process associated with the facility. Specifically, based on the results of a facility inspection conducted by the U.S. Environmental Protection Agency (EPA) in July 2013 of the City of Lodi's (City) White Slough Water Pollution Control Facility (WPCF), the LEC is being required to submit a Wastewater Discharge Permit Application to the City for discharge into the WPCF (see Appendix A).

The existing NCPA site in Lodi, California, currently encompasses two separate power plant facilities. The most recent power project, the LEC (08-AFC-10), was permitted by the CEC in early 2010, and became operational in late 2012. This facility consists of a natural-gas-fired, combined-cycle arrangement capable of generating a nominal 296 megawatts (MW) of power. The second power project, referred to as the STIG Combustion Turbine Project #2 (STIG), consists of an approximate 49 MW gas turbine with a heat recovery steam generator. STIG was commissioned in 1995 and, for the life of that project, has had an approved wastewater discharge permit to the City's WPCF, in addition to an EPA Class 1 nonhazardous UIC (underground injection control) permit for discharge into an injection well.

When the LEC was licensed by the CEC in 2010, its application for certification (AFC) assumed that all wastewater generated by the project would be discharged to its own, new injection wells, with no direct connection to the City WPCF. As such, no LEC wastewater was contemplated to be sent to the WPCF, therefore, a wastewater discharge permit was not obtained from the City. The subsequent UIC permitting process for the two new LEC nonhazardous injection wells occurred at the same time renewal was required for the STIG injection well, therefore, the newer LEC UIC application was filed with the EPA as a joint permit with STIG's expired permit. (To date, LEC has only constructed one of the two new wells that were permitted, holding the second "on reserve.")

In October 2009, NCPA received approval from the EPA for three injection wells on the STIG/LEC plant site (see Appendix B). These include the one existing STIG well (STIG-1), and the two new additional wells, known as LEC-1 and LEC-2. Additionally the EPA approved the discharge of wastewater from either power plant to any of the three injection wells. To date LEC has constructed one new well for use (LEC-1), with the third well (LEC-2) "on reserve". During construction of the LEC, a cross-connect between the LEC wastewater tank and the STIG wastewater tank was established (see Figure 1). This resulted in a "connection" between the LEC and the City WPCF that was not originally discussed in the CEC's license.

In July 2013, the City's WPCF underwent a compliance audit by EPA. One finding from the audit was that the LEC constituted a potential waste stream into the City's facility that was not authorized by permit, by virtue of the cross-connect between the LEC and STIG wastewater discharge systems. It was determined that because the LEC wastewater tank has a connection to the STIG-1 injection well and to the City's WPCF, there exists a possibility for the STIG waste stream to comeingle with LEC's waste stream, whereby some of LEC water might make its way back to the City. It is worth noting that no LEC wastewater is planned for discharge to the City's WPCF, all wastewater is intended for the injection wells. LEC's connection to the STIG was for emergency use of the injection well, and the connection by extension the City, was unintentional.

Therefore, based on the EPA's 2013 audit of the WPCF, in order to ensure that the City was aware of this potential "comingled" waste stream, and the associated water quality and water volume discharge issues, the City has been required to issue a discharge permit to the LEC for this potential "comingled" waste stream. The result is that the LEC has prepared an application permit to discharge wastewater to the City's WPCF.

Additionally, based on the LEC's conversations with the CEC, the LEC has prepared this Petition to Amend to the CEC to "memorialize" this existing condition. It is important to note that this Petition is essentially administrative in nature, and does not result in any equipment modifications or changes to the Conditions of Certification for the LEC.

Introduction

1.1 Overview of Modifications

Northern California Power Agency (NCPA) petitions the California Energy Commission (CEC) to amend the certification for Lodi Energy Center (LEC) (08-AFC-10). This Petition to Amend is intended to address a minor wastewater discharge permitting issue associated with the wastewater underground injection wells and discharge process associated with the facility. The Application for Certification (AFC) for this project was filed on September 10, 2008, and CEC Certification was granted on April 21, 2010, as the Lodi Energy Center. The LEC began commercial operation in November 2012.

The LEC is located on 4.4 acres of land owned and incorporated by the City of Lodi (City), 6 miles west of the Lodi city center, located near Interstate 5 approximately 1.7 miles south of State Route 12. On the east side of the site is the City's White Slough Water Pollution Control Facility (WPCF). The WPCF's treatment and holding ponds are located to the north; the existing STIG generating plant (49-MW NCPA Combustion Turbine Project #2) is located to the west, and the San Joaquin County Mosquito and Vector Control facility is to the south. The LEC is located near the city of Stockton, which is approximately 2 miles south.

This Petition to Amend (Petition) does not propose any new equipment modifications to the LEC facility, nor any resulting changes to any of the Condition of Certification language contained in the original AFC license. This Petition has been prepared at the recommendation of the CEC, based on recommendations from an U.S. Environmental Protection Agency (EPA) audit of the City's WPCF.

1.1.1 Equipment Modifications

No equipment modifications are proposed in this Petition.

1.2 Information Requirements for the Post-certification Amendment

This Petition contains all of the information that is required pursuant to the CEC's Siting Regulations (California Code of Regulations [CCR] Title 20, Section 1769, Post Certification Amendments and Changes). The information necessary to fulfill the requirements of Section 1769 is contained in Sections 1.0 through 6.0, as summarized in Table 1.

TABLE 1
Informational Requirements for Post-Certification Modifications

Section 1769 Requirement	Section of Petition Fulfilling Requirement
(A) A complete description of the proposed modifications, including new language for any conditions that will be affected	Section 2.0—Proposed modifications Sections 3.1 to 3.15—Proposed changes to Conditions of Certification, if necessary, are located at the end of the technical section
(B) A discussion of the necessity for the proposed modifications	Section 1.3
(C) If the modification is based on information that was known by the petitioner during the certification proceeding, an explanation why the issue was not raised at that time	Section 1.3
(D) If the modification is based on new information that changes or undermines the assumptions, rationale, findings, or other bases of the final decision, an explanation of why the change should be permitted	Sections 1.4, 3.0

TABLE 1
Informational Requirements for Post-Certification Modifications

Section 1769 Requirement	Section of Petition Fulfilling Requirement
(E) An analysis of the impacts the modification may have on the environment and proposed measures to mitigate any significant adverse impacts	Section 3.0
(F) A discussion of the impact of the modification on the facility's ability to comply with applicable laws, ordinances, regulations, and standards;	Section 3.15
(G) A discussion of how the modification affects the public	Section 4.0
(H) A list of property owners potentially affected by the modification	Section 5.0
(I) A discussion of the potential effect on nearby property owners, the public and the parties in the application proceedings.	Section 6.0

1.3 Ownership of the Facility Property

NCPA owns and operates the LEC, which is located on land owned and incorporated by the City of Lodi.

1.4 Necessity of Proposed Changes

The Siting Regulations require a discussion of the necessity for the proposed revision to the LEC certification and whether the modification is based on information known by the petitioner during the certification proceeding (Title 20, CCR, Sections 1769 [a][1][B] and [C]).

This Petition to Amend is intended to address a minor wastewater discharge permitting issue associated with the wastewater injection wells and discharge process associated with the facility. Specifically, based on the results of a facility inspection conducted by the EPA in July 2013 of the City of Lodi's White Slough WPCF, the LEC is being required to submit an additional Wastewater Discharge Permit Application to the City for discharge into the WPCF.

1.5 Consistency of Changes with Certification

The Siting Regulations also require a discussion of the consistency of the proposed project revision with the applicable laws, ordinances, regulations, and standards (LORS) and whether the modifications are based on new information that changes or undermines the assumptions, rationale, findings, or other basis of the final decision (Title 20, CCR Section 1769 [a][1][D]). If the project is no longer consistent with the certification, the Petition to Amend must provide an explanation why the modification should be permitted.

The proposed project revisions are consistent with the purpose of the project and applicable LORS as described in the Commission Decision. This Petition to Amend is not based on new information that changes or undermines any basis for the Final Decision. The findings and conclusions contained in the Commission Decision for LEC (CEC, 2010) and subsequent license amendments, are still applicable to the project, as modified.

1.6 Summary of Environmental Impacts

The CEC Siting Regulations require that an analysis be conducted to address the potential impacts the proposed modifications may have on the environment, and proposed measures to mitigate any potentially significant adverse impacts (Title 20, CCR, Section 1769 [a][1][E]). The regulations also require a discussion of the impact of the modification on the facility's ability to comply with applicable LORS (Section 1769

[1][a][F]). Section 3.0 of this Petition includes a discussion of the potential environmental impacts associated with the modifications, as well as a discussion of the consistency of the modification with LORS. Section 3.0 also includes updated environmental baseline information if changes have occurred since the AFC that would have a bearing on the environmental analysis of the Petition. Section 3.0 concludes that there will be no significant environmental impacts associated with implementing the actions specified in the Petition and that the project as modified will comply with all applicable LORS.

1.7 Conditions of Certification

LEC requests no changes to the Conditions of Certification set forth in the 2010 certification.

1.8 References

California Energy Commission (CEC). 2010. *Energy Commission Decision, Application for Certification for the Lodi Energy Center, Docket Number 08-AFC-10*. California Energy Commission, Sacramento, California. April.

Northern California Power Agency. 2008. *Application for Certification for Lodi Energy Center Power Plant Project*. Submitted by Northern California Power Agency, Lodi, California. Submitted to California Energy Commission, Sacramento, California. September.

LEC / STIG WASTEWATER FLOW DIAGRAM

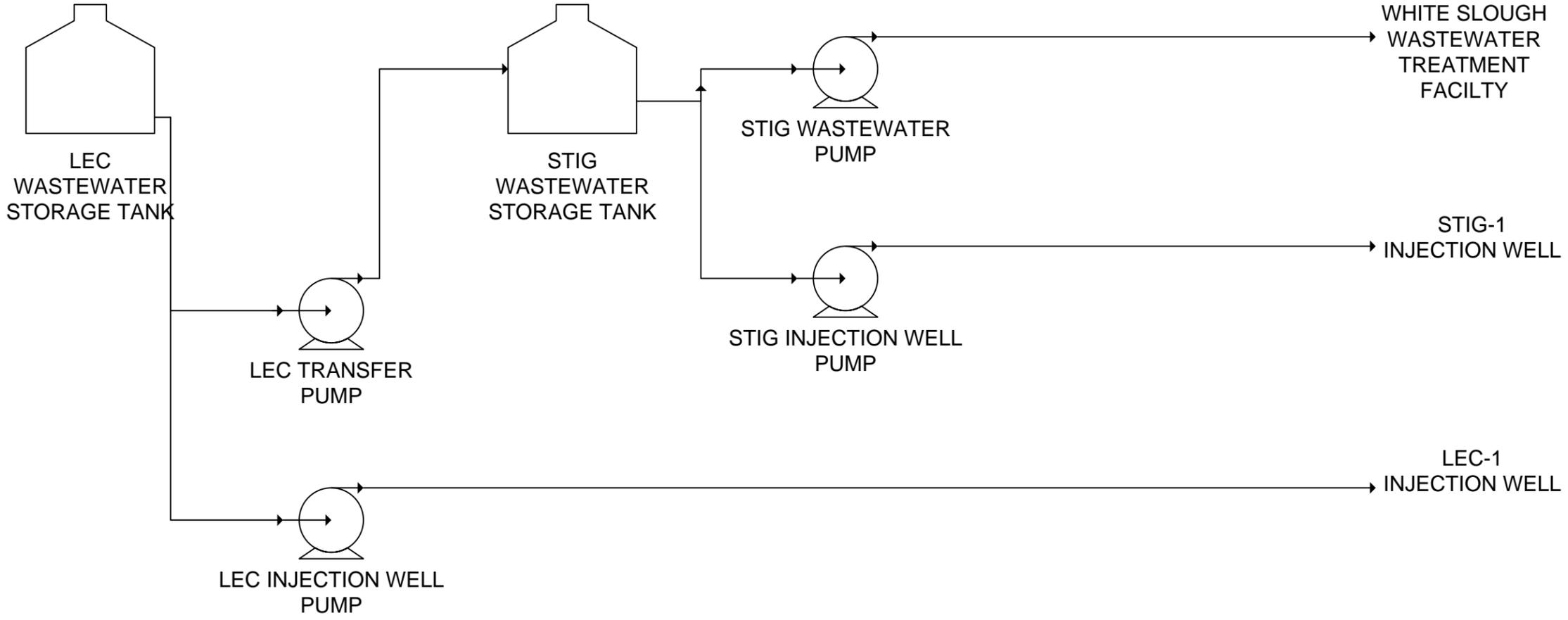


FIGURE 1
LEC/STIG Wastewater Flow Diagram
Lodi Energy Center Petition to Amend No. 4

SECTION 2.0

Description of Project Modifications

This section includes a description of the proposed project modifications, consistent with CEC Siting Regulations (Title 20, CCR, Section 1769 [a][1][A]). The project changes will not include any equipment or interconnection modifications.

2.1 Equipment Modifications

The project changes will not include any equipment or interconnection modifications.

SECTION 3.0

Environmental Analysis of Proposed Project Modifications

The following applicable sections provide environmental analyses for each environmental discipline area that may be affected by the proposed Petition, and address:

- Significant changes to the project area environmental baseline if these changes have taken place since the certification was granted and have a bearing on the environmental impact analyses for the amended facility;
- Significant changes to environmental impacts of the facility that are a result of the equipment modifications or new generator tie-line and substation.

This proposed Petition is limited to necessary, additional local and federal permitting associated with a potential wastewater discharge from the facility. No changes in equipment or the Conditions of Certification are proposed. A discussion of issues related to Soil and Water Resources is included below in Section 3.1.

The environmental analysis for all of the remaining environmental disciplines listed below does not differ from that described in the AFC, and the impacts associated with this Petition would be less than significant. The environmental analysis for the following environmental disciplines would not differ from the AFC:

- Air Quality
- Biological Resources
- Cultural Resources
- Geology and Paleontology
- Hazardous Materials Management
- Land Use
- Noise and Vibration
- Public Health
- Socioeconomics
- Traffic and Transportation
- Visual Resources
- Waste Management
- Worker Safety and Fire Protection

3.1 Soil and Water Resources

The effects of additional local and federal permitting necessary to reflect the operation of the existing wastewater cross-connection between the LEC and STIG facilities would not cause impacts beyond those considered in the Commission Decision.

3.1.1 Environmental Baseline Information

Soil and water resources associated with the LEC site were described in the AFC. The issuance of a City of Lodi wastewater discharge permit would not result in any physical changes to the site. Although the permit would allow discharge into the City of Lodi wastewater system, changes to LEC operations are not expected—LEC wastewater would continue to be discharged to the injection wells. If discharges to the wastewater system occur due to the cross connection, all City of Lodi industrial discharge requirements (Lodi Municipal Code, Chapter 13.12) would be met.

3.1.2 Environmental Consequences

It is anticipated that the environmental consequences, and therefore mitigation measures, identified in the original AFC will remain the same. No additional project impacts beyond those described in the AFC for the LEC would result from the additional project permitting.

3.1.3 Mitigation Measures

No additional or modified mitigation measures will be required as a result of this Petition.

3.1.4 Consistency with LORS

The operation of LEC, as amended, will conform with all applicable LORS related to soil and water resources.

3.1.5 Conditions of Certification

LEC does not request any changes to the soil and water resources Conditions of Certification as a result of this Petition.

3.2 LORS

The Commission Decision certifying LEC concluded that the project is in compliance with all applicable LORS. LEC, as amended, will continue to comply with all applicable LORS.

SECTION 4.0

Potential Effects on the Public

This section discusses the potential effects on the public that may result from the modifications proposed in this Petition to Amend application, pursuant to CEC Siting Regulations (Title 20, CCR, Section 1769[a][1][G]).

Changes to the project permitting will result in no greater impacts on the public and property owners than those analyzed during project licensing, resulting in no effect on the public and property owners beyond what was originally approved by the CEC.

Therefore, impacts on the public and property owners are expected to be the same as those analyzed during the license proceeding for the project.

SECTION 5.0

List of Property Owners

The list of property owners within 1,000 feet of the proposed project provided in the AFC has not changed as a result of the wastewater interconnection. Therefore, the list of property owners within 1,000 feet of the proposed project is incorporated by reference from the AFC.¹

¹ CEC Siting Regulations Section 1769(a)(1)(H).

SECTION 6.0

Potential Effects on Property Owners

This section addresses potential effects of the project changes proposed in this Petition to Amend on nearby property owners, the public, and parties in the application proceeding, pursuant to CEC Siting Regulations (Title 20, CCR, Section 1769 [a][1][1]).

The project, as modified, will not differ in potential effects on adjacent land owners, compared with the project as previously proposed. The project, therefore, would have no adverse effects on nearby property owners, the public, or other parties in the application proceeding.

Appendix A
City of Lodi, Public Works Department
Wastewater Discharge Permit

CITY COUNCIL
JOANNE MOUNCE,
Mayor
ALAN NAKANISHI,
Mayor Pro Tempore
LARRY D. HANSEN
BOB JOHNSON
PHIL KATZAKIAN

CITY OF LODI

MUNICIPAL SERVICE CENTER
1331 SOUTH HAM LANE
P.O. BOX 3006
LODI, CALIFORNIA 95241-1910
(209) 333-6740
FAX (209) 333-6841
EMAIL pwdept@lodi.gov
<http://www.lodi.gov>

KONRADT BARTLAM,
City Manager

RANDI JOHL,
City Clerk

D. STEPHEN SCHWABAUER,
City Attorney

F. WALLY SANDELIN,
Public Works Director

February 22, 2012

Northern California Power Agency CT-2
Attention: Mr. Vinnie Venethongkhan
P.O. Box 1478
Lodi, Ca 95241

SUBJECT: Approval of 2012-2014 Wastewater Discharge Permit

Enclosed please find a copy of an approved Wastewater Discharge Permit. This permit will be valid through February 28, 2014. Please make note of special conditions on page four.

Your firm will need to apply for renewal on or before December 28, 2013.

Thank you for your cooperation. If you have any questions, please contact Mr. Brian Bock at (209) 333-6749.

Sincerely,



Michael Schafer
Laboratory/Environmental Compliance Superintendent

MS/sm

Enclosure



CITY OF LODI
WASTEWATER DISCHARGE PERMIT

NUMBER 482

In accordance with the provisions of the City of Lodi Municipal Code, Chapter 13.12,

Name: Northern California Power Agency CT-2

Location: 12745 North Thornton Road
Lodi, CA 95242

has submitted a wastewater discharge permit application and is hereby authorized to discharge industrial wastewater from the above identified facility into the City of Lodi White Slough Water Pollution Control Facility in accordance with the effluent limitations, monitoring requirements, and other conditions set forth in this permit.

All discharges authorized herein shall be consistent with the terms and conditions of this permit. The discharge of any pollutant identified in this permit more frequently than or at a level in excess of that authorized shall constitute a violation of the permit. Any significant changes effecting wastewater discharge quantity or strength must be reported in advance of discharging and written approval by the City received.

This permit shall not be assigned, transferred or sold to a new owner, new user, different premises or new or changed operation without prior written approval of the Public Works Director.

This permit shall become effective on February 29, 2012,

and shall expire at midnight on February 28, 2014.

The permittee shall not discharge after the date of expiration. If the permittee wishes to continue to discharge after this expiration date an application must be filed 60 days before the expiration date for reissuance of this permit in accordance with the requirements of City of Lodi Municipal Code, Chapter 13.12.

Renewal must be applied for on or before December 28, 2013.



F. Wally Sandelin
Public Works Director

Issued this 22 day of February, 2012

PART 1 - EFFLUENT LIMITATIONS

A. During the duration of this permit the discharge from the outfall(s) indicated in Section 3.1 of the permit application, Building Layout, shall not exceed the following effluent limitations. In addition, the discharge shall comply with all other applicable regulations and standards contained in City of Lodi Municipal Code, Chapter 13.12.

EFFLUENT LIMITATIONS

Outfall(s) to WSWPCF (See Appendix A).

<u>Parameter</u>	<u>Daily maximum (mg/L)</u>
Arsenic	2.5 ₁
Cadmium	0.5 ₁
Chromium, total	29.1
Copper	3.0 ₁
Cyanide, total	1.4 ₁
Lead	4.0 ₁
Mercury	0.8 ₁
Nickel	13.1
Silver	2.9 ₁
Zinc	3.5 ₁

Discharges containing concentrations of tetrachloroethylene (PCE) or trichloroethylene (TCE) exceeding five micrograms per liter for any grab sample are prohibited.¹

1. Lodi Municipal Code, Chapter 13.12.030.

The pH shall not be less than 6.5 standard units nor greater than 8.5 standard units.

PART 2 - MONITORING REQUIREMENTS

A. While this permit is in effect the permittee shall monitor outfall(s) to WSWPCF (See Appendix A) for the following.

<u>Parameter</u>	<u>Sample Location</u>	<u>Measurement Frequency</u>	<u>Sample Type</u>
Flow	Influent from clarifiers	Daily	Continuous
Flow	Effluent to City*****	Daily	Continuous
pH	Effluent to City*****	Daily	Continuous
Temperature	Effluent to City*****	Daily	Continuous
Conductivity	Effluent to City*****	Daily	Continuous
BOD	Effluent to City*****	Quarterly	24 hour composite****
Suspended Solids	Effluent to City*****	Quarterly	24 hour composite****
TDS*	Effluent to City*****	Quarterly	24 hour composite****
Metals**	Effluent to City*****	Yearly	24 hour composite****
TTO's***	Effluent to City*****	Yearly	Grab

* TDS to be total dissolved solids at 180° C.

** Metals to include arsenic, cadmium, copper, chromium, lead, molybdenum, nickel, zinc and mercury.

*** TTO's to be total toxic organics by EPA methods 624 and 625 (See Appendix B).

**** A Grab sample may be taken in lieu of a composite sample as long as the wastewater tank has not been discharged 24 hours prior to sampling.

*****effluent to WSWPCF (See Appendix A).

(Continued on next page)

MONITORING REQUIREMENTS (Continued)

B. The City must be notified and re-sampling is required within 24 hours of noticing any slug load, spill or effluent violations to the sewer system. Results from re-sampling must be submitted to the City of Lodi within 30 days of the slug load, spill or effluent violation.

C. All handling and preservation of collected samples and laboratory analyses of samples shall be performed in accordance with 40 CFR Part 136 and amendments thereto by a State certified laboratory unless specified otherwise in the monitoring conditions of the permit.

PART 3 - REPORTING REQUIREMENTS

A. Monitoring Reports

1. All monitoring and sampling results shall be reported to the City. The report should indicate the nature and concentration of all pollutants in the effluent which are regulated by the limits set forth in Part 1 A. Reports shall include a copy of all laboratory analysis reports, a summary of any violations of provisions in this permit, and a summary of other monitoring activities (such as pH and flow monitoring).

2. All wastewater user reports must be signed by an authorized representative of the user and contain the following certification statement:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

3. If the permittee monitors any pollutant more frequently than required by this permit, using test procedures approved under 40 CFR Part 136 or as specified in this permit, the results of such monitoring shall be included in the calculations and results shall be reported in the monitoring report and submitted to the City of Lodi.

4. All monitoring reports are due 30 days after the conclusion of monitoring or receipt of the laboratory analysis report and shall be sent to the Deputy Public Works Director-Utilities at 1331 S. Ham Lane, Lodi, CA 95242.

5. All records must remain available for a period of at least three years per 40 CFR 403.12(0).

B. Accidental Discharge Report

1. The permittee shall notify the White Slough Water Pollution Control Facilities (WSWPCF) personnel immediately upon the occurrence of an accidental discharge of substances prohibited by City of Lodi Municipal Code, Chapter 13.12. During the hours of 7:00 a.m. to 11:00 p.m. WSWPCF personnel should be notified by telephone at 333-6749. At all other times, the City of Lodi alarm service, Bay Alarm Company, should be notified by telephone at 333-1231 to contact the on call operator. The notification shall include the location of discharge, date and time thereof, type of waste, including approximate concentration and volume, and corrective actions taken. Within ten days following an accidental discharge, the permittee shall submit to the City of Lodi a detailed written report. The report shall specify the following:

(Continued on next page)

REPORTING REQUIREMENTS (Continued)

- a. Description and cause of the upset, slug or accidental discharge and the impact on the permittee's compliance status. The description should also include location of discharge, type, concentration and volume of waste.
- b. Duration of noncompliance, including exact dates and times of noncompliance, and if the noncompliance continues, the time by which compliance is reasonably expected to occur.
- c. All measures taken or to be taken to reduce, eliminate, and prevent recurrence of such an upset, slug, accidental discharge, or other conditions of noncompliance.
- d. All accidental discharge reports shall be submitted to the City of Lodi, Public Works Director, 221 W. Pine Street, Lodi, CA 95240.

PART 4 - REOPENER CLAUSE

- A. This permit may be reopened and modified to incorporate any new or revised requirements resulting from the City of Lodi's reevaluation of its local limits.
- B. This permit may be reopened and modified to incorporate any new or revised requirements developed by the City of Lodi as are necessary to ensure POTW compliance with any new federal, state, or local regulations promulgated.

PART 5 - COMPLIANCE SCHEDULE

Not Applicable.

PART 6 - SPECIAL CONDITIONS

- A. The City will supply well water to the facility for use in sinks, toilets, eyewashes and hosebibs with the agreement that at such time the City decides to replace the existing well that NCPA will share the cost of the replacement well including the cost of associated additional piping. All fixtures shall be posted with signs stating that the water is not designated for consumption.
- B. A minimum of 20% of all wastewater on a yearly basis must be injected with the deep well injection system.
- C. Operate and maintain a wastewater sampler, temperature recording, pH monitoring and flow monitoring equipment. Submit annual certification of calibration of flow and pH monitoring and temperature recording equipment.
- D. Submit monthly summaries of the following:
 1. Flow to NCPA from secondary clarifiers.
 2. Flow to WSWPCF.
 3. pH of flow to WSWPCF.
 4. Temperature of flow to WSWPCF.
 5. Injection Well Summary.
- E. Oil/water separator on storm drain system must be maintained to operate at maximum efficiency.

PART 7 - APPLICABLE PENALTIES

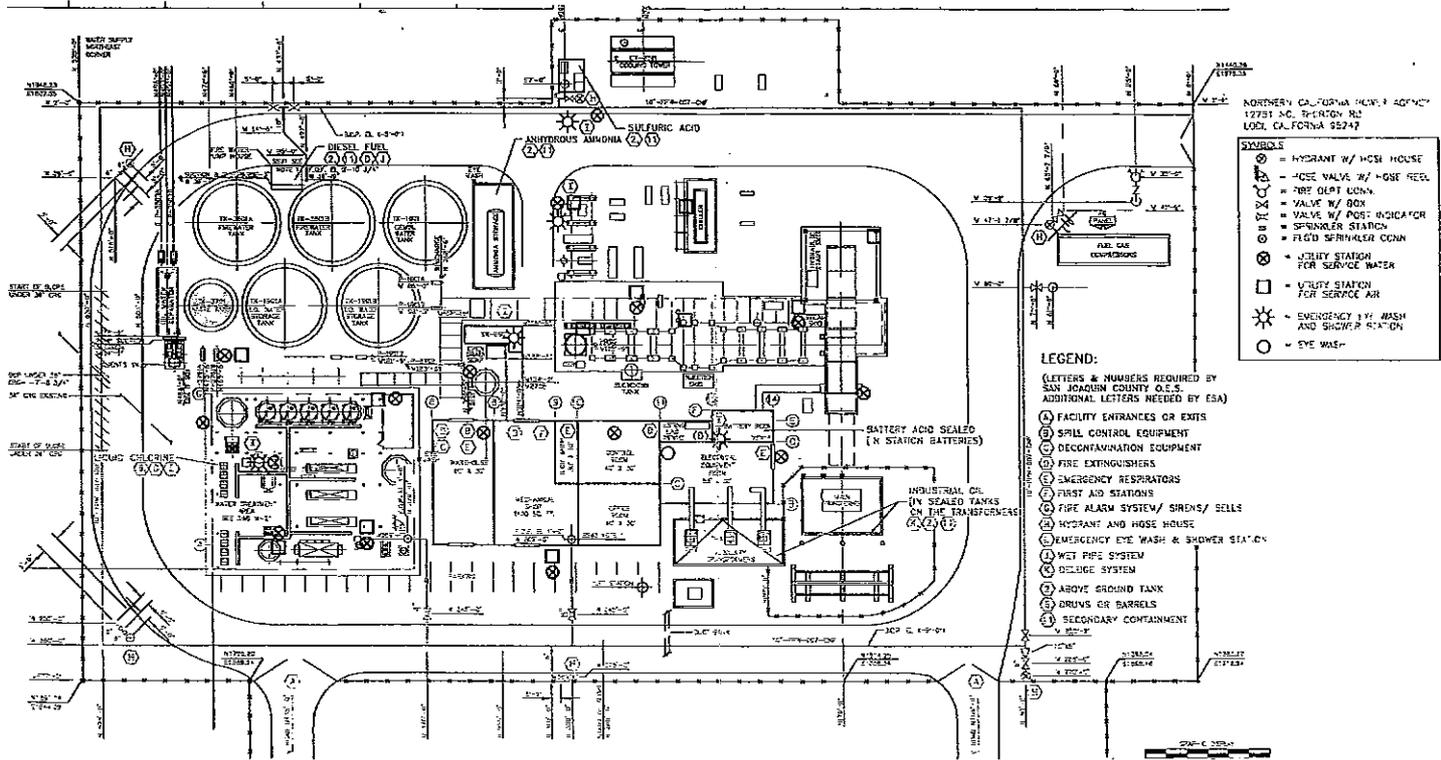
Penalties which may be assessed by the City for discharge or permit violations include: Notice of violation, Cease and Desist Order, Discharge Permit suspension or revocation, Compensation to the City for damages to POTW, Criminal penalties, civil penalties not to exceed six thousand dollars for each day in which such violation occurs, and termination of service.

PART 8 - STANDARD CONDITIONS

See attached sections of City of Lodi Municipal Code Chapter 13.12

Appendix (A)

Sample Location



APPENDIX (B)

The term TTO [per 40 CFR 433.11(e)] shall mean total toxic organics, which is the summation of all quantifiable values greater than 0.01 milligrams per liter for the following toxic organics:

Acenaphthene	Pentachlorophenol
Acrolein	Phenol
Acrylonitrile	Bis (2-ethylhexyl) phthalate
Benzene	Butyl benzyl phthalate
Benzidine	Di-n-butyl phthalate
Carbon tetrachloride (tetrachloromethane)	Di-n-octyl phthalate
Chlorobenzene	Diethyl phthalate
1,2,4-trichlorobenzene	Dimethyl phthalate
Hexachlorobenzene	1,2-benzanthracene
1,2-dichloroethane	(benzo(a)anthracene)
1,1,1-trichloroethane	Benzo(a)pyrene (3,4-benzopyrene)
Hexachloroethane	3,4-Benzofluoranthene
1,1-dichloroethane	(benzo(b)fluoranthene)
1,1,2-trichloroethane	11,12-benzofluoranthene
1,1,2,2-tetrachloroethane	(benzo(k)fluoranthene)
Chloroethane	Chrysene
Bis (2-chloroethyl) ether	Acenaphthylene
2-chloroethyl vinyl ether (mixed)	Anthracene
2-chloronaphthalene	1,12-benzoperylene
2,4,6-trichlorophenol	(benzo(ghi)perylene)
Parachlorometa cresol	Fluorene
Chloroform (trichloromethane)	Phenanthrene
2-chlorophenol	1,2,5,6-dibenzanthracene
1,2-dichlorobenzene	(dibenzo(a,h)anthracene)
1,3-dichlorobenzene	Indeno (1,2,3-cd) pyrene
1,4-dichlorobenzene	(2,3-o-phenylene pyrene)
3,3-dichlorobenzidine	Pyrene
1,1-dichloroethylene	Tetrachloroethylene
1,2-trans-dichloroethylene	Toluene
2,4-dichlorophenol	Trichloroethylene
1,2-dichloropropane	Vinyl chloride (chloroethylene)
1,3-dichloropropylene (1,3-dichloropropene)	Aldrin
2,4-dimethylphenol	Dieldrin
2,4-dinitrotoluene	Chlordane (technical mixture and metabolites)
2,6-dinitrotoluene	4,4-DDT
1,2-diphenylhydrazine	4,4-DDE (p,p-DDX)
Ethylbenzene	4,4-DDD (p,p-TDE)
Fluoranthene	Alpha-endosulfan
4-chlorophenyl phenyl ether	Beta-endosulfan
4-bromophenyl phenyl ether	Endosulfan sulfate
Bis (2-chloroisopropyl) ether	Endrin
Bis (2-chloroethoxy) methane	Endrin aldehyde
Methylene chloride (dichloromethane)	Heptachlor
Methyl chloride (chloromethane)	Heptachlor epoxide
Methyl bromide (bromomethane)	(BHC-hexachlorocyclohexane)
Bromoform (tribromomethane)	Alpha-BHC
Dichlorobromomethane	Beta-BHC
Chlorodibromomethane	Gamma-BHC
Hexachlorobutadiene	Delta-BHC
Hexachlorocyclopentadiene	(PCB-polychlorinated biphenyls)
Isophorone	PCB-1242 (Arochlor 1242)
Naphthalene	PCB-1254 (Arochlor 1254)
Nitrobenzene	PCB-1221 (Arochlor 1221)
2-nitrophenol	PCB-1232 (Arochlor 1232)
4-nitrophenol	PCB-1248 (Arochlor 1248)
2,4-dinitrophenol	PCB-1260 (Arochlor 1260)
4,6-dinitro-o-cresol	PCB-1016 (Arochlor 1016)
N-nitrosodimethylamine	Toxaphene
N-nitrosodiphenylamine	2,3,7,8-tetrachlorodibenzo-
N-nitrosodi-n-propylamine	p-dioxin (TCDD)

Appendix B
EPA Underground Injection Control Plan
Final Permit

U.S. EPA Underground Injection Control Program

FINAL PERMIT

Class I Nonhazardous Waste Injection Wells

Permit No. CA 10910003

Well Names: STIG-1, LEC-1, LEC-2

Lodi, California

Issued to:

Northern California Power Agency
Steam Injected Gas Turbine (STIG) Project #2 & Lodi Energy Center (LEC)
12745 North Thornton Road
Lodi, CA 95242-1478

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PART II. SPECIFIC PERMIT CONDITIONS

A. REQUIREMENTS PRIOR TO DRILLING, TESTING, CONSTRUCTING, OR OPERATING

1. Financial Assurance

The Permittee shall supply evidence of financial assurance prior to commencing Injection Well Drilling and Construction, in accordance with Section G of this part.

2. Field Demonstration Submittal, Notification, and Reporting

- (a) Prior to each demonstration required in the following sections B through D, the Permittee shall submit plans for procedures and specifications to the U.S. Environmental Protection Agency Region IX Ground Water Office (“EPA”) for discussion and approval. The submittal address is provided in Section E, paragraph 5. No demonstration in these sections may proceed without prior written approval from EPA.
- (b) The Permittee must notify EPA at least thirty (30) days prior to performing any required field demonstrations after EPA approves the demonstration workplan, in order to allow EPA to arrange to witness if so elected.
- (c) The Permittee shall submit results of each demonstration required in this section to EPA within sixty (60) days of completion.

California Division of Oil, Gas, and Geothermal Resources (“CDOGGR”) reporting forms (such as a Well Summary Report) may be acceptable provided all information specified by this permit is included.

B. WELL CONSTRUCTION

1. Locations of Injection Wells STIG-1, LEC-1, and LEC-2

Injection wells, LEC-1 and LEC-2, authorized under this permit, will be located at the STIG-LEC facility on 12751 North Thornton Road, in Lodi, California (See Appendix A, Figure 1). The STIG-1 well already exists on site (See Appendix A, Figure B). The proposed general location for the two new wells is found in Appendix A, Figure 3.

- (a) Prior to drilling any well, the Permittee must submit proposed field coordinates (Section, Township, Range, with latitude/longitude) for the surface location of that specific well; for subsequent wells, also provide the distance between all wells, along with any justification for the proposed separation distance between the wells, both at the surface and at total depth.

- (b) After drilling is completed, the Permittee must submit final field coordinates (Section, Township, Range, with latitude/longitude) of any well constructed under this permit with the Final Well Construction Report required under paragraph 9(a) of this section. If final well coordinates differ from the proposed coordinates submitted under paragraph (a) above, justification and documentation of any communication with and approval by EPA shall be included.

2. Testing during Drilling and Construction

Logs and other tests conducted during drilling and construction shall include, at a minimum, deviation checks, casing logs, and injection formation tests as outlined in 40 CFR §146.12(d). Open Hole logs shall be conducted over the entire open hole sequence below the conductor casing. Permittee shall conduct Formation Evaluation wireline logging operations and shall provide and use those results to estimate and report values for hydrocarbon saturation, porosity, lithology, rock mechanical properties for both the injection and confining zones identified within the permitted geological sequence.

Before surface, intermediate, and long string casings are set, dual induction/spontaneous potential/gamma ray/caliper (DIL/SP/GR/CAL) logs will be run over the course of the entire open hole sequence after the well is drilled to each respective terminal depth. After each casing is set and cementing is completed, a spherically focused cement bond evaluation log (CBL) will be run over the course of the entire cased hole sequence (See Section D.2(a)(iv) of this part).

3. Injection Formation Testing

Injection formation information as described in 40 CFR 146.12(e), shall be determined through well logs and tests and shall include porosity, permeability, static formation pressure, and effective thickness of the injection zone. Reservoir compressibility (typically coefficient “*c*”) must also be computed. A summary of results shall be submitted to EPA with the Final Construction Report required in paragraph 9(a) of this section and updated periodically with subsequent analyses.

(a) Ground Water Testing

During construction of the wells, information relating to ground water at these sites shall be obtained and submitted to EPA. This information shall include direct Total Dissolved Solids (“TDS”) analysis of target injection formation water to demonstrate either the presence and characteristics of, or the lack of, any Underground Sources of Drinking Water (“USDW,” as defined in 40 CFR §144).

(i) The Permittee shall provide well logs and representative water sample analyses from the targeted injection aquifer using method(s) approved by EPA as evidence. These analyses shall be sufficient to confirm compatibility of the injectate with the injection formation. Formation water samples from the injection zone will be collected (swabbed or other approved method) from the first new injection well (LEC-1 or LEC-2) upon its completion. Field measurements of pH, electrical conductance, and temperature will be carried out to confirm that representative Domengine Sand Formation water is being collected. Subsequent laboratory analysis of the samples will include at least Trace Metals, Alkalinity, Conductivity, Hardness, pH, TDS, Specific Gravity (see II.E.1(a)), and Oil and Grease (per 40 CFR §136.3, Table I).

(b) Step-Rate Test (“SRT”)

A SRT will be conducted on at least one representative well (STIG-1, LEC-1 or LEC-2) before injection is authorized, to establish maximum injection pressure. Refer to Society of Petroleum Engineering (“SPE”) paper #16798 for test design and analysis. Similar testing may be required in other wells, at the discretion of EPA. The SRT will be used to establish the injection pressure and rate limitations, in accordance with section D, paragraphs 3 and 4 of this part. Detailed plans for conducting the SRT must be submitted to EPA for review, possible editing, and approval. Once approved, Permittee may schedule the SRT, providing EPA at least thirty (30) days notice before the SRT is conducted.

- (i) Injection as proposed in an approved SRT procedure is temporarily authorized while the SRT is completed.
- (ii) Prior to testing, shut in the well long enough so that the bottom-hole pressure approximates shut-in formation pressure.
- (iii) Measure pressures with a down-hole pressure bomb or other approved pressure monitoring system and synchronize the data with data from a surface pressure recorder. Data sampling rate must allow for observation and analysis of the pressure transient behavior during each rate step as well as during the final pressure falloff period which is discussed in item (vi) below.
- (iv) Use equal-length time step intervals throughout the test; these should be technically justified and should be sufficiently long to overcome well bore storage and to achieve radial flow. Use thirty (30) minute or longer time intervals.

- (v) Record at least three (3) time steps (data points on pressure vs. flow plot) before reaching the anticipated fracture pressure. Use one (1) barrel per minute rate increments in the early test stages. Larger rate increments may be used later in the test, but justification for this request must be approved.
- (vi) At the end of the test, shut down pumps and record the instantaneous shut in pressure and observe the pressure falloff for a sufficient time period to observe and later analyze the radial flow portion of the injection zone during the SRT. The length of time for pressure falloff observation must be determined and discussed in the Permittee's submission plans in advance of conducting the SRT.

(c) Fall Off Pressure Test ("FOT")

To determine and to monitor formation characteristics, a FOT shall be run in at least one representative well selected by EPA after a radial flow regime has been established at an injection rate which is representative of the expected contribution to that well from the facility's total wastewater generation. The FOT will be conducted in accordance with EPA guidance found in Appendix E. The Permittee shall use the test results to recalculate the Zone of Endangering Influence ("ZEI," as defined in 40 CFR §146.6) and to evaluate whether any corrective action is now required (refer to Section C of this part); a summary of the recalculation shall be included with the FOT report. Detailed plans for conducting the FOT must be submitted to EPA for review and approval. Once approved, the Permittee may schedule the FOT, providing EPA at least thirty (30) days notice before the SRT is conducted.

- (i) Annually, the FOT test shall be repeated at an interval of not less than nine (9) months nor greater than fifteen (15) months from the previous test. The results of the test shall be included with the quarterly report due each January, as described in Section E paragraph 5 of this part.
 - (ii) The latest static reservoir pressure and its cumulative behavior over time on a graphic plot of the injection zone shall be determined and reported with the FOT report listed in paragraph (i) above.
- (d) Particulate Filters may be used upstream of the well, at the discretion of the operator, to prevent formation plugging or damage from particulate matter. The Permittee shall include any filter specifications in the Final Construction Report required in paragraph 9(a) of this section, including proposed particle size removal with any associated justification for the selected size. For any particulate filters used, follow appropriate waste analysis and disposal practices.

4. Drilling, Work-over, and Plugging Procedures

Drilling, work-over, and plugging procedures must comply with the CDOGGR “Onshore Well Regulations” of the California Code of Regulations, found in Title 14, Natural Resources, Division 2, Department of Conservation, Chapter 4, Article 3, Section 1722-1723. Drilling procedures shall also include the following:

- (a) Details for staging long-string cementing or justification for cementing without staging;
- (b) Records of daily Drilling Reports (electronic and hard copies);
- (c) Blowout Preventer (BOP) System testing on recorder charts including complete explanatory notes during the test(s),
- (d) Casing and other tubular and accessory measurement tallies; and
- (e) Details and justification for any open hole gravel packing.

Procedures provided on reporting forms such as CDOGGR’s Well Summary Report may be acceptable provided all required information as specified above is included.

5. Casing and Completion Specifications

Notwithstanding any other provisions of this permit, the Permittee shall case and cement the wells to prevent the movement of fluids into or between USDWs. Cement evaluation analyses shall be performed as described in Section D paragraph 2(a)(iv) of this part. Casings shall be maintained throughout the operating life of the wells. See Appendix B, Figure 1, for the approximate construction specifications pertaining to the two proposed injection wells LEC-1 and LEC-2. See Appendix B, Figure 2 for the exact specifications of well STIG-1 as built.

EPA may require minor alterations to the construction requirements for wells LEC-1 and LEC-2 based upon the information obtained during well drilling and related operations if the proposed casing setting depths will not completely cover the base of the USDWs and the confining formation located immediately above the injection zone.

Final depths will be determined by the field conditions, sieve analysis, well logs, and other input from the drilling consultant and geologists. EPA approval will be obtained for any revisions prior to installation and these will be documented in the well completion report (See paragraph 9(a) below).

6. Injection Intervals

Injection for wells STIG-1, LEC-1 and LEC-2 shall be permitted for the lower sand member of the Domengine Formation at depths between approximately 4,234 feet bgs and 4,507 feet bgs. The entire injection unit is 831 feet thick at STIG-1, extending from 3,747 feet bgs to 4,578 feet bgs (the unit is not less than 780 feet within the Area of Review). The exact depths of injection zone intervals and casing setting depths are expected to be realized upon drilling. These alterations and other rework operations that may occur later in the course of operation of the wells are considered minor for this permit and must be properly reported (use EPA Form 7520-12). The Permittee must demonstrate that each well has mechanical integrity, in accordance with Section D paragraphs 1(a) and 2 of this part, before any initial injection is authorized or before injection is recommenced after a workover has compromised the seal (see Part II.D.2(b)(i)).

7. Confining Layer

The upper confining layer, the Nortonville Shale, is a dark gray marine shale and siltstone. It ranges in thickness from 100 to 200 feet within the Area of Review, with a thickness of 117 feet at the STIG-1 well. The Nortonville Shale confining layer is located between approximately 3,610 and 3,727 feet bgs.

The lower confining layer, the Capay Shale Formation, is a marine shale to silty shale with occasional sand stringers. The estimated thickness of the Capay confining layer is approximately 150 feet, from 4,578 to 4,728 feet bgs.

Field information on the Nortonville Shale formation at the LEC-1 and LEC-2 sites, such as its characteristics, thickness, and local structure will be obtained and updated during drilling of the injection wells and shall be included in the Final Well Construction Report required in paragraph 9(a) of this section.

8. Monitoring Devices

The Permittee shall install and maintain in good operating condition:

- (a) A tap on the discharge line between the injection pump and the wellhead for the purpose of obtaining representative samples of injection fluids; and
- (b) Devices to continuously measure and record injection pressure, annulus pressure, flow rate, and injection volumes, subject to the following:
 - (i) Pressure gauges shall be of a design to provide:
 - (1) A full pressure range of at least fifty (50) percent greater than the anticipated operating pressure; and

(2) A certified deviation accuracy of five (5) percent or less throughout the operating pressure range.

(ii) Flow meters shall measure cumulative volumes and be certified for a deviation accuracy of five (5) percent or less throughout the range of injection rates allowed by the permit.

9. Final Well Construction Report and Completion of Construction Notice

(a) The Permittee must submit a final well construction report, including logging, and other results, with a schematic diagram and detailed description of construction, including driller's log, materials used (i.e., tubing tally), and cement (and other) volumes, to EPA within sixty (60) days after completion of either of the Injection Wells LEC-1 or LEC-2.

(b) The Permittee must also submit a notice of completion of construction to EPA (see EPA Form 7520-9 in Appendix C). Injection operations may not commence until EPA has inspected or otherwise reviewed the injection wells and notified the Permittee that it is in compliance with the conditions of the permit.

10. Proposed Changes and Workovers

The Permittee shall give advance notice to EPA, as soon as possible, of any planned physical alterations or additions to the permitted injection wells. Any changes in well construction require prior approval of EPA and may require a permit modification under the requirements of 40 CFR §§144.39 and 144.41. In addition, the Permittee shall provide all records of well workovers, logging, or other subsequent test data, including required mechanical integrity testing, to EPA within sixty (60) days of completion of the activity. Appendix C contains samples of the appropriate reporting forms. Demonstration of mechanical integrity shall be performed within thirty (30) days of completion of workovers or alterations and prior to resuming injection activities, in accordance with Section D paragraphs 1(a) and 2 of this part.

C. CORRECTIVE ACTION

Corrective action to 40 CFR §§144.55 and 146.7 may be necessary for existing wells in the Area of Review ("AOR", defined in 40 CFR §146.6) that penetrate the injection zone, or which may otherwise cause movement of fluids into USDWs.

No corrective action plan is currently required as all wells within the Area of Review were plugged and abandoned in accordance with CDOGGR review and oversight. See Appendix

A, Figures 4-5, and Appendix B, Figure 3 (excerpted from Attachments B and C to the Permit Application).

1. Annual ZEI Review

Annually, the ZEI calculation shall be reviewed by the Permittee, based on any new data obtained from the FOT and static reservoir pressure tests required in Section B, paragraph 3(c) of this part. A copy of the modified ZEI calculations, along with all associated assumptions or justifications, shall be provided to EPA with the quarterly report due in January, as required in Section E paragraph 5 of this part.

2. Implementation of Corrective Actions

- (a) If any wells requiring corrective action are found within the modified ZEI, a list of these wells along with their locations shall be provided to EPA as soon as possible.
- (b) If requested by EPA, the Permittee shall submit a plan to re-enter, plug, and abandon the wells listed in paragraph (a) above in such a manner to prevent the migration of fluids into a USDW.
- (c) The Permittee may not commence corrective action activities without prior written approval from EPA.

D. WELL OPERATION

1. Demonstrations Required Prior to Injection

For each well, injection operations may not commence until construction is complete and the Permittee has complied with following paragraphs (a) and (b):

(a) Mechanical Integrity

The Permittee shall demonstrate that each well has and maintains mechanical integrity consistent with CFR §146.8 and with paragraph 2 of this section. The Permittee shall demonstrate that there are not significant leaks in the casing and tubing and that there is not significant fluid movement into or between USDWs through the casing wellbore annulus or vertical channels adjacent to the injection wellbore. The Permittee may not commence initial injection into a well nor recommence injection after a workover which has compromised well integrity until it has received written notice from EPA that such a demonstration is satisfactory.

(b) Injectate Hazardous Waste Determination

The Permittee shall perform an Injectate Hazardous Waste Determination of each unique waste stream injected into any of the wells authorized by this permit, according to 40 CFR §262.11. The results of the analyses shall demonstrate that the injectate does not meet the definition of hazardous waste as defined in 40 CFR §261.

- (i) Operation of the injection facility is temporarily granted for the two (2) weeks following initial operations to allow for sample analyses to be performed and for the results to be submitted to EPA.
- (ii) The Permittee will be required to submit a letter to EPA confirming that the “Hazardous Waste Determination” was carried out according to 40 CFR §261 within sixty (60) days of its having been completed.
- (iii) The Permittee shall perform an additional “Hazardous Waste Determination” whenever there is a process change or a change in fluid chemical constituents or characteristics.

2. Mechanical Integrity

(a) Mechanical Integrity Tests (“MITs”)

Mechanical integrity testing shall conform to the following requirements throughout the life of the injection wells:

(i) Casing/tubing annular pressure (internal MIT)

A demonstration of the absence of significant leaks in the casing, tubing and/or liner shall be made by performing a pressure test on the annular space between the tubing and long string casing. This test shall be for a minimum of thirty (30) minutes at a pressure equal to or greater than the maximum allowable injection pressure. A well passes the MIT if there is less than a five (5) percent change in pressure over the thirty (30) minute period. A pressure differential of at least 350 pounds per square inch (“psi”) between the tubing and annular pressures shall be maintained throughout the MIT.

(ii) Continuous pressure monitoring

The tubing/casing annulus pressure and injection pressure shall be monitored and recorded continuously by a digital instrument with a resolution of one tenth (0.1) psi. The average, maximum, and minimum monthly results shall be included in the quarterly report to

EPA per Section E paragraph 5 of this part unless more detailed records are requested by EPA.

(iii) Injection profile survey (external MIT)

In conjunction with the annual FOT required in Section B paragraph 3(c), a demonstration that the injectate is confined to the proper zone shall be conducted and presented by the Permittee and subsequently approved by EPA. This demonstration shall consist of a radioactive tracer and a temperature log (as specified in Appendix D) or other diagnostic tool or procedure as approved by EPA. Detailed plans for conducting the external MIT must be submitted to EPA for review and approval. Once approved, the Permittee may schedule the external MIT, providing EPA at least thirty (30) days notice before the external MIT is conducted.

(iv) Cement Evaluation Analysis

After casing is installed, after conducting a cement squeeze job in an open hole, or after any well cement repair, for any well constructed under this permit, the Permittee shall submit cementing records and cement evaluation logs that demonstrate the isolation of the injection interval and other formations from underground sources of drinking water by means of cementing the surface casing and the long string casing well bore annuli to surface. The analysis shall include a spherically-focused tool, run after the long-string casing is set and cemented, which enables the evaluation of the bond between cement and casing as well as of the bond between cement and formation. The Permittee may not commence or recommence injection until it has received written notice from EPA that such a demonstration is satisfactory.

(b) Subsequent MITs

EPA may require that an MIT be conducted at any time during the permitted life of the well. The Permittee shall also arrange and conduct MITs according to the following requirements:

- (i) Within thirty (30) days from completion of any work-over where well integrity is compromised, or when any loss of mechanical integrity becomes evident during operation, an internal pressure MIT shall be conducted on each injection well authorized under this permit.
- (ii) At least annually for the life of the well, an injection profile survey external MIT shall be conducted on each injection well authorized

under this permit in accordance with 40 CFR §146.8 and paragraph (a)(iii) above.

- (iii) At least once every five (5) years during the life of the well, an internal pressure MIT shall be conducted on each injection well authorized under this permit in accordance with 40 CFR §146.8 and paragraph (a)(i) above.

(c) Loss of Mechanical Integrity

The Permittee shall notify EPA, in accordance with Part III, Section E paragraph 10 of this permit, under any of the following circumstances:

- (i) The well fails to demonstrate mechanical integrity during a test, or
- (ii) A loss of mechanical integrity becomes evident during operation, or
- (iii) A significant change in the annulus or injection pressure occurs during normal operating conditions. See Section D.6 of this part.

Furthermore, in the event of (i), (ii), or (iii), injection activities shall be terminated immediately and operation shall not be resumed until the Permittee has taken necessary actions to restore mechanical integrity to the well and EPA gives approval to recommence injection.

(d) Prohibition without Demonstration

After the permit effective date, injection into wells may continue only if:

- (i) The well has passed an internal pressure MIT in accordance with paragraph 2(a)(i) of this section; and
- (ii) The Permittee has received written notice from EPA that the internal pressure MIT demonstration is satisfactory.

3. Injection Pressure Limitation

- (a) Maximum allowable injection pressure measured at the wellhead for wells STIG-1, LEC-1 and LEC-2 shall be based on the Step-Rate Test conducted under Section B paragraph 3(b) of this part. EPA will provide the Permittee written notification of the maximum allowable injection pressure for each injection well constructed and operated under this permit, along with a minor modification of the permit under 40 CFR §144.41(e).

- (b) Permittee may continue injection into well STIG-1 at a Maximum Available Injection Pressure (MAIP) at the wellhead of 975 psi, as established while injecting under the authority of the original permit (#CA194000002), only until re-establishing the MAIP for the well by conducting a Step-Rate Test in accordance with Section B paragraph 3(b) of this part.
- (c) In no case shall pressure in the injection zone during injection initiate new fractures or propagate existing fractures in the injection zone or the confining zone. In no case shall injection pressure cause the movement of injection or formation fluids into or between underground sources of drinking water. In no case shall injection fluids be allowed to migrate to oilfield production wells.

4. Injection Volume (Rate) Limitation

- (a) The injection rate for wells LEC-1 and LEC-2 shall not exceed the volume determined appropriate through the demonstrations conducted in this section and justified by measured friction factors. EPA will provide written notification of the maximum injection volume allowed under this permit prior to any injection conducted after an approved SRT (see Section B.3(b)).
- (b) Permittee may continue injection into well STIG-1 at a maximum injection rate of 200 gallons per minute (gpm), as established while injecting under the authority of the original permit (#CA194000002), only until re-establishing the maximum injection rate for the well by conducting a Step-Rate Test in accordance with Section B paragraph 3(b) of this part.
- (c) The Permittee may request an increase in the maximum rate allowed in paragraphs (a) and (b) above. Any such request shall be made in writing and appropriately justified to EPA.
- (d) Any request for an increase in injection rate shall demonstrate to the satisfaction of EPA that the increase in volume will not interfere with the operation of the facility, its ability to meet conditions described in this permit, change its well classification, or cause migration of injectate or pressure buildup to occur beyond the Area of Review.

5. Injection Fluid Limitation

Injection fluids in well STIG-1 consist of tertiary-treated makeup water from the City of Lodi's White Slough Water Pollution Control Facility ("WPCF"), brine reject from the ultrafiltration units, brine from the reverse osmosis units, and blowdown from the cooling towers. The remaining fluids consist of both continuous and intermittent blowdowns from the Heat Recovery Boilers.

Injection fluids in wells LEC-1 and LEC-2 will consist of tertiary-treated makeup water from WPCF, other recovered process wastewater that has been concentrated by evaporative losses in the cooling tower, as well as the chemicals added to the circulating water that are used to control scaling and biofouling of the cooling tower and to control corrosion of the circulating water piping and intercooler.

All fluids from WPCF that are injected using STIG-1, LEC-1 and LEC-2 will be used in the power generation processes/systems identified in this section prior to injection.

In addition,

- (a) The Permittee shall not inject any hazardous waste, as defined by 40 CFR Part 261, at any time. See also paragraph 1(b) of this section.
- (b) Injection fluids shall be limited to only waste fluids authorized by this permit and produced at the Northern California Power Agency and White Slough Water Pollution Control facilities. No fluids shall be accepted from other sources.
- (c) Any well stimulation or treatment procedure performed at the discretion of the operator shall be proposed and submitted to EPA for approval prior to implementation.

5. Tubing/Casing Annulus Requirements

- (a) Corrosion-inhibiting annular fluid shall be used and maintained during well operation. A complete description and characterization shall be submitted to EPA for approval before use.
- (b) A minimum pressure of one hundred (100) psi at shut-in conditions shall be maintained on the tubing/casing annulus. Within the first quarter of injection operations, the Permittee shall determine the range of fluctuation of annular pressure for the well during periods of normal operation. This normal pressure range shall be submitted with the first quarterly report after injection has commenced. Any annular pressure outside of the normal range shall be considered a loss of mechanical integrity and shall be reported per Paragraph 2(c) of this section.

E. MONITORING, RECORDKEEPING, AND REPORTING OF RESULTS

1. Injection Well Monitoring Program

Injection fluids from different sources and/or of different composition will be analyzed to yield representative data on their physical, chemical, or other relevant

characteristics. The Permittee shall take samples at or before the wellhead for analysis. Test results shall be submitted to EPA on at least a quarterly basis (see paragraph 5 below).

Samples and measurements shall be representative of the monitored activity. The Permittee shall utilize applicable analytical methods described in Table I of 40 CFR §136.3 or in EPA Publication SW-846, "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," unless other methods have been approved by EPA.

(a) Summary of acceptable analytic Methods:

- (i) Inorganic Constituents – appropriate USEPA methods for Major Anions and Cations (including an anion/cation balance).
- (ii) Solids - Standard Methods 2540C and 2540D for Total Dissolved Solids and Total Suspended Solids.
- (iii) General and Physical Parameters – appropriate USEPA methods for Temperature, Turbidity, pH, Conductivity, Hardness, Specific Gravity, Alkalinity, and Biological Oxygen Demand ("BOD"); and Density and Viscosity (See EPA Bulletin 712-C-96-032) under standard conditions.
- (iv) Trace Metals - USEPA Method 200.8.
- (v) Volatile Organic Compounds ("VOCs") - USEPA Method 8260C.
- (vi) Semi-Volatile Organic Compounds - USEPA Method 8270.

(b) Analysis of injection fluids.

Quarterly, or whenever there is a significant change in injection fluids, injectate sampling and analyses shall be performed as outlined in paragraph (a) above.

2. Monitoring Information

Records of monitoring activity required under this permit shall include:

- (a) Date, exact location, and time of sampling or field measurements;
- (b) Name(s) of individual(s) who performed sampling or measuring;
- (c) Exact sampling method(s) used;

- (d) Date(s) laboratory analyses were performed;
- (e) Name(s) of individual(s) who performed laboratory analyses;
- (f) Types of analyses; and
- (g) Results of analyses.

3. Monitoring Devices

(a) Continuous monitoring devices

Temperature, annular pressure, and injection pressure shall be measured at the wellhead using equipment of sufficient precision and accuracy. All measurements must be recorded at minimum to a resolution of one tenth of the unit of measure (e.g. injection rate and volume must be recorded to a resolution of a tenth of a gallon; pressure must be recorded to a resolution of a tenth of a psig; injection fluid temperature must be recorded to a resolution of a tenth of a degree Fahrenheit). Exact dates and times of measurements, when taken, must be recorded and submitted. Injection rate shall be measured in the supply line immediately before the wellhead. The Permittee shall continuously monitor and record the following parameters at the prescribed frequency:

Monitoring Parameter	Frequency	Instrument
Injection rate (gallons per minute)	Hourly	digital recorder
Daily Injection Volume (gallons)	Daily	digital totalizer
Total Cumulative Volume (gallons)	Daily	digital totalizer
Well head injection pressure (psig)	Hourly	digital recorder
Annular pressure (psig)	Hourly	digital recorder
Injection fluid temperature (degrees Fahrenheit)	Hourly	digital recorder

The Permittee is required to adhere to the preferred format below for reporting injection rate and well head injection pressure. An example of the preferred electronic data format:

<u>DATE</u>	<u>TIME</u>	<u>INJ. PRESS (PSIG)</u>	<u>INJ. RATE (GPM)</u>
06/27/09	16:33:16	1525.6	65.8
06/27/09	17:33:16	1525.4	66.3

Each data line shall include four (4) values separated by a consistent combination of spaces or tabs. The first value contains the date measurement in the format of mm/dd/yy or mm/dd/yyyy , where mm is the number of the

month, dd is the number of the day and yy or yyyy is the number of the year. The second value is the time measurement, in the format of hh:mm:ss, where hh is the hour, mm are the minutes and ss are the seconds. Hours should be calculated on a 24-hour basis, i.e. 6 PM is entered as 18:00:00. Seconds are optional. The third value is the well head injection pressure in psi. The fourth column is injection rate in gallons per minute.

(b) Calibration and Maintenance of Equipment

All monitoring and recording equipment shall be calibrated and maintained on a regular basis to ensure proper working order of all equipment.

4. Recordkeeping

The Permittee shall retain the following records and shall have them available at all times for examination by an EPA inspector:

- (a) All monitoring information, including required observations, calibration and maintenance records, recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the permit application;
- (b) Information on the nature and composition of all injected fluids;
- (c) Results of the injectate “Hazardous Waste Determination” according to 40 CFR §262.11. Analyses results shall demonstrate that the injectate does not meet the definition of hazardous waste as defined in 40 CFR §261; and
- (d) Records and results of MITs, any other tests required by EPA, and any well workovers completed.
- (e) The Permittee shall maintain copies (or originals) of all records described in paragraphs (a) through (d) above during the operating life of the well and shall make such records available at all times for inspection at the facility.
- (f) The Permittee shall only discard the records described in paragraphs (a) through (d) if:
 - (i) the records are either delivered to the Regional Administrator, or
 - (ii) written approval from the Regional Administrator to discard the records is obtained.

5. Reporting

Quarterly, the Permittee shall submit accurate reports to EPA containing, at minimum, the following information:

- (a) Hourly and daily values, submitted in electronic format, for the continuously monitored parameters specified for the injection wells in paragraph 3(a) of this section;
- (b) Monthly cumulative total volumes, as well as monthly average, minimum, and maximum values for the continuously monitored rate, pressure, and temperature parameters specified for the injection wells in paragraph 2(a) of this section, unless more detailed records are requested by EPA;
- (c) Quarterly analyses, to be included in the next quarterly report following completion:
 - (i) Injection fluid characteristics for parameters specified in paragraph 1(a) of this section;
 - (ii) When appropriate, Injectate Hazardous Waste Determination according to Section D, paragraph 1(b) of this part.
- (d) To be included with the next quarterly report immediately following completion, results of any additional MITs or other tests required by EPA, and any well workovers completed; and
- (e) To be included in the quarterly report due in January each year, the following annual analyses:
 - (i) Annual reporting summary (7520-11 in Appendix C);
 - (ii) FOT results as required in Section B, paragraph 3(c) of this part;
 - (iii) Shut-in static reservoir pressure cumulative behavior plot of the injection zone, as required in Section B, paragraph 3(c)(ii) of this part;
 - (iv) Annual injection profile survey results as required in Section D paragraph 2(a)(iii) of this part; and
 - (v) Annual ZEI recalculation for each well as required in Section B paragraph 3(c) of this part.

- (f) To be included in the next quarterly report due in January after completion every five years, an internal MIT as required in Section D.2(a)(i) of this part.
- (g) A narrative description of all non-compliance that occurred during the reporting period.

Quarterly report forms as specified in Appendix C shall be submitted for the reporting periods by the respective due dates as listed below:

<u>Reporting Period</u>	<u>Report Due</u>
Jan, Feb, Mar	Apr 28
Apr, May, June	July 28
July, Aug, Sept	Oct 28
Oct, Nov, Dec	Jan 28

Monitoring results and all other reports required by this permit shall be submitted to the following address:

U.S. Environmental Protection Agency, Region IX
 Water Division
 Ground Water Office (Mail Code WTR-9)
 75 Hawthorne St.
 San Francisco, CA 94105-3901

Copies of all reports shall also be provided to the following:

California Division of Oil, Gas, and Geothermal Resources
 District 6 Office
 Attn: Tim Kustic
 801 K Street, MS 20-22
 Sacramento, CA 95814-3530

California Regional Water Quality Control Board
 District 5 Office
 Attn: Diana Messina
 11020 Sun Center Drive, Suite 200
 Rancho Cordova, CA 95670

F. PLUGGING AND ABANDONMENT

1. Notice of Plugging and Abandonment

The Permittee shall notify EPA no less than sixty (60) days before conversion, workover, or abandonment of any well authorized by this permit. EPA may require

that the plugging and abandonment be witnessed by an EPA representative.

2. Plugging and Abandonment Plans

The Permittee shall plug and abandon the well(s) as provided in Appendix F, the general Plugging and Abandonment Program submitted as Attachment Q to the application, and consistent with CDOGGR requirements and 40 CFR §146.10. EPA reserves the right to change the manner in which a well will be plugged if the well is modified during its permitted life or if the well is not consistent with EPA requirements for construction or mechanical integrity. EPA may require the Permittee to update the estimated plugging cost periodically. Such estimates shall be based upon costs which a third party would incur to plug the wells, including mud and disposal costs, with appropriate contingencies.

3. Cessation of Injection Activities

After a cessation of injection operations for two (2) years, the Permittee shall plug and abandon the inactive well(s) in accordance with the Plugging and Abandonment Plans, unless it:

- (a) Provides notice to EPA;
- (b) Has demonstrated that the well(s) will be used in the future; and
- (c) Has described actions or procedures, satisfactory to EPA, that will be taken to ensure that the well(s) will not endanger underground sources of drinking water during the period of temporary abandonment.

4. Plugging and Abandonment Report

Within sixty (60) days after plugging any well, the Permittee shall submit a report on Form 7520-13, provided in Appendix C, to EPA. The report shall be certified as accurate by the person who performed the plugging operation and shall consist of either:

- (a) A statement that the well was plugged in accordance with the approved Plugging and Abandonment Plans, or
- (b) Where actual plugging differed from the Plugging and Abandonment Plans, a statement specifying the different procedures followed.

G. **FINANCIAL RESPONSIBILITY**

1. Demonstration of Financial Responsibility

The Permittee is required to demonstrate and maintain financial responsibility and resources sufficient to close, plug, and abandon the underground injection operation as provided in the Plugging and Abandonment Plans and consistent with 40 CFR §144 Subpart D, which the Director has chosen to apply.

- (a) The Permittee shall maintain a bond rating within the four highest categories of Standard and Poor's (AAA, AA, A, or BBB), Moody's (Aaa, Aa, A, or Baa) or Fitch (AAA, AA, A, or BBB). If the most recent bond rating does not fall within the four highest categories, the the Permittee shall post a financial instrument such as a surety bond with a standby trust agreement or arrange other financial assurance for each well constructed in the amount of \$314,400 per well, to guarantee closure.
- (b) The financial responsibility mechanism and amount shall be reviewed and updated periodically, upon request of EPA. The permittee may be required to change to an alternate method of demonstrating financial responsibility. Any such change must be approved in writing by EPA prior to the change.
- (c) The Permittee must provide proof to EPA of its bond rating or renewal every year by March 31.

1. Insolvency of Financial Institution

The Permittee must submit an alternate instrument of financial responsibility acceptable to EPA within sixty (60) days after either of the following events occurs:

- (a) The institution issuing the bond or financial instrument files for bankruptcy; or
- (b) The authority of the trustee institution to act as trustee, or the authority of the institution issuing the financial instrument, is suspended or revoked.

Failure to submit an acceptable financial demonstration will result in the termination of this permit pursuant to 40 CFR §144.40(a)(1).

2. Insolvency of Owner or Operator

An owner or operator must notify EPA by certified mail of the commencement of voluntary or involuntary proceedings under U.S. Code Title 11 (Bankruptcy), naming the owner or operator as debtor, within ten (10) business days. A guarantor of a corporate guarantee must make such a notification if he/she is named as debtor,

as required under the terms of the guarantee.

H. **DURATION OF PERMIT**

This permit and the authorization to inject are issued for a period of up to ten (10) years unless terminated under the conditions set forth in Part II, Section B.1 of this permit.

PART III. GENERAL PERMIT CONDITIONS

A. **EFFECT OF PERMIT**

The Permittee is allowed to engage in underground injection well construction and operation in accordance with the conditions of this permit. The Permittee shall not construct, operate, maintain, convert, plug, abandon, or conduct any other injection activity in a manner that allows the movement of fluid containing any contaminant (as defined by 40 CFR §144.3) into underground sources of drinking water (as defined 40 CFR §§144.3, 146.3).

No injection fluids are allowed to migrate to any nearby oilfield production wells. Further, this permit requires systematic and predictive documentation over the facility's operational life to ensure that no injection fluids, either presently or in the future, will migrate to oilfield operation production wells.

Furthermore, any underground injection activity not specifically authorized in this permit is prohibited. The Permittee must comply with all applicable provisions of the Safe Drinking Water Act ("SDWA") and 40 CFR Parts 144, 145, 146, and 124. Such compliance does not constitute a defense to any action brought under Section 1431 of the SDWA, 42 U.S.C. § 300(i), or any other common law, statute, or regulation 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 all applicable laws or regulations.

B. **PERMIT ACTIONS**

1. Modification, Revocation and Reissuance, or Termination

EPA may, for cause or upon request from the permittee, modify, revoke and reissue, or terminate this permit in accordance with 40 CFR §§124.5, 144.12, 144.39, and 144.40. The permit is also subject to minor modifications for cause as specified in 40 CFR §144.41. The filing of a request for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance by the Permittee, does not stay the applicability or enforceability of any permit condition. EPA may also modify, revoke and reissue, or terminate this

permit in accordance with any amendments to the SDWA if the amendments have applicability to this permit.

2. Transfers

This permit is not transferable to any person unless notice is first provided to EPA and the Permittee complies with requirements of 40 CFR §144.38. EPA may require modification or revocation and reissuance of the permit to change the name of the Permittee and incorporate such other requirements as may be necessary under the SDWA.

C. **SEVERABILITY**

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

D. **CONFIDENTIALITY**

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

1. Name and address of the Permittee, or
2. Information dealing with the existence, absence, or level of contaminants in drinking water.

E. **GENERAL DUTIES AND REQUIREMENTS**

1. Duty to Comply - The Permittee shall comply with all applicable UIC Program regulations and all conditions of this permit, except to the extent and for the duration such noncompliance is authorized by an emergency permit issued in accordance with 40 CFR §144.34. Any permit noncompliance constitutes a violation of the SDWA and is grounds for enforcement action; permit termination, revocation and reissuance, or modification; or denial of a permit renewal application. Such noncompliance may also be grounds for enforcement action under the Resource Conservation and Recovery Act ("RCRA").

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 and may be subject to enforcement actions pursuant to RCRA. Any person who willfully violates a permit condition may be subject to criminal prosecution.
3. Need to Halt or Reduce Activity Not a Defense - It shall not be a defense, for the 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.
4. Duty to Mitigate - The Permittee shall take all reasonable steps to minimize and correct any adverse impact on the environment resulting from noncompliance with this permit.
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. Property Rights - This permit does not convey any property rights of any sort, or any exclusive privilege.
7. Duty to Provide Information - The Permittee shall furnish to EPA, within a time specified, any information which EPA 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 EPA, upon request, copies of records required to be kept by this permit.
8. Inspection and Entry - The Permittee shall allow EPA, or an authorized representative, upon the presentation of credentials and other documents as may be required by law, to:
 - (a) Enter upon the Permittee's premises where a regulated facility or activity is located or conducted, or where records are kept under the conditions of this permit;
 - (b) Have access to and copy, at reasonable times, any records that are kept under the conditions of this permit;

- (c) Inspect and photograph 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 location.
9. Signatory Requirements - All applications, reports, or other information submitted to EPA shall be signed and certified by a responsible corporate officer or duly authorized representative according to 40 CFR §§122.22 and 144.32.
10. Additional Reporting
- (a) Planned Changes – The Permittee shall give notice to EPA 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 EPA 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 to EPA no later than thirty (30) days following each schedule date.
 - (d) Twenty-four Hour Reporting
 - (i) The Permittee shall report to EPA any noncompliance which may endanger health or the environment. Information shall be provided orally within twenty-four (24) hours from the time the Permittee becomes aware of the circumstances. The following information must 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; and
 - (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; and
 - (ii) A written submission of all noncompliance as described in paragraph (c)(i) shall also be provided to EPA within five (5) 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; 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 - At the time monitoring reports are submitted, the Permittee shall report in writing all other instances of noncompliance not otherwise reported. The Permittee shall submit the information listed in Part III, Section E.10(c) of this permit.
- (f) Other Information - If the Permittee becomes aware that it failed to submit all relevant facts in the permit application, or submitted incorrect information in the permit application or in any report to EPA, the Permittee shall submit such facts or information within two (2) weeks of the time such facts or information becomes known.

11. Continuation of Expiring Permit

- (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 one hundred and eighty (180) days before this permit expires.
- (b) Permit Extensions - The conditions and requirements of an expired permit continue in force and effect in accordance with 5 U.S.C. §558(c) until the effective date of a new permit, if:
 - (i) The Permittee has submitted a timely and complete application for a new permit; and
 - (ii) EPA, through no fault of the Permittee, does not issue a new permit with an effective date on or before the expiration date of the previous permit.

Figure 1. Project vicinity map of the STIG and Lodi Energy Center (from the Introduction to the Permit Application)

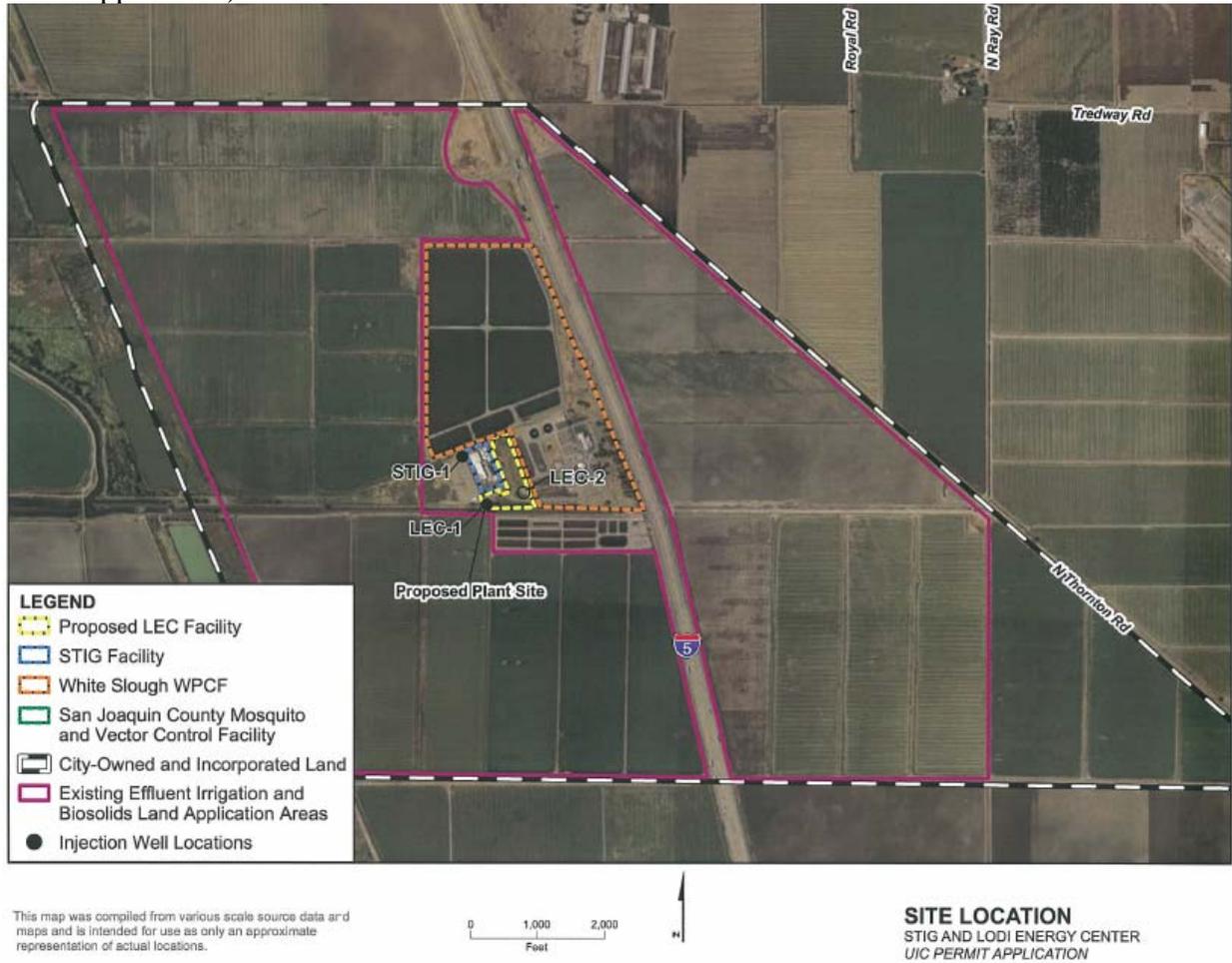


Figure 2. Site location of the STIG and Lodi Energy Center, showing the site of the proposed power plant, well STIG-1, and the proposed locations of wells LEC-1 and LEC-2 (from the Introduction to the Permit Application).

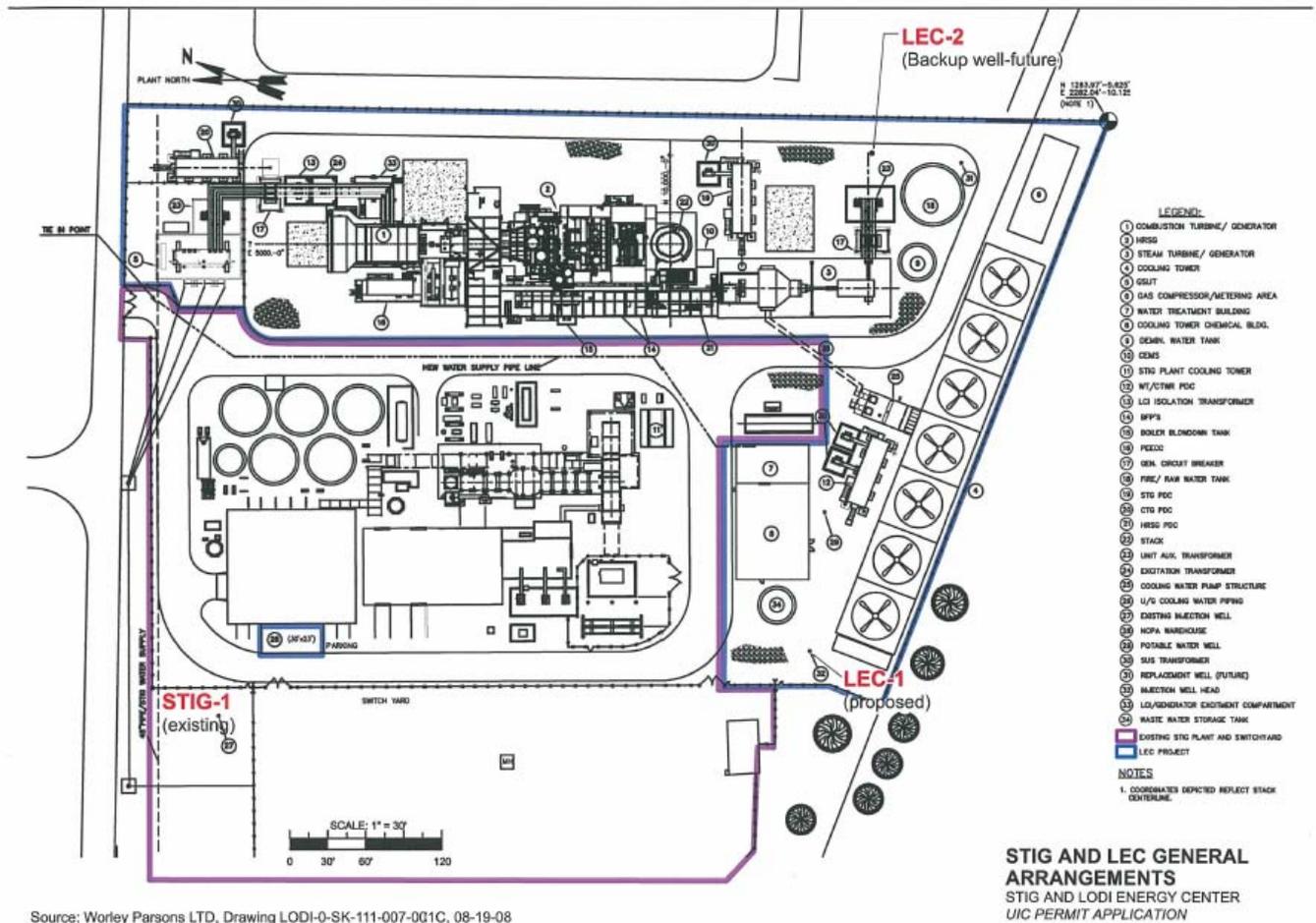


Figure 3. STIG and Lodi Energy Center general arrangements, showing the site of currently existing well STIG-1, and the proposed locations for wells LEC-1 and LEC-2 (from the Introduction to the Permit Application).

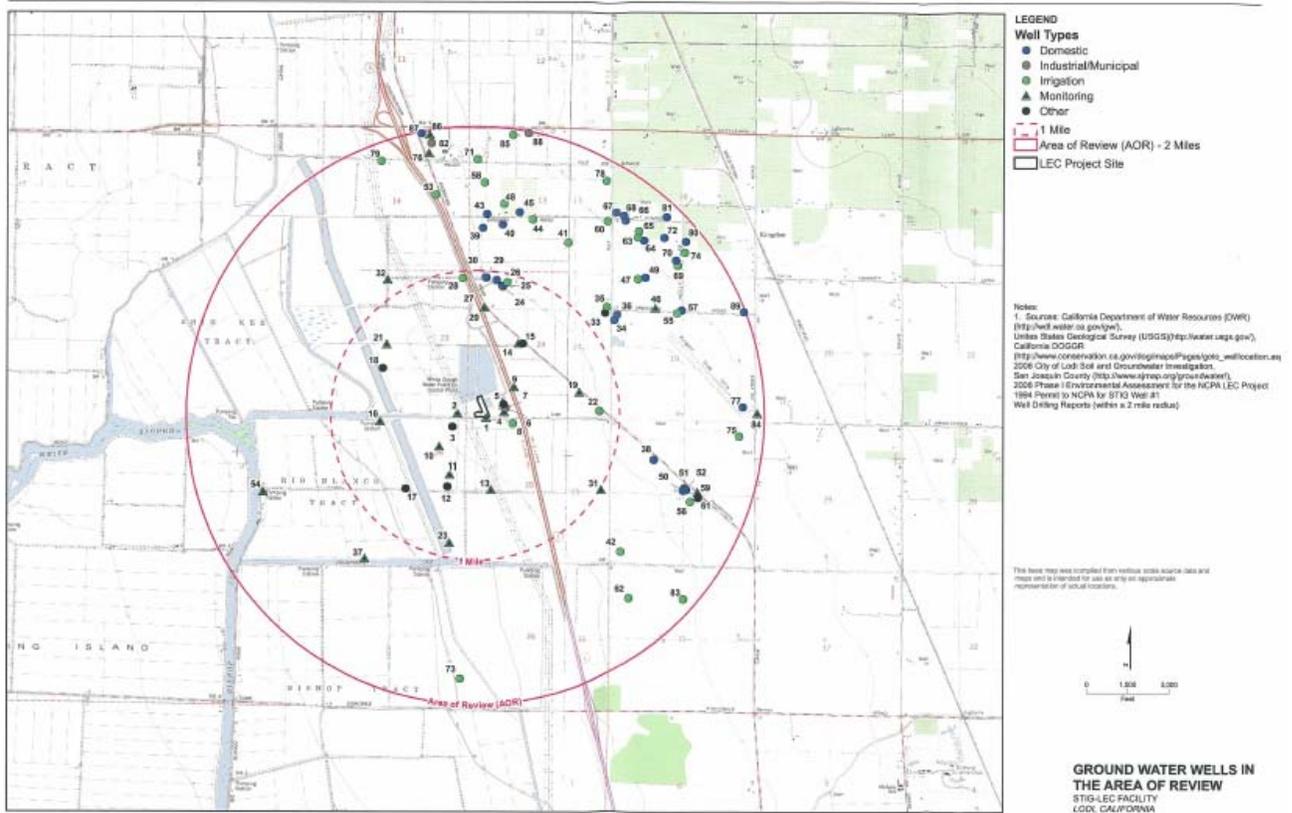


Figure 4. Map showing ground water wells within the two-mile Area of Review (from Attachment B of the Permit Application).

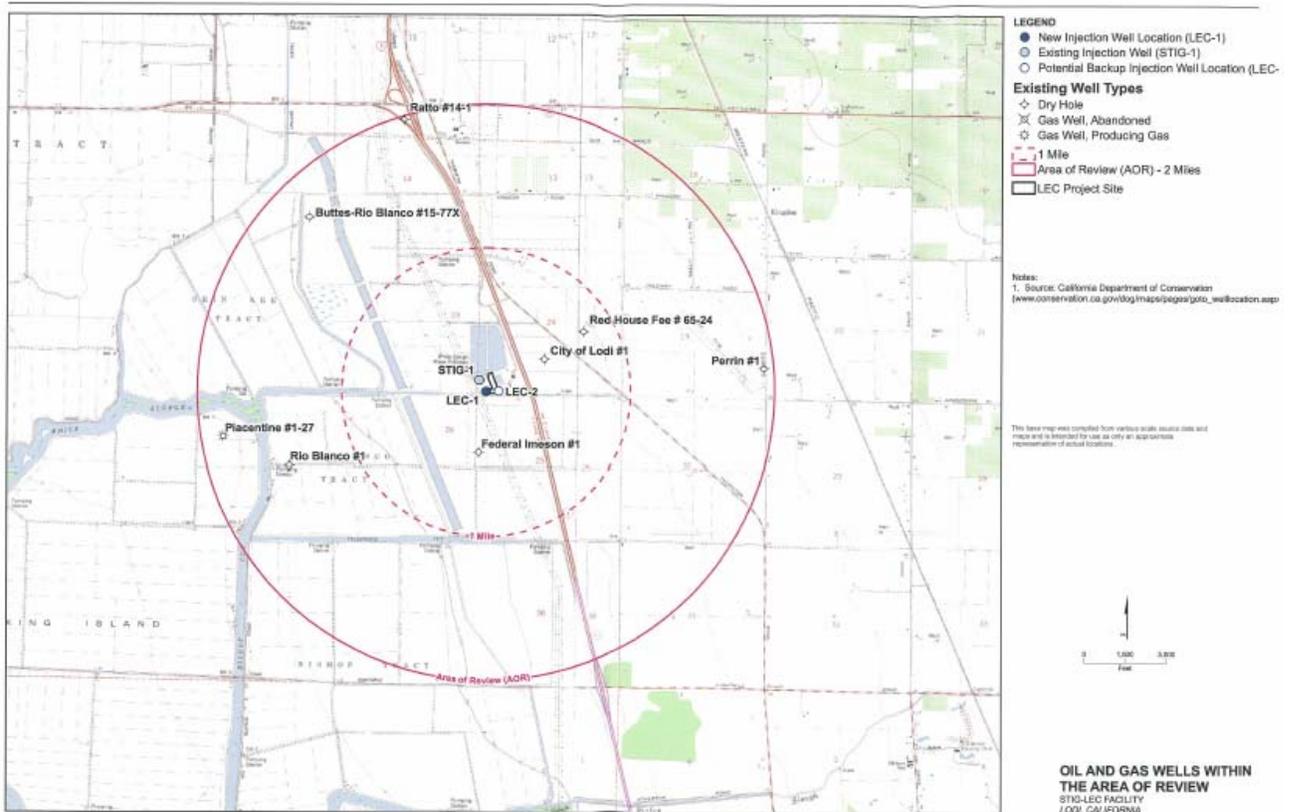


Figure 5. Map showing oil and gas wells within the two-mile Area of Review (from Attachment B of the Permit Application).

APPENDIX B – Well Schematics

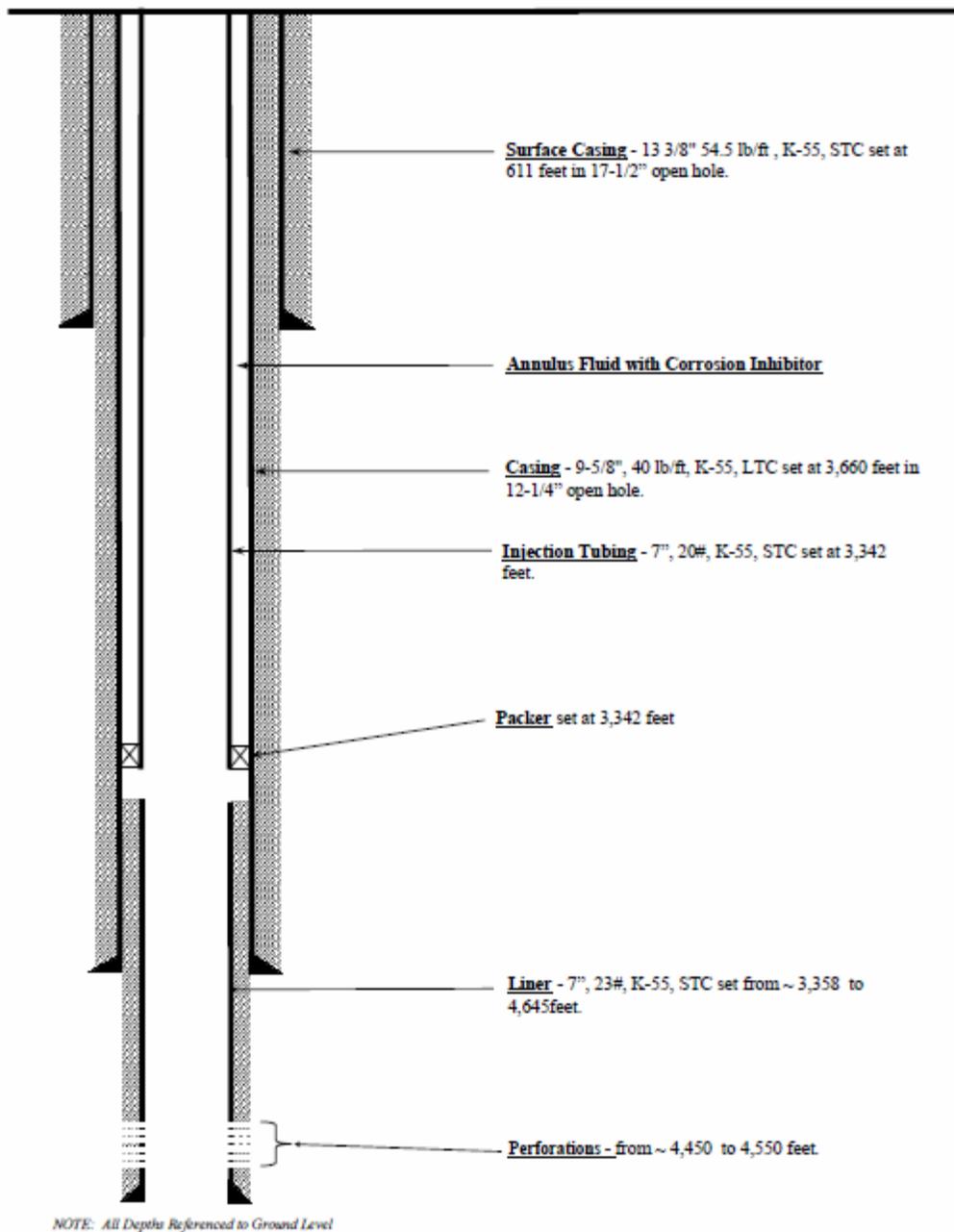
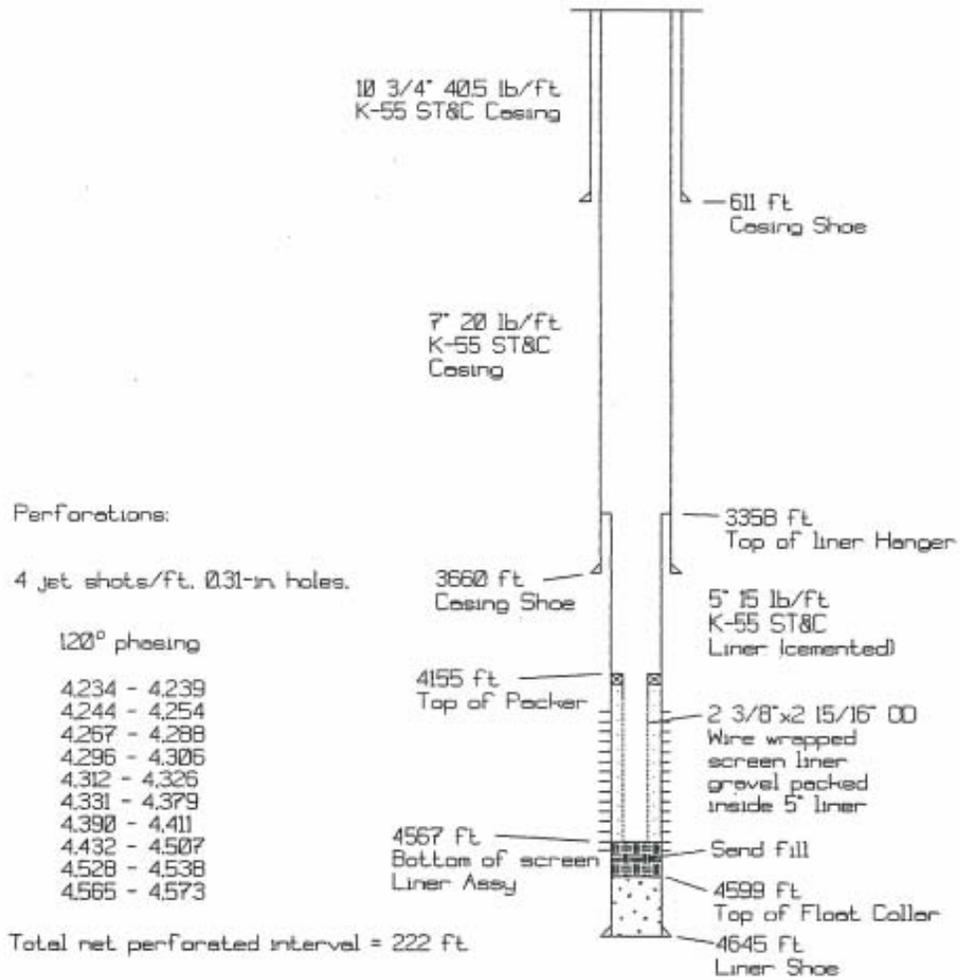


Figure 1. Proposed construction specifications for wells LEC-1 and LEC-2.

Casing Diagram
 NCPA Lodi STIG #1 Injection Well
 June 6, 1993 After Installation
 of Gravel Packed Liner



* Depths are based on HLS open hole logs dated 5/2/93 and 5/7/93

Figure 2. As-built construction specifications for well STIG-1 (from Appendix 10 of the Permit Application).

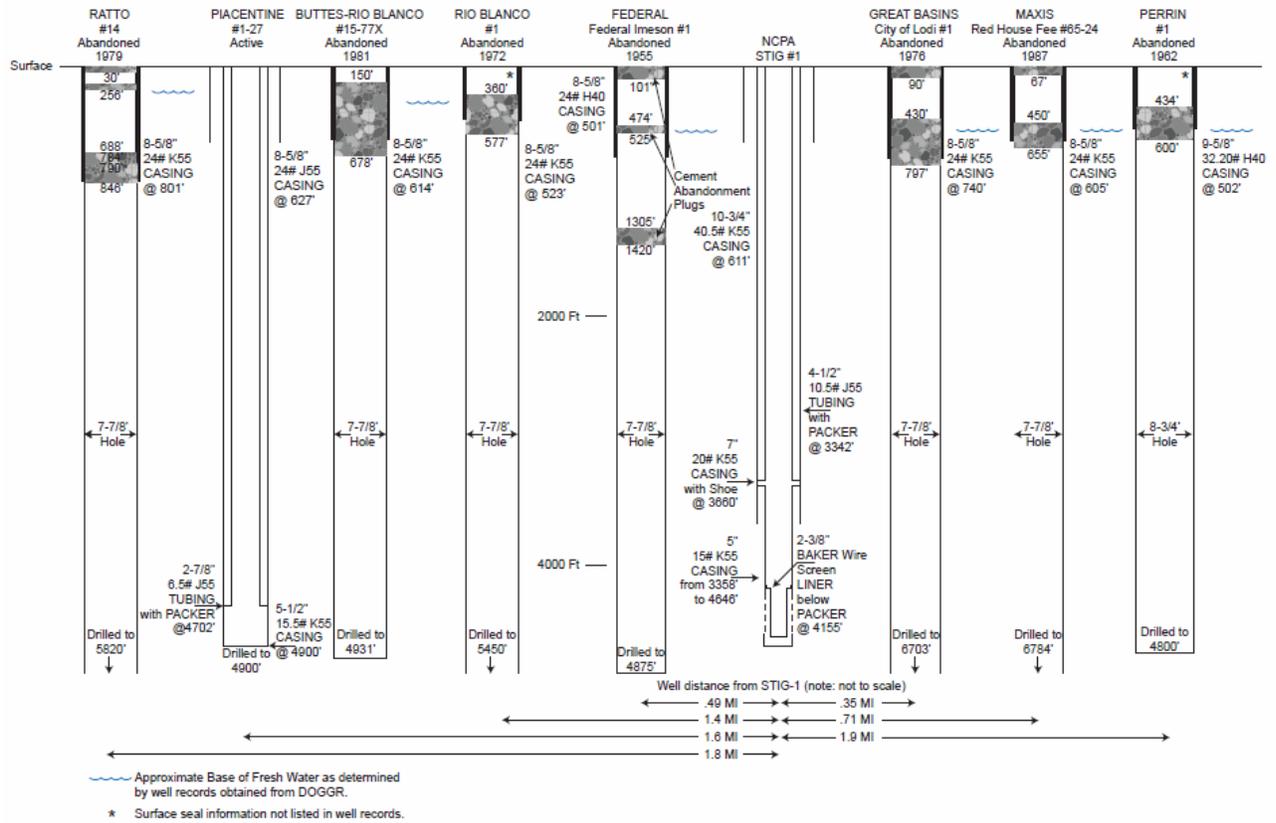


Figure 3. Wellbore schematics of the active and abandoned exploratory gas wells in the Area of Review.

APPENDIX C – EPA Reporting Forms

Form 7520-7: Application to Transfer Permit

Form 7520-9: Completion of Construction

Form 7520-11: Annual Well Monitoring Report

Form 7520-12: Well Rework Record

Form 7520-14: Plugging and Abandonment Plan

APPENDIX D – Logging Requirements

Region 9 Temperature Logging Requirements

A Temperature “Decay” Log (two separate temperature logging passes) must satisfy the following criteria to be considered a valid Mechanical Integrity Test (“MIT”) as specified by 40 CFR §146.8(c)(1). Variances to these requirements are expected for certain circumstances, but they must be approved prior to running the log. As a general rule, the well shall inject for approximately six (6) months prior to running a temperature decay progression sequence of logs.

1. With the printed log, also provide raw data for both logging runs (at least one data reading per foot depth) unless the logging truck is equipped with an analog panel as the processing device.
2. The heading on the log must be complete and include all the pertinent information, such as correct well name, location, elevations, etc.
3. The total shut-in times must be clearly shown in the heading. Minimum shut-in time for active injectors is 12 hours for running the initial temperature log, followed by a second log, a minimum of 4 hours later. These two log runs will be superimposed on the same track for final presentation.
4. The logging speed must be kept between 20 and 50 ft. per minute (30 ft/min optimum) for both logs. The temperature sensor should be located as close to the bottom of the tool string as possible (logging downhole).
5. The vertical depth scale of the log should be 1 or 2 in. per 100 ft. to match lithology logs (see 7(b)). The horizontal temperature scale should be no more than one Fahrenheit degree per inch spacing.
6. The right hand tracks must contain the "absolute" temperature and the "differential" temperature curves with both log runs identified and clearly superimposed for comparison and interpretation purposes.
7. The left hand tracks must contain (unless impractical, but EPA must pre-approve any deviations):
 - (a) a collar locator log,
 - (b) a lithology log:
 - i. an historic Gamma Ray that is "readable", i.e. one that demonstrates lithologic changes without either excessive activity by the needle or severely dampened responses; or
 - ii. a copy of an original SP curve from either the subject well or from a representative, nearby well.
 - (c) A clear identification on the log showing the base of the lowermost Underground Source of Drinking Water (“USDW”). A USDW is basically a formation that contains less than 10,000 ppm Total Dissolved Solids (“TDS”) and is further defined in 40 CFR §144.3.

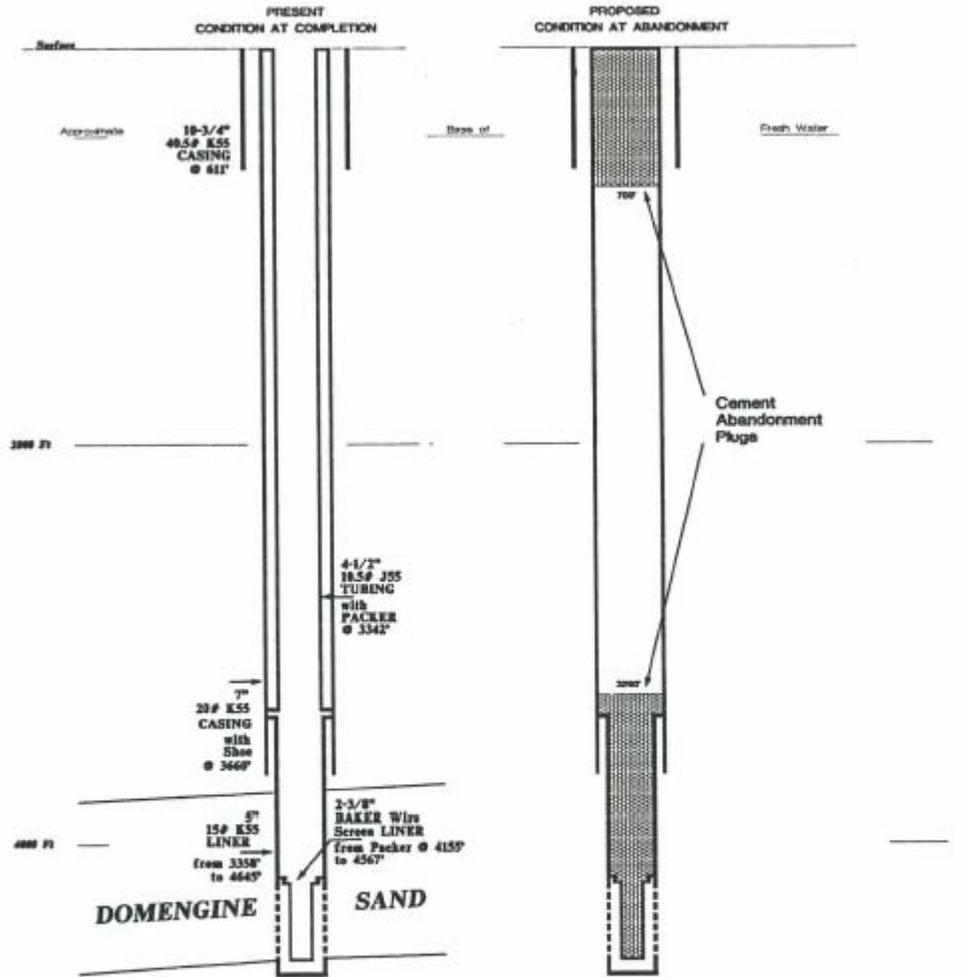
APPENDIX E - Region 9 UIC Pressure Falloff Requirements

For reference please refer to:

<http://www.epa.gov/region09/water/groundwater/uic-docs/falloff-testing-guidelines.pdf>

APPENDIX F - Plugging and Abandonment Plans

Upon completion of injection activities the well(s) shall be abandoned according to State and Federal regulations to ensure protection of Underground Sources of Drinking Water.



Source:
Northern California Power Agency, 1994

**WELLBORE SCHEMATICS OF
THE STIG-LEC FACILITY
INJECTION WELLS
STIG AND LODI ENERGY CENTER
UIC PERMIT APPLICATION**

Figure 1. General Plugging and Abandonment plan schematics for wells STIG-1, LEC-1 and LEC-2 (from Attachment Q of the Permit Application).

**APPENDIX G –
REGION 9 Step Rate Test Policy**

For reference please refer to:
Society of Petroleum Engineers (SPE) Paper #16798, Systematic Design and Analysis of Step-Rate
Tests To Determine Formation Parting Pressure
(This paper may be obtained from the SPE.)