Department of Conservation

Division of Oil, Gas, and Geothermal Resources

Underground Injection Control Program

Work Plan

(DRAFT)

August 18, 2014

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Executive Summary

Oil and gas production in California is a $34 billion annual industry, employing more than 25,000 people with an annual payroll of over $1.5 billion. California is the fourth largest oil-producing State in the nation, producing about 625,000 barrels per day. Property and other tax payments to the State and local governments from the industry amount to about $800 million annually. There are approximately 90,000 active or idle production and injection wells in the state.

Injection wells have been an integral part of California's oil and gas operations for over 50 years. Currently, over 50,000 oilfield injection wells are operating in the state. Injection wells are used to increase oil recovery and to safely dispose of waste luid produced with oil and natural gas. About 72 percent of California's oil production is the result of Enhanced Oil Recovery (EOR) methods such as steam flood, cyclic steam, water flood, and natural gas injection.

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Most of the oil and gas fields in the state are old and require EOR development. Each year more responsibility rests with the Division of Oil, Gas, and Geothermal Resources (Division) Underground Injection Control (UIC) Program to deal with the enhanced oil recovery of the resource. This includes new methods and techniques developed by the industry to produce the oil and gas. The increased use of injection also presents new public health and safety risks, especially in fields with older wells. These risks include groundwater contamination, reservoir fluids leaking to the surface, and fires and blowouts caused by the migration of oil and gas. Urban encroachment, on or around older oil and gas wells, raises additional issues and concerns.

The US EPA audit, conducted by Horsley Witten, was completed and sent to the Division in September 2011. In December 2012, the Division responded to the US EPA and stated that the Division would develop UIC regulations to address the concerns and short comings identified in the audit. The following issues were specifically outlined in the audit:

- Additional plugging and cementing requirements to protect Underground Sources of Drinking Water (USDW)
- More in-depth evaluation of the zone of endangering influence (ZEI)
- Requirements for waste fluid disposal
- Changes to requirements for pressure gauges and/or monitoring of zone pressure
- Well construction and cementing
- Annual project reviews

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- Standard Annual Pressure Test (SAPT) requirements
- Well monitoring requirements instead of the SAPT
- Mechanical integrity surveys and testing
- Inspections and compliance/enforcement practices and tools
- Idle well planning and testing program
- Financial responsibility requirements
- UIC staff qualifications
- Cyclic steam injection well testing requirements

In addition to the US EPA audit, the legislature has been very involved with several UIC issues and has made it clear that there are other areas that need to be addressed in regulation. These areas include:

- H2S/Waste Gas Disposal
- Freshwater usage relating to EOR projects
- CO2 EOR Projects
- CO2 Sequestration

Additional areas of concern that have been brought to the Division's intention that needs to be addressed in regulations, and associated to our UIC program include:

- Shallow Thermal Diatomite
- Surface expressions
- The Aquifer Exemption Process
- Well construction standards
- Injection relating to formation fracturing pressure

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Division Next Steps:
The Division has already started its UIC program evaluation and will continue the following:

- Identify gaps in UIC Program compliance and develop a corrective action plan
- Hire qualified and highly educated personnel to fill retirement vacancies
- Provide technical and regulatory training for UIC staff
- Increased management oversight of UIC staff
- Heightened accountability for technical work
- Work with US EPA on identifying UIC Program gaps
- Continue outreach to the oil and gas industry to raise awareness of concerns
- Public outreach on the state and federal mandates
- Electronic data maintenance

California is moving forward to meet the changing needs in regards to technology and demographics associated to oil and gas production. The Division is working towards establishing a program to oversee the injection and monitoring of new technology not

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covered by existing regulations. This work plan is designed to strengthen the current UIC Program. Since the Division already has authority over all methods of increasing the recovery of oil and gas under State mandates, it makes sense to extend that regulatory authority to cover all new technologies for EOR, including, cyclic steaming, shallow thermal injection diatomite, hydraulic fracturing, acid matrix operations, waste gas disposal, and CO_2 injection wells.

Work Plan Components

I. **Assessment**

II. **Plan Development**

III. **Plan Implementation**

IV. **Compliance Monitoring**

V. **Public Outreach**

VI. **Legislation/Rulemaking**

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I. Assessment

The Division has developed and begun an assessment of the Division-wide UIC Program. In the development of the assessment, the Division has considered the following concerns to help develop a priority list:

- Risk to the public
- Risk to health and safety
- Risk to property
- Risk to natural resources
- Risk of litigation

The highest priority issues are being addressed first. Based upon known current conditions, the injection projects located in the Cypress District (Division – District 1) appeared to have the highest priority. The district has 160 injection projects, which includes nearly 2,000 injection wells. A draft report has been completed for the Cypress district. The evaluation of the Bakersfield district is beginning this month.

The assessment is designed to determine the possible shortcomings in the Division's UIC program. The UIC program standards that should be used are listed in both California's Primacy application and the federal regulations associated with the Safe Drinking Water Act and Class II injection wells. The assessment will:

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- Evaluate a representative sampling of old projects that are in fields that were discovered in the 1930's and 1940's to determine if appropriate AORs were completed and to determine if possible conduits for the injection fluid are present
- Evaluate a representative sampling of recent projects to determine if appropriate AORs were completed and to determine if possible conduits for injection fluid are present
- Evaluate a representative sampling of the records for annual project reviews to determine if they were performed and documented adequately to determine if the project is in compliance with the project approval
- Evaluate a representative sampling of the Division's UIC monitoring program to determine if adequate Mechanical Integrity Testing (MIT) surveys are conducted, evaluated, and documented to ensure mechanical integrity of the injection wells
- Evaluate a representative sampling of the Division's UIC monitoring program to determine if the Maximum Allowable Surface Pressures (MASP) are determined correctly and monitored to ensure compliance with the project approval
- Evaluate if the Division's UIC staff are appropriately educated and trained and have the necessary tools to enforce the Safe Drinking Water Act in regards to Class II wells
- Evaluate if the Division has enough staff and resources to adequately enforce the Safe Drinking Water Act in regards to Class II wells

To accomplish the assessment of the Division's UIC program, the Division has created a Monitoring and Compliance Unit to perform a Peer review of the program. The Division has experience with this model and has used this for a permitting review, and is currently using it to evaluate district UIC operations. The Peer Review Team is assessing the following to ensure compliance:

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- Injection project applications
- Project files
- Monitoring data
- Surveys
- Injections reports

In addition, it has also necessary that site visits take place to evaluate the current program, staff, and business processes to ensure compliance with the Primacy application.

A draft report that lists the results of the assessment in our Cypress district office, including both the shortcomings and adequacies of the Division's UIC program, has been prepared. In addition, the final report will include recommendations for improving the Division's UIC program, listing what steps should be taken to bring the program into compliance with the expectations of the US EPA and the Safe Drinking Water Act.

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Plan Development

Once the assessment of the Division-wide UIC Program is completed, a plan will be developed to address the issues identified. This plan will address the following:

- **Issues Identified**
  It is anticipated that the issues previously listed, which include deficiencies in: conducting Area of Review evaluations; annual project reviews; step-rate testing, injection above fracture pressure will be identified. It is also anticipated that additional issues may be identified which may include: lack of adequate training for UIC staff; lack of accountability of staff; and inadequate hiring practices to ensure qualified staff.

- **Action plan – including timelines to remediate issues**
  An action plan will be developed to address all issues identified in the assessment. This plan will be a "road map" for management and staff to move forward to address specific issues to ensure the Division fulfills it mandates. This may include: a realignment of staff, additional support from Department staff, modification of current policies, development of new policies, training needs, modifications to position job classifications, new hiring standards, and reporting and documentation standards.

- **Identify available resources to remediate the issues**
  The additional positions have been provided to the Division and has provided much of the anticipated resources to initiate an action plan. However, depending on the assessment and the goals of the action plan, additional resources above and beyond the past Budget Change Proposals (BCP) staff allotment may be required. Needed resources will be calculated and verified. If additional resources are required, a BCP will be initiated to address the identified needs.

- **Plan management and oversight**
  Part of the work plan will include a peer review team that will also have a role in monitoring the work performed within the UIC unit. A reporting structure, documentation guidelines, and oversight guidelines will be created to ensure the program is in compliance with laws and regulations.

- **Action Plan Monitoring and/or adjustments to meet plan goals**
  The action plan will have specific milestones and due dates to meet the identified objectives. This timeline will include strategic points in the plan to re-evaluate the progress and goals of the plan. The plan will be dynamic to address issues that will arise, not identified in the plan. Corrections and modifications to the plan are anticipated.

- **Training**
  Ongoing assessments of the Division's program have identified the need for specific training of the UIC staff. The work plan's assessment will include much

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more valuable information regarding the training needs of the UIC staff. It is anticipated that a new training plan to revamp the Division's current training model will be developed. The Division has already taken steps to re-create an engineering training consultant position to address the training needs of the engineering staff.

- **Follow-up**
  As mentioned above under action plan monitoring, the plan implementation will include a model for following the progress of the action plan. This will include not only specific documentation, quarterly and monthly reporting, but also the day to day oversight of the UIC program. Progress will be tracked and the quality of work will be evaluated. This oversight will continue after the full plan has been implemented.

Plan Implementation

Again, once the assessment is completed for all the district offices, a plan will be developed to address the Division's UIC short comings. Once the plan has been approved by management, the plan will be implemented and monitored until completion. Regular reporting will be generated to document action taken. The specifics regarding the implementation of the action plan cannot be determined until the assessment has been completed and the action plan has been developed.

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Compliance - Monitoring

The work plan includes utilizing the Monitor and Compliance Unit. This unit is separate from the UIC Program in order to provide objective analysis of the adequacies of the UIC Program. This unit is comprised of one Senior Oil and Gas Engineer to oversee the unit, three Associate Oil and Gas Engineers, and one Associate Government Program Analyst to be part of a Peer Review Team to continue to provide the necessary resources to assist with the assessment, plan development, plan implementation, and the follow-up monitoring to ensure Division statutes, regulations, and policies are followed. This unit is providing feedback to the Technical Services Manager, UIC Program Manager, and the Chief Deputy to ensure accountability. This unit is focusing its attention on the assessment phase of the work plan.

This Unit is designed to have flexibility and mobility to ensure that the UIC Program requirements are met by:

- Completing the Assessment Phase for the Work Plan
- Overseeing Annual Injection Project Reviews
- Updating Manual of Instruction (MOI)
- Interfacing with Training Coordinator to provide technical training support for UIC
- Performing oversight of casing diagrams on Area of Review (AOR)
- Verifying no migration through MIT testing

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- Reviewing Step-Rate Tests to determine Maximum Allowable Surface Pressure (MASP)
- Providing cross-training from District-to-District to improve staff awareness of issues outside their locale

Public Outreach

There are potential issues associated with bringing the Division's UIC regulatory into compliance. One such issue is the need to provide public outreach to all the affected stakeholders. This includes the oil and gas industry, state and local governmental agencies, and the general public. Depending on the issues identified in the assessment phase, a public outreach program will be developed and implemented.

Legislation/Rulemaking

The Division has already begun drafting regulations to address those issues identified in the Horsley Witten audit, as well as those issues identified by the Legislature and the Division. These regulations may be quite extensive and will take some time to fully develop. In addition, many of the areas covered by these regulations will be controversial and require considerable discussion with all stakeholders. We anticipate that these draft regulations will be modified several times. Because of this issue, the Division is planning on conducting workshops to develop a priority list in order to submit the regulations to the Office of Administrative Law (OAL) in phases. This will allow the Division to have separate rulemaking packages in order to allow less controversial changes to move forward quickly, and the more controversial issues to have adequate time to work out the controversial details.

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The Division anticipates scheduling workshops to discuss UIC priorities as soon as October. Active participation in these workshops should include, and not be limited to the following: US EPA, State Water Board, Regional Water Quality Control Boards, Department of Toxic Substance Control, Air Resources Control Board, Western States Petroleum Association, California Petroleum Association, Independent Oil Producers' Agency, County and City agencies, Non-Government Organizations, and the general public.

The discussion of priorities will be designed to take into consideration multiple phases, beginning with those areas identified by the Horsley Witten audit, followed by those areas of concern identified by the Legislature, the Division, the regulated community, and the public. Once the priority lists are generated, the Division will move forward with publishing discussion documents and conducting limited workshops. After the discussion draft workshops are complete for each section, the Division will submit draft regulations to OAL and begin the rulemaking process. The Division anticipates having a new section of the proposed regulations out every few months, and thereby having several rulemaking packages in the process simultaneously.

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