Statement of Basis

U.S. Environmental Protection Agency, Region 9 Draft Class V Experimental Underground Injection Control Permit R9UIC-CA5-FY11-3R CA
City of Los Angeles, CA

Facility Information

Bureau of Sanitation
Department of Public Works
City of Los Angeles
1149 S. Broadway St.
Los Angeles, California 90015

Contact:

Omar Moghaddam
Division Manager
Regulatory Affairs Division
Los Angeles Department of Public Works
Bureau of Sanitation
1149 South Broadway, Suite10018
Los Angeles, CA 90015
Ofc phone (213) 485-3916

Regulatory Contact:

George Robin, Environmental Engineer
United States Environmental Protection Agency Region IX
Ground Water Office, WTR-9
75 Hawthorne Street
San Francisco, CA 94105
Ofc phone (415) 972-3532
Fax (415) 947-3549
Email: robin.george@epa.gov

I. Purpose of the Statement of Basis

Pursuant to the Underground Injection Control (UIC) regulations in Title 40 of the Code of Federal Regulations (CFR), §124.8, the purpose of this statement of basis is to briefly describe the principle facts and the considerations that went into preparing the draft permit. To meet these objectives, this statement of basis contains background information on the permit process, a description of the facility, a brief discussion of the permit conditions, and a description of the rationale for these permit conditions.

II. Background and Project Overview

In November 2006, EPA issued a Class V Experimental UIC permit to the City of Los Angeles (the City) authorizing the drilling, construction, and operation of three injection/monitoring wells at the City's Terminal Island Water Reclamation Plant. These wells are the focus of Los Angeles' Terminal Island Renewable Energy (T.I.R.E.) project. The T.I.R.E. project is an innovative experimental project whereby the City's slurry mixtures of treated, non-hazardous, municipal sludge and other wastewater residuals are blended with treatment plant wastewater, creating a "bioslurry" that is injected into a porous, permeable, unconsolidated sandstone formation approximately one mile below the ground surface. The sources of biosolids are the Terminal Island Plant, the Hyperion Treatment Plant, the Carson Treatment Plant, and the Orange County Treatment Plant.

The injection of municipal waste water would normally be classified under EPA's UIC program as Class 1 Non-Hazardous. However, because the City blends municipal biosolids with the waste water, the injection does not conform to the requirements of the Class I UIC program. Given that, and the experimental and innovative nature of the City's project, EPA determined that a Class V Experimental classification for this project is appropriate.

The main objectives of the City's experimental project include: demonstrating the potential for high temperature sub-surface treatment of the biosolids; observing and monitoring biodegradation – conversion of the biomass to methane and carbon dioxide; permanent sequestration of the majority of the carbon dioxide; and recovery of the methane that is generated and collected from within the sandstone for energy use at the City's surface facilities. Experimental techniques to enhance geophysical monitoring are also being employed and evaluated by the City in the course of the project.

During the initial 5-year permit term, the City drilled and constructed three wells; one is used for biosolids slurry injection (SFI-1) and two wells are used solely for monitoring (SFI-2 and SFI-3). The City has injected a total of more than 240 million gallons of biosolid slurry into SFI-1 since project inception, averaging about 100 tons of biosolids wetcake per day. The City's UIC permit expired in November 2011, however, it remains effective and the terms and conditions of the permit remain in force as EPA has evaluated their application to renew the permit for an additional 5-year term.

III. Permit Information

Application and Review

The U.S. Environmental Protection Agency, Region 9 (EPA) Water Division Director has authority to issue permits for underground injection activities under 40 CFR §144.31. The City of Los Angeles submitted an application to the EPA on May 18, 2011 for renewal of their existing Class V Experimental UIC permit. The L.A. application proposes to continue demonstrating and expand the operational scope of their innovative experimental biosolids injection project. As noted above, EPA designated the City's injection project/permit as Class V

Experimental when we granted initial authorization in 2006. EPA intends to maintain this classification of the project because the City's operational conditions and our regulatory criteria have not changed.

The draft permit would allow the City an additional 5-year operating period to continue evaluating their main experimental objectives, described above. In addition to the experimental effort that is being conducted by L.A., several universities and governmental agencies are also conducting independent research from data and samples obtained and provided by the City.

Slurry Fracture Injection

In order to inject a bioslurry, it is necessary to use injection pressures that will allow hydraulically-created fractures within the vicinity of the injection well to provide pathways for the bioslurry to flow. The fracture pattern also functions to permanently contain the solids portion of the bioslurry, while allowing the liquid medium to permeate into the sandstone matrix, and relieving pressure accumulation through dissipation.

Slurry fracture injection is not a new technology. For example, it has been employed within the oil and gas industry for several decades. However, EPA's Class I UIC regulations do not provide for injection at or above fracture pressures, which are required to emplace a bioslurry into the subsurface. Within the UIC program, only Class II (oil and gas) wells are authorized for such injection and Federal permitting regulations do not contain specific criteria and standards for these operations. In California, there are several permitted injection wells for long-term "slurry injection" activities (all of them Class II wells). Class II "slurry injection" projects have been ongoing for over a decade at the THUMS platform located offshore in Long Beach Harbor.

EPA considered these and other existing operations, along with the City's previous permitted performance and results when developing this draft permit. In addition, despite the Class V Experimental classification, the contents and requirements of this draft permit, like those of the initial permit, are similarly stringent to what EPA requires in a Class I Nonhazardous injection well permit, with the exception of the experimental and research activities and those requirements specifically relating to slurry injection operations. These latter requirements include provisions which require L.A. to use state-of-the-art technology in the areas of fracture implementation, modeling and monitoring.

Operational Information

L.A. is proposing to drill an additional monitoring well (SFI-4) to a deeper total depth (down to 7,500 ft, approximately 2,000 ft deeper than the existing three wells) and convert an existing monitoring well (SFI-3) to injection at their Terminal Island Water Reclamation Plant site. Additionally, the three existing wells may be deepened if the geology encountered in the newly drilled well proves to be advantageous to the City's operations. The Treatment plant is located within the County of Los Angeles in the city of San Pedro at 445 Ferry St. (zip code 90731), on the east side of Terminal Island, an artificial, industrially-zoned island, surrounded by the Los Angeles Main Channel, the Cerritos Channel, the Back Channel and San Pedro Bay. The permit would authorize two injection wells operating alternately and two monitoring wells.

The two injection wells (SFI-1 and SFI-3) are proposed to inject the bioslurry for approximately eight to twelve hours each, daily, on an alternating basis. The combined slurry volume at maximum injection for the two wells will consist of approximately 400 tons of biosolids mixed with sufficient water for injection into the Repetto and Puente sandstone formations. Each sandstone interval within this larger group of sandstones will be separately authorized for injection as needed.

During the technical review process for the initial permit application, the EPA examined the area of review (AOR) within a one-mile radius surrounding the three proposed well locations. Based on this review, EPA identified three improperly plugged and abandoned wells (Superior Well B-1, Apex Hards-Warnock Well 1, and SP LA Harbor Well 301). These wells are located within the target sandstone approximately one mile away from the project area. To address this, EPA included operational limitations in the draft permit (e.g., injection pressure/volume limits) to prevent the reservoir pressure from increasing at the location of these three wells. Based on the carefully monitored historical performance of the reservoir pressure within the project area, and upon extrapolating the pressure influence at the location of these three wells, EPA determined that there has been zero pressure influence during the previous permitting period. For the current permit evaluation, EPA also determined that no pressure increase is expected for the additional 5-year injection period, even with the addition of a second, alternating injection well. Therefore, EPA determined that no corrective action is needed at this time for wells located within the AOR.

All wells authorized by the permit will be constructed, operated, tested, monitored and eventually plugged in accordance with standards found in the federal Underground Injection Control regulations for Class I nonhazardous injection wells. The experimental and fracture-related components of the project will also adhere to specific modeling and monitoring standards included in the draft permit.

During the actual drilling and approved logging and testing operations for any of the wells, L.A. will submit appropriate information to EPA. EPA will not grant new or modified authorization to inject for this Class V Experimental permit until all necessary field data and testing information for the relevant wells is submitted and approved by EPA. In the event the actual field information provided is inconsistent with this Draft Permit, a permit modification will be prepared and submitted for public comment.

Public Participation

The public is provided **30 days** to review and comment on the Class V Experimental UIC draft permit (40 CFR §124.10). During the public comment period, the Draft Permit, Public Notice, and this statement of basis are available at the following locations:

Los Angeles Central Public Library
630 W. 5th Street
Los Angeles, CA 90071

Los Angeles Harbor Gateway – Harbor City Branch Library
1555 W. Sepulveda Blvd.
Los Angeles, CA 90501

Los Angeles San Pedro Regional Branch Library
931 S. Gaffey St.
San Pedro, CA 90731

Los Angeles Wilmington Branch Library
1300 N. Avalon Blvd.
Wilmington, CA 90744

Long Beach Public Library Main Location
101 Pacific Avenue
Long Beach, CA 90822

CA Division of Oil, Gas, and Geothermal Resources
Cypress District 1 Office
5816 Corporate Avenue, Ste. 200
Cypress, CA 90630

The Draft Permit, Public Notice, Statement of Basis, and the City's UIC permit application are also available at EPA's Regional Office location noted below, and on Region 9's web page at:

http://www.epa.gov/region09/water/groundwater/uic-permits.html

U.S. Environmental Protection Agency, Region 9
Region 9 Library or Ground Water Office, WTR-9
75 Hawthorne Street
San Francisco, CA 94105

The public comment period begins on November 17, 2013 and ends on December 17, 2013. All written comments on the draft permit can be mailed, faxed, or e-mailed to George Robin using the contact information listed on the first page of this statement of basis. George Robin is also available by phone for any questions regarding the draft permit

During the public comment period, any interested person may submit written comments on the draft permit and may request a public hearing. All persons, including the applicant, who object to any condition of the draft permit or EPA's decision to prepare a draft permit must raise all reasonably ascertainable issues and submit all reasonably available arguments supporting their position by the close of the comment period (40 CFR §124.13).

Final Decision Making Process

After the close of the public comment period, EPA will review and consider all comments and issue a final permit decision. A response to comments will be sent to the applicant and each person who has submitted written comments or requested notice of the final permit decision. The response to comments and notification will contain: a response to all significant comments on the draft permit, the final decision, any permit conditions that are changed and the reasons for the changes, and procedures for appealing the decision. The final decision shall be to either issue or deny the permit. The final decision shall become effective thirty (30) days after the service of the notice of decision. Within thirty (30) days after the final permit decision has been issued, any person who filed comments on the draft permit or participated in a public hearing, or who takes issue with any changes in the draft permit, may petition the Environmental Appeals Board to review any condition of the permit decision. Commenters are referred to 40 CFR §124.19 for procedural requirements of the appeal process.