

Title Page:

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Principal Author: Ben Grunewald & Paul Jehn

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Recipient Name and Address: Ben Grunewald  
Ground Water Protection Research Foundation  
13308 North MacArthur Boulevard  
Oklahoma City, OK 73142

Significant Contractors: Dan Arthur, Mark Layne and Bruce Langhus  
ALL, LLC.

*P.O. Box 520997*  
Tulsa, OK 74152-0997

Tom Gillespie  
VES, Inc.  
6740 Mt. Vernon Drive  
Melrose, FL 32666

Ben Binder  
DDG, Inc.  
7970 Sheridan Boulevard  
Arvada, CO 80003

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*Final Report – November 29, 2002*

**Advancing Technology and Methodology to Streamline Environmental Compliance**

**Task 1. Install the RBDMS in all Oil and Gas Agencies That Desire the System and Provide Customization Assistance to Current User States**

By early 2000, fifteen oil and gas State Agencies were using RBDMS or a RBDMS utility to handle a significant amount or all of their data management needs. There are three additional State slated to begin implementation this year. There are an additional twelve State agencies that are not utilizing this technology that have proven to be very useful for so many other States. This project will allow for the base RBDMS install in all State oil and gas agency that desire it.

This Task includes the following 4 subtasks:

**1. Additional Base Installs**

With this project the GWPRF will be installing or upgrading the generic version of RBDMS for any oil and gas state agency. States requesting an install or upgrade include North Dakota, Florida, Alaska, West Virginia, and Illinois. This project will also install RBDMS utilities for any oil and gas state. The RBDMS utilities have been developed to work with RBDMS or an individual state developed data management system. For example, Colorado has requested that we install RBDMS utilities for use with their system.

*Accomplishments:*

*RBDMS or a RBDMS utility has now been installed in the following states and Indian Nations:*

	<i>Activity</i>					
<i>State</i>	<i>RBDMS base install</i>	<i>SQL Upgrade</i>	<i>On-line Data access</i>	<i>Field inspection</i>	<i>e-permit</i>	<i>e-reporting</i>
<i>Alaska</i>	<i>Completed</i>	<i>Completed</i>				
<i>California</i>				<i>Beta testing</i>	<i>Beta testing</i>	
<i>Nevada</i>	<i>Under development</i>					
<i>Utah</i>	<i>Completed</i>	<i>Completed</i>	<i>Completed</i>	<i>Completed</i>		<i>Under development</i>
<i>Montana</i>	<i>Completed</i>	<i>Completed</i>	<i>Completed</i>			<i>Under development</i>
<i>Colorado</i>			<i>Completed</i>	<i>Beta testing</i>		<i>Under development</i>

<i>New Mexico</i>	<i>Completed</i>	<i>Completed</i>		<i>Completed</i>		
<i>North Dakota</i>	<i>Completed</i>	<i>Completed</i>		<i>Completed</i>		
<i>Nebraska</i>	<i>Completed</i>	<i>Completed</i>				
<i>Kansas</i>	<i>Completed</i>					
<i>Oklahoma (OCC)</i>	<i>Test data migrated to RBDMS</i>					
<i>Osage Indian Nation</i>	<i>Completed</i>					
<i>Missouri</i>	<i>Completed</i>	<i>Completed</i>				
<i>Arkansas</i>	<i>Completed</i>	<i>Completed</i>	<i>Completed</i>			
<i>Michigan</i>	<i>Completed</i>	<i>Completed</i>	<i>Completed</i>	<i>Completed</i>		
<i>Ohio</i>	<i>Completed</i>	<i>Completed</i>				
<i>Kentucky</i>	<i>Completed</i>	<i>Completed</i>				
<i>Mississippi</i>	<i>Completed</i>	<i>Completed</i>	<i>Completed</i>			
<i>Alabama</i>	<i>Completed</i>	<i>Completed</i>				
<i>New York</i>	<i>Completed</i>	<i>Completed</i>	<i>Completed</i>			<i>Beta testing</i>
<i>Penn</i>						<i>Beta testing</i>
<i>Florida</i>	<i>Completed</i>					

## 2. System Documentation

There is a need to place more emphasis on documentation for the customized versions of RBDMS. Some states are beginning to see a turnover in their trained RBDMS computer personnel. With the loss of RBDMS operators who have been with the program since the inception, states are have to rely more on the GWPC consultants to maintain the system. Under this task, GWPC will develop documentation and users manuals for requesting states that are using a customized version of RBDMS. New customize base installs will include a detailed users and administrative manual.

The development of detailed user and administrative manuals will decrease the dependence on consultants.

### *Accomplishments:*

*State RBDMS documentation has been completed. State documentation will be posted on the GWPC EIMS/RBDMS web site. This will facilitate technical exchange and peer review.*

*The documentation will be updated on an ongoing basis as part of new RBDMS projects.*

### **3. Help Desk and Web Upgrade**

Funds are requested to maintain the help desk feature of the RBDMS program. In many cases, an hour of help desk time is all that is necessary to get a state back up and running. The continued use of help desk reduces or eliminates the need for costly on-site visits. The use of help desk has the added feature of enabling the states and users to learn more about their system and to become less reliant on consultants.

The State RBDMS users group has identified Web reporting as a priority RBDMS project. We have successfully tested this concept in Montana (<http://www.mt.gov/dnrc/oilgas/RBDMSJava.htm>). Web reporting makes information contained in RBDMS more accessible to the public, oil and gas operators, and other regulatory agencies.

#### ***Accomplishments:***

*GWPC maintains a help desk for all RBDMS users. States contact GWPC when a technical issue with RBDMS arises. GWPC assigns a case number and refers the issue to one of the RBDMS consultants. The consultant contacts the state and frequently solves the problem in less than one-hour.*

*Web-reporting: Under this task web, reporting is described as states making their data available on the internet for use by industry, regulatory agencies, or the public. So as not to confuse this with industry reporting of production or injection data, the RBDMS user group refers to this task as “on-line data access.”*

*As shown in the above table, on-line data access is operational in Montana, Utah, New Mexico, Arkansas, Mississippi, and Michigan*

### **4. SQL 2000 Upgrade**

Due to the extensive development of RBDMS using new tools, many states are in need of funds to assist them in the purchase of Microsoft SQL server software. SQL server also enables states to house more data in the RBDMS system. This project will provide a limited amount of assistance to help states purchase SQL software. SQL software will only be supplied as part of an install or upgrade when the GWPRF receives a written request from the director stating that the state is unable to purchase the software.

#### ***Accomplishments:***

*SQL server upgrade (primarily technical assistance and not software purchasing) has been accomplished in: Alaska, Utah, New Mexico, Montana, Nebraska, Arkansas, Missouri, Kentucky, North Dakota, Missouri, Michigan, New York, Mississippi and Alabama.*

## **Task 2. Advance the Capabilities of the RBDMS**

RBDMS is a scalable client/server application that standardizes the data elements collected and stored by each state's oil and gas regulatory agency. The GWPRF has managed upgrades and enhancements to RBDMS each year since the early 1990s. Funding for this program development over the years has come from the Department of Energy and the many states that have embraced the technology.

This Task includes the following 7 subtasks that will provide advancements to the RBDMS:

### **1. E-permit Custom Installs:**

**e.Permmit.** Used for online well permitting, e.Permmit access is protected by NT Server security, user names, and passwords, and multiple tiers of immediate client-side and automatic server-side data integrity checks. Operators will upload permit applications to the database singly through menu-driven HTML forms or in batch through XML-formatted data transfers. GWPRF will also offer **e.PermmitRemote**, an Access2000 application that will generate XML files for selected database record sets. The Well bore Schematic Utility will be bundled with e.PermmitRemote as a bonus feature. Users will be able to check their permit review status through e.Permmit's reporting features. Permits will be prepared as HTML reports, and special condition sets will be dynamically selected and sent as e-mail attachments.

With completion of the generic version of e-permitting, the GWPRF will be installing the e-permit in at least three states. This involves mapping the fields in the generic version to state specific fields. The GWPRF intends to hold a meeting with industry representatives on the e-permit program. This work session will identify how e-permit can help oil and gas operators comply with state requirements.

### ***Accomplishments:***

*E-permit generic has been developed and is currently being tested in California with CA DOGGR and industry. California is automating some permitting function so operators can receive automatic approvals for routine permit applications. The state of California has met with industry to identify necessary electronic permitting features.*

*The RBDMS Core group and GWPC are developing e-permitting as part of the overall e-commerce strategy. As part of this strategy, GWPC is developing a XML schema for all e-commerce applications. The first part of this schema (e-reporting) is under review by API to be adopted as a national standard.*

### **2. Field Inspection Utility:**

The RBDMS Field Inspection utility consists of a set of programs that assist with the tasks of scheduling UIC field inspections and efficiently entering field inspection data into the oil and gas agencies' database. The programs within the utility perform the following functions:

- ❖ Determine wells requiring annual Bradenhead inspections and five-year pressure tests.
- ❖ Allow the UIC District Office staff to customize inspection schedules by assigning inspections to inspectors on specific dates.
- ❖ Optimize inspection schedules by synchronizing inspection dates for all wells in a geographic area.
- ❖ Automatically print Notice-of-Inspection letters for mailing to operators.
- ❖ Download inspection schedules to inspectors' notebook computers.
- ❖ Minimize the time needed for inspectors to enter data in the field by displaying a scrolling list of all wells scheduled for inspections in the order in which they are to be inspected. This scrolling list contains data fields for the most commonly entered inspection data.
- ❖ Generate a file of completed inspections for uploading from the inspector notebook computers to the district servers.

Tested and now in use by the New Mexico Oil Conservation Division (OCD), the Field Inspection Utility minimizes the amount of work required to capture inspection data in the field and then to migrate that data to district and departmental systems. In New Mexico, inspection data is entered into notebook computers in the field when the inspections are performed. States that do not intend to provide field inspectors with notebook computers are able to use hard copies of the inspection forms and transfer the data to computers back in the office. This project will implement this utility in the states of New York, North Dakota and Nebraska.

### ***Accomplishments:***

*The field inspection utility has been completed as is available for use with laptop computers or PDA's (both Palm and Windows CE operating systems). Field inspection utilities are now operational in Utah (palm), New Mexico (laptop), North Dakota (laptop), New York (palm), and Michigan (windows CE). Beta testing is underway for Colorado (palm), Nebraska (palm), Kentucky (windows CE), and Alabama (windows CE).*

## **3. Web Reporting**

### **Electronic Commerce and Internet Reporting Options:**

Enhancement to the data reporting over the Internet will be one of the enhancements to the RBDMS. GWPRF will manage the development of several utilities designed to download information from existing state agency databases through queries with a variety of user interfaces over the Internet. Even more promising will be the development of a Web application designed to give oil and gas operators access to ***upload*** data to state

agency databases, specifically well permit applications and supporting documentation. Summaries of this year's development efforts follow.

**Java-Based Reporting.** Planned is the development with Bulletproof's JDesignerPro software, the EIMS Java program allows dynamic data access via the Internet and can run as an application over a local or wide area network. The program includes data entry, filtering, downloading, and advanced querying of the database. It offers spreadsheet, graph, and form views of the data. JDesignerPro allows the developer to remotely access the system and perform customization through a Web browser. The program runs under Windows NT Server and other operating systems such as Unix and Linux. The most recent version of JDesignerPro allows for development on the Windows CE or the Palm OS operating systems.

**Internet Reporting.** The Internet Reporting program works with an ODBC data source and Windows NT. The program produces dynamic reports from Crystal Reports or SQL queries. Reports and selection criteria are easy to customize. This project will enhance the function.

**Static Report Download.** Standard reports for oil and gas drilling, completion and production information can be made available for use with any data source accessible by SQL Server 7.0+ or Access2000. This Web program automates the creation of static HTML reports from SQL queries, stored procedures, and Access. The HTML reports will be created on a Windows PC running SQL Server 7.0 and transferred to the Web server (any platform) on a user-specified schedule.

### ***Accomplishments***

*GWPRF in cooperation with the RBDMS user group, API and industry is developing a XML e-commerce schema for the oil and gas industry. The e-reporting phase of this schema development has been completed and is currently under review by the API. E-reporting modules are now in beta testing in Colorado and Montana. Industry is participating in the beta testing. Additional refinements will be completed before the final version is released.*

*E-commerce is proving to be a much more completed task than was originally anticipated. The development of the XML reporting schema has been the major accomplishment under this task. The GWPRF will continue developing the XML e-commerce schema and installing e-reporting in RBDMS states.*

*The RBDMS user group, based on industry input, is devising several e-reporting techniques. Design and use will be based on size of the industry operations and computer capabilities. Solutions currently under development include:*

- 1) XML schema development and data transfer capabilities. Industry will be able to map their data using the XML schema developed by GWPC, industry and API.*
- 2) On-line data reporting. Industry will have the option of logging onto a state web site, entering identifying information (e.g., operator, API number...), the database will automatically populate the on-line form, and Industry can then supply the updated information.*
- 3) An Access run-time program will also be available. In this version, the state will make available for download, or send a CD with a run-time data bases containing information*

*for individual wells or operators. Operators will update the information and submit the data either electronically or in hard copy.*

**GWPC/GWPRF Web Site.** As part of this project, GWPRF will redevelop and update the RBDMS Web site to reflect recent advances in this program. We will maintain a section for downloading new software and patches to existing software. This will help states maintain their Web reporting capabilities.

***Accomplishments:***

*The GWPC- EIMS/RBDMS web site has been updated (<http://www.gwpc.org/eims>). Data is currently be uploaded to this site. This site supports data uploading and downloading and features a user forum and RBDMS knowledgebase.*

**4. Well Bore Schematic**

The WSU was developed as a means of simplifying and extending the use of ODBC environmental data sources. The application uses OLE automation deployed through a Visual Basic interface to link Visio drawing capabilities with any Level 2 ODBC environmental data source to render well bore schematics instantly. Well construction and production zone information is read directly from the database. This information is then used to render a scaled diagram of the well instantly. The WSU can be customized to meet operations-specific requirements.

The WSU can be used as a visual tool to evaluate well construction details as a part of permit application programs and to generate review documents for well plugging and abandonment plans. Likewise, well owners and operators might find the utility helpful as a visual tool in the following activities:

- ❖ Performing volumetric cement calculations for well construction and plugging plans
- ❖ Preparing scaled design drawings of well construction details for application reviews of proposed wells
- ❖ Preparing as-built drawings for new wells

This project will allow the implementation of this utility in additional states.

***Accomplishments:***

*The well bore schematic utility has been upgraded. Utah uses the well bore schematic internally for as-built diagrams and calculations. Colorado has made the well bore diagram available on the internet as an interactive tool. A user can select a well using a GIS interface, click on the well, and generate a diagram.*

*State using the well bore schematic utility includes: Colorado, Mississippi, New Mexico, New York, and the Osage Indian Nation.*

## 5. Economic Evaluation

### **Production Forecasting and Economic Evaluation Tool (PFEET):**

Many state oil and gas regulatory agencies depend on taxation from oil and gas production to provide operational funding. Production taxation may occur in a variety of forms, perhaps including a flat fee on production quantities (e.g., \$0.05 per MCF) or a percentage of sales. During time of declining production, state agencies in this situation must have the ability to forecast production to estimate income for budgeting and management decision-making.

Economic analyses can identify operators who may be experiencing financial difficulties in advance of an operator's decision to shut-in a field or even go out of business completely. Considering that many states have and continue to inherit many wells from defunct operators, proactive work by the state can avoid significant inherited liabilities.

Further, as public entities, oil and gas agencies often get requests for information about oil and gas production, forecasted production, and reserve estimates. Many states generate monthly or annual reports of production that include cumulative production totals and estimated reserves. Current methods vary significantly among states and may

involve significant manual efforts, the results of which may or may not be saved for future evaluation or statistical analysis.

Since RBDMS is the primary management information system for many state oil and gas agencies, production forecasting and economic evaluation tools that integrate with RBDMS will be able to provide a broad range of benefits to individual agencies and industry.

In late 1999, the GWPRF funded a Needs Assessment for a proposed Production Forecasting and Economic Evaluation Tool (PFEET), which confirmed the desirability of such a tool. Therefore, GWPRF proposes to move forward with the initial design of the PFEET. In February 2000, the development team met to review a production forecasting tool that the California Division of Oil, Gas, and Geothermal Resources is now using. This meeting also established a plan for moving forward with development of the tool.

### ***Accomplishments***

*The economic evaluation utility has been upgraded with oversight by Nebraska, California, and Montana. A decline curve analysis has been added and is use by North Dakota and Utah.*

## 6. GIS

For RBDMS users, the GWPRF offers the ability to integrate the Sylvan Maps GIS control via ActiveX technology. The GIS control has been integrated with the Well Selection Criteria navigation form in RBDMS. Several state oil and gas agencies are now using this option. In this project, GWPRF will develop a program which will make data contained in RBDMS viewable in ESRI Arc View software.

***Accomplishments:***

*Basic GIS functionality has been added to RBDMS using both Sylvan Maps and Arc View. Currently, this is limited to the ability select a well and open the RBDMS well form. Additional GIS functionality is being planned for future upgrades. Basic GIS capabilities are available for New Mexico, Alaska, Utah, Montana, and Colorado. Under development is a GIS utility which will enable field inspectors to view maps on PDA's using the Windows CE operating system. This is being beta tested in California and Kentucky.*

**7. RBDMS Base Upgrade**

Recent advances in software (e.g., Access 2000, Windows 2000, Java, SQL, and Cold Fusion) have provided RBDMS users with a wealth of new tools for data management and reporting via the Internet. Under this task, a RBDMS users group will be convened to identify upgrades to the RBDMS base or generic version. XLM transfer protocols is an example of the types of capabilities that should be included in this upgrade. XLM allows for easier and more reliable data transmissions between databases.

***Accomplishments:***

*The RBDMS core program has been upgraded to take advantage of recent technical advancements in programming languages. Updates include: Access 2000, SQL server 2000, Java, Cold Fusion, and Crystal Reports. In keeping with the policy of the RBDMS user group, RBDMS is being developed and upgraded using "off the shelf software." This helps to minimize cost to states and ensures nationwide compatibility.*

**Task 3. Advance Knowledge Regulatory Streamlining through State Program Peer Reviews and Providing a National Forum on Water Re-Use Issues**

This Task includes the following 2 subtasks:

**1. Assistance to States with Data Acquisition through State Program Review**

The GWPRF will initiate a Class II UIC three State peer review project. In order to further assist State agencies and other regulators in decision making on whether hydraulic fracturing of coal beds poses any threats to sources of drinking water, the GWPRF will collect additional information, written or verbal concerning the practice in the peer review state. Such information, particularly incidents of contamination, will be included in the peer review report. These program reviews will include an assessment regarding data acquired by the State regarding hydraulic fracturing and other activities involving the gathering of information and recommendations regarding the management and utilization of these data.

***Accomplishments:***

*This effort included the creation of the state peer review development team. By mid-2001 the State Peer Review Questionnaire had been drafted and the revised peer review process was*

*piloted in the state of Oklahoma (See ATTACHMENT A). After the completion of this pilot effort, the State Peer Review Questionnaire was finalized for this new round of state program reviews (See ATTACHMENT B).*

*In early 2001 an independent organization called the State Review of Oil and Natural Gas Environmental Regulatory Programs (STRONGER), utilizing EPA funding, had begun the process of developing and conducting reviews of state oil and gas environmental regulatory programs. GWPC/GWPRF began dialog with STRONGER representatives with the purpose of convening the joint STRONGER/GWPC workgroup to explore opportunities for collaboration in the preparation for and performance of STRONGER state reviews and GWPC UIC peer reviews. Upon review of the efforts and discussions via conference calls, it became evident that although the GWPC review was to be UIC alone and the STRONGER review was to be environmental programs other than UIC, there still were similarities in the questionnaires and that for a state to complete both would mean some duplication of effort. Similarities include the subject matter of the reviews and the general methods of preparation and performance of the reviews. Differences include the questionnaires used, the composition of the review teams, and the sources of program funding. While STRONGER has completed a pilot in New Mexico and GWPC has completed a pilot review in Oklahoma by mid-2001 discussions regarding coordinating the two efforts continued with a joint meeting in early December. It was decided that not all states would likely request that the two reviews be done concurrently, however the decision was made to complete a pilot joint review. This pilot joint review was held in the state of California April 21-25, 2002 and the report is currently in draft form. (See ATTACHMENT C). Final development of the selection of criteria for the order of states to review has been placed on hold until we identify which states are interested in the joint review and the results of the pilot joint review but will likely contain the following components; joint reviews will only be done if the state has completed a previous UIC review; if the state has the desire to do a joint review; and if the UIC portion of the questionnaire can be completed thoroughly by the state prior to the joint review. GWPC identified two states (Alaska and Virginia) that do not wish to complete a joint review and will likely be states slated for GWPC UIC peer reviews this year. The Alaska peer review was conducted July 15-18. EPA funds were used to support the review of the Alaska program. The report for the Alaska review is currently in development.*

## **2. Initial Development of National Conference on Water Re-Use**

Limited water resource issues are an increasing concern for all citizens of the United States. The oil and gas industry has always been a part of water issues, primarily through protection of the resource from production, refinement, and distribution of the product. The GWPRF is interested in assisting the oil and gas industry in taking the next step and getting involved in water resource issue. This task will consist of the establishment of a focus group to develop the framework for a national conference that deals with water re-use issues pertaining to oil and gas activities.

### ***Accomplishments:***

*October 16-17, 2002 in Colorado Springs Colorado the Ground Water Protection Council, through the funding from the Ground Water Protection Research Foundation and this DOE*

grant. The purpose of the meeting was to explore innovative approaches to handling oil and gas produced water. There were 120 in attendance.

**Meeting Structure:**

The 2002 Ground Water Protection Council (GWPC) Produced Water conference was functionally organized around five areas that together provide a framework for produced water treatment and handling.

- **Setting the Stage for Produced Water Handling and Beneficial Use**
- **Produced Water Quality, Chemistry and Treatment Regional Review**
- **Produced Water Handling and Treatment**
- **Produced Water Beneficial Use**
- **CBM Operations and Produced Water Handling**

Infusing the spirit of the conference is six overall themes that play a critical role in our ability to meet the challenges of produced water treatment and beneficial use.

- **Traditional Treatment Methods and Use**
- **State and Federal Regulations dealing with Produced Water Handling and Disposal**
- **Beneficial Use of Produced Water**
- **The Special Case of CBM Operations and Produced Water Treatment and Handling**
- **Changing Expectations with Regard to Produced Water Handling**
- **Sharing Results and Successes**

The final agenda was as follows...

Wednesday, October 16 ~ Agenda		*Bio/Abstract#
7:30-8:30 Registration & Morning Reception		
8:30-9:40	<b>Opening Session</b> (Salon D) Moderators: <b>Lori Wrotenbery *1</b> , Director, New Mexico Oil Conservation Division and <b>Mike Paque *1</b> , GWPC Executive Director -Welcome - <b>Brian Macke *1</b> , Deputy Director, Colorado Oil & Gas Conservation Commission -Keynote - <b>Senator Jeff Bingaman *2</b> , New Mexico -Overview of Issues Related to Handling and Beneficial Use of Produced Water – <b>Bill Bryson</b> , Kansas Geological Survey -Overview of Coal Bed Methane Development, and Associated Environmental Issues of Concern – <b>Dan Arthur *3</b> , ALL Consulting -Charge to Participants - <b>Lori Wrotenbery</b> , Director, New Mexico Oil Conservation Division	
9:40-10:00 Break		
10:00-11:15	<b>State Panel Discussion</b> (Beneficial Water Re-use Issues: Current Practice, Policies, Barriers, etc.) Moderator: <b>Lori Wrotenbery</b> , Director, New Mexico Oil Conservation Division Colorado – <b>Brian Macke</b> , Deputy Director, Colorado Oil & Gas Conservation Commission <b>Dick Wolf</b> , Professional Engineer, Colorado Division of Water Resources Montana – <b>Tom Richmond</b> , Administrator, Montana Board of Oil & Gas Conservation Wyoming – <b>Craig Eggerman</b> , Senior Environmental Analyst, Wyoming Oil and Gas Commission Utah – <b>Gilbert Hunt</b> , Technical Services Manager, Utah Division of Oil, Gas and Mining California – <b>Mike Stettner</b> , UIC Program Manager, California Oil & Gas Division	
11:15-12:00	<b>Federal Panel Discussion</b> (Beneficial Water Re-use Issues: Current Practice, Policies, Barriers, etc.) Moderator: <b>Bill Bryson</b> , Kansas Geological Survey US Department of Energy – <b>Peter Lagiovone</b> , Environmental Specialist, DOE US Environmental Protection Agency – <b>Bruce Kobelski</b> , section Chief, Office of Ground Water & Drinking Water, EPA, and <b>David Hogel</b> , Director Ground Water Program, Region 8 EPA Bureau of Land Management – <b>Jim Burd</b> , National Resource Specialist, BLM and <b>Matt Janowiak</b> , Geohydrologist, BLM	
12:00-	<b>Networking Lunch</b>	

1:15	(Salon ABC)	
1:15-4:30 <b>Concurrent Sessions</b>		
	<b>Produced Water – General</b> (Salon FGH) Moderator: <b>Bill Bryson</b> , Kansas Geological Survey	<b>Coal Bed Methane Produced Water Quality and Treatment</b> (Salon D) Moderator: <b>Fred Jones</b> , Marathon Oil Company
1:15-1:45	Evaluation of Technical and Economic Feasibility of Treating Oilfield Produced Water to Create a “New” Water Resource – <b>Roger Funston *4</b> , Kennedy/Jenks Consultants	Comparative Analysis of Water Quality Impacts to the Tongue River, Powder River Basin – <b>Brian Bohm *19</b> , ALL Consulting and <b>Tom Richmond</b> , Montana Oil & Gas
1:45-2:15	Overview of Texas A&M’s Program for the Beneficial Use of Oil Field Produced Water – <b>David Burnett *5</b> , Texas A&M University	CBM Produced Water Treatment Options – <b>Brian Hodgson *20</b> , Marathon Oil Company
2:15-2:45	A National Produced-Water Geochemistry Database - <b>James K. Otton *6</b> , U.S. Geological Survey	Organic Species in Produced Water: Nature, Distribution and Implications to Water Reuse – <b>Yousif Kharaka *21</b> , U. S. Geological Survey
2:45-3:00 Break		
3:00-3:30	Characterization and Modeling of Produced Water – <b>Joanna McFarlane *7</b> , Oak Ridge National Laboratories	Production Characteristics of Coal Bed Methane Wells in the Powder River Basin – <b>Bruce Langhus *22</b> & <b>Mark Layne</b> , ALL Consulting, and <b>Jim Halvorson</b> , Montana Oil & Gas
3:30-4:00	Hybrid Bioreactors - Cost Saving Processes for Decontamination of Water and Air - <b>Jeffrey Boles *8</b> , Tennessee Valley Authority	Water Rights and Beneficial Use of Produced Water In Colorado - <b>Dick Wolfe *23</b> , Colorado Division of Water Resources
4:00-4:30	Stochastic and Well Optimization Modeling to Evaluate Injection Potential of a California Oilfield – <b>Jeffery Anderson *9</b> , Geomega Inc	Demonstrated Economics of Managed Irrigation for CBM Produced Water – <b>Jonathan Paetz *24</b> , Cascade Earth Sciences
4:30-5:20	<b>Plenary Session</b> (Sessions Summary and Discussion) (Salon D) Moderators: <b>Bill Bryson</b> , <b>Fred Jones</b> , and <b>Mike Paque</b>	
5:30-7:00 <b>Evening Reception (Salon E)</b>		

**Thursday, October 17 ~ Agenda**

**\*Bio/Abstract#**

7:30-8:30 <b>Morning Reception, Registration</b>		
8:30-12:00 <b>Concurrent Sessions</b>		
	<b>Produced Water Handling – Salon E</b> Moderator: <b>Bill Bryson</b> , Kansas Geological Survey	<b>Coal Bed Methane Produced Water Handling Salon D</b> Moderator: <b>Fred Jones</b> , Marathon Oil Company
8:30-9:00	TBA	Strategic Produced Water Management and Disposal Economics in the Rocky Mountain Region – <b>Deidre Boysen *25</b> , B.C. Technologies, Ltd.
9:00-9:30	Strategies for Produced Water Handling in New Mexico - <b>Robert Lee *10</b> , PRRC/New Mexico Tech	Using a Three-Tiered Systems Approach for Managing the Environmental Risk of CBM Operations: Risk Analysis, Environmental Management, and Quality Assurance - <b>Anthony Gorody *26</b> , Universal Geoscience Consulting, Inc.
9:30-10:00	An Integrated Treatment System of Bio-processing and Membrane Separation for Beneficial Use of Produced Water – <b>Tom Hayes *11</b> , Gas Technology Institute	Fruitland Coal Bed Methane Seepage Modeling Study and Fruitland Coal Aquifer Recharge – <b>Russell Schucker *27</b> , Questa Engineering Corporation
10:00-10:20 Break		
10:20-10:50	The Freeze-Thaw/Evaporation (FTE) Process for the Commercial Treatment and Beneficial Use of Oil and Gas Produced Water - <b>John Boysen *12</b> , B.C. Technologies, Ltd.	Management of Produced Water from Coal Bed Methane Wells: Discharge, Inject, or Reuse? – <b>John Veil *28</b> , Argonne National Laboratory
10:50-11:20	Purification of Brackish Water Using Electronic Water Purification – <b>Robert Atlas *13</b> , Sabrex of Texas, Inc.	Preparation of Water Management Plans for the Development of Coal Bed Methane in the Powder River Basin – <b>Dan Arthur</b> , & <b>John Seekins *29</b> , ALL Consulting

11:20-12:00	<b>Plenary Session</b> (Sessions Summary and Discussion) (Salon D) Moderators: <b>Bill Bryson, Fred Jones, and Mike Paque</b>	
12:00- 1:30	<b>Lunch</b> (on your own)	
1:30-4:30	<b>Concurrent Session</b>	
	<b>Beneficial Use of Produced Water – General</b> (Salon E) Moderator: <b>Bill Bryson</b> , Kansas Geological Survey	<b>Beneficial Use of Produced Water from CBM Production</b> (Salon D) Moderator: <b>Fred Jones</b> , Marathon Oil Company
1:30-2:00	Alternative Use of Produced Water in Aquaculture and Hydroponic Systems at Naval Petroleum Reserve No. 3 – <b>Lorri Jackson *14</b> , Rocky Mountain Oilfield Testing Center	Reuse of Produced Water Using Nanofiltration and Ultra-Low Pressure Reverse Osmosis to Meet Future Water Demands – <b>Chris Bellona *30</b> , Environmental Science & Engineering Division
2:00-2:30	Produced Water: An Oasis for Arid and Semi-arid Rangeland Restoration - <b>William E. Fox *15</b> , & <b>David Burnett</b> , Texas Cooperative Extension	Updated Information on Analysis of Water Management Alternatives and Beneficial Uses of Coal Bed Methane Produced Water – <b>Matt Janowiak</b> , BLM, <b>Gary Gianniny</b> , Ft. Lewis College, and <b>Dan Arthur &amp; Greg Casey *31</b> , ALL Consulting
2:30-3:00	Water Quality Monitoring at the Kern River Field – <b>Dale Brost *16</b> , ChevronTexaco	Utilization of Water Produced from Coal Bed Methane Operations at the North Antelope / Rochelle Complex Campbell County, Wyoming – <b>Philip Murphree *32</b> , Powder River Coal Company
3:00-3:20	Break	
3:20-3:50	Capacitive Deionization Technology, A Cost Effective Solution for Brackish Ground Water Remediation – <b>Tobie Welgemoed *17</b> , Lee & Ro, Inc.	Developing Sustainable Practices for CBM Produced Water Irrigation – <b>Aaron DeJoia *33</b> , Cascade Earth Sciences
3:50-4:20	Beneficial Use of Produced Water in the Indian Basin Field: Eddy County, NM – <b>Paul Peacock *18</b> , Marathon Oil	Using Geospatial techniques to develop best management practices and produced water beneficial use options relative to the development of coal bed methane – <b>Jason Patton *34</b> , ALL Consulting and <b>Jim Halvorson</b> , Montana Oil & Gas
4:20-5:20	<b>Plenary Session</b> (FINAL Wrap Up Discussion) (Salon D) Moderators: <b>Bill Bryson, Fred Jones, and Mike Paque</b>	

***Produced Water Conference Proceedings***

***Produced Water Conference Proceedings Web Link***

*ATTACHMENT A:*

# OKLAHOMA OIL & GAS AGENCY PEER REVIEW

*April, 2001*



GROUND WATER PROTECTION COUNCIL  
13208 North MacArthur Boulevard  
Oklahoma City, Oklahoma 73142  
405 516-4972  
[www.gwpc.org](http://www.gwpc.org)

Michel Paque, Executive Director

## **CLASS II UIC PEER REVIEW**

### **INTRODUCTION**

The findings included in this report and any comments added subsequent to this report are the result of an ongoing effort to evaluate the effectiveness of state programs to protect Underground Sources of Drinking Water (USDW) from potential contamination resulting from the operation of injection wells related to the production of oil and gas (Class II injection wells). A USDW is defined as an aquifer or the portion of an geologic unit which supplies a public water system (PWS), or contains sufficient water to supply a PWS, or contains a concentration of less than 10,000 mg/l total dissolved solids (TDS) and which is not otherwise exempted as a USDW. Individual states may have definitions, either by statute or regulation for waters designated as fresh, potable, usable, etc. Such waters generally have maximum TDS concentrations, which are equal to or more stringent than the Federal maximum TDS concentration for USDWs. These definitions were historically carried over into the UIC regulatory program from preexisting statutes, regulations and /or policies. In this report, where other definitions of a USDW are part of the state program, they are highlighted in the General Program Comments and Observations portion of the report. Readers will need to exercise care when using this report to understand specific relationships between USDWs and those more limited definitions of water used by the state. The Review Team's conclusions are in every case based on the protection of USDWs.

The UIC program examined in this study covers wells which are used for the injection of fluids into oil reservoirs for the purpose of maintaining producing formation pressure, stimulating or furthering their production when natural (primary) production mechanisms decline or cease (enhanced recovery wells, Class II EOR), and for the disposal of waters produced in conjunction with the production of oil and gas (disposal wells, Class II-D). If improperly constructed, operated, maintained, or abandoned, such wells may allow contaminants to enter USDWs, which would potentially deprive the public of current or future water supplies.

The program examined in this report is the Oklahoma Class II UIC program administered by the Oklahoma Corporation Commission (OCC) where primary enforcement authority was delegated to the state in 1981 by the US Environmental Protection Agency (EPA) under provisions of Section 1425 the Safe Drinking Water Act (SDWA) and EPA regulations. (See Underground Injection Control Development Section of this report). The Oklahoma UIC Class II program was first evaluated in 1989 as a part of a series of peer review which GWPC, then UIPC, sponsored between 1989 and 1992. This program evaluation was conducted under the auspices of the Ground Water Protection Council (GWPC). The GWPC is an association of state and federal UIC officials, representatives of the regulated community, consultants, environmental groups, academia and other interested parties. The GWPC promotes and facilitates communication and exchange of information with regard to practices and regulation of injection wells. The organization also promotes the best practices for the protection of ground water and the principles of source water planning. The GWPC further promotes related research and the

dissemination and exchange of technical data on injection well technologies and general protection of ground water through integrated and coordinated methodologies.

The purposes of the State Class II reviews are as follows:

- (1) To determine the effectiveness of state of UIC programs to protect USDWs.
- (2) To increase the knowledge of the oil and gas producing states of the content and operation of the various Class II programs and to identify evolutionary program changes since UIC programs were first granted primacy by EPA or instituted as Direct Implementation by EPA.
- (3) To assist the states and GWPC in identifying potential problem areas in the Class II UIC program resulting from statutory and philosophical changes at either the Federal or State level or from economic cycles within the oil and gas producing industry.
- (4) To provide states an independent evaluation of their Class II UIC program and to consider the recommendations in making program improvements.

This Peer Review was conducted and completed in the following manner:

- (1) A Review Questionnaire Workbook was prepared containing numerous questions about the important aspects of a state's Class II UIC program including: (A) permitting and file (compliance) review (the process by which new injection well applications are examined, technically reviewed and approved); (B) inspections (the process by which actual injection well operations are examined for compliance with rules and permit conditions by regulatory agency field personnel); (C) mechanical integrity testing (the process by which wells are tested to ensure that injected fluids are confined in the well bore and target formation and to certify no upward migration of fluids is occurring along the back side of the well casing); (D) compliance and enforcement (the process used to assure that compliance with all state UIC regulations and permitting requirements is achieved and, where appropriate, penalties are sought and enforced); (E) plugging and abandonment (the process by which assurance is made that when there is no longer any use for the well as an injection point, it can and will be plugged in a manner as to prevent the movement of fluid into a USDW); (F) inventory and data management (the process by which important program data is organized into usable formats to demonstrate program compliance and evaluate risk of injection well use); and (G) public outreach (the process used by the agency to keep the public aware of developments and permitting activities in the UIC program).
- (2) The Peer Review Questionnaire Workbook was furnished to the State and the questions were completed by State Class II and other qualified personnel. The State submitted whatever additional material they thought would be helpful to the reviewers in understanding the program

- (3) The Review Team was assembled and given copies of the completed State Workbook prior to traveling to the state. The Review Team consisted of two state UIC program directors or their immediate subordinates, a GWPC contract employee (a former state oil and gas division director) and the GWPC Associate Director. The Review Team members for the Oklahoma Review are identified at the beginning of this report and resumes' for each are included in the Oklahoma report appendix.
- (4) The Review Team traveled to Oklahoma City and, using the completed Workbook as a guide, questioned the UIC program supervisor and other persons designated by the State to participate in the Review extensively about the operation of the various program areas. Additionally, the Review Team was given a complete tour of the UIC offices and the area of operations where UIC data management activities were conducted.
- (5) The Review Team reviewed the Workbook responses to questions, the oral responses to questions given at the time of the visit, and the various documents supplied by the State and prepared a daily list of strength, areas of concern and subjects which required additional discussion clarification. These thoughts were shared with the UIC Department Head and others participating in the interview for the State of Oklahoma. The Reviewers also conducted an exit interview process, which consisted of a summary of major points of concern. A draft report was then prepared by the GWPC contractor and sent to the State and the Review Team for final comment. Where appropriate, corrections supplied by the State in the form of clarification or supplemental information was incorporated into the report.
- (6) The Review Team report and evaluations are generally arranged in the same order as the Workbook. Each Workbook section is followed by identified strengths and other considerations of the Review Team. Any such comments are followed by the Review Teams conclusions relative to the effectiveness of that portion of the State's UIC program in protecting USDWs. Where portions of the report, strengths, other considerations or conclusions did not fit within one of the major program areas identified in the Workbook, they were placed in a General Program Comments and Observations of the Report. An Executive Summary precedes the specific technical subject sections. "Data Management" and "Program Changes since 1990" were included in the Workbook for each Section. In a sense, data management is a crosscutting issue and a State response may apply to more than one Section. These issues are included in the report at the most appropriate place for the discussion.

## **UNDERGROUND INJECTION CONTROL PROGRAM DEVELOPMENT**

The Underground Injection Control (UIC) programs have been developed and implemented as a result of the federal Safe Drinking Water Act (SDWA) of 1974. Under Part C of the SDWA (Public Law 93-523), as amended by Public Law 96-502; 42 USC 300f et seq.) Congress

directed the USEPA to develop regulations for a nationwide UIC program that would control the permitting and operation of injection wells to protect Underground Sources of Drinking Water (USDWs). The EPA was given the responsibility for developing minimum requirements for state UIC programs. States had the option of developing regulations that were more stringent than the federal regulations, however, the states could not adopt regulations, which were less strict than the minimum federal requirements.

The EPA promulgated the current regulations, which they use to implement UIC programs in 1980 under authorities of Section 1422 of SDWA. The Congressional intent was for individual states to assume administration of the UIC program. States could receive grant money from EPA to develop a UIC program and apply to EPA for primary enforcement responsibility (“primacy”) for that program. In states, which have not sought or have not received primacy, the EPA administers the program directly (“direct implementation” programs). States have the option of applying for primacy for all or only a portion of the injection wells classes with some restriction by EPA. For example, in Alaska, the EPA administers the UIC program for Class I, III, IV and V, while the state administers the program for Class II injection wells. Although there has been some subsequent modification to these regulations since 1980, the only real changes have been regarding regulatory interpretations and program implementation as the UIC program has matured.

EPA regulations established five classes of injection wells, which were defined and delineated, in part, by the source of the injected fluids and the physical relationship of the injection zone to a USDW. Class I wells are those that inject hazardous and non-hazardous industrial waste fluids and also municipal liquid wastes into formations located stratigraphically beneath the lowermost USDW. Class II wells are those used for injection related to oil and gas activities or some types of hydrocarbon storage. Class III wells are those that inject fluids for the extraction of minerals as in solution mining operations. Class IV wells, those directly injecting hazardous waste above or into a USDW, were banned nationwide on May 13, 1980 (40CFR Part 122.36) and all other Class IV wells were banned on and after May 11, 1984 (40CFR Part 144.13). Class IV is now restricted to those injection wells, which are part of contamination remediation operations at Federal Superfund sites. Class V wells are injection wells not covered by the other classes and generally include wells injecting fluids into formations above USDWs.

In 1980, Congress amended the SDWA to include Section 1425, which established a method for a state to obtain primary enforcement authority for its Class II program by substituting the existing state regulatory program for the prescribed EPA program. This alternative program could be approved by the EPA if the state demonstrated a level of equivalent effectiveness for USDW protection as defined by the SDWA, specifically subparagraphs (A) through (D) of Section 1421 b)(1), and that such program represented an effective program to prevent injection which endangers USDWs.

## **OKLAHOMA CLASS II PEER REVIEW**

### **EXECUTIVE SUMMARY**

The peer review of the Oklahoma Corporation Commission, Oil and Gas Division, Underground Injection Control Department Class II UIC program was conducted from April 9-12, 2001. The Review Team consisted of one state UIC deputy department chief, one state natural resource manager from an oil and gas commission, one former state oil and gas division director and a GWPC Associate Director.

The review was conducted using a comprehensive questionnaire completed by the state UIC personnel and on the basis of the response, asked in-depth questions of the OCC UIC staff and other personnel made available for responding to specific areas of agency operations which have some effect on UIC activities. The OCC staff also provided statutes and rules, and other administrative and technical documents and materials relating to agency procedures, interagency agreements and statistical information, which gave insight and understanding to program operation. The questionnaire originally completed by the OCC is included in the appendix of this report along with other materials on organizational structure of the Commission and its UIC Department. Principal forms used for UIC inspections, MITs, complaint investigations and required operator reporting forms are also included for reference.

#### **PERMITTING/ FILE (COMPLIANCE) REVIEW**

The Review Team believes the UIC Department generally uses good permitting and file review procedures. The UIC Department staff in the Oklahoma City office conducts all UIC permitting and file review activities. During recent years, the file review has taken on more the characteristics of a compliance review where review of amendments to existing permits and injection well ownership transfers afford an opportunity to determine compliance with permit condition through reports submitted by the Operator. Casing and cementing requirements are set out by rule and permits contain requirements for tubing and packer, injection well pressure limitations, and reporting of measured pressures and injection volumes. Plugging bonds or other financial assurances are required for all wells although the amounts of financial assurance may be set too low for current financial liabilities. In 1986, the OCC made a major commitment to document reviews of every injection well and by the early 1990's this task was complete. Documentation and well files exist in the Oklahoma City office for each injection well; however, the Review team understood that the district offices do not have a complete set of permit records for all UIC wells under their responsibility.

The State has adequately mapped the base of the USDW in each producing county and protects such USDWs uniformly both in its UIC and oil and gas production programs. The OCC is currently revising all county maps to use Sea Level Datum Elevations as a basis for surface pipe setting and cementing requirements to better standardize protection of USDWs. The project is about one-third complete, however, the completed counties represent more than one-half of all UIC wells. OCC now requires 250 feet of cement above the perforated interval on all newly completed wells. This was intended to address one concern in the 1989 Report.

The Review Team believes the permitting and compliance review procedures are being carried out in a manner that will protect USDWs.

## **INSPECTIONS**

The basics of the inspection program have not changed during the last ten years. Field inspections are still performed by state employees operating from their homes. Each inspector works an assigned geographical area and is responsible for establishing his or her own daily schedules based on contacts with operators, required MI testing in accordance with the permit conditions, citizen complaints and directives from their supervisors. Inspectors are in daily contact with their supervisors in the district offices both by cell phones and pagers. The OCC has not provided e-mail capability nor laptop computers to the inspectors who work out of their homes but this enhancement is incorporated into the Division's future data management plan. To meet this data management goal, OCC informed the review team that laptops have been purchased but are not ready for distribution for field inspection use. Each inspector is provided an extensive field manual that is currently being revised to include new or amended program elements. The revised version is planned for release at the end of August 2001. Each inspector is also provided a map of the base of the USDW. These maps are being revised to provide more accurate information and the revised maps will be provided to the field inspectors as they are completed. Inspection reports are promptly completed and sent to district office supervisors where they are reviewed. Inspectors also have the authority to issue field citations for certain violations and to ensure the non-complying conditions are corrected.

The Review team concluded that the State's inspection program is providing a high degree of protection to USDWs. The area of concern expressed in the 1989 Peer Review report over the relatively high injection well / inspector ratio remains unchanged. However, given the realities of state funding, ideal inspection personnel numbers will be at a level desired by some parties outside the regulatory regime. The Review team also had some concern that the MIT scheduling was established by the UIC Department in Oklahoma City and imposed on the routine district inspection program. There is no person in the district office strictly dedicated to UIC who is responsible for coordinating the UIC activity flow between district and central office.

## **MECHANICAL INTEGRITY TESTING**

The OCC uses annulus pressure testing (APT), and in some cases, annulus pressure monitoring to determine mechanical integrity of a well (Part I MI). Radioactive tracer surveys, temperature surveys and review of cementing records are used to satisfy external integrity (Part II MI). The procedures being used to establish that wells have mechanical integrity are protective of USDWs. The OCC does have the authority to require other types of logs if circumstances dictate. APTs require no more than a 10% decline in pressure within a 30-minute period to pass. The field inspectors make an attempt to witness all MI tests and come close to 100 %. They also witness the retests of all wells where repairs have been made. The results are entered into a computer database in the central offices. Technical review of MIT reports, tracking of wells on

the 5 year testing cycle, and notification of an upcoming test is done in the Oklahoma City office. Commercial disposal wells are tested annually. Field inspectors make arrangements with operators to schedule the actual date and time of the test. The OCC, at times, has difficulty in getting the required 20 percent of all injection wells tested within a given year. Oklahoma ranks second in the number of Class II injection wells to be tested. Economic downturns in the industry, frequent lease ownership transfers, and the lack of available service testing equipment all hamper the periodic testing of wells. The Review Team concluded giving the districts a more substantial role in the annual scheduling might assist the OCC in reaching its annual commitment under the Federal UIC program.

## **COMPLIANCE/ ENFORCEMENT**

The OCC has tremendous authority to obtain compliance from the regulated industry. The shut-in authority given to field inspectors is the most effective deterrent to discourage non-compliance by operators. The OCC central office in Oklahoma City may also initiate UIC enforcement actions. Multi-level enforcement is used to achieve voluntary enforcement. The field inspectors also have the authority to issue Notices of Violation (NOVs) to operators for less serious matters and subsequently work with the operator to resolve the non-compliance problem. In recent years, the EPA Region VI has expressed concerns to the OCC about the reporting of instances of Significant Non-Compliance (SNCs). The Review Team recommends the OCC incorporate the accounting of UIC contamination cases into its revised and improving data management program so that long- term program effectiveness can be quantified.

The Review Team concluded that the compliance and enforcement portion of the UIC programs has been very well structured, effective and is more than adequate for the protections of USDWs.

## **ABANDONMENT and PLUGGING**

The OCC well plugging program has been in place for a long time and the plugging of injection wells is an extension of the plugging program for producing wells. The plugging of any well may only take place after a plugging plan for a well has been filed and approved by the OCC. The operator works closely with the field inspector to ensure the approved plan is followed and has been effective. The base of USDW maps provides a good framework for the correct placement of plugs to isolate injection and producing zones from USDW's. Well cementers and operators are required to certify the setting of cement plugs. State inspectors witness a very high percentage of injection well plugs.

The Review team concluded that this portion of the Oklahoma UIC program is technically effective in causing injection wells to be plugged in a manner protective of USDWs. Currently, OCC does not recognize injection wells as having a status of temporary abandonment as it does producing wells. Some Review Team members felt uniquely tracking and accounting of idle

injection wells may be important to the future of the primacy program with EPA as production declines on mature leases toward the economic limit.

## **DATA MANAGEMENT**

The OCC has been working at improving and modernizing its data management system for almost twenty years and the system has gone through several stages in the upgrading. The UIC files and associated records such as well pluggings, inspections and MIT records use the same data management system. OCC is currently trying to further upgrade the system to track wells within an Area of Review. OCC has the same problem most states have where several hundred thousand wells have been drilled, i.e. selection of a data management system that accommodates a large flow of diverse daily reports. The final stage of the current program will be when the field inspectors have laptop computers or can access the data management system from their homes. The Review Team encourages the OCC to continue to explore ways to enhance its data management system to the extent where it can efficiently accommodate the vast amount of information needed for reference on well tests, inspections, and permit review.

## **PUBLIC OUTREACH**

The public outreach program for the OCC UIC program is designed to give the regulated community, interest groups, the public and any persons who may be affected by any particular permit an opportunity to present their concerns at public hearings. The Oklahoma Administrative Procedures Act guides the hearing process and the notification process. In addition, the EPA is always given an opportunity to review any proposed rule prior to hearing. Published notices of proposed injection wells are required in Oklahoma Courts and the county where the injection well is to be located. Since the mid 1990's, the OCC has been required to develop an agency Water Quality State Implementation Plan that enhances cooperation with other agencies. The OCC also established a citizen's advisory committee in the mid-1990's to enhance receipt of public comment.

The Review Team found this portion of the Oklahoma's UIC program to be both adequate and appropriate. The OCC does use mailing lists to inform both the regulated community and interest groups of proposed rule changes. A quarterly newsletter that reiterates the information supplements this. Operators have to ask to be on the mailing list and if they don't, the newsletter is the only notification of rule changes. OCC may consider sending notification of rule changes via mailing list to all operators who receive the newsletter.

## **PEER REVIEW OF THE OKLAHOMA CLASS II UIC PROGRAM**

### **OKLAHOMA CORPORATION COMMISSION**

#### **REVIEW TEAM REPORT**

## **REVIEW TEAM MEMBERS**

Wendy Mahan	Natural Resource Manager Alaska Oil and Gas Conservation Commission
Joe Ball	Assistant UIC Program Manager Injection and Mining Division Louisiana Office of Conservation
William R. Bryson	GWPC Staff Consultant Former Director of Kansas Corporation Commission Oil and Gas Conservation Division
Ben Grunewald	Associate Director GWPC

### **PART I: GENERAL: ADMINISTRATIVE OVERVIEW**

#### **A: Statutory Authorities and Regulatory Jurisdictions.**

The OCC derives its statutory authority to regulate all phases of the oil and gas production regime from Chapters 17 and 52 of the Oklahoma Statutes. Overall responsibility for the Oklahoma Corporation Commission's (OCC) Class II program is contained within its Oil and Gas Division's Underground Injection Control (UIC) Department. The UIC Department is completely responsible for carrying out administrative and technical activities related to the permitting, review of injection well files for accuracy and compliance with permit conditions, scheduling of mechanical integrity tests, and reporting to the Environmental Protection Agency in accordance with the Federal – State Class II UIC Program primacy agreement as conditioned under Section 1425 of the SDWA. The UIC Department coordinates with other divisions within the OCC and with the other departments of the Oil and Gas Conservation Division (OGCD) on matters relating to budgeting, personnel, mapping, records, hearings, enforcement initiatives, environmental matters, corrective actions and inspections. The OCC also maintains four district offices throughout the state, which are instrumental in carrying out the inspection assignments for the OGCD. Even though the primary responsibility for these latter functions is centered within those other Departments within the Division, or in the case of legal services, within the OCC administrative hierarchy, there appears to be a good degree of cooperation and coordination among all Divisions. This greatly assists the UIC Department in accomplishing its primary objective; the protection of Underground Sources of Drinking Water (USDWs). The Department also works in close coordination with the Oklahoma Department of Environmental Quality (DEQ) where UIC matters come under the provisions of the Jurisdictional Guidance Document between the DEQ and OCC.

The OCC rules contain two definitions of water that must be protected. Treatable water is defined as “subsurface water in its natural state, useful or potentially useful for drinking water for human consumption, domestic, livestock, irrigation, industrial, municipal and recreational purposes, and which will support aquatic life, contains less than 10,000 mg/l total dissolved solids (TDS) or less than 5,000 ppm chloride. Treatable water includes but is not limited to fresh water.” OAC 65-10-1-2: Definitions: also contains a definition of “fresh water strata” as any “strata from which fresh water may be produced in economical quantities. The definition of “treatable water” was modified in 1981 to 10,000 TDS to conform to the Federal UIC program definition of USDW from a numerical standard standpoint. In this report, both terms may be used, even though the level of protection alluded to is the same. The statutes of Oklahoma do not contain specific definitions of any oil, gas or injection well. These are defined under OAC 65-10-1.

The OCC is a quasi-judicial agency in which oil and gas production, injection and other matters follows definite legal procedures and results in the issuing of Orders, allow Operators to carry out an activity under a set of specific conditions. The injection of produced water is one of those activities. The operator is entitled to proceed with that activity until such time as he or she does not follow the conditions of the Order or ceases to carry out the activity. At this time, the authority to proceed with the activity is withdrawn by official Order of the Commission, unless transferred to another party. The Commission style of oil and gas regulation is distinctive and its origin came in the early days of the regulation of the industry when every produced lease became a legal relationship between a landowner and a company who wanted to extract petroleum from under the property. The OCC, like other Commissions of the Mid-Continent Region, became the entity to prevent senseless overproduction or premature depletion of oil and gas reservoirs (waste and protection of correlative rights of royalty owners) with a secondary objective to prevent contamination of water resources. Through the years, Oklahoma’s oil production has reached maturity and the issues of waste and conservation, while still important considerations, have been equaled, if not superceded by matters of water and environmental resource protection. Oklahoma has had an Underground Injection Control program since the mid- 1930’s and has a long history of regulating injection practices. Whereas the focus of injection of produced water was always toward proper disposal into saline subsurface formations or the reinjection of water back into the producing formations to effect the recovery of additional oil, the mission since 1981 has been directed strongly toward using injection practices that will prevent contamination.

The OCC regulates oil and gas operations in 76 of 77 counties. Injection wells located on the Osage Indian Reservation (Osage County) are regulated by EPA Region VI under Section 1422 Direct Implementation in agreement with the Osage Indian Bureau. The OCC has no authority to regulate any waste generation or disposal activities on Osage Indian lands.

### **Facts on Oklahoma Oil and Gas Production and Injection (1)**

The first commercial oil well was drilled at Bartlesville in 1897, when Oklahoma was still a territory. In 1905, the Glenpool Field was discovered near Tulsa and was the first stratigraphic trap discovery. Discovery of the Glenpool Field was followed by several other major discoveries:

- The Hugoton Panhandle Gas Field in 1918, which eventually became the largest gas field in the United States (now more than 10,000 wells in Kansas, Oklahoma and the Texas Panhandle);
- The Burbank Field in Osage County in 1920;
- The Oklahoma City Field in 1927, which soon became the nation's largest oil field; and
- The giant West Edmond Field in 1943

(1) The above was taken from the 1992 Oklahoma State Review published by the Interstate Oil and Gas Compact Commission (IOGCC).

In 1999, Oklahoma produced 71,047,405 barrels of oil and condensate and compared with 112,321,064 barrel in 1990 after the first UIC Peer Review was done. The peak production year was in 1927 when 277,775,000 barrel was produced. Oklahoma production is currently from 88,000 oil wells and 20,000 gas wells. In 1999, 841 oil wells were plugged and 193 new oil wells were completed. At the end of the year 1999 there were 15,610 injection wells as opposed to 22,309 wells in 1989. Other statistics could be provided, however, the ones presented show a dramatic decline in oil production over the past ten years and consequently, reflects a similar decline in the number of injection wells. Producing wells vary in depth from 320 feet in Craig County in Northeastern Oklahoma to more than 25,000 feet in western portion of the state in the Anadarko Basin. Throughout history, oil or gas has been produced in 71 of 77 counties.

Major sources of ground water include the Ogallala (High Plains) aquifer in the Oklahoma Panhandle, the Cambro-Ordovician Roubidoux in Northeastern Oklahoma where oil and gas is not produced, the Garber-Wellington aquifer (Oklahoma City area), the Rush Spring sandstone (west central) and the Vamoosa formation (east central). The Garber-Wellington aquifer is protected through a federal sole source aquifer designation.

### **Staffing and Funding**

The UIC program is a Unit within the Pollution Control Department and is currently allocated 13 positions in the OCC Oklahoma City Central Office. The currently filled positions include a Program Manager, 7 Oil and Gas Specialists and 3 administrative support staff. Two positions are currently unfilled, one Oil and Gas Specialist and one Administrative Technician. The field inspectors are under the Department of Field Operations, however, 7.5 FTEs are allocated to UIC program activities.

The total FY2001 budget for UIC is \$1,249,562 of which about \$356,000 is Federal UIC program grant money. The total salary allocation for UIC is \$887,558. The OCC indicated that the technical and administrative support is adequate to maintain the UIC program based on the concept the state is willing to fund 72% of the program. A fully-funded program with parity from the Federal UIC grant would allow for a more efficient program. For example, the database needs to be cleaned-up and a large number of orders need to be prepared to vacate abandoned well orders. Other funding for UIC activities comes from permit fees and fine payments, which

go into a Revolving Fund. The OGCD budget is \$6.1 million of which the UIC program represents 10%.

The OCC staff indicated the responsibilities for administering the Non-Point Source program (Storm Water) drains funds that used to support UIC. State dollars are harder to get as previously available federal money is diverted to other programs. The OGCD is prohibited by law from using General Fund money.

### **Data Management**

The Peer Review Questionnaire was formatted in such a way to have the State describe the data management system for each major part of the report; i.e. permitting, mechanical integrity testing and inspection. The UIC Department uses the same data management system for all phases of the program. All data is captured in one well file using the O'Lalle system. In 1998, the UIC program converted to the Oracle data base which replaced the Dbase III Program that had been used since 1986 for the Permitting /File Review activities. The Oracle database was described as "adequate for entering data and for keeping records but not efficient for tracking problem wells within one-half mile radius". Running reports off the system can be difficult. The OCC's data management system is locally (intramural) designed and is not linked to any other state databases.

The OCC has been trying to grapple with a suitable data management system for almost twenty years. The OCC purchased a 168 Platter Jukebox and has imaged every Commission Order and historic wells records using inmate labor from the Department of Corrections at the cost of \$300,000. The agency is working toward linking the data management systems to these images so staff will be able to query well records and view documents online.

The Deputy Director of the OGCD provided an overview of future plans, pending approval of budget requests by the Oklahoma Legislature for web based application and linkage to the state Geographical Information System (GIS) servers, which would allow the agency to build base maps. Even if the additional funding is not approved, the OCC will continue toward a system, which accommodates online electronic filing of reports and applications. The Department of Environmental Quality currently cannot access oil, gas and UIC data but will be able to in the future. The Division is considering using the Risk Based Data Management System (RBDMS).

The OCC data management system is only available to the field inspector who works out of a home base if he or she physically travels to the district office or has someone in the district office relay the information by phone. The OCC is working toward an automated system that would allow field inspectors to access the system through from home.

### **Summary of Program Changes in the Last Ten Years**

The UIC Program for Oklahoma has not changed appreciably in terms of activities during the past ten or twelve years since the last Peer Review was conducted. In 1994, a Citizen's Advisory

Committee was created to advise the OCC on UIC issues. The primary outgrowth was the adoption of stricter requirements for commercial disposal wells. Commercial wells now receive annual MITs and stricter construction requirements for well bore tubing. The Area of Review radius for non-commercial UIC wells was reduced from ½ mile to ¼ mile, which is more in conformance with other Class II primacy programs.

The UIC program also added a Compliance (Enforcement Officer) in 1994 to assist with cases where non-compliance had escalated to formal enforcement status.

When the Department of Environmental Quality established Wellhead Protection Areas in the mid 1990s, the permit review and AOR process underwent some changes to accommodate this program. According to OCC staff, the SARA Title III-Community Right-to-Know program has had little impact on the UIC Department activities. In April 2001, Oklahoma adopted a Water Quality Standards Implementation Plan (WQSIP), which defines areas of jurisdictional responsibility for all agencies protecting or allocating water and environmental resources, which includes the OCC. There is also a Memorandum of Agreement between the OCC and the DEQ that delineates areas of responsibility and discusses cooperation toward resolving issues where lines of responsibility are not clear.

The Data Management System for the OCC and the UIC Department continues to be an evolving process. In 1998, the UIC program was converted to the Oracle database. The EPA has commented on OCC's data management capabilities in terms of the reporting violations and the OCC is currently trying to make the database more efficient and user friendly.

## **PART II**

### **PERMITTING/ FILE (COMPLIANCE) REVIEW**

#### **A. OBJECTIVE: UNDERSTAND THE PERMIT FLOW PROCESS**

Applications for permits are filed with the Underground Injection Control Department of the OCC's Oil and Gas Conservation Division. The same application form, Form 1015, is used for both disposal (Class II-D) and enhanced recovery (Class II-EOR). This form is also used for filing applications for Commercial Disposal wells that receive oil field-related fluids. Form 1015 is used where an applicant wishes to amend an existing permit order. Beginning in 1981, permits have been issued for individual wells only. The Department has provided an information packet to the operator with instructions for completing an application as well as the format required for public notice. In 1997, the OCC's Underground Injection Control (UIC) Department developed a more detailed brochure for the operator's reference entitled "1997 Operator's Guide to Filing UIC Applications and Reports". This document is very comprehensive and tells a prospective

applicant for a Class II injection well just what is required to comply with UIC regulations. A flow diagram of the UIC application process is included in this report as Appendix --.

Applications (six copies) are routed to the Commission Court Clerk who officially records their receipt and assigns them a pollution docket (PD) number. This number is assigned regardless of whether or not subsequent review activities by UIC technical and administrative staff find application defects. The number also provides the key to tracking the status of the application during the permitting process. The applicant is informed of the PD number assigned to the application.

The numbered applications are then routed to the UIC Department where the Oil and Gas Specialist first screens them for completeness. The screening process entails determining whether the application has the required attachments for well construction, area of review plat, logs (if required), and other documentation necessary for technical review. When an application is determined to be incomplete, the Specialist also checks the surety check of the applicant on the automated records and to insure the submitted application fee amount is correct. Application filing fees are \$35 for each enhanced recovery and noncommercial disposal well and for each amendment to an existing application and \$1,000 for each commercial disposal well. The OCC provided the Review Team a copy of the letter sent to an applicant denoting incomplete items which have to be submitted prior to approval. The applicant is given six months to respond and supply the insufficient information. Usually the UIC Department will send a letter about pending applications and extending the time for response after the filing date. If no response is received from the operator at the end of the extension date, the OCC will dismiss the application by hearing process and send the applicant the Commission's Order to Dismiss Application. In the case of applications voided through dismissal, the application (1015, 1015a, etc) is kept by the reviewing agency, but the attachments are normally returned to the applicant.

Much of the review process of an application after it is determined complete remains unchanged since the last Peer Review in 1989. The OCC staff completing the questionnaire stated that the completed application is routed to an Oil and Gas Specialist to review the permit application, identify any technical issues and evaluate the information supplied on the attachments. The file is then sent to the UIC Department Manager who prepares a draft order and recommends to the Commissioners that the application be either approved or denied. The UIC computerized database is used to ensure that the technical review and permit issuance or denial recommendations occur within an acceptable time frame. Usually permits (Orders) are issued within four to six weeks from the date of filing. Dates are logged when the application is received, when the operator is notified of any incomplete items, when the application is complete, and when it is recommended for approval or denied. The O&G Specialist responsible for tracking the progress of an application is responsible for forwarding the application to the next reviewer and recording the progress on the database. This allows the UIC Department to track the status and location of any application at a given time for itself or any interested party. Applications for amendments to existing applications undergo an almost identical administrative flow route. There are some variations in the technical review aspects. The OCC staff used examples of reclassifying a non-commercial disposal well to a commercial well or request to reduce the injection rate or the injection pressure where they would require all of the

attachments. In all cases, the OCC requires the operator to give notice (i.e., affidavit of mailing and publication). All amendments, whether considered to be major or minor, go through the same process.

A commercial disposal well is defined as a well where the primary purpose is to profit from the disposal of fluids. Applications for commercial disposal wells are processed by the same procedures except for the fee difference and the comment period of 30 days as opposed to 15 days for regular applications. Additional requirements also include surface casing extending below all USDWs, a Cement Bond Log run on the injection string prior to permitting, annual MIT at the requested injection pressure and monitoring wells if a pit is located at the facility. Public hearing is still optional. OAC 165:10-5-5 (d) outlines the requirements for commercial wells.

Permits (Pollution Docket Orders) and attachments are microfilmed and imaged (optical database) for a permanent record. Hard copies are kept by the UIC Department and in the Court Clerk's office. Copies are also sent to the district office; however, the Review Team was informed that district offices are missing some of the older injection dockets.

OCC rules provide for annular disposal of drilling reserve pit fluids on a one-time basis. Approval is limited to the drilling fluids generated at the well site only. The casing through which the disposal is to take place must be set and cemented at least 200 feet below the base of treatable water (USDW). Injection pressure must be limited to prevent vertical fractures that could extend upward to the base of the USDW. A mechanical integrity test may be required prior to the use of the well for annular disposal. The approval process is very similar to that for all other types of injection.

In those rare situations where a disposal well is to be used for disposal of Class I (industrial or municipal) and Class II fluids (oilfield), the OCC would permit this type of arrangement only if the non-hazardous Class I were so light that the injector needed to mix the fluid with salt water to make it flow by gravity. The Operator has to have both an OCC Order for the salt-water disposal and a Class I Order from the State Department of Environmental Quality (DEQ). The latter regulates the facility as their testing and reporting rules are more stringent.

## **B. OBJECTIVE: UNDERSTAND THE CURRENT FILE (COMPLIANCE) REVIEW PROCESS**

The original purpose of the file review process was to determine that all active and temporarily abandoned injection wells which had received approval prior to the beginning of the Class II primacy program were not injecting in such a manner as to endanger USDWs. The OCC received primacy in 1981 and by 1989; file reviews had been conducted on approximately 10,000 of 16,000 "existing" wells. All formal file reviews for existing wells were completed in the early 1990's and at the time of this report, well application files are primarily selected for review on the basis of compliance violations. Compliance history has become a major factor in determining the priority schedule for review. Factors such as late filed MITs on new wells

(because of grace period, operator has 18 months to complete the well after the permit is issued), transfer of well ownership, information submitted on annual fluid injection reports (Form 1012A) and regularly scheduled MIT on 5 year cycle can trigger a compliance review. Over a period of a year, about 20 percent of the active permits receive a file or compliance review. Inactive injection wells are considered to be a part of the active number until the well is officially plugged and abandoned and the permit Order closed out by the OCC.

Prior to 1994, the same oil and gas specialists who were responsible for the conduct of the UIC application review and approval process conducted all file reviews. The compliance reviews, however, also involve field inspection and observation and district personnel do many compliance reviews. The oil and gas specialist who now conducts most of the file and paper compliance reviews in the Oklahoma City office is the UIC Enforcement Officer. The data from the file (compliance) review is entered into the computer system and subsequently crosschecked with the permit conditions. When deficiencies are discovered during the review, the operator is given a notice of the deficiency that contains a description of the violation and the number of days that the operator has to bring the well into compliance. OCC staff indicated that 90% of the wells are returned to compliance within the allotted time frame. The OCC District staff may write a ticket or file contempt as necessary. The procedure for addressing compliance is OAC 165:10-7-7. If the violation is technical, the field inspector can “red tag” (seal) the well and if the operator breaks the red tag, the fine is \$2,500 to \$5,000.

The length of time needed to do an adequate file review varies widely. File reviews without any complications may take five minutes whereas one with complications might take up to an hour. When the Oklahoma Peer Review took place in 1989, each file review averaged about three hours. This was because the database was incomplete and cumbersome to manage and the easiest way to identify wells and operators was to research the Petroleum Information data index and the State production tax reports. Most file reviews now can be done in less time and the type of time consuming complications are where missing or conflicting data is discovered during the review and correspondence with the operator becomes necessary to resolve the problem. OCC staff indicated some complications might take several months to resolve.

OAC 165-10-7-7 guides the type of compliance action taken by OCC staff when a deficiency is discovered during file (compliance) review. For technical violations which may have a bearing on the continued mechanical integrity of the well, the well is “red tagged” and cannot be used by the operator until the deficiency is corrected. For example, if the wellhead injection pressure exceeds not only the permitted amount but also exceeds the amount of pressure which would be allowed based on casing program or depth, the well would be red tagged until the operator either reduced the pressure to the permitted amount, or reworked the well to reduce the pressure requirement. For many administrative or paper violations (need to increase permitted brine volume, failure to submit Form 1012A, a surety lapse or pressure increase within normally accepted limits, etc.) the Department of Field Operations may allow the operator to inject while the deficiency is being corrected.

**C: OBJECTIVE: Understand the Technical Review and Related Aspects of the Permit/File (Compliance) Review.**

For newly drilled injection wells, the OCC requires surface casing to be set 50 feet below the base of USDWs with cement circulated to the surface or production casing cemented 100 feet below USDWs and cemented to the surface. Surface casing depth requirements are given for each well site by an Oil and Gas Division geologist using the mapped base of the USDW for the county. The OCC geologist in charge of refining the maps used to delineate the base of USDWs informed the Review Team that maps for each Oklahoma County are gradually being redone to use Sea Level Datum Elevations as a basis for establishing surface pipe setting and cementing requirements to protect USDWs. This project is about 35% towards completion for Oklahoma's 77 counties. The first effort at revising the determination for the base of USDWs occurred in 1984. Electric logs were used to determine the base of the 10,000 mg/l total dissolved solids (TDS) water. Contour maps were prepared for all of the oil and gas producing counties in the State. The OCC uses the same procedure as in the past in that all maps are updated whenever new logs show that a revision is needed. The OCC believes the new methodology is more realistic, cost effective, and enhances protection of USDWs because it reduces the number of areas where an excessive length of surface pipe may be required. The revisions have also afforded additional protection in areas where the previous requirements were inadequate to protect USDWs. The older information, which is updated as new information becomes available, is still used in the counties not converted to the new system

All injection wells completed since 1982 must have minimum confining zones which are determined as follows: wells injecting at a rate of 1000 barrels per day or less must have a minimum cumulative confining thickness of 200 feet while those injecting quantities exceeding 1,000 barrels per day must have a minimum cumulative thickness of 500 feet. Electric logs are used to calculate the confining interval. In the 1989 review, UIC staff asserted that geologic confinement criteria are not difficult to meet because of the presence of extensive clays and shale sequences underlying the USDWs. All newly completed injection wells are required to cement the production casing for 250 above the perforated injection interval. Wells converted from oil or gas production to use as an injection well are required to set and cement casing as described above for new wells. If a converted well does not have adequate surface casing, the production casing is to be cemented from 100 feet below the USDW to surface.

Throughout the years since oil was first discovered in Oklahoma, the OCC has been able to develop an extensive appreciation of the lithology in most counties through log coverage. Well control in Oklahoma is extensive and the logs and drilling reports have been used to develop a series of water maps which delineate the stratigraphic location of USDWs in reference to potential injection zones. Geologic features such as subsurface karst surfaces, faults, and other unique geologic conditions, which could affect the desired level of containment of injected fluids, have been delineated. The UIC Department staff generally uses the confining thickness of 200 feet for non-commercial injection wells and 500 feet for commercial wells as the primary geologic determinant. Approval of injection into areas of high formation pressures, either natural or imposed by past injection practices is evaluated on a case-by-case basis. In the 1989 Peer Review Report, the OCC indicated most of the faults in Oklahoma are sealing faults.

Tubing and packer are routinely required for all newly completed and converted wells. Packer type and its setting depth are specified in the permit. The UIC staff indicated there are no exceptions to the packer requirement. The OCC does have the regulatory flexibility to impose alternate requirements in the absence of a packer (i.e., more frequent MITs, annulus and pressure monitoring, limitations on injection volume). The packer depths specified in the permit allow for a plus or minus 20-foot tolerance. Permits also specify the use of tubing but, except for commercial wells where lined tubing is required, no specifications exist for other classes. The UIC Department does not prescribe or impose restrictions on the weight, grade, material, internal coating, or other tubing/packer qualities except for commercial wells as stated above. The rules basically state that oil field grade pipe is to be used. The OCC does not approve packerless wells even though a few are left from vintage completions of the past. Dual injector/producers are allowed as long as production occurs above the injection zone. The OCC commented that there are only a few of these wells actively injecting.

Maximum permitted surface injection pressure limits are the same for both Enhanced Recovery (EOR) and Saltwater Disposal (SWD) wells. In the past, formation fracture pressures were evaluated to determine the fracture gradient for various depths and producing fields. The fracture gradients used in 1989 ranged from 0.7 to 0.9 psi per foot of depth for depths below 2,500 and 1.1 psi per foot of depth for shallower formations. The general current pressure allowable is 0.5 psi per foot of depth; however, 1.0 psi is allowed if the cemented surface casing extends more than 250 feet below the USDW. Except in special situations, the injection rates are not a consideration because the maximum permitted surface injection pressure limits the rate. Modeling is not used to determine fracture pressure although the OCC can require or allow consideration of a step-rate test. The types of monitoring systems that have been approved include measurement of flow rates and monitoring of the tubing/annuli pressures. The OCC has not experienced any situations where compatibility of the injected fluid/cement or injected fluid/formation fluid has been a problem.

#### **D. OBJECTIVE: To Understand the Area of Review Considerations and Procedures.**

OCC uses a one-quarter mile radius for determining the AOR for enhanced recovery wells and non-commercial disposal wells. For commercial disposal wells, the requirement is a ½ mile radius. The UIC staff engineers calculate Zone of Endangering Influence (ZEI) using a modified Theis equation which is forwarded into the permit record even though the ¼ mile is the standard. The radius of the AOR consideration may be reduced on the basis of ZEI calculation and through the years since primacy in 1981, 50% of the wells permitted have been based on the ZEI calculation and not the fixed radius. The rules were amended in 1996 to reestablish the AOR at ¼ mile. The EPA Region VI has expressed concern over the change from ½ to ¼ mile for non-commercial disposal wells and is still, after four years, reviewing the matter after OCC informed them of the change. All permits in Oklahoma are issued for single wells, rather than area permits. OCC technical staff indicated that the criteria for review are the same. If the injection well is to

be under gravity flow (low pressure), this would be taken into consideration for judging other wells' potential for problems in the AOR.

Where the UIC Department finds that the Operator must take corrective action on a well within the Area of Review, two options are generally open. If the Operator desires to use the applicant well for injection, corrective action must be performed before approval can be given. Corrective actions for AOR wells are typically cement squeeze operations on wells with uncemented casings opposite the injection zone, or occasionally, as a condition of the permit, to require monitoring of the surface casing pressures of offset wells. The monitoring approach may become difficult where a different Operator produces the offset lease. When the Area of Review reveals a problem beyond the geographical control of the Operator, the OCC may impose permit limitation such as injection pressure reduction, volume decrease or continuous pressure monitoring. Occasionally permit conditions will include more frequent MITs or radioactive tracer surveys to satisfy corrective action concerns. The Operator may also work with the Department of Field Operations to get permission to plug the problem well. If all options fail, the application will be denied.

Usually the Operator elects not to take corrective action, in which case the OCC staff ends up dismissing the application. This occurs 90% of the time, however, the OCC does have the authority to force an Operator to produce or plug a well if it appears, even without the influence of injection, to be a threat to USDWs.

#### **E. OBJECTIVE: Understand the Administrative Permit Application Components.**

Prior to permit issuance, the Operator is required to notify the surface owner of the land where the well is to be located and also all offset operators within ½ mile radius of a filing of an injection well application with the Commission. The Operator is also required to publish in the local newspaper of the county where the injection well is to be located and in an Oklahoma City newspaper. Public notice is accomplished by publication for one day and is done at the applicant's expense. Affidavits of publication must be included with the filing of the form 1015. The protest period (public comment) begins fifteen (15) days from the date of last publication for non-commercial injection wells. The comment period for commercial wells is thirty (30) days. The public comment period can run concurrently with the technical review by the UIC Department or after completion of the review. The comment period may also run during the time when the UIC Department staff is working with the operator to assemble a "complete application"; i.e. an application which has all of the necessary components to afford proper review and approval. This includes documentation of financial assurance.

Most applications for injection wells do not receive public hearing unless protested by an outside party or the UIC Department of the OCC objects to the application and the applicant has sought relief through the hearing process. An example of where the UIC Department would enter an objection would be when a problem well exists within the Area of Review around the applicant's proposed well. The OCC actually takes a very liberal position concerning who may protest an application. Any party in the State, regardless of whether it has any particular interest in the well

may object and cause the application to go to hearing. When protests are filed with the Commission Secretary, the applicant is notified and a hearing date is scheduled. All parties are notified of the date, time and location of the hearing. The hearings are generally held in the OCC courtroom in Oklahoma City from 9:00 a.m. to 4:30 p.m. or in Tulsa. The OCC has video-conferencing available where hearing participants can go to Vo-Techs. Some hearings are held in Tulsa because of its status as an oil business center. The OCC is currently expanding the hearing participation capacity to include internet linkage. Hearings are presided over by an Administrative Law Judge (ALJ) from the OCC's Office of Administrative Procedures (OAP). The Administrative Law Judge also determines the criteria for whether protests are valid, however, traditionally all protests are given hearing opportunity. The hearing record closes on the day of the hearing. The Operator has ten days to appeal the decision of the Administrative Law Judge at which time the record can be reopened to accept additional comments or the ALJ may elect to just leave the record open for a period of time. If the case is protested the ALJ will write a report in support of his or her judgment and the protesting party may appeal the decision within 10 days in writing to the Commission. The Commissioners may decide to hear the case or refer it to an Appellate Referee within the OCC who either concurs or denies the ALJ's ruling. Further appeal goes to a Deliberations Panel appointed by the OCC. These cases are usually not heard by the Commission *en banc* unless the case has vast public opinion or interest. Decisions from the OCC are appealable only to the State Supreme Court.

The OCC has not established a definition of "significant interest" in reference to the number of protesters or the seriousness of the protest. All protests are assumed to be "significant" and eligible for hearing opportunity. The UIC Department does set a pretrial conference between the applicant and any protestant to attempt clarification of issues and concerns to potentially resolve the conflict. About a third of the protests are withdrawn as a result of pretrial conferences. The UIC technical staff participates in the hearing and offers an opinion either favoring or opposing the application. Approximately five percent of applications are protested. While a small percentage of the protests are from offset operators, a majority is from tenants, landowners and area citizens. About five percent of the time, public comment causes modification to the final permits conditions. Complaints related to a proposed permit or application which are submitted to the agency after the UIC Department has given approval follow essentially the same process as described above. A letter will be sent to the UIC Department and a hearing will be set and heard by an ALJ at the Commission. After a permit is issued, the complaints will go to a complaint and enforcement official in the UIC Department who will follow up and file a case with the Commission, if necessary.

The OCC requires financial assurance prior to permit issuance. The type of surety system in place is as follows: The Operator has evidence of a Letter of Credit for \$25,000 for a non-commercial disposal and \$50,000 for a commercial disposal well. New operators or operators with a history of compliance problems are required to file a Category B surety or post a bond in the amount of at least \$25,000 not to exceed \$100,000. All bonds are for blanket coverage for all wells operated by that operator within the state and are renewed and filed annually as a part of an Operator Agreement. The OCC does not deal with surface remediation, however, there is a requirement under the Surface Damage Act; Title 52 Section 03-118 that the operator file a \$25,000 bond with the Oklahoma Secretary of State to cover surface damages on a lease.

## **F. OBJECTIVE: Understand the Process for Aquifer Exemptions**

The OCC has only issued one aquifer exemption since being granted primacy by EPA in 1981 and this was on the basis the aquifer was a producing zone. The aquifer exemption was granted through OCC Order after concurrence and approval was received from EPA. The process for obtaining an exemption is contained in OAC165: 5-7-28 of the Rules of Practice. This regulation is detailed and describes the process an operator or other petitioner would have to go through to file the application and provide justification for exemption through the OCC hearing process. OAC 165 5-7-28 (b) (5) (A-C) describes the three criteria for exemption. In addition to the above, justification can be made on the basis that the depth or location of the ground water is such that recovery for drinking water purposes would be technically or economically impractical or its so contaminated that it would be technologically or economically impractical to render the water fit for human consumption.

### **Permitting/File Review: Discussion, Evaluation and Recommendations**

#### **Identified Strengths**

1. The OCC has a well-structured application, review and supervision process that includes oversight for completeness of required application components and thorough technical review. Extensive use of automated data processing, including the computer tracking of application status and file location facilitates the process. This system was installed prior to the 1989 Review and has gradually evolved into a better system
2. Operators who wish to apply for injection well permits are provided with a well-organized information booklet, which assists them in properly completing applications and providing the necessary attachments. This booklet is dated 1997 and replaces the informational packets given out prior to that time.
3. The OCC is continually revising the maps of various counties delineating the base of USDW's. This is a collaborative effort within the agency and involves qualified geologists and engineers outside the UIC Department. The base of USDWs is readily known at most injection well sites. Currently, the maps are being converted to identifying the base of USDW in each county on the basis of sea level datum instead of surface-depth base. Information for approximately a third of the 77 Oklahoma counties has been revised.
4. The OCC focuses on the adequacy of cemented surface casing to protect USDWs. Surface casing is required to be set below the base of the USDW for newly drilled wells and all commercial disposal wells. Squeeze cementing is required to protect USDWs for newly converted wells when the surface casing does not extend to the currently mapped base of the USDW.

5. The OCC has a very liberal (“open door”) policy for protests resulting from public notification. Any concerned citizen or other operator is assured of a hearing on an application upon filing a written objection. Proposed commercial wells are so identified in the published notice. Pre-hearing meetings with an applicant, complainant and UIC department staff eliminate many hearings through negotiation. When hearings are necessary, the OCC offers a well-structured appeals route for the participants to use if aggrieved by an adverse opinion at a lower level.
6. Tubing and packer are required for newly permitted wells and have historically been required for more than two decades. The instances of ground water contamination have been minimized through this longstanding requirement.
7. The file reviews are still performed in conjunction with the filing of amendments, permit transfer requests, and various record filings made by the operator. The formal file review of all injection dockets, however, was completed in the early 1990’s and the process has been primarily used to track permittee compliance.

### **Other Comments**

1. The aquifer exemption process under OAC165: 5-7-28 is detailed and would allow for a comprehensive technical evaluation of any application for exemption. OAC 165:10-5-14 also covers “Exempt Aquifers” and duplicates much of the language regarding the exemption criteria. The latter rule states that the OCC order, “shall be subject to the approval of the Environmental Protection Agency whereas the Chapter 5 rule does not. The Review Team recommends that OAC165: 10-5-14 be revoked since most of the rule duplicates the more detailed rule in Chapter 5 and the matter of approval by EPA is a OCC directive unto itself and is only informational to the regulated community. Having a part of the rule in another Chapter of the Administrative Code is somewhat confusing to a reader.
2. The OCC allows operators to submit design applications for injection wells, which means that the UIC Department can provide technical review on a well’s conceptual design. This is similar to a Drilling Plan for a well. The Application Form 1015 is submitted to the UIC Department and reviewed. If deemed acceptable, an Order of the Commission is issued to the Operator authorizing the well for EOR/disposal. The authorization, however, is based on the applicant’s proposed data. The MIT data (Form 1075) and actual well completion data (Form 1002A) is not submitted to the OCC for review and approval until after the Commission Order is issued. The Review Team expressed strong concern that injection could commence before final testing and well testing data can be reviewed. The OCC has no provision, nor does EPA UIC program philosophy allow for testing a well for injection capability prior to having a permit.
3. The Review Team does not share the same concern as EPA Region VI that the Area of Review radius has been reduced from ½ mile to ¼ mile around a well.

4. The Review Team suggests that OCC consider supporting a revision in the law, which requires UIC orders to be signed by the Commissioners before the Order to Inject is official. If this is not feasible, the Commission Order should contain language informing the well operator that the permit to inject will not be issued until after the OCC has received and reviewed all actual well completion data, mechanical integrity test data, and any other information required by the OCC. Some states that used to do all business by official Commission order have delegated this responsibility to the Division level. The old Conservation Laws of the 1930's, while not a dead issue, have become less of a concern with stripper production; however, the UIC permit is designed to protect USDWs, which is more of a permitting activity rather than an Order to Inject.

### **PART III INSPECTIONS**

#### **A. UNDERSTAND HOW FIELD OPERATIONS ARE CONDUCTED AND MANAGED BY THE AGENCY**

The division employs approximately 52 field inspectors who are State employees and are assigned to the OCC's Field Operations Department. For the most part, the inspectors work out of their homes rather than an office and a district office supervisor coordinates all work. When the field inspector feels he or she needs advice or assistance on solving a particular problem, that guidance generally comes from the supervisor in the district. Additionally, supervisors periodically accompany the field inspectors on both routine inspections and special assignments to critique the quality of work and determine if the necessary work is getting accomplished. To ensure that all inspections, tests required of operators and observations of lease or well conditions meet a common standard of quality and fairness to operators, the supervisor and field inspector discuss findings and observations and develop a plan to pursue in those cases where follow-up is necessary. This would also include approaches to operator non-compliance or preparation of enforcement cases.

There are four district offices in the State. These offices provide inspectors with the use of a telephone and copies of Division files and records. The managers of the district offices report to the Manager of the Field Operations Department in the Oklahoma City office. The inspectors have cell phones and pagers and are able to contact the district office from almost any location in their area. The inspectors commonly contact the district office at least once, if not twice a day to see if there are new orders or special inspections to be made, however, with the cell phones and pagers, the contact may be initiated from the district supervisor at any time of the day.

Inspectors are generally given the freedom to arrange their own daily work schedules, however, the district office manager and assistant manager have the prerogative to prioritize inspection schedules to accommodate complaints, reports of pollution, and Mechanical Integrity Tests (MIT's). The OCC does have a written inspection strategy in the form of a guidance manual that is available to inspectors and is in the process of finalizing a revised and substantially updated

Field Inspector's Manual. This manual will replace the one used for many years called "Standard Operating Procedures and Technical Guidelines". This manual contains outlines of field operations procedures for a wide variety of standard inspections and emergency procedures, definitions of oilfield-related terms, and explanations of certain protocols. This document was provided to the Review Team in draft form and is anticipated for release around the end of August 2001. Routine UIC Department requests are sent to the District Office. Only in special situations does the UIC Department directly contact a field inspector to conduct an inspection of a well.

Inspectors are responsible for performing all types of field inspections, including oil, gas, UIC and environmental facilities. Overall, about 15 % of the average inspectors time is spent on UIC matters. Pollution problems and complaints take priority for inspection scheduling followed by routine and random inspections. In addition, the Division periodically does "sweeps", where a group of inspectors will take part in a focused inspection run-through of a certain area. OCC believes these sweeps are an effective and cost-efficient method to make routine lease and well inspections in a short period of time. This allows the inspectors to devote more attention to the operators with poor compliance records. The compliance history of all operators and the selection of wells coordinated for inspection is done at the district office in coordination with the Department of Field Operations. All inspections are logged in and located in the district office file.

Inspectors play a critical role in enforcement. Field inspectors cite infractions, send first notice of violations and will dismiss the case in accordance with OCC administrative procedures when compliance is met. The inspectors receive training in proper sampling techniques and the proper legal procedures for developing enforcement cases. They will testify in court as necessary to ensure enforcement of state regulations. Meetings are held bi-monthly at the district offices with the various district inspectors and other staff. These meetings provide an opportunity to discuss new rules, policies and procedures with the district staff and also serve as a training opportunity.

Inspectors must have at least four years of actual prior oilfield experience and a high school education to qualify as an inspector. The candidate inspector must also pass a test of a hundred questions given by the Office of Personnel Management. The questions are 40% technical and 60% situational and the test score plus the other qualifications serve to rank the candidates. New inspectors receive at least two weeks training in the district offices, and then are put with their field supervisor for a period of time to ensure training on OCC procedures and policies. The length of training time depends upon the supervisor's perception of progress and subsequently the field inspector is given an area or county to work. Safety meetings are conducted periodically in the districts. Safety hats, shoes, glasses or goggles, first aid kits, H2S detection meters, and fire extinguishers are issued as standard field inspector equipment. Cellular phone communication is maintained with all inspectors. The Division has sixty-three (63) Global Positioning System (GPS) Units in the field and fifty-two (52) laptop computers in the field.

**B. OBJECTIVE: Understand how routine/ periodic inspection program are performed in the state**

OCC inspectors routinely inspect most UIC wells on at least an annual basis although it may take three years to get around to all wells. The inspectors routinely visit 9,000 to 10,000 UIC sites per year with approximately 3,000 being in conjunction with a scheduled MIT. The field inspectors collectively make about 80,000 site inspections per year on all of the facilities under the jurisdiction of OGCD. Enhanced Recovery wells (EOR) and Saltwater Disposal wells are inspected using the same criteria. UIC wells located in areas of more frequent incidents of non-compliance receive a higher percentage of inspections. The schedule for routine inspections of UIC wells is established through coordination of the field inspector and the district manager. These inspections are done as part of a coordinated, comprehensive inspection of other facilities on the lease. These inspections are in addition to MIT's, which are scheduled separately, however, inspection of other facilities on the lease may receive a routine inspection concurrent with the on-lease witnessing of a MIT. The random, routine inspection program is used to detect rule violations; operational problems which if not corrected may lead to more serious violations, or environmental problems. Operators are not given advanced notice of routine inspections. The OCC has the right of ingress and egress and stated that at least half of all inspections are unannounced, however, the inspector does have the option to call the operator and request his presence on-location if his presence is deemed necessary. The operator does not get a copy of the routine inspection report. The operator does get a copy of the 1085 form when a violation is discovered during inspection or when the inspection was performed on the basis of complaint.

Since the previous review of the Oklahoma UIC Program in 1989, the OCC has used the Inspector's Manual to instruct field inspectors what to look for when investigating spillage of oil, saltwater leaks, and integrity of tank batteries and flow lines. The inspectors also check pressure gauges and the UIC wellheads for leaks. The inspectors do not carry gauges and flow meters at all times but gauges are available in the District offices for Inspectors' use. In addition, the Enforcement Officer has and carries his own gauges whenever he is in the field. At one time the OCC budgeted funds for purchase of gauges but found it was easier to require the operator to put on a gauge to check pressure if any questions arose.

There is no formal checklist used by inspectors. Inspectors perform an average of 15 UIC inspections per month. Winter and periods of inclement weather can adversely affect the number of inspections for any given month. About two hours are required for the average UIC inspection including pre-trip preparation, travel time and time on location. Photographs and water samples may be taken by inspectors on a routine investigation when violations or environmental problems are discovered. The inspectors have been trained in the proper sampling and sample handling techniques including chain of custody procedures. Whether samples are collected as a part of a complaint investigation or as a problem discovered upon routine investigation, the information obtained includes operator's name, name of lease, legal description, and the name of the person collecting samples. Samples are collected in sterilized containers and transported to private laboratories by chain of custody procedures. All sampling is done under procedures established in the state's QA/QC plan and training on correct procedures is included in the Field Inspector's Manual.

**C. OBJECTIVE: UNDERSTAND THE EMERGENCY AND CITIZEN COMPLAINT RESPONSE PROCEDURE**

When a citizen calls in a complaint, potential rule violation, or environmental problem (oil spill, leak at a well, etc), the field inspector is notified by the Department of Field Operations or the district manager. About 5% of all complaints are associated with UIC permitted wells. The District Manager is responsible for prescribing the appropriate response to the event. The field inspector and his supervisor will do an onsite inspection to determine what level of coordination is required to provide proper response. In addition, the Department of Environmental Quality operates the State Hotline and this is another point of complaint referral for the OCC. A representative of the Department of Environmental Quality visited with the Review Team and described a well-structured cooperative relationship with the OCC staff. The Review Team was also provided a packet of sample reports from the DEQ to OCC referring complaints and pollution incident reports on various topics. The Oklahoma Conservation Commission compiles an annual report of incidents from all agencies and OCC investigations are included.

All complaints and particularly those from citizens reporting potential pollution are given the highest priority and are investigated within 24 hours. After the inspection, Form 1085 is completed documenting the findings and recommendations of the inspection and is copied to the district office and entered into the computer system. If the complaint involves a UIC matter, the 1085 form is sent to the UIC Department. A copy of the report is also sent to the operator. In most cases, the operator is contacted after the initial investigation because the field inspector wants to view the situation as the complaint describes. The OCC staff routinely makes unannounced inspections. The complainant is routinely contacted prior to field investigation of the alleged problem and subsequently notified of the results of the complaint investigation. If a situation calls for additional technical expertise and /or further investigation, the UIC Department or Pollution Abatement Department will be contacted, depending upon the nature of the problem. The Pollution Abatement Department will take over responsibility for the site if remediation of contamination is necessary is complex or requires extreme measures.

Following emergency and /or complaint responses and corrective actions, a follow-up inspection is performed to ensure that all required work has been completed to resolve the complaint, violation, or UIC integrity problem. A final report is then written. If the emergency situation requires notification of another agency(s) that may have their own regulatory issues to resolve (brine flow into a Public Water Supply, lake or well) the district manager or assistant manager does the notification. Some of the common emergency situations involving UIC permitted wells include false information on MITs, uncertain well ownership, well purges, and breakouts, although the latter category usually involves wells that are abandoned and not plugged.

**D. OBJECTIVE: To Understand the Reporting and Follow-up Procedures Used in the Inspection Program**

The Field Inspectors use two basic forms for reporting inspections. Form 1075 is used for MITs and Form 1085 is used for all other inspections (routine, complaints, emergencies and for violations the operator needs to address). Notes taken by field inspectors are entered into a yearly logbook that is used solely for that purpose. Inspectors are required to keep logbooks for a period

of three years before they are destroyed. The logbooks are not microfilmed. Records for routine injection well inspections that are done as a part of comprehensive lease evaluation operations are generally not crosschecked to the permit file in the district office unless the information is included on a Form 1085. In some cases, the UIC Department would review the information. The state does have a statute regarding the destruction of potentially historic files and this would include field notes, however, as previously indicated, the minimum retention period is three years. The statutory requirement refers to both hard copy files and electronic records and the judgments on the type of records to be retained and the length of time is the responsibility of the Manager of the Department of Field Operations and /or the Managers of the District Offices

There is very little lag time between when inspections are made and the reports written. Inspections are written on-site and complaint reports are written within 24 hours. Hard copies of the reports are retained at the District offices and also mailed in to the Department of Field Operations. All computer entry is done at the district office. If any of the reports have continuous monitoring records, these charts or electronic recordings are forwarded to the Central Office to be included with the well file. All violations recorded through inspections are kept at the district level as hard copies and also entered on the computer where they are accessible to Central Office staff where the Compliance Officer tracks the progress on the violation resolution. The OCC Legal Department routinely reviews all inspection procedures to assure the results may be used in formal enforcement actions. The Legal Department also reviews all form revisions. Drafts of UIC Rules changes are sent to EPA for comment.

The manager of the district office is responsible for reviewing inspector reports and usually does this within 24 hours of filing. He also reviews 1036 forms used for more formal complaints and correspondence to operators. The Field Inspector's primary access to UIC permit contents, letters to operators and records of NOV's is the District office. He can either call for the information or come into the office. He can also call or come into the UIC Department office. Information and forms filed on the chain of custody for injection well obligations is kept at the UIC Department central office. Photos are sent to the Legal Department for use in the hearing process.

### **Evaluation and Recommendations**

1. The Review Team felt that the retention of inspector log books for only a three year period was an insufficiently short time, particularly since no entries were microfilmed. The logbooks are destroyed even before the end of the cycle for MITs has been completed. The Team believes that even though other forms are used to document tests, violations, etc. The historical value of these books for future inspectors is important.
2. The documentation for complaint responses has been considerably upgraded during the past few years and the cooperation with the DEQ on the referral and resolutions of complaints and reported environmental problems appears to be very well designed and is working.

3. Inspectors routinely inspect 9,000 to 10,000 UIC wells in addition to the more than the 3,000 MITs witnessed in conjunction with scheduled MITs. It takes about three years to inspect all the UIC wells on inventory. Although this is about the same inspection rate as reported in the 1989 Review, OCC indicated that for several years they have been at the budgeted level for field inspectors. Those areas that have a higher rate of historical non-compliance receive more inspection. The inspection time for all UIC wells to be completed with a frequency of once every five years is approximately 18 months, on the basis of the current inventory of about 14,500 wells.
4. Neither the inspection strategy nor the inspection checklist has been put into writing; however, a new, very comprehensive manual for field inspectors will be completed and distributed in August 2001.
5. The Review Team had some concern that the two-week training period for new inspectors might be inadequate given the complexities of the OCC district inspection program. Inspectors are given adequate communication equipment to call in to the district office for information and on problems.
6. The Review Team was especially concerned that the OCC inspectors do not use standardized field inspection report forms when conducting routine inspections. Routine inspections are only recorded in an inspector's personal logbook. The lack of such a standardized form may allow for overly subjective inspections. The OCC stated they use Form 1085 (Incident and Complaint Investigation Report) for all types of inspections. However, that is not a routine inspection form. The Review Team recommended that additional forms be developed for the other inspection categories to ensure uniform, consistent reporting by field inspectors.
7. The OCC should furnish field inspectors with their own calibrated pressure gauges. This is needed to verify the well is operating within its permitted or regulatory parameters. Gauges supplied by well operators may not be properly calibrated.

### **Conclusions**

The Oklahoma field inspection program is providing a high degree of protection to USDWs because it focuses on program areas which provide the greatest degree of water protection such as MI testing, well construction, rapid response to environmental problems and citizen complaints, and close monitoring of non-compliance resolution. The new field inspection manual should be of great benefit to all field inspectors providing that the OCC continues periodic training on inspection procedures and updates the manual as needed.

As was recommended in past reviews, providing inspectors with a generalized inspection schedule, particularly since the MIT five-year test accounting is done in the central office may further enhance the inspection programs. The OCC will probably never obtain enough funding to employ the optimum number of field inspectors.

## **PART IV      MECHANICAL INTEGRITY TESTING**

### **A. OBJECTIVE: UNDERSTAND the TYPES of MECHANICAL INTEGRITY TESTS ALLOWED for DIFFERENT UIC WELL COMPLETION PROGRAMS**

The OCC allows a variety of tests for demonstration of mechanical integrity for significant leaks (Part I- MIT). These include the casing-tubing annulus pressure test, positive annulus pressure monitoring, radioactive tracer survey and nitrogen pressure test. OAC 165: 10-5-6 provides the limitations on which tests can be used for certain well completion programs. The criteria used for determining the Pass/Fail of a pressure test is a 10% bleed-off in thirty minutes. Fluid volume loss is not a consideration and no stabilization period is required to dampen the effects of fluid temperature changes prior to starting the test period. The 10% variance has traditionally been the industry accepted practice and has proven to be a good test criterion, even though the technical origin of the standard is not known. The actual demonstration of mechanical integrity occurs if, under the testing pressure, leaks at the wellhead cause a loss of pressure of 10% or less over a thirty-minute test period.

Test pressures are set out in the OCC rules. Initial test pressures for new or newly converted wells must be at the permitted pressure or 1000 psi, whichever is less, but not less than 300 psi. All subsequent tests must be done at a minimum of 200 psi. All existing (pre-primacy) wells have now been tested and continue to be tested at a pressure of not less than 200 psi. New or newly completed commercial disposal wells must be tested at the permitted pressure or 1000 psi, whichever is greater. Once in operation, these wells are tested to the required pressure authorized by the Order but not less than 300 psi. In 1996, the OCC promulgated OAC 165:10-5-6- (f) to require annual testing for commercial SWD' wells. Higher test pressures are required for commercial wells because the operating pressures are generally higher; shut downs for maintenance less frequent and a perception by the public that less care and attention exists.

The rules do permit an operator to use Annulus Pressure Monitoring (APM) by monitoring and recording the casing-tubing annulus pressure during actual injection. Permission to use APM is given by the Manager of the UIC Department on a case-by-case basis. When APM is allowed, a measurable positive pressure must be maintained on the annulus and continuously recorded. Injection rates, volumes, and annulus pressure must be monitored monthly and the result submitted annually on Form 1012A. Charts must be maintained by the operator but not required to be submitted. Operator must retain the record for three years after the test. The UIC Technician reviews all information on the test and if the report shows positive pressure, then it is forwarded to the coordinator who is a Petroleum Engineer. No stricter standards are imposed to account for special geological conditions such as faults, salt deposits and artesian zones unless dictated through the complaint process or through the OCC hearing procedures. All wells using APM are required to have an initial pressure test unless the requirement is waived by special order of the Commission. The OCC staff indicated no recollection of such wells under special order. Where monitoring records are used and reviewed to establish MI, alleged failures are investigated from review of annual reports. Where the well is not using APM, there should be no

pressure on the casing-tubing annulus. When such conditions are discovered, the report is given to the investigating coordinator for further review.

The radioactive tracer survey (RATS) is primarily used on wells where there is not an annulus to test or to verify that a packer or tubing leak does not exist. The RATS is used to determine leaks in the tubing packer, casing or to satisfy Part II of MIT. RATS is also used to determine if there is not enough cemented column behind the pipe to extend above the injection zone. This would be considered a failure of Part II MI. Cementing reports are used to verify cement occurrence 250 feet above the injection zone. In all cases, the cementer or the operator must verify cementing reports.

The OCC allows radioactive tracer surveys, temperature surveys and cement bond logs to be used to demonstrate MI. The OCC staff did not indicate whether operators were required to run logs more frequently in areas of Oklahoma where potential adverse geological situations (e.g. corrosive ground water) have historically caused problems in past oilfield operations. OCC uses RATS to indicate vertical movement behind casing and temperature surveys to indicate anomalies that indicate top of cement and possible casing leaks. Cement bond logs are not required on all wells but are requested on a case-by-case basis. The UIC technical staff, engineers, and geologists have the authority to require the Operator to run a suite of logs. They also are capable of interpreting the logs submitted by the Operator. The most common remedial action required to correct MIT failures is to repair the tubing or reset/replace the packer. Casing problems are corrected by squeezing cement or other acceptable sealant into the holes in the production pipe. If the Operator of a well requiring corrective action proves to be insolvent, the OCC can use funding from the state well plugging program to abate the potential for pollution to USDWs.

## **B. OBJECTIVE: UNDERSTAND THE IMPLEMENTATION OF THE MIT PROGRAM**

The UIC database is used to flag wells that are due for a MIT on the five- year cycle. The operator is notified at least 30 days in advance of the scheduled test date for a MIT. Tests are scheduled by state field inspectors at their convenience. The UIC Department in Oklahoma City maintains the responsibility for scheduling tests. Where an operator has a large number of MITs to run in a geographical area, the operator will work with the field inspector to set an effective schedule for testing all the wells. The OCC does not maintain a priority schedule for testing all of the wells in the routine five- year cycle due to the sheer number of wells. While there is no priority schedule, commercial disposal wells are tested on an annual basis. The injection Order may determine the frequency at which a well is to be tested when radioactive tracer surveys (RATS) are to be used as evidence of MIT. Packerless wells are tested on a five-year schedule.

The scheduling of MITs by automated methods started in 1986. That data entry system, with minor refinement, is still used to provide a monthly listing of wells that have five-year tests due. Any wells, which are discovered through compliance review or other information made available to the UIC Department, warranting a special out-of cycle MIT are added to the monthly listing.

Test results are reported on a Mechanical Integrity Pressure Test Form, Form 1075. The form is usually completed and signed by the inspector who witnessed the test. In the event that the test is not witnessed, two parties, the operator and the service company, certify the testing. The inspector usually makes the determination as to whether a well has passed or failed a test. When the UIC Department receives Form 1075 from the district office, MIT information is entered into the data system where it becomes part of the permit compliance record. The Form 1075s are filed in the well file in both the district offices and the OCC/UIC office in Oklahoma City and the information is entered into the database for recordkeeping and for notifying the operator of the next five- year test. Failed tests are also entered into the database and a letter is sent to the operator from the OCC/UIC Department with a copy to the district office requesting repair and retest of the well within 30 days. If the UIC review uncovers inconsistencies with the permit conditions or appropriate MIT practice, the operator and the district are notified. Wells are generally shut-in by the field inspector until repairs are completed.

The UIC staff indicated that only in the case where the Operator is running a RATS, would Parts I and II of MI be coordinated and performed concurrently. Most of the wells pass Part II of MIT by demonstrating the top of cement (TOC) is at least 250 feet above the injection zone. The Permit Review team in the OCC/ UIC Department does this evaluation. Other tests capable of determining fluid migration on the back side of pipe such as sonic/temperature combination or cement bond logs are not required of operators except in special situations.

Operators of wells that are delinquent in meeting scheduled tests are sent follow-up notices. Follow-up notices are issued approximately every 90 days. The current approximate MIT failure rate is 10 percent as compared with an 11 percent failure rate in 1989. Currently about 60 percent of the failures are due to tubing and packer leaks.

The staff assigned the responsibility of Part I of MI update and revise a test available to the review team conducting Part II. Only in cases where the operator is running a RATS would the tests be coordinated to be conducted at the same time. Most wells demonstrate the lack of fluid migration (Part II) by proving the top of cement is 250 feet above the injection zone.

### **C. OBJECTIVE: Understand the Procedures of Witnessing a MI Test**

State field inspectors assigned to the district offices witness the MI demonstrations. The UIC Department makes every attempt to ensure that the quality and criteria of witnessing is standard throughout the state. Inspectors witness almost 100 percent of all tests and retests but only occasionally will the inspector witness casing repairs. This high percentage of witnessing is primarily due to the fact that the inspectors are able to schedule the tests themselves. Each year, eight man-years are required to perform the normal MIT witnessing and UIC inspection programs by the inspectors. The OCC indicated to the Review Team that this manpower commitment could vary from the norm in years when the petroleum industry is in a state of low economic development. These times of industry depression make scheduling of MITs a challenge due to wells being temporarily abandoned, leases being transferred and operators without readily available service companies to do the required tests.

An average of two hours is needed for the test, including travel time. The test time can take longer if the Operator is not set up to conduct the test when the field inspector arrives. Aside from observing that the test is conducted in accordance with applicable criteria and documenting the test by completing and signing Form 1075, the inspector checks for any violation of the Order or OCC rules on the lease. Both the inspector and the operator must sign the Form 1075 if the inspector was not able to witness the test and submission of a pressure chart is required with the date and time of the test. The OCC is not concerned when an Operator conducts an MIT prior to the scheduled date and subsequently makes repairs, however, in these cases, the Operator is required to notify the OCC when an MI failure occurs and subsequently notify the OCC when the packer is pulled in order to provide an opportunity for the inspector to witness the test. No penalty is incurred if this procedure is followed.

#### **D. Follow-up on Failed MI Tests**

When a known MIT failure becomes known to the OCC, the field inspector notifies the Operator by phone call or contacts the pumper to shut-in the well. If the tubing and packer have integrity, the well may be allowed to continue to inject for up to two days after a failed pressure test. In addition, a failed well may be established on a special monitoring schedule on a case-by-case basis where the cause of MI is known and can be properly controlled until repairs are possible and USDWs are not endangered. The Operator is required to institute corrective action to resolve the failure. The OCC does have the authority to require the Operator to repair a well prior to plugging and abandoning it, however this is rarely used except in established Wellhead Protection Areas where ground water use is highly sensitive due to its development for public supply. The general requirement in these cases is additional cement during the plugging operation. Although stated elsewhere in this report, the UIC Department gives the Operator 30 days to make repairs and test the well. The UIC Department does not require Operators to submit documentation of well workovers unless the packer has been unseated. Activities to enhance injection capacity such as well fracing and removal of scale are not required to be reported.

### **Discussion, Evaluation and Recommendations; MIT Program**

#### **Program Strengths**

1. The State uses the positive pressure test for MI demonstration on all new wells and most newly converted wells unless the option for continuous monitoring of annulus pressure (APM) is selected. External well integrity (PART II MI) is often established through the review of well cementing records, however, OCC does allow use of RATS and temperature surveys and can required cement bond logs to be run.
2. The OCC field inspectors witness nearly all of the MITs run by operators, including retests after repair of failures. The high percentage of tests witnessed is probably because the inspector who does the witnessing also does the scheduling of tests.

3. In most cases, the inspector completes and signs the test report form on site assuring accurate information.
4. When a well fails an MIT, the inspector has not only the authority to shut-in (red tag) the well either immediately or within 48 hours but is normally present to see this is done.
5. Commercial disposal wells are required to MIT annually, which is a change since the previous review.
6. The MIT program is computerized to the extent that all information on tests is sent in to the UIC Department Office and entered on the system. The five-year testing cycle for each well can be retrieved in terms of sending out notice of the next test.

### **Concerns and Recommendations**

1. During the Review, it was not established whether field inspectors require stabilization of the annulus pressure before beginning the actual 30-minute test period. This may be a practice but was unclear to the Review Team. Temperature effects of the annulus fluid can substantially affect the test results greater than the allowed 10% variance. Field Inspectors do require stabilization of the annulus pressure before beginning the actual 30-minute test.
2. EPA has been concerned that the full 20% of all Class II wells in Oklahoma are not tested in any given year although OCC generally comes with 10-15% of the primacy commitment. The Review Team has some concern that the “numbers” game overshadows the dedication that OCC field inspectors demonstrate by witnessing nearly all of the tests. From a program integrity standpoint, the Review Team believes witnessing tests is very important and should continue at its present rate. OCC might correct some of their number deficiency problem by transferring more authority for developing the 5-year testing schedule to the District Office and designate one staff person in each district as UIC coordinator.

## **PART V. COMPLIANCE/ENFORCEMENT**

### **A. OBJECTIVE: Understand Enforcement Procedures in the State**

The OCC has a variety of informal and formal enforcement actions available to address non-compliance situations. The OCC is a quasi-judicial agency, which has sole jurisdiction over the drilling, production and disposal of waste from the oil and gas industry. The UIC Department uses all the powers of the Commission in carrying out its duties. OCC staff make a distinction between informal enforcement actions that are the operator’s response to being served with a

notice of violation and more serious violations which could escalate to legal directives and enforcement Orders. The informal venue includes field citations issued by field inspectors and notices of violation issued by the UIC Department to have a particular violation corrected within a specified time frame. Prior to the mid-1990's, a notice of violation given to operators by field inspectors and other District staff could be either verbal or in writing. At the present time, most of the violations relating to UIC carry a fine of \$500 up to \$ 5,000 (failure to obtain an injection well permit). Fines are now part of the OCC regulations with the amount of a particular fine specified in the rule. Fines for various violations are two tiered: Schedule A encompasses the gamut of fines for environmental violations which have potential for causing pollution if not corrected and Schedule B encompasses the administrative and paper violations (failure to turn in reports). If a certain violation escalates because it cannot be resolved at the lowest possible level, the ideal situation, the OCC can issue contempt citations.

The Commission may initiate formal enforcement action if the operator fails to comply with an inspector's or the UIC Department's directive or where the operator has repeated or willful violations. The inspector, district manager, or UIC Department may also "red tag" or shut in or seal a well or facility until compliance is achieved. The OCC indicated that approximately five percent of all formal enforcement actions taken relative to oil and gas matters are on UIC violations and are in the form of contempt citations or through the OCC hearing process. Commission orders usually result in directing compliance through formal enforcement order. These orders may require site cleanup, well plugging or the shut- in of the operator's well(s) and variety of other compliance actions. To initiate an enforcement action through the Commission process, either the Department of Field Operations or the UIC Department will file a complaint with the Office of General Counsel (OGC). A representative of the OGC will be assigned to assist the appropriate department by developing and drafting the complaint recommending a hearing or contempt citation.

All hearings are held before an Administrative Law Judge of the Commission. Occasionally the Commission will hear a case on an initial basis. The OCC serves as both a tribunal and an agency of investigation. If the operator desires to appeal the decision of the Administrative Law Judge, it is referred to the OCC Appellate Court. Environmental organizations and concerned citizens have the right to appear as interested parties at hearings on appealed violations and have their views documented as a part of the record. Interested parties are informed through notices of hearings published in local newspapers and in the Oklahoma Journal of Record (an Oklahoma City paper).

## **B. Nature and Disposition of "Paper" Violations versus Technical Violations**

As previously mentioned, the OCC has developed a schedule of fines within the rules; OAC Section 165: 10-7-9(Appendix E&F). These are automatically issued for a specific violation. Contempt fines are assessed on a case-by-case basis depending on the nature of the violation. Falsification of a MIT, for example, would draw a contempt fine. The "red tag" is the most common type of penalty imposed and may be used for any kind of violation. The OCC does specify the penalties in the issued Notices of Violation (NOVs). The Department's Enforcement Officer who issues the NOV in accordance with the General Rules of Practice does this. An

average fine is about \$500. The General Law Office of the OCC tracks the payment of fines. The Enforcement Officer is the single point of contact for staff to use in determining what follow-up procedures to implement to assure compliance and correction of a non-compliance event. The report of the status of the action is sent to the UIC Department Manager. The District Office will also get a copy of the final enforcement action. Follow-up activities on a non-compliance complaint has two parts: the payment of the penalty, which is a Central Office activity, and the corrective action that involves the District staff and field inspector. No one person in a district office is assigned as district enforcement officer.

### **C. Time Allowance for Corrective Action**

The Operator is generally given from 15 to 30 days to correct a “paper” violation. The UIC staff indicated the most common “paper” violation was failure to file the annual report on the injection well. In cases where the condition causing the violation could threaten a USDW if left uncorrected, the Operator is given orders to shut-in the well and begin repair immediately. MIT failures would cause this type of action to be taken although in the case of most such failures, the Operator is given up to thirty days to have the OCC inspectors perform a follow-up inspection and file C-1 and C-2 forms. All follow-up inspections are coordinated through the Enforcement Officer, whose position was established in 1994.

In extreme situations, the OCC has authority to order the well to be plugged if immediate contamination is occurring. This is accomplished through an emergency hearing process. If an Operator has numerous violations on wells spread over one or more OCC districts, the OCC can issue a statewide shut-in order of all wells in the state belonging to that Operator. For example, failure to run MITs or falsification of MITs would cause the OCC to shut-in all wells, producers and injectors. The only appeal to a Commission Order is to the State Supreme Court. This gives the Commission very strong enforcement authority. Historically, the State Supreme Court has never overturned a Commission Enforcement action. The amount of time allowed to correct a violation or series of violations is assessed on a case-by-case basis and has no set time allowances.

### **D. Understanding the Flow from Non-Compliance to Formal Enforcement Action**

Field violations become formal enforcement actions when the operator does not come into compliance within the allowed time frame for correction of the violation and no arrangements for extension of time has been given. In the case of UIC violations, the UIC Department Manager would approve having the Enforcement Office commence enforcement action. Bonds are not usually revoked as a part of an initial enforcement action. The OCC prefers not to recall bonds and uses this tool as a last resort. Bond recalls are usually called-in for plugging and abandonment. Penalties associated with enforcement actions range from \$500 for paper violations to a maximum of \$5,000/day per violation. The normal range for fines issued in administrative proceedings is \$500 to \$2,500. The OCC has issued fines exceeding \$250,000, however, a typical fine for a serious violation is in the \$10,000 to \$25,000 range.

The Enforcement Officer, in cooperation with the Field Inspector, makes the determination whether a non-compliance event has been successfully resolved. There may be an interim order issued allowing the Operator to reactivate the well. Reactivation of a well becomes more difficult if the enforcement action has gone to hearing. In this case, resolution may require a court order. The UIC Department staff indicated that the timeliness of enforcement is hampered by a number of factors. They have a lack of resources to provide adequate follow-up and industry downturns such as in 1999, create a lack of responsible parties and increase the number of orphaned wells. Naturally, MITs are more difficult to schedule and defunct operators usually do not file annual reports in a timely manner, if at all.

#### **E. State/Federal Enforcement Action Interface**

The UIC Department reports all UIC violations to Region VI EPA on quarterly reports in accordance with conditions of the State/EPA primacy agreement, including those violations classified as Significant Non-Compliance (SNC). During the last few years, Region VI has expressed concerns during their annual review of the Class II UIC program that the OCC submitted quarterly reports after the deadline and the information on SNCs was lacking. This subject was not elucidated during the Peer Review session, but in the material sent by the Region to the Review Team in lieu of their presence at the review. The OCC believes the issues relevant to quarterly reports have been satisfactorily resolved with EPA Region VI. The OCC and EPA are currently evaluating the issues regarding SNC Violations. Oklahoma has never requested EPA to take over enforcement on an UIC violation nor has EPA ever overfiled on a case during enforcement proceedings in the state.

#### **F. Contamination/ Alleged Contamination Resulting from Injection Well Practices or Associated Activities During the Past Ten Years.**

The Peer Review asked about any known or alleged USDW contamination incidents reported to the state during the past ten years. The OCC indicated they did not track pollution incidents categorized by source of contamination. The OCC indicated that due to lack of resources, a study has never been made to relate the number of well failures to USDW contamination cases against the hundreds of cases the Pollution Abatement Department is responsible for investigating. The supposition of the OCC staff was that most of the incidents of alleged contamination as discovered from purging wells (wells flowing to the surface) were from abandoned, improperly plugged wells and not from wells under the UIC regulatory program. If UIC was involved, it was a very small percentage. Accurate historical statistics on contamination sites do not exist either with the UIC or Pollution Abatement Departments. OCC indicated that when an alleged USDW contamination case is UIC related, the UIC staff is involved. However it is a very small percentage compared to the number of cases investigated by the Pollution Abatement Department.

### **Compliance/ Enforcement: Evaluation and Recommendations**

1. The OCC has tremendous authority to use in achieving compliance from the regulated industry. The shut-in authority exercised by field inspectors is the most effective deterrent to non-compliance by operators.
2. Violations and/or problems are usually handled at the inspector level and normally results in effective and timely compliance. Both the district office and the Compliance Officer in the Central Office review field inspection reports. The Compliance Officer's position was established in 1994 and is a positive addition to the compliance/enforcement interface. Delays in proceeding with enforcement cases referred to in the 1989 report have been corrected.
3. The OCC/ DEQ guidance document has been developed to delineate responsibilities and allow discussion of jurisdictional "gray" areas. Both agencies visited with the Review Team and gave an aura of positive cooperation and good feeling. This document, in part, replaces the Oklahoma Pollution Control Board that was abolished in 1993.
3. The OCC has an array of enforcement tools available through other to achieve compliance.
4. The Review Team encourages the UIC Department to work with Region VI to resolve their concerns about untimely reporting and SNC accounting. While it is not the role of the Review Team to explore the State/EPA relationship, they believe a healthy primacy image reflects positively on how others view the program.
5. The Review Team recommends the UIC Department develop a statistical program to track UIC contamination events because one of the successes of a program is to show either reduction in the number of events over time or the fact the program is effective in preventing them.

## **PART VI. ABANDONMENT AND PLUGGING**

### **A. OBJECTIVES: Understanding the Technical Aspects of Plugging and Abandonment (P&A)**

The type of well construction and the casing and cementing program, generally dictates the selection of plugging technique to be used in plugging an injection well. The OCC staff provided the following detailed description of the plugging scenario:

In all cases, the mud weight should not be less than 9 lbs/gal and the viscosity of the mud should be 36 API or higher. Wells without casing must be filled with mud before plugging operations commence. The OCC requires operators to place plugs through tubing or drill pipe in the pump and plug method. Cast Iron Bridge Plugs (CIBP) may be used if there is cement behind pipe 50 feet below the water-bearing formation and 50 feet above the injection formation.

Cement may be placed on top of a bridge plug by use of a bailer. The bridge plug must be set in cement with 10 feet of cement on top of it. A CIBP cannot be used as a top plug. The top plug is set to encompass the interval from 30 feet below surface to three feet below surface. The placing of cement plugs (minimum 100 feet) across the top and bottom of USDWs, oil, gas, H<sub>2</sub>S and injection or disposal zones. These requirements may not apply to formations behind production or intermediate casing left in the hole unless the OCC believes endangerment of a USDW is possible.

A plugging plan is not required as a part of the original permit application and approval process for the injection well. The plugging plan is filed by the operator on Form 1001, Intent to Plug, before the well is plugged. The OCC's plugging requirements are basically the same for UIC wells as they are for oil and gas producing wells and haven't changed since the 1989 review. Briefly, these rules as described in the 1989 Review, provide for:

- (1) Written notice to the OCC and approval of the operator's plugging procedure plan five days prior to commencement of plugging operations. In Oklahoma, field inspectors give "plugging instructions" which may or may not be a modification of the plugging plan submitted by the Operator. The District Manager may waive the 5-day requirement because the primary reason for the rule is to allow field inspectors time to schedule and witness the setting of key plugs.
- (2) Notice to the owner(s) of offset producing leases;
- (3) Notice to the district office prior to the beginning of actual plugging operations.
- (4) Plugs are placed through tubing or drill pipe (except for cement placed on top of bridge plugs by use of a bailer).
- (5) Placing of cement plugs as described above across the top and bottom of treatable water, oil, gas, H<sub>2</sub>S, and injection and disposal zones;
- (6) Plugging at the surface casing shoe or top of a liner;
- (7) The loading of the hole with 9 pound per gallon mud.
- (8) The filing of a report of the well plugging operation by the operator within 30 days certified by both the operator and the cementer giving details of the plugging operation.

The field staff uses geologic and hydrogeologic standards, tables, and other technically based policy documents to determine the setting of plugs. In addition, Table I, which guides the setting and cementing of surface pipe necessary to protect treatable water, is also used to determine the proper placement of plugs. The field staff also has plugging procedures outlined in the Oil and Gas Field Inspection Manual that is to appear in revised form in August 2001.

The OCC witnesses more than 75% of all plugging operations that include injection wells, producing wells and dry holes (D&A). When workload requires witnessed wells to be prioritized, injection wells, particularly disposal wells receive the highest priority. The details of the plugging operation are developed individually between the operator and the appropriate district staff or field inspector. In general, plugs are to be set a minimum of 50 feet above and

below the top and bottom of the zone to be protected. The plugs will be set in open hole or across casing shoes. A top plug from 30 to three feet below surface is required if the cement has otherwise not come up to that depth. Where the well is located in a Wellhead Protection Area for a Public Water Supply, special plugging rules, if any, have been incorporated into the OCC plugging regulations by Order or agreement. Plugs that do not come to the surface are required to be tagged. This ensures proper placement since some plugs may fall due to the failure of the cement to set properly. The field inspector witnesses the operator's verification of the top of the plug by wire line measurement or tubing string. The tagging of plugs is required at the discretion of the field inspector. The regulation is permissive and does not require the tagging of plugs on all P&As nor in specified hydrogeological situations.

The district staff reviews all plugging reports sent in by the field inspectors and use these review to exercise control over P&As that are not witnessed. The district office sends all plugging reports (Form 1003) to the Department of Field Operations in Oklahoma City. The plugging report is also accompanied by Form 1002, Cementing Report. The plugging report has to be signed by the Field Inspector, District Manager, Operator and cementing company's representative.

**B. OBJECTIVE: Understand the Non-technical Aspects of P&A and How This Activity is Integrated with the Remainder of the Program**

The P&A reports are an important part of the Area of Review considerations during UIC well permitting. Since the last Peer Review in 1989, the Information Management System (IMS) has developed to the point where the status of abandoned wells can be tracked both in the Central Offices and the District Offices. When P&A information is received in the Central Office, it is entered onto the data management/tracking system within 30 days of the receipt of the report. Newly entered P&A data is available to a user within 24 hours of data entry.

OCC rules provide that working interest owners and the operator of a well shall be jointly and severally liable and responsible for the plugging of a well. The rules further state that wells may be kept in idle status (See Part VI .C. for discussion of TA program) no longer than one year without OCC approval. The OCC has a definite procedure in place when an abandoned well is discovered. The first action is to conduct an investigation to identify the responsible party. The OCC Legal Counsel will then go through the proper legal process to force the identified responsible party to plug the well. If the OCC discovers that an operator is not tied to the wellbore or that no other party has modified or worked on the well in any way, then the well is placed on the "orphan" well list and becomes public record. Once on the "orphan" well list, funding is requested for the well to be plugged. A bidding procedure is commenced and the winning bidder plugs the well under the Field Inspector's supervision.

The OCC funds the plugging of abandoned wells with no responsible party from a tax assessed at the wellhead on oil and gas production. At the current time, the tax funding generated is sufficient to plug 200 wells per year. OCC expects the funding level to increase in FY2001 due to the increase in the prices received for the sale of the product. The selection of wells to be plugged is based on the "potential for pollution" whether they were producing wells or injection

wells. Abandoned wells on the contamination site projects being reclaimed by the Oklahoma Energy Resource Board (OERB) are the OCC's responsibility to plug.

**C. OBJECTIVE: Understand the Temporary Abandoned (TA) Well Program Used by the State.**

The Oklahoma Class II UIC program does not recognize the temporarily abandoned (TA) concept as an injection well status and has no formalized rules, policies, procedures, or tracking system for temporarily abandoned wells. Injection wells can be classified as active, orphaned or plugged, however, producing wells can be classified as having TA status. An injection well is termed "idle" for one year and maintenance beyond the one-year period (with OCC approval) would normally require protection of formations above the injection zone by means of a bridge plug or tubing and packer set in the cemented interval above that zone or, if injection had been on a vacuum, by means of annual fluid level tests to determine that fluid levels in the well bore were no closer than 50 feet below the base of the USDW. The appropriate district manager is responsible for administratively approving temporary abandonment. In either case, approval must be obtained annually and exceptions can only be gained through hearing. The basic procedure for addressing temporary abandonment has not changed since the 1989 Peer Review. TA'd injection wells are subject to the same MI testing frequency as any active injection well, i.e. five years or one year for commercial wells, unless a continuous monitoring device is installed. All "idle" injection wells are tracked through annual injection reports and retain the well status of active.

The temporary exemption from plugging requirements that became effective on July 1, 1997 as a result of measures passed by the 1997 Oklahoma Legislature was for oil and gas producing wells. The measure did not include injection well. This legislation was to bring relief to operators during low oil prices when normally productive wells were temporarily uneconomical to produce.

**Evaluation and Discussion of Plugging Program**

1. The OCC plugging program is implemented through the use of the same USDW protection criteria for oil, gas and injection well isolation as is used to establish surface pipe cementing and depths and USDW/injection zone confining intervals. The field inspectors have considerable experience in working with operators to plug all wells properly and supervise corrective action where directed by the OCC. The inspectors also have a specialized knowledge of their areas of responsibility and their work is aided by having county base maps of USDWs.
2. The percentage of the disposal wells and EOR pluggings actually witnessed by OCC is quite high. The field inspectors have the authority to require tests and measurements to ensure plugs have been positioned properly and can require the operator to tag the plug.
3. In 1989, the Peer Review Team recommended that an Operator submit a written plugging plan for approval to avoid confusion among parties involved in plugging the well. The

Team did not specify how far in advance this plan should be submitted. This Review Team believes the current system of five days notice to allow for scheduling and discussion of well conditions at the time of plugging is adequate.

4. The requirement of signed certification by both the Operator and cementer on wells not witnessed by the field inspector is acceptable and should provide OCC sufficient legal documentation should the OCC have to order corrective action on the well.
5. One member of the Review Team believes the injection wells, which are termed “idle” by the OCC, should be tracked separately as “temporarily abandoned” injection wells. While these wells are subject to annual review and well test and may have been fitted with a retrievable plug similar to temporarily abandoned oil and gas wells, the use of the well is different. The operators tend to relegate injection wells to the lowest priority when plugging out a lease. OCC views these wells that are not receiving water as active when some may be closer to inactive and, therefore, tracked more closely. EPA has expressed some concerns over the lack of information on TA’d injection wells in their Annual evaluation of the Oklahoma Class II Program, but their concern appears to be more statistical than programmatic.

## **PART VII    PUBLIC OUTREACH**

### **A.    OBJECTIVE: Understand the Public Outreach Mechanisms Used by the    State**

The OCC’s public outreach program is designed to inform the regulated community, interest groups, and the USEPA about proposed changes and initiatives. It is also designed to reach persons who may be affected by any particular UIC permit. The OCC is required to follow the Oklahoma Administrative Procedures Act, which requires public notice and hearing for each application prior to approval. The OCC has recently posted hearing procedures and oil and gas rules on their Website. Generally, the OCC will accept comments on rules or applications up to and including the date of the hearing. Once the hearing record is closed, the OCC will issue an Order for the Operator to Inject. In the case of rules, the Oklahoma Legislature has 30 days to do their review.

The OCC ‘s UIC Department informs the regulated community through instructional handouts and periodic training programs in association with the Oklahoma Independent Producers Association (OIPA). These sessions are used to discuss all regulatory issues including UIC matters. The OCC also has a Technical Advisory Committee composed of representatives from all spectra of the regulated community, which meets at least annually. The OCC also uses its quarterly newsletter to inform the regulated community on reporting deadlines and new or amended requirements. The OCC established a Citizen’s Advisory Committee in the mid-1990’s to advise the Commission on issues and concerns of the public on oil and gas. Most issues centered on commercial disposal and eventually help shape some changes in the OCC commercial disposal rules. This committee has been relatively inactive in recent years.

The Oil and Gas Division has a mailing list that is used for all rule notices. Operators or individuals can request to be placed on the list. All operators of record receive the quarterly newsletter. All state agencies with jurisdiction over environmental and water resource subjects are automatically on the mailing lists along with the Oklahoma Wildlife Federation and the League of Women Voters. OCC staff indicated that none of these groups or agencies has expressed concerns or commented on UIC well completion practices. During the past five years, the only attention the UIC Department has received from interest groups was the potential location of a salt water disposal well within the perimeter of a Wellhead Protection Area (WHP) for a public water supply well.

#### **B. OBJECTIVE: Understand the State Hearing Opportunity Process**

As previously stated, the OCC hearing process must follow the procedures outlined in the Oklahoma Administrative Procedures Act. The applicant for a UIC well is required to publish in a newspaper of general circulation within the county where the well is to be located and in Oklahoma City. The owner of the land on which the well is to be located is also given notice. Public comment and the filing of protests are allowed for 15 days after the last date of publication. The USEPA does not routinely attend OCC public hearings unless the hearing issue is drawing great public interest nor do they normally comment at the agency hearings. EPA Region VI is always notified and consulted prior to the OCC initiating a rulemaking and before the agency's formal hearing process. They are forwarded copies of all rule changes related to the UIC program

#### **C: OBJECTIVE: Identify Coordination with State and Local Water Planning Efforts**

In 1998, the Oklahoma Legislature passed Senate Bill 549, which mandated that each state environmental agency promulgate, by July 2001, a Water Quality Standards Implementation Plan (WQSIP) for its jurisdictional areas of environmental responsibility. This plan specifies how the OCC uses and enforces the Oklahoma Water Quality Standards for surface water and ground water. The WQSIP for the OCC was completed in late March 2001. A copy was furnished to the Review Team. This document is not strictly for coordination of water planning in the State of Oklahoma, however, it does describe the OCC's obligations in upholding the Water Quality Standards and this requires a degree of coordination with other environmental control agencies.

None of the state water resource-planning entities; water management districts and municipal wellhead protection programs appear to have issues with the Class II UIC program in Oklahoma. Any proposed UIC well within a wellhead protection area is required to give public notice and hearing. When concerns are raised, the OCC's UIC Department conducts technical meetings to exchange ideas and concerns.

#### **D. Changes in Public Outreach for UIC since 1990**

Most of the concerns during the last ten years have centered on Class II commercial disposal facilities. The OCC's Oil and Gas Division created a Citizens Advisory Committee in the mid 1990's to solicit and create a forum for discussing public comments and concerns. OCC staff indicated no concerns have been raised regarding UIC regulatory activities.

#### **PUBLIC OUTREACH ---- Evaluation and Discussion**

The UIC application notification and hearing process follows the Oklahoma Administrative Procedures Act of 1993 and also satisfies the timelines established under the Federal UIC regulations. The citizens advisory committee established in the mid 1990's gives the public an opportunity to express comments and concerns over UIC program elements and overall quality of program administration. In addition, operators may request to be added to a mailing list, which informs them of changes in regulations. The quarterly newsletter instituted in the 1986 goes to all operators of record plus interest groups, other agencies and two major environmental groups active in Oklahoma.

*ATTACHMENT B:*

# **ALASKA OIL & GAS AGENCY PEER REVIEW**

*August, 2001*



**GROUND WATER PROTECTION COUNCIL**

13208 North MacArthur Boulevard

Oklahoma City, Oklahoma 73142

405 516-4972

[www.gwpc.org](http://www.gwpc.org)

Michel Paque, Executive Director

PEER REVIEW

## Table of Contents

**PART I:     GENERAL     **Underground Injection Control Program****

- A.     Statutory Authorities and Regulatory Jurisdictions
- B.     Program Coordination
- C.     Staffing and Funding
- D.     Data Management Program for Agency
- E.     Interagency Coordination
- F.     Changes in General Activities Since 1990

**PART II     PERMITTING/FILE REVIEW**

- A.     Permit Flow
- B.     File Review
- C.     Technical Aspects
- D.     Area of Review Considerations and Procedures
- E.     Administrative Aspects
- F.     Aquifer Exemptions
- G.     Data Management Systems Used in Review
- H.     Changes and Modifications to Program Since 1990

**PART III    INSPECTIONS**

- A.     Management of Inspectors
- B.     Routine Inspections
- C.     Response to Citizen Complaints and Emergency Situations
- D.     Reporting and Follow Up Procedures
- E.     Data Management Systems: Field Access and Use
- F.     Changes and Modifications to Program since 1990

**PART IV     MECHANICAL INTEGRITY TESTING**

- A.     Types of MI Tests Allowed:
- B.     Implementation of MIT Program
- C.     Witnessing Strategy
- D.     Follow Up on Failed MI Tests
- E.     Data Management Utilization
- F.     Changes and Modifications to Program Since 1990

**PART V COMPLIANCE/ ENFORCEMENT**

- A. General Enforcement Procedures Available to State
- B. Nature and Disposition of “Paper” Violations versus Technical and Mechanical Violations
- C. Time Allowance for Corrective Action
- D. Flow from Non-Compliance to Enforcement Action
- E. State/ Federal Enforcement Action Interface
- F. Contamination /Alleged Contamination from UIC Practices
- G. Changes in Compliance or Enforcement Capability Since 1990

**PART VI ABANDONMENT/PLUGGING**

- A. Technical Aspects
- B. Non-Technical Aspects
- C. Temporary Abandonment Allowances and Limitations
- D. Data Management System for Plugging and Abandonment
- E. Changes and Program or Policy Since 1990

**PART VII PUBLIC OUTREACH**

- A. Public Outreach Mechanisms Used by State
- B. Hearings
- C. Coordination with State and Local Water Planning Efforts
- D. Changes Since 1990

**PART VIII REVIEW OF WATER REUSE MANDATES AND POLICIES**

**PART IX REVIEW OF COAL BED METHANE PROGRAM (If Applicable)**

- A. Statutory Authorities and Regulatory Jurisdictions
- B. Program Coordination
- C. Staffing and Funding
- D. Technical Regulation
- E. Data Management Program
- F. Interagency Coordination

**PART I: GENERAL Underground Injection Control Program**

**A. Statutory authorities and regulatory jurisdictions**

1. Please include a copy of all statutes, rules, regulations, policies and orders applicable to the management and disposal of Class II eligible wastes, abandoned oil, gas and service wells, enhanced recovery projects, oil field NORM (naturally occurring radioactive materials) if injected into wells and water produced in connection with the production of coal bed methane.

**Attached? Yes/No, (attachment identifier)**\_\_\_\_\_

2. What is the statutory authority upon which your UIC program is based?

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*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

3. Does this statutory authority include promulgation of rules and regulations? \_\_\_\_\_

\_\_\_\_\_  
*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

4. Do the statutes relating to oil and gas or statutes pertaining to the protection of “waters of the State” contain definitions of injection, enhanced oil recovery, disposal, types of wells, hydraulic fracturing, fresh and/or usable water, and USDW’s (Underground Sources of Drinking Water)?

\_\_\_\_\_  
*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

5. Do the statutes mandate or allow the establishment of advisory boards, regulation review boards, or other mandated vehicles designed to bring UIC program stakeholders together? If not mandated by statute, are other policies or orders issued by the agency, which brings such groups together.

\_\_\_\_\_  
*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

6. Please provide a brief (three pages or less) historical overview of the evolution of the UIC program in your state. This should include the evolution of statutes, oil and gas production history, geology and hydrogeology, changes in agency jurisdiction, institution of injection practices and the trend of injection wells through time. Geologic maps and tables of trends are acceptable *in lieu* of rhetoric.

\_\_\_\_\_  
*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

**B. Program coordination**

1. Attach an agency organizational chart and identify UIC positions in permitting and file review, inspections, mechanical integrity testing, compliance and enforcement, data management and public outreach.

*Attached? Yes/No, (attachment identifier)* \_\_\_\_\_

2. Discuss the mechanisms in place in your state for the coordination of UIC activities and environmental protection programs, complaint and emergency response among the public, government agencies and the regulated industry.

\_\_\_\_\_  
*Attached? Yes/No, (attachment identifier)* \_\_\_\_\_

3. Describe briefly the nature of the agency (Commission, Board, Appointed Head etc.) and further discuss the relationship of the oil and gas authority to the agency leadership.

\_\_\_\_\_  
*Attached? Yes/No, (attachment identifier)* \_\_\_\_\_

**C. Staffing and funding**

1. Please provide funding levels and the total staff complement for the agency or division of agency (if applicable) for the period FY 1998 to present. Please differentiate between UIC and non-UIC program funding and staffing levels. Assume fractional FTEs for staff who perform both UIC and non-UIC functions.

*Attached? Yes/No, (attachment identifier)* \_\_\_\_\_

2. Are the levels of funding and staff provided adequate for full UIC program implementation? Please discuss in reference to the trends shown in C-1.

\_\_\_\_\_  
**Attached? Yes/No, (attachment identifier)** \_\_\_\_\_

**D. Data management program for agency**

Describe in either flow chart form or by general description how the UIC data management system fits into the agency system, the state data base shared by other agencies having responsibility for oil, gas, water allocation and protection, and water planning for the state. Also describe the linkage that exists with any state GIS system or system affording Global Positioning capability.

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*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

**E. Interagency coordination**

1. Please provide or summarize any memoranda of agreements or similar agreements between state agencies, or between the state and any other governmental entities (BLM, US Fish and Wildlife Service, EPA, Indian Tribes, local jurisdictions and water management districts) which relate to UIC regulation, oil and gas waste, sharing of information, or processing of complaints.

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*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

2. Provide a flow chart, organizational diagram or other document which shows how your oil and gas program (agency) fits into the state picture with other agencies or entities having authority over portions of oil and gas regulation, oil related environmental protection, or regulation of water use and state water planning.

*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

**F. Changes in general activities since 1990**

1. Excluding the changes in data management that are to be described in Section I-D and throughout the remaining sections, what significant changes have occurred within the agency or outside the agency that have affected the administration of the UIC program? New statutes or major regulatory changes?

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*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

2. Has the Congressional passage of the Safe Drinking Water Act Reauthorization (1996) and other Federal mandates caused changes in the way the UIC program is administered (i.e. Wellhead protection, Source Water Protection, Watershed Management etc.)?

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*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

3. Has the SARA Title III Program of EPA and the Community Right -to Know Program (EPCRA) had an impact on your UIC program? On the ability of the regulated community to meet deadlines established in the State UIC regulations? If so, describe the impact.

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*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

**PART II     PERMITTING/FILE REVIEW**

**A.     OBJECTIVE: Understand the application flow process in the state.**

1. How does the Operator initiate a permit application?

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*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

2. Who receives the application from the Operator?

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*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

3. How and by whom are permit applications screened for completeness?

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*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

4. What is the procedure used when an application is found to be incomplete?

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*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

5. How long is the Operator given to reply in the case of incomplete applications before they are considered null and void and how is the Operator notified?

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*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

6. In the case of voided applications, is the application returned to the Operator or kept by the reviewing agency?

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*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

7. Upon a determination of application completeness, how is it routed and concurred upon?

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*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

8. Who are the individuals responsible for reviewing the different aspects of the permit application? Technical Issues? Administrative Issues?

\_\_\_\_\_

*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

9. What are the professional qualifications required for agency personnel reviewing a permit application?

\_\_\_\_\_

*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

10. How is an application tracked to ensure that both review and permit issuance/denial recommendation occurs in a timely manner?

\_\_\_\_\_

*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

11. Is the process describes under questions 1-10 the same or different for amendments applications to existing permits? (Existing in the sense the permit for which amendment is sought is active.) Is the process flow different for major versus minor amendments?

\_\_\_\_\_

*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

12. How are UIC well applications at commercial facilities handled?

\_\_\_\_\_

*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

13. How are the official copies of the permits stored and protected from loss?

\_\_\_\_\_

*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

14. Does the State allow a well to be used for the disposal of both Class I and Class II fluids? Under what circumstances? How are these wells permitted and which agency acts as the principle in holding hearings?

\_\_\_\_\_

*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

**B. Objective: Understand the current file review process.**

1. What is the file review strategy? (i.e.) How are wells selected for file review)? Is the compliance history a factor of selection?

\_\_\_\_\_  
\_\_\_\_\_  
*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

2. Who performs the file review and what are the qualifications of the reviewers?

\_\_\_\_\_  
\_\_\_\_\_  
*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

3. Over a year period, what percentage of total UIC permits receives a file review?

\_\_\_\_\_  
\_\_\_\_\_  
*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

4. How is the quality of file review assured and subsequently documented?

\_\_\_\_\_  
\_\_\_\_\_  
*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

5. Where deficiencies are recovered during the review, what actions are taken to correct the deficiency?

\_\_\_\_\_  
\_\_\_\_\_  
*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

6. How long does it take to do an average file review of a well without complications? What are complications?

\_\_\_\_\_  
\_\_\_\_\_  
*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

7. Assuming that file reviews are currently conducted on wells under permit, what action is taken toward the continued use of the well for injection while the deficiency is being corrected by the Operator? For technical deficiencies? For administrative or paper deficiencies?

\_\_\_\_\_  
\_\_\_\_\_  
*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

**C. OBJECTIVE: Understand the technical review and related aspects of the permit/file review process.**

1. What are considered to be adequate casing and cementing (surface and production, etc.) requirements for a newly drilled injection well (depth, thickness, material, etc.)? Is casing set and cemented through all USDW's? If not, how are USDW's otherwise protected?

\_\_\_\_\_  
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*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

2. What are considered to be adequate casing and cementing requirements for converted wells? Is casing required to be set and cemented through all USDW's? If not, how are the wells protected?

\_\_\_\_\_  
\_\_\_\_\_  
*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

3. Packer/ tubular goods requirements:

a. Are packers routinely required for all newly completed and converted wells? If there are exceptions, what are the criteria used? Does an exception impose alternative requirements (i.e., more frequent MITs, annulus and pressure monitoring, limitation on injection volume)?

\_\_\_\_\_  
\_\_\_\_\_  
*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

b. Do permits specify the type or packer to be used?

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\_\_\_\_\_  
*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

c. Do permits specify the use of tubing? Is lined tubing acceptable and under what conditions?

\_\_\_\_\_  
\_\_\_\_\_  
*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

d. Does the agency prescribe or impose restrictions on weight, grade, material, internal coating or other packer/tubing qualities?

\_\_\_\_\_  
\_\_\_\_\_  
*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

4. Are dual completions accepted? What types?

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*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

5. How are the locations of USDW's determined. How often is the maps, charts or other information used for determination updated and by whom?

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**Attached? Yes/No, (attachment identifier)**\_\_\_\_\_

6. How is the adequacy of the confining system determined? In those areas where confining geological deposits may consist of prominently incised channel sand fills or karst surfaces faults or other unique geologic conditions that may affect the containment of injected fluids, what buffer or insurance is provided to compensate for irregularities? How are such conditions evaluated?

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*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

7. What types of monitoring systems are required or have been approved (flow rate and cumulative volumes, tubing pressure, annuli pressures, etc.)?

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*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

8. Has the compatibility of injectant/cement and injectant/formation fluid been a problem?

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*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

9. How are the maximum injection pressures and rates established?

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*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

10. How is corrective action handled in those cases where the approval of the application is contingent upon resolution of an adverse situation?

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*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

**D. OBJECTIVE: To understand the Area of Review considerations and procedures.**

1. How is the Area of Review determined for enhanced recovery wells or projects? For salt-water disposal wells? For commercial wells?

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*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

2 If area permits are issued, how is their area of review determined?

\_\_\_\_\_

*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

3. In a case where the Operator elects to withdraw the application rather than take corrective action measures, what is the subsequent course of action taken by the agency?

\_\_\_\_\_

*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

4. What authorities are open to the State where the Area of Review reveals a problem (unplugged wells or other USDW threatening situation) that is on acreage outside the Operator's control? Is the Operator's application denied if he/she has no legal status to effect corrective action?

\_\_\_\_\_

*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

**E. OBJECTIVE: Understand the administrative permit application components.**

1. Prior to permit issuance, what is the public notification for applications before the agency?

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*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

2. When does the public comment period start? Upon determination of completeness or after completion of technical review?

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*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

3. When and where is public hearing opportunity held on an application?

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*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

4. How are the public hearings conducted (formal, informal, transcript, qualifications etc.)?

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*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

5. What criteria, conditions or circumstances would prompt a public hearing on an application?

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*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

6. In reference to hearing participation, does the agency have a definition for “significant interest” below which level the permit would automatically be issued after notification?

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*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

7. How often have public comments modified the conditions of the final permit?

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*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

8. What types of financial assurance mechanisms are used in connection with UIC applications? If used, how is the adequate coverage per well determined?

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*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

9. In reference to question #8, what conditions is blanket surety coverage allowed?

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*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

10. How are complaints related to the proposed permit or application recorded and filed? Is the same filing process used for complaints, which are submitted to the agency after UIC approval has been given?

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*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

**F. OBJECTIVE: Understand the process for aquifer exemptions**

1. How many exemptions have been requested since the inception for the program and what criteria were used for the request?

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*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

2. How many requests have been granted/denied and, if denied, what basis or reason was given? Who issued the denial?

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*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

3. Are minor aquifer exemptions granted? How many have been granted/denied?

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*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

4. Are certain aquifers granted exemptions in some parts of the State while the SAME aquifer is considered non-exempt in other parts of the State? If so, what criteria are used?

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*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

**G. Objective: To understand the Data Management Systems Used in Review**

Describe the data management system (s) used in the various components of the Permitting/File Review process as set forth in Section A-F. The description should delineate both the systems used for technical and administrative activities.

1. When were the data management systems currently in use first put into operation?

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*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

2. Are these systems effective and efficient for the type of data management use? What are the limitations in terms of addressing the basic regulatory needs?

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*Attached? Yes/No, (attachment identifier)* \_\_\_\_\_

3. Is there capability for the Operators to file some or all documentation pertaining to application submission electronically? Describe what electronic communication is currently available to the regulated community and the public.

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*Attached? Yes/No, (attachment identifier)* \_\_\_\_\_

4. Is the agency's data management system locally (intramural) conceived or linked with other state databases?

\_\_\_\_\_

*Attached? Yes/No, (attachment identifier)* \_\_\_\_\_

**H. Changes and Modifications to Program Since 1990**

Exclusive of the changes in data management described under Section G., what statutory, regulatory or policy changes have occurred during the past ten years in the UIC Permitting/File Review process? Please list or explain.

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*Attached? Yes/No, (attachment identifier)* \_\_\_\_\_

**PART III INSPECTIONS**

**A. Objective: Understand how field operations are conducted and managed by the agency.**

1. Are inspectors State employees or are they contractors?

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*Attached? Yes/No, (attachment identifier)* \_\_\_\_\_

2. Do inspectors work out of an office, their homes, or other setting? Who coordinates the work of the inspectors and at level does this supervision take place (central office, district office, field supervisor working out of home)?

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*Attached? Yes/No, (attachment identifier)* \_\_\_\_\_

3. Do the inspectors perform all types of inspections or is there specialization of inspection responsibilities?

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*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

4. Do supervisors periodically accompany inspectors on field assignments:  
(a) to observe and critique their work (please explain how often and the process?)

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**Attached? Yes/No, (attachment identifier)**\_\_\_\_\_

(b) to ensure that inspections, tests required of operators and general observations of lease and well conditions meet a common standard of quality and fairness to operators?

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*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

- (c) for other purposes (please explain how often and for what purpose(s)?)

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**Attached? Yes/No, (attachment identifier)**\_\_\_\_\_

5. Does the agency have a written inspection strategy, guidance manual or policy document which is available to inspectors? How are inspection priorities determined?

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*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

6. What professional qualifications and /or experience is required to be and inspector?

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*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

7. What training do inspectors receive? Initially upon employment? To keep trained on new regulations, industry techniques, etc.? Do inspectors receive training in safety procedures and is special safety equipment readily available?

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*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

8. What role do inspectors play in developing enforcement cases and to what extent are they involved in the hearing or judicial process?

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*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

9. Is the operator compliance history and selection of wells coordinated for inspection at the field or central office level?

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*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

**B. OBJECTIVE: Understand the routine/periodic inspection program in the state.**

1. How often is each UIC permitted well inspected? Is there a different inspection periodicity for Class II ER than for SWDs?

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*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

2. Who determines the inspection frequency for each UIC facility? Are UIC inspections done separately or are they generally coordinated with inspections of other permitted facilities on the lease?

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*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

3. How is communication between field inspectors and the central office staff in charge of UIC permit review handled? Are inspections ever required after an Operator files an application but before technical review is completed?

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*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

4. How many UIC related inspections are conducted in an average month, which are not related to scheduled MITs? Discuss seasonal variations.

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*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

5. What does the inspector look for during a routine inspection? Is there a checklist? (Please supply a copy of forms and checklists used).

*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

6. What is the average length of time needed for a routine inspection? Include the amount of time needed for preparation, travel time, and time spent on location. Is the preparation performed by the inspection and/ or others? What review occurs during preparation?

\_\_\_\_\_

*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

7. Is the operator given advance notice of inspections? How much? Does the state inspectors have statutory right on ingress and egress from leases and UIC well locations to make unannounced inspections. What restrictions apply?

\_\_\_\_\_

*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

8. Does the Operator receive a copy of the completed inspection report?

\_\_\_\_\_

*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

9. Are photographs taken during an inspection? How does the inspector log photographs? Are their written procedures designed to preserve the legal integrity of photographs for potential enforcement actions or hearings?

\_\_\_\_\_

*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

10. Are samples of the injectate collected routinely at some/all inspections? How are samples documented, preserved and transported? Are analyses performed by State or private laboratories?

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*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

11. Do inspectors carry their own gauges and flow meters? How and how often are the gauges calibrated and how is this documented?

\_\_\_\_\_

*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

12. What training does the inspectors received on the states QA/QC plan?

\_\_\_\_\_

*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

**C. OBJECTIVE: Understand the emergency and citizen complaint procedures.**

1. How is the state notified of emergency situations regarding oil and gas lease operations? What percentages of these incidents are associated with UIC permitted wells?

\_\_\_\_\_

*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

2. Who communicates with the inspectors and prescribes the response? Who performs the on-scene response and coordination?

\_\_\_\_\_

*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

3. How is emergency response action documented? Is there written guidance that the agency uses to insure adherence with procedures that will produce acceptable documentation for possible enforcement action?

\_\_\_\_\_

*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

4. What is the procedure for conducting follow-up to emergency response events?

\_\_\_\_\_

*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

5. If the emergency requires notification of other agencies that may have their own regulatory issues to resolve (e.g. brine flow from a well into an aquifer or lake which is a public water supply), who does the notification?

\_\_\_\_\_

*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

6. What type of emergency situation has been reported that have involved UIC permitted wells?

\_\_\_\_\_

*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

7. What type of significant citizen complaints has been received? Are complaints responded to in accordance with a priority system or are all complaints investigated?

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*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

8. Is the complainant routinely contacted prior to field investigation of the alleged problem and subsequently notified of the results of the complaint investigation?

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*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

9. Is the operator notified of the complaint?

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*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

10. What is the typical response time to complaints?

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*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

11. Is the agency obligated to routinely notify Federal agencies or other state agencies when an emergency occurs? Upon such notification, are their occasions where the lead for resolution of the emergency is transferred to another agency even if the permitting authority is the transferring agency?

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*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

12. What is the agency's policy or procedure for communicating with the news media on an emergency situation or complaint? Who is responsible?

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*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

**D. OBJECTIVE: To understand the reporting and follow- up procedures used in the inspection program.**

1. Are there a standard inspection forms for routine inspections? For complaints or emergency situations? For inspections connected to well tests?

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*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

2. Do the inspectors take field notes and if so, are there retained or destroyed? If notes are retained, where is the repository?

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*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

3. If the routine UIC well inspections are a part of a comprehensive evaluation of the lease operations, are the injection well inspections cross-referenced to the permit file? Where is this done?

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*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

4. Does the state have a statute or policy regarding the destruction of potentially historical files that would affect the retention of field notes? Does this mandate or policy pertain to hard copy records or records retained in electronic format or both? Who makes the judgment on record retention or the length of time records are to be kept?

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*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

5. What is the lag time between the inspection and write-up of the report? Does the Central Office receive copies of the reports as hard copy or by electronic transfer?

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*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

6. Where and how are inspections, and violations revealed through inspections tracked to ensure compliance deadlines are met? Is this tracking system computerized or primarily manual?

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*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

7. Has the State Counsel or agency Legal Department reviewed all inspection procedures to assure the results may be used in formal enforcement actions? Are form revisions routinely reviewed by the Legal Department? In the case of the UIC program, are such form drafts sent to EPA for comment?

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*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

8. Who reviews inspectors' reports? What is the lag time between submission of the report and review? Where is the review generally done?

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*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

9. What is the inspector's access to UIC information in the field such as permit contents, letters to operators, notices of violation, etc.?

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*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

10. Where are chain of custody, photograph negatives and analysis forms filed?

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*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

**E. OBJECTIVE: To understand the Data Management Systems Accessible to Inspectors for Conducting Field Inspections and Addressing Emergency Situations.**

1. Describe the data management system (s) which are available to field inspectors in conducting routine lease and well inspections as well as providing background support for responding to complaints and emergency situations. The description should delineate how the data management system(s) available to inspector's interfaces with the systems used the other oil and gas regulatory activities.

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*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

2. When were the data management systems currently in use first put into operation?

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*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

3. Are these systems sufficiently effective and efficient to allow inspectors to effect retrieval of data on wells, tests, past emergency situations thus minimizing unnecessary duplication of previous findings? What limitations exist in addressing basic regulatory and response needs of the inspector?

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*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

4. Are relevant data bases and systems of other agencies having authority for water resource allocation, water protection regulation, emergency response and water resource

contamination accessible to inspectors and other field office personnel (if any)?

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*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

5. What are the restrictions or limitations imposed on inspectors in the sharing of data with field personnel of other water resource agencies who may have cooperative functions on an investigation or may have a need to notify entities permitted by them of the findings?

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*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

**F. Changes and Modifications to Program since 1990**

Excluding the changes in **data management** described under Section E above, what statutory, regulatory, policy or budgetary changes have occurred during the past ten years that directly affect the UIC field inspection program? Please list or explain.

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*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

**PART IV MECHANICAL INTEGRITY TESTING**

**A. OBJECTIVE: Understand the Types of Mechanical Integrity Tests Allowed for different UIC well completion programs.**

1. What types of MITs are acceptable to the state for satisfying the leak test (Part 1 of MI)? Are some tests acceptable only for a specific set of well completion conditions? Please list the tests and their limitation as to applicability.

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*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

2. What criteria (is, are) used for the pass/fail of a pressure test? Why were these criteria selected? Are the criteria more strict in sensitive ground water areas, wellhead protection areas, or areas of known corrosive ground waters?

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*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

3. Is the volume of fluid loss a factor in the determination of a failure?

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*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

4. Is annulus pressure monitoring (APM) used to determine MI? How is an MI failure determined utilizing APM?

\_\_\_\_\_

*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

5. How often is APM recorded? What is reviewed and who reviews it? Are there stricter standards imposed on wells located in special geological areas (faults, salt deposits, e.g.) or in ground water situations described under Section A-2. Above?

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*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

6. Are wells using APM required to have an initial pressure test?

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*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

7. If other monitoring records are reviewed to establish MI, how are failures determined? If the determination of failure is different for each type of monitoring record, explain the process for each.

\_\_\_\_\_

*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

8. What type of technical judgment or MIT is used to satisfy Part 2 MI Fluid migration test)? If cement records are reviewed, what criteria are used to determine pass/fail?

\_\_\_\_\_

*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

9. Identify any logs used for the determination of MI and the limitations imposed on their use. Are logs more frequently used in areas where potential adverse geological situations are historical to past oil operations or where groundwater may be from vulnerable or artesian sources? Who interprets the logs or makes the decision to have the Operator runs special log suites? How are failures of MI determined?

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*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

10 What are the most common remedial actions required to correct MIT failures? Who performs the remedial action and /or plugging of the well if the Operator of the well proves

to be insolvent?

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*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

**B. OBJECTIVE: Understand the Implementation of the MIT Program**

1. What is the process for notifying an Operator that demonstration of MI is due? How much prior notice is given? Are tests scheduled at the Operators or states convenience?

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*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

2. If tests are scheduled at the state's convenience, is consideration given to having an Operator run MITs on large numbers of wells in the same area in accordance with an efficient schedule?

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*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

3. What is the priority schedule of wells to be tested? If the general cycle for testing is five years are there wells tested on a more frequent schedule and, if so, what are the criteria?

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*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

4. How are the pressure test and fluid migration test (Part I and II of MIT) coordinated?

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*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

5. How are the MIT results filed and managed? In those cases where the well passed the test? In those cases where test failure occurred and follow-up for compliance purposes is necessary?

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*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

6. What are the personnel (inspector) resources required to implement the MIT program? Does this vary significantly from one year to the next? During periods within the industry where economic exhilaration or depression occurs?

*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

**C. OBJECTIVE: Understand the procedures of witnessing a Mechanical Integrity (MI) test.**

1. Who witnesses MI demonstrations and what percentages of MI tests are witnessed by State inspectors? Does witnessing vary from one producing region of the state to another?

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*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

2. What do inspectors look for during an MI demonstration? Are routine inspections of the other lease facilities conducted at the same time as a visit for MIT?

\_\_\_\_\_

*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

3. How much time is spent witnessing an average MI test? This estimate should also include travel time. Are there occasions where the Operator is not set up to do the test at the appointed time?

\_\_\_\_\_

*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

4. How is the witnessing of MIT documented? What documentation is required of the Operator in those cases where the test was not witnessed?

\_\_\_\_\_

*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

5. What action does the inspector take in those cases where it is discovered that the Operator conducted a MIT prior to the scheduled time and subsequently made repairs? Does the State required documentation of the work even though the action was taken voluntarily by the Operator?

\_\_\_\_\_

*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

**D. Follow -Up on failed MI tests**

1. In the event of MIT failure, how is the operator notified to shut the well in? If all wells failing MI are not shut in, please elaborate.

\_\_\_\_\_

*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

2. Is the Operator required to institute corrective measures for each failed MI? If an alternative to effecting corrective measures is the plugging and abandonment of the well, does the State ever require the Operator to repair the well prior to plugging?

\_\_\_\_\_

*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

3. How long is the Operator given to complete repairs?

\_\_\_\_\_

*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

4. Are repairs witnessed (what percentage)?

\_\_\_\_\_

*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

5. If workover of the well is required as a part of repair, does the state require copies of reports documenting the work? Does this include such activities as well fracturing or removal of scale to enhance intake capacity?

\_\_\_\_\_

*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

6 What are the current MI failure rates for enhanced recovery and disposal wells? How has the failure rate changed through successive five-year cycles of testing?

\_\_\_\_\_

*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

**E. OBJECTIVE: Understand the data management of the MIT program**

Describe the data management system(s) used in the various components of the MIT program as set forth in Section A-D. The description should delineate how the system manages the program from test scheduling to follow up on failure.

1. When was the MIT data management system currently used first put into use?

\_\_\_\_\_

*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

2. Is RBDMS used by the State as a tool to determine when MITs should be conducted in certain areas of the State and if such tests should be conducted more frequently than five years?

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*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

3. Is the MIT database used by the agency conceived as an intramural system or is it linked with other state water protection databases?

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**Attached? Yes/No, (attachment identifier)**\_\_\_\_\_

**F. Changes and modifications to program since 1990**

Exclusive of the changes in data management described under Section E, what statutory, regulatory or policy changes have occurred during the past ten years in the MI Testing program. Please list changes or explain.

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*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

**PART V COMPLIANCE/ ENFORCEMENT**

**A. OBJECTIVE: Understand enforcement procedures in the state.**

1. What types of enforcement tools and legal actions (formal and informal) are available to the State? Indicate which are available through direct agency action and which are dependent upon other enforcement authorities (Attorneys General, County Attorney, or Federal)

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*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

2. What sort of formal enforcement actions have been taken relative to UIC violations? Roughly, what percentage of enforcement actions taken by the agency does this represent?

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*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

3. What is the nature of the appeals process available to the Operator? Does the UIC staff get involved in the appeals?

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*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

4. Who evaluates field reports for violations and possible enforcement actions?

\_\_\_\_\_  
\_\_\_\_\_  
*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

5. How and who develops formal enforcement cases?

\_\_\_\_\_  
\_\_\_\_\_  
*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

6. Who drafts the required documents and who reviews the proposed action?

\_\_\_\_\_  
\_\_\_\_\_  
*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

7. When hearings are held on an appealed violation, what is the standing of environmental organizations or concerned citizens and their opportunity for input?

\_\_\_\_\_  
\_\_\_\_\_  
*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

**B. Nature and disposition of “Paper” violations versus technical and mechanical violations**

1. Is there a difference in procedures when penalties are imposed for “paper violations and for violations which may threaten USDWs? Are fines and penalties issued automatically for some violations? For all violations? For no violations?

\_\_\_\_\_  
\_\_\_\_\_  
*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

2. Does the agency issue Notices of Violation (NOV) and attached penalties? If so, who issues the NOVs and who tracks payment by the Operator?

\_\_\_\_\_  
\_\_\_\_\_  
*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

3. What are the follow up procedures to assure compliance and correction of the non-compliance event? Who does the follow-up and where is the report of the status sent?

\_\_\_\_\_  
\_\_\_\_\_

*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

**C. Time Allowance for Corrective Action**

1. How much time is granted to an Operator to correct a “paper violation” or a violation that involved the issuance of a NOV?

\_\_\_\_\_

*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

2. How much time is granted to an Operator to correct a violation (condition) that if left uncorrected could threaten a USDW? Please provide a range of situations and associated time allowances.

\_\_\_\_\_

*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

3. How much time is allowed the inspectors to perform follow-up inspections and report submission on C-1 and C-2?

\_\_\_\_\_

*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

**D. Flow from Non-Compliance to Enforcement Action**

1. How and when are field violations escalated into formal enforcement actions?

\_\_\_\_\_

*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

2. Are Operator bonds and license revocations (if applicable) reviewed as a part of initial enforcement action and under what conditions are bonds called in?

\_\_\_\_\_

*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

3. Is there coordination with other State or local agencies (RCRA, NPDES, EPCRA, SDWA etc.?)

\_\_\_\_\_

*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

4 What actions have been taken in response to enforcement actions? What penalties have been assessed and collected on UIC violations?

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*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

5. How and who determines when the non-compliance event has been successfully resolved and the Operator can reactivate the well? Is this accomplished by formal order from the agency or by other communication?

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*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

6. Identify and list the more prevalent UIC related problems faced by the State in providing adequate enforcement?

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**Attached? Yes/No, (attachment identifier)**\_\_\_\_\_

**E. State/ Federal Enforcement Action Interface**

1. Describe the existing cooperative relationship with the EPA Region on UIC violations. Are significant non-compliance events being reported to EPA?

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*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

2. Has the agency ever requested EPA to take over enforcement on an UIC violation? Has EPA ever over filed on a case during enforcement proceedings by the state? If so, what was the result?

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*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

**F. Contamination/alleged contamination resulting from injection well practices or associated activities in the last ten years.**

The purpose of these questions is to determine the extent of reports of alleged and proven USDW contamination resulting from “current” UIC practices or practices associated with UIC well completion and construction.

1. Estimate the number of alleged USDW contamination incidents reported to the State in the past ten years. Were any of these associated with such activities as hydraulic fracturing, zone acidizing or other well stimulation activity?

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*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

2. What actions are taken by the state when an alleged contamination report is received?

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*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

3. How many of such contamination cases were found to be actual and were proved to be as a result of failure of an injection well or wells? How many were due to abandoned, unplugged injection wells?

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*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

4. As related to question #3 and to the degree possible, briefly describe the well failure, the extent of contamination and any remedial and /or enforcement actions taken?

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*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

**G. Changes in Compliance or Enforcement Capability Since 1990**

What statutory, regulatory, or policy changes have occurred during the past ten years in the agency's compliance/enforcement program? Have these changes been generated at the state level or by changes in the EPA Class II UIC regulations or State primacy agreement?

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*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

**PART VI. ABANDONMENT/PLUGGING**

**A. OBJECTIVES: Understanding and documenting the technical aspects of Plugging and Abandonment (P&A)**

1. For each major type of well construction, what techniques of plugging are approved? (Give detail on minimum plug size or length: use of mud between plugs and weight: use of bridge plugs; standard plugs at the pay or injection zone, base of freshwater or casing stubs etc;).

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*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

2. Does the state have any geological standards, tables or other technically based policy documents available to field staff which are used as a guide in plugging wells?

\_\_\_\_\_  
\_\_\_\_\_  
*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

3. Are there wells with no surface casing? How are they plugged?

\_\_\_\_\_  
\_\_\_\_\_  
*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

4. If pipe is pulled (surface, intermediate or otherwise), what special plugging procedures are followed?

\_\_\_\_\_  
\_\_\_\_\_  
*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

5. Are plug locations verified? When and how? Are inspectors present to witness the plugging?

\_\_\_\_\_  
\_\_\_\_\_  
*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

6. What percentage of well plugs is witnessed? If all wells are not witnessed by inspectors, is there a priority system, which determines those plugs to be witnessed in all cases (producing wells, injectors, D&A)?

\_\_\_\_\_  
\_\_\_\_\_  
*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

7. Are plugs required to be tagged and if so, is the tagging witnessed? Is plug tagging required by regulation, elective on the part of the agency, or limited to certain geological or hydrogeological situations?

\_\_\_\_\_  
\_\_\_\_\_  
*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

8. What control is exercised over unwitnessed plugs?

\_\_\_\_\_  
\_\_\_\_\_  
*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

**B. Understand the non-technical aspects of P&A and how this activity is integrated with the remainder of the program.**

1. How are P&A reports coordinated with the permitting/area of review process?

\_\_\_\_\_  
\_\_\_\_\_  
*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

2. Where are plugged and abandoned injection wells tracked? In the Central or district office? By whom?

\_\_\_\_\_  
\_\_\_\_\_  
*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

3. What is the flow of activity starting with the Operators notice to the agency of an intention to plug a well through the submission of the final report?

\_\_\_\_\_  
\_\_\_\_\_  
*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

4. Is P&A information incorporated into the data management/tracking system? How current is this information and how often are newly P&A wells available in a report?

\_\_\_\_\_  
\_\_\_\_\_  
*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

5. What is the State's action when an abandoned well is discovered? Please describe the process used to get the well plugged.

\_\_\_\_\_  
\_\_\_\_\_  
*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

6. Does the State maintain an inventory of abandoned wells? Does the State maintain a well plugging fund that is used to plug wells with no responsible party? Describe the nature of the fund, its sources of funding, and any limitations on the use of the fund.

\_\_\_\_\_  
\_\_\_\_\_  
*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

**C. OBJECTIVE: Understand the Temporary Abandoned (TA) Well Status Program used by the state.**

1. Does your UIC program include a separate formalized (by statute or regulation) administrative program for temporarily abandoned wells and how is a TA well defined.

Please provide a summary of the limitations on the Operator once TA status has been approved by the agency for a given well.

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*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

2. Please provide a copy of any regulations or policies on TA wells that your agency has issued in the past five years.

*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

3. Does the agency require a mechanical integrity test to be run on a TA well before it is reactivated to an injection well?

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*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

4. Describe how TA's wells are tracked and whether they are tracked as a part of the active or abandoned well regimes?

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*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

**D. OBJECTIVE: Understand the Data Management System Used in the Plugging and Abandonment Program.**

1. When was the data management system currently used first put into operation?

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*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

2. Is there capability for the Operators and field inspectors to file some or all of the documentation pertaining to well pluggings and abandonments electronically? Describe what electronic communication is available to the regulated community, other state and federal agencies and the public.

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*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

3. Is the agency's data management system locally (intramural) conceived or linked with other state databases?

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*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

**E. Changes and Program or Policy Since 1990**

Exclusive of the changes in data management described under Section D., what statutory, regulatory, or policy changes have occurred during the past ten years to address abandonment of wells and financing of orphan wells?

\_\_\_\_\_  
\_\_\_\_\_  
*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

**PART VII PUBLIC OUTREACH**

**A. OBJECTIVE: Understand the Public Outreach Mechanisms used by the State**

1. How is the public informed about UIC issues and the promulgation of new regulations and amendments to existing regulations?

\_\_\_\_\_  
\_\_\_\_\_  
*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

2. How is the regulated community identified and informed about UIC requirements?

\_\_\_\_\_  
\_\_\_\_\_  
*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

3. If used, are mailing lists kept up to date? How often do general mailings occur? Are special mailings sent on specific UIC issues? Who do the mailings go to?

\_\_\_\_\_  
\_\_\_\_\_  
*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

4. Please indicate any local, regional. Or national interest groups included in the mailing lists?

\_\_\_\_\_  
\_\_\_\_\_  
*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

5. Which of these groups have shown an active interest in UIC issues? Have any groups shown concerns over UIC well completion practices including hydraulic fracturing of the injection zone?

\_\_\_\_\_  
\_\_\_\_\_

*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

6. During the past five years, what UIC issues have attracted attention from interest groups?

\_\_\_\_\_

*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

**B. Hearings**

1. Describe briefly the hearing process used by the agency for UIC issues and the value as a public outreach mechanism.

\_\_\_\_\_

*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

2. Does the USEPA attend agency hearings on UIC issues? Does EPA ever comment at agency hearings on proposed regulations or UIC policy issues?

\_\_\_\_\_

*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

3. At what point in the regulatory process does the agency notify EPA of draft regulations? Once adopted, is EPA provided copies of regulations in final form so they can be codified in a timely manner?

\_\_\_\_\_

*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

**C. Coordination with State and Local Water Planning Efforts**

1. What coordination exists with state programs in other agencies in public outreach?

\_\_\_\_\_

*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

2. Does the state have water resource planning groups, water management districts, source water protection or groundwater protection programs and municipal well head protection areas which have been developed in other agencies and Class II has become an issue? How does your agency facilitate discussion with these groups?

\_\_\_\_\_

*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

**D. Changes Since 1990**

What changes have occurred within your State's government during the past ten years that have increased the participation of other mineral, water or environmental resource agencies in your Public Outreach activities? Has there been any decrease in interest by other agencies in UIC regulatory activities? Please list and explain changes.

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*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

**PART VIII      REVIEW OF WATER REUSE MANDATES AND POLICIES**

This set of general questions is designed to describe the states efforts to use various categories of wastewater including those associated with the oil industry and UIC Class II wells.

1. Does the state have any statutes, regulations or policies mandating or precluding the reuse of wastewater from the following:
  - a. Low level chloride (less than 3000 TDS) produced water from oil field operations that could be returned to the surface or ground water regime?

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*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

- b. Low level chloride water produced from coal bed methane?

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*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

2. Which agency in your state would have to give the Operator permission to either reuse water produced under (1) or return it to the environment through wells? Is reuse taking place at the current time? If so, describe.

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*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

**PART IX      REVIEW OF COAL BED METHANE PROGRAM (If Applicable)**

**A.      Statutory Authorities and Regulatory Jurisdictions**

1. Please include a copy of all statutes, rulers, regulations, policies and orders applicable to the production of coal bed methane (CBM) and the wastes derived from the production of coal bed methane.

*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

2. If coal bed methane is regulated by another entity, either as a mineral resource or as an environmental issue, please indicate the proper agency (entity) and request they provide all possible material to applicable to A-1.

\_\_\_\_\_

*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

3. Does this statutory authority include the promulgation of regulations?

\_\_\_\_\_

*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

4. Do the statutes or regulations pertaining to either production of CBM or the protection of the "Waters of the State" contain definitions of injection?

\_\_\_\_\_

*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

5. Do the statutes mandate or allow the establishment of advisory boards or other groups designed to bring stakeholders together for discussion of environmental issues associated with coal bed methane production?

\_\_\_\_\_

*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

## **B. Program Coordination**

1. Attach an agency organizational chart that identifies where the regulation of coal bed methane is accomplished.

\_\_\_\_\_

*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

2. Discuss the mechanisms in place in your state for the coordination of CBM production and environmental protection programs, complaint and emergency response among the public, government agencies and the regulated industry.

\_\_\_\_\_

*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

3. Describe briefly the nature of the agency or division of agency and how the CBM regulatory function ties in the with the agency leadership.

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*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

4. Is CBM regulated in your state as a gas activity or one associated with the mining of coal?

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*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

**C. Staffing and funding**

1. Please provide funding levels and the total staff complement for the coal bed methane regulatory program for the last three years. Assume fractional FTE's for staff who perform both CBM and non-CBM functions.

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*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

2. Is the CBM regulatory program fully state funded or partly funded by a federal grant? If the latter, please identify the amount of the grant and the agency supporting your program with Federal dollars.

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*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

**D. Technical Regulation**

1. Please describe the application flow for a coal bed methane well or project. Are applications filed for each individual well or by project representing a group of wells?

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*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

2. Once the application by the operator has been determined to be complete and technical review proceeds, does the subsequent review concern itself primarily with the feasibility of the project as a viable CBM recoverable resource or is it balanced with an equal consideration of the environmental and water resource aspects?

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*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

3. Does the agency require the applicant (Operator) to provide environmental or cultural information for the project area and adjacent acreage (i.e. location of surface and ground water supplies, proximity to residences, significant topographic features such as drainages, shallow bedrock and associated outcrops)?

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*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

4. Who issues the permit for the well or project and at what level in the agency is the permit signed under?

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*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

5. In terms of the development of the project, once approved, is the agency notified when wells are constructed or hydraulically fraced so that the agency is afforded an opportunity to witness or inspect the operation?

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*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

6 Does the applicant for a CBM project have to pay an application fee to the agency? What type of financial assurance mechanisms are used in connection with CBM applications?

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*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

7. Please describe the agency's inspection program for CBM projects. The description should cover the frequency of inspections, how findings and observations are documented, who reviews the documentation. What are the qualifications of inspectors?

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*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

8. Are the formations from which coal bed methane water is produced exempt from protection under the UIC program because it was identified as a gas producing formation?

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*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

9. Describe the CBM well plugging and abandonment program both from the technical aspect of securing the well and documentation filed with the state. Are CBM wells witnessed by state inspector at the time of plugging?

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*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

**E. Data Management Program**

1. Describe the data management system(s) used in the various components of the administrative and technical program for CBM regulation, which allows for:
  - a. Efficient and effective tracking of applications from the time of submission by the operator to the time of eventual approval or denial of the project.

\_\_\_\_\_  
\_\_\_\_\_  
*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

- b. Efficient monitoring and inspection of CBM facilities and wells.

\_\_\_\_\_  
\_\_\_\_\_  
*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

- c. Use in determining compliance and non-compliance enforcement activities.

\_\_\_\_\_  
\_\_\_\_\_  
*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

2. When was the data management system currently in use first put into operation?

**F. Interagency Coordination**

1. If other agencies are involved in the production of Coal Bed Methane in your state, please explain what the respective roles are and whether Memoranda of Understanding exist to facilitate delineation of duties and responsibilities.

\_\_\_\_\_  
\_\_\_\_\_  
*Attached? Yes/No, (attachment identifier)*\_\_\_\_\_

2. Does the State Geological Survey in your state have a role in the regulation of CBM or is their role purely research, a repository for data, and advisory to the regulatory agencies?

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*Attached? Yes/No, (attachment identifier)*

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**DRAFT**  
**STRONGER Review of California**  
**Report 9/1/02**

**INTRODUCTION**

This report includes a follow-up review of the progress made by the several California state agencies including the Division of Oil, Gas and Geothermal Resources (DOGGR), the State Water Resources Control Board (SWRCB), the Division of Toxic Substances Control (DTSC), the Regional Water Quality Control Boards of Regions 3 and 5 (RWQCBs), the California Air Resources Board (CARB), and the Integrated Waste Management Board (IWMB) since the original assessment performed pursuant to the 1990 *EPA/IOCC Study of State Regulation of Oil and Gas Exploration and Production Waste* (the "IOGCC Guidelines"). That assessment, known as the California State Review, was published in May 1993, and contained specific findings and recommendations for action based on the IOGCC Guidelines.

Since the initial review, the IOGCC Guidelines were updated and revised by the Interstate Oil and Gas Compact Commission (the "IOGCC") in 1994. In 1999, administration of the state review program devolved to State Review of Oil and Natural Gas Environmental Regulations, Inc. ("STRONGER"), a non-profit, multi-stakeholder organization. STRONGER again revised, expanded and updated the Guidelines, which were accepted by the IOGCC, and published in June 2000 as the *Guidelines for the Review of State Oil and Natural Gas Environmental Regulatory Programs* (the "2000 Guidelines"). This report is also a review of aspects of the agencies' activities not covered by the IOGCC Guidelines, but which are addressed in the 2000 Guidelines.

In addition, this report contains a follow-up review of the California Underground Injection Control (UIC) program. The UIC program is designed to protect Underground Sources of Drinking Water (USDWs) through the regulation of Class II injection wells. An initial Peer Review of the California UIC Program was conducted in 1988, resulting in a report by the Underground Injection Practices Council (UIPC) dated 1989. The UIPC is now the Ground Water Protection Council (GWPC). The UIPC Peer Review contained a number of recommendations to the California UIC program. This follow-up UIC review focuses on those recommendations.

In April, 2002, a thirteen-person team appointed by STRONGER and GWPC conducted a follow-up and supplemental review to evaluate progress made in the California program since the initial review, and to evaluate the adequacy of the program compared to the 2000 Guidelines. In addition, the team conducted a follow-up UIC review of the California UIC program. The fourteen-person team consisted of six members and seven observers. Don Garvin of Trout Unlimited; Diane Conn of Citizens for the Goleta Valley; Lori Wrotenbery of the New Mexico Oil Conservation Division; Carroll Wascom of the Louisiana Office of Conservation; Catherine Reheis-Boyd of Western States Petroleum Association; and William Brommelsiek of ChevronTexaco served as team members. Ben Grunewald of the Groundwater Protection Council; George Robin of the U. S. EPA Water Management Division; Nancy Johnson of the U.S. Department of Energy; Mark Carl representing the IOGCC; William Bryson

representing the Groundwater Protection Council; James Erb of the STRONGER Board and the Pennsylvania Bureau of Oil and Gas Management; and Jeff Prude of the Bureau of Land Management Bakersfield District participated as observers. Four team members, Lori Wrotenbery, Carroll Wascom, Cathy Reheis-Boyd, Bill Brommelsiek, and one observer, Jim Erb, served on the initial IOGCC review. One observer, Bill Bryson, served on the initial UIPC Peer Review team. Nancy Johnson served as the DOE observer to both the IOGCC and UIPC reviews.

The in-state portion of the follow-up review was conducted in Bakersfield, California at the offices of the DOGGR on April 21<sup>st</sup> through 25<sup>th</sup>, 2002. Mr. William Guerard and Mr. Michael Stettner of the DOGGR responded to questions from the team and observers. Other DOGGR staff participating included Hal Bopp, Steve Fields, Dave Mitchell and Ed Brannon. Other agencies' representatives who participated in the review included Peter Fuller, SWRCB; Claudia Nagy, DTSC; Shelton Gray, RWQCB Region 5; and Lou Blanck, RWQCB Region 3. Following the interviews and review of the written materials and backup documentation provided by the state, the review team compiled this follow up review report.

The follow-up review of the California responses to the recommendations of the initial 1993 review, and the supplemental review of program aspects not covered by the IOGCC Guidelines, have been integrated under the section headings of the 2000 Guidelines in order to group like subject matter. Each report section is divided into follow-up review and supplemental review subsections. Those portions of the 2000 Guidelines that are new or changed since the 1993 review are re-printed to clarify the scope of the supplemental review. References to the "Guidelines" in the text of the report refer to provisions of the 2000 Guidelines rather than the IOGCC Guidelines.

The follow-up UIC review report is presented as section VII of this report.

## PROGRAM OVERVIEW

### Oil Production

California continues to rank fourth among the oil-producing states, behind Louisiana, Texas, and Alaska. In 2000, California's oil was produced from 207 fields at a rate of about 840,000 barrels a day.

During 2000, California's crude oil production decreased slightly from 1999. Production totaled 307.4 million barrels in 2000, compared with 311.5 million barrels in 1999. Although production in the state onshore and state offshore areas was about the same as 1999, production decreased in the federal offshore area. The state total includes 253.2 million barrels of oil produced from onshore fields and 54.2 million barrels from offshore fields.

Of the more than 174,000 known wells ever drilled in the State, there were 46,799 producing oil wells and 1,169 producing gas wells in 2000, an increase of 1,202 oil wells from 1999. The number of stripper wells in operation in 2000 was 22,244.

### Enhanced Oil Recovery

In 2000, incremental oil production from all types of enhanced oil recovery (EOR) projects accounted for approximately 181.5 million barrels, or 59 percent of California's oil production. Steam stimulation was credited with approximately 135.7 million barrels, or 75 percent of all incremental oil production. Waterflooding accounted for approximately 43.8 million barrels, or 24 percent of the incremental production total. As of 2000, there were 23,934 EOR wells in the State.

### Natural Gas Production

California's total net natural gas production increased from 376.4 billion cubic feet in 1999 to 379.0 billion cubic feet in 2000, continuing a trend that started in 1998. The 2000 total included 45.8 billion cubic feet from federal offshore fields.

### Reserves

As of December 31, 2000, California's estimated recoverable (proven) oil reserves totaled 3.6 billion barrels. Proven gas reserves in the state were estimated at 5.0 trillion cubic feet.

### Drilling Activity

The number of new oil, gas, service, and prospect (exploratory) wells drilled increased from 1,752 wells in 1999 to 2,666 wells in 2000. The number of wells completed increased from 1,379 wells in 1999 to 2,131 in 2000. The number of wells plugged and abandoned increased from 1,307 wells in 1999 to 1,935 in 2000.

### Disposal Wells

As of 2000, there were 1,186 Class II disposal wells in the State.

### Environmental Regulations

Since 1950, the exploration and production waste management program for the State of California has developed into a complex system of local and state controls. Aesthetics were the primary environmental concern until 1971, when the Division of Oil, Gas and Geothermal Resources (DOGGR) and the California Department of Fish and Game began a program to inventory and

eliminate oilfield pits (sumps) that were hazardous or immediately dangerous to wildlife. Assembly Bill 2209, enacted in 1973, provided for a legally mandated, full-scale sump inspection and correction program. In 1975, DOGGR targeted hazardous and idle-deserted wells for plugging and abandonment under a program that was funded through DOGGR budget and drilling bonds. This program is on-going, as well.

## **Regulatory Jurisdictions and Authorities**

A variety of state, regional, and local agencies regulate E&P waste management activities in California. The principal state agencies with jurisdiction in this area are:

- DOGGR within the Department of Conservation (DOC);
- State Water Resources Control Board (SWRCB);
- Regional Water Quality Control Boards (RWQCB);
- Department of Toxic Substances Control (DTSC);
- California Integrated Waste Management Board (IWMB); and
- California Air Resources Board (CARB).

SWRCB, DTSC, IWMB and CARB are all within the California Environmental Protection Agency (Cal-EPA).

## **Division of Oil, Gas, and Geothermal Resources**

Led by the State Oil and Gas Supervisor, DOGGR is headquartered in Sacramento and has six oil and gas district offices. In general, DOGGR is responsible for the protection of life, health, property, and natural resources, and the conservation of oil, gas, and geothermal resources in California. DOGGR's E&P waste management jurisdiction covers only those wastes originating in oil and gas fields and the operations of Class II injection wells.

DOGGR's jurisdiction includes the drilling, operation, maintenance, and plugging and abandonment of oil, natural gas, and geothermal, and service wells; removal of unused tanks and facilities attendant to oil gas production; the management of pipelines within the oilfields; spill contingency planning; and, general lease maintenance. In addition, DOGGR's sump (pit) requirements apply to wildlife protection from production sumps and sumps associated with workover operations. However, air and water quality matters related to production sumps, land treatment operations, or other onsite units are largely the responsibilities of other agencies that are within Cal-EPA .

DOGGR is authorized to promulgate regulations governing E&P waste management practices within its jurisdiction. Those regulations are codified in Chapters 2 and 4 of Title 14 of the California Code of Regulations (CCR).

Since the initial review in 1993, DOGGR has made several significant changes to its programs. To address the growing number of idle wells, DOGGR implemented the idle-well management program in an effort to reduce the number of long-term idle wells by encouraging operators to reactivate or plug and abandon their idle wells. In addition, DOGGR has strengthened its requirements regarding well bonds and pipelines located in environmentally sensitive areas.

## **REVIEW HIGHLIGHTS**

A characteristic of the California program for the management of E&P waste is that a number of state, and in some cases local, agencies have lead responsibility for different portions of the program. This presents coordination complexities that are not present in most E&P waste management programs. Some California waste management standards, notably the definition of hazardous wastes, are more stringent than required by the Guidelines. The Review team noted several aspects of the California E&P waste management and UIC programs that merit special recognition, and that may offer ideas for other state regulatory programs.

### **Public Participation and Outreach**

The primary agencies involved in oil and gas E&P waste issues are actively involved in outreach and education programs for the regulated community and the public. The DOGGR, particularly, is to be commended for its efforts in supporting agency/industry/public oil and gas work groups, a bi-annual oil and gas conference, and development of the Department's data management system and web site. DOGGR has been especially proactive in conducting workshops among other jurisdictional agency staff members, local planning agencies and industry representatives to address emerging issues and coordinate the efforts of state and local jurisdictional entities.

### **Interagency Coordination**

In light of the many agencies with jurisdictional responsibilities for management of E&P wastes, DOGGR has expended a great deal of effort to improve communications and coordinate activities among the involved agencies. Those efforts have borne fruit, particularly in coordination with the BLM on idle and orphaned wells, with CAL-EPA on UIC activities, with RWQCB Region 5, and with local agencies in planning and abandoned site remediation activities.

DOGGR also supports multi-agency working groups that address specific E&P issues. The Cal-E&P Regulatory Reform Task Force formed a Roadmix Working Group which developed guidelines for the use of hydrocarbon bearing materials (such as tank bottoms and soils) as roadmix. The Guidelines were ultimately adopted by RWQCB Region 5. This is an excellent example of a multi-interest approach to problem-solving and filling regulatory gaps. The review team commends this joint agency/industry Task Force for development of the Roadmix Guidelines.

Another example is a study undertaken by DTSC to clarify management of hazardous and non-hazardous wastes. In California, some E&P wastes covered by the federal hazardous waste exemption of 40 CFR 261.4(b)(5) are regulated as hazardous under state law. In 1999 a question arose regarding the quantities of California-regulated hazardous wastes in federally exempt E&P waste streams. In 2000 and 2001 DTSC, in cooperation with DOGGR and funded by an EPA grant, conducted a study of waste samples from selected sites to determine whether E&P wastes were generally being managed in accordance with State law. The study concluded that most federally exempt E&P wastes are not hazardous under California law. In those instances where California hazardous wastes are present, guidance is given to the generators to properly characterize and manage the wastes.

### **Abandoned Wells Program**

DOGGR has a thorough procedure for identifying wells and well sites that may constitute a threat to public health and safety or the environment, and for determining whether a responsible party exists. DOGGR has developed and maintains an active inventory of orphaned wells. To track the number of idle wells in the state, the DOGGR maintains an inventory of idle wells which may be downloaded from the DOGGR web page. DOGGR compiles monthly Well Production and Injection Reports submitted by operators and other data to identify: # of wells operated, # of idle wells, # of long-term idle wells (both 10-year and 15-year inventories), and # of observation wells. When a new orphaned well is identified, it is evaluated as to its potential threat to health and the environment and placed on the state's inventory of orphaned wells for tracking and plugging. DOGGR also responds to all referrals by other agencies and citizen complaints. Procedures are in place for attempting to notify the last known responsible party, and providing legal notice. In cases where there may be overlapping jurisdictions, agency activities are coordinated and emergency protocols are in place if instant remedial action is required.

DOGGR also sets annual targets for plugging of orphaned wells, and tracks its performance in meeting the targets. DOGGR's rules also create an incentive for operators to bring idle wells back into production, thereby avoiding abandonment. In 1997, the California legislature adopted legislation that attaches the ultimate liability for proper plugging and abandonment of wells to the operator of the well on January 1, 1996. In this way, as well ownership changes, the January 1, 1996 owners build assurance for future proper plugging and abandonment into contracts for transfer.

### **Data Management**

DOGGR has made great strides in automating its record keeping and other business processes and in posting data on its website. DOGGR's WellStat data management system, used to manage monthly production and injection reports submitted by operators, is an innovative system that has potential for expanded utility to DOGGR, operators and the general public. Current information includes a list of all active wells, production and injection volumes, production and injection days, pressures, etc. Expansion of the WellStat data management system will include well permitting and field inspection data. The information is posted monthly on the DOGGR's web page and printed in the Annual Report.

**DOGGR is developing an Internet-based electronic bi-directional permitting system (ePermit) to streamline the permitting process. The ePermit is nearing completion and is being tested before being released to the oil and gas industry.**

**CALIFORNIA STATE  
FOLLOW-UP AND SUPPLEMENTAL REVIEW  
FINDINGS AND RECOMMENDATIONS**

Note: The text under each subheading entitled “California Response” was extracted from the state’s initial survey response and many not reflect additional information made available to the review team during the course of the review.

**I. General Criteria (Guidelines Section 3)**

**Follow-up to Initial Review Recommendations**

**INITIAL REVIEW FINDING I.1.**

*As DOGGR acknowledged during the in-state review, DOGGR's pit standards warrant improvement.*

**INITIAL REVIEW RECOMMENDATION I.1.**

*DOGGR should review and revise its rules governing pits. (See [Initial] Findings and Recommendations III.1 and VI.11.)*

**CALIFORNIA RESPONSE:**

DOGGR – The DOGGRGR does not have primary authority over sumps or pits. The DOGGR has regulations restricting sumps from drainage areas, and unlined sumps are restricted from areas overlying shallow groundwater. Also, drilling sumps must be removed (closed) before a drilling bond is released.

**SWRCB – The RWQCBs have authority for discharges to land, permit the construction of sumps, specify how sumps are constructed, what is allowed in sumps, and how they are closed. The DOGGR met with the RWQCB’s staff to review the sump-oversight issue. A modified Department of Conservation/State Water Resources Control Board MOU (giving the DOGGR the responsibility) was pursued unsuccessfully.**

**In mid-1993, the Bureau of Land Management (BLM) and Region 5 RWQCB reached agreement on a set of sump-closure guidelines affecting BLM leases in the San Joaquin Valley. The BLM sump closure guidelines are used by the Region 5 RWQCB office on a region-wide basis. DOGGR pursued an MOU [Memorandum of Understanding] with RWQCB on sump closure jurisdiction, but particularly with the adoption of the BLM closure standards, DOGGR does not feel it remains an issue.**

**Local land-use authorities also have some jurisdiction.**

#### **FOLLOW-UP REVIEW FINDING I.1**

*Technical criteria for pits are discussed in Section 5.5 of the Guidelines. However, the above response, along with responses to questions from the review team, indicate that several agencies and jurisdictions have varying degrees of responsibilities and involvement in the regulation of pit construction and control. As indicated above, an MOU with the Department of Conservation/State Water Resources Control Board giving DOGGR primary oversight responsibility was pursued by the DOGGR unsuccessfully. There remains a “gray area” regarding standards for workover and reserve pits. The primary authority is the SWRCB, although there are some requirements in DOGGR. For further discussion, see the findings and recommendations regarding technical criteria for pits and inter-agency coordination under III., Technical Criteria.*

#### **INITIAL REVIEW FINDING I.5**

*DTSC’s land disposal restrictions and IWMB’s landfill diversion/beneficial use programs will form the cornerstone of a comprehensive waste management hierarchy for E&P wastes, provided the DTSC restrictions take effect as scheduled and the relevant LEAs incorporate E&P wastes into their hierarchy activities within a reasonable time frame.*

#### **INITIAL REVIEW RECOMMENDATION I.5**

*Further progress in implementing the waste management hierarchy is strongly encouraged by the review team. IOGCC Guidance section 5.1e.*

#### **CALIFORNIA RESPONSE:**

**DOGGR – The majority of the E&P wastes managed by the DOGGR are injected into UIC Class II wells for disposal. The DOGGR has expanded the definition of a Class II-type fluid to include CoGen waste fluids, non-haz tank bottoms, oil-contaminated soils, NORM, and slurrified drill cuttings. The EPA [U.S. Environmental Protection Agency] has approved each expansion. Injection of these wastes minimizes surface treatment and disposal. DOGGR’s ongoing lease inspections help to ensure proper lease maintenance and a reduction in the number of spills.**

#### **FOLLOW-UP REVIEW FINDING I.5**

See Follow-up Review Finding I.16 and Supplemental Review Findings and Recommendations I.1 and III.3 below (pp. 15, 41).

#### **INITIAL REVIEW FINDING I.8.**

*The legislature now requires that wastes DTSC considers hazardous on the basis of the narrative toxicity criterion (i.e., wastes deemed hazardous based upon presence of carcinogens) must be identified by regulation. Accordingly, regulations must now be issued for all wastes DTSC deemed hazardous due to the narrative toxicity criterion, including any E&P wastes.*

#### **INITIAL REVIEW RECOMMENDATION I.8.**

*Although beyond the scope of the IOGCC Guidelines, DTSC should review its rules to determine if any E&P wastes warrant regulation as hazardous wastes under the narrative criterion.*

**CALIFORNIA RESPONSE:**

*SWRCB – Regions have no information. However, Region 3 has unsuccessfully requested DTSC help on the waste classification issue of KD distillate. KD distillate was determined to be hazardous by the Hazardous Materials Laboratory for toxicity and ignitability and some of it was found to contain PCBs that were likely to exceed the STLC [state toxic level of contamination] at the time they were spilled. Following the sampling discussed in Rec. 1.4, no action was taken or proposed.*

**FOLLOW-UP REVIEW FINDING I.8**

DTSC identifies the hazardous waste criteria by regulation. Generators are required to determine whether E&P wastes meet the criteria. Although beyond the scope of the guidelines, this recommendation has been met.

**INITIAL REVIEW FINDING I.9.**

The variety of state and local agencies involved in E&P waste regulation contributes to the complexity of the regulatory program.

**INITIAL REVIEW RECOMMENDATION I.9.a.**

*The complexity of the California program should be counterbalanced by aggressive outreach and education programs for the regulated community and the public. Such programs should extend beyond the workshops conducted, or materials currently prepared by individual agencies which tend to focus exclusively on their own programs. IOGCC Guidance section 4.2.2.2.*

**CALIFORNIA RESPONSE:**

**DOGGR – The DOGGR has developed effective public/industry outreach and education programs, but has not coordinated the efforts with other agencies because policies and regulations within each agency change regularly. However, each state agency provides information to its regulated community and the public on its own regulations.**

**In addition, the basic purpose of the California Environmental Quality Act (CEQA) is to: inform governmental decision makers and the public about the potential significant environmental effects of proposed activities; identify ways that environmental damage can be avoided or significantly reduced; require changes in a project through the use of alternatives or mitigation measures when feasible; and disclose to the public the reasons why a project was approved if significant environmental effects are involved.**

*SWRCB – Region 3 has conducted several erosion control workshops and initiated MOU meetings with Santa Barbara County and the local DOGGR office. The Regions have made several outreach efforts. Attempts at regular meetings in Region 3 among industry, County, and DOGGR have been unsuccessful.*

*Region 5 Fresno staff participates in numerous oil industry conferences annually; is a member of the IOPA Oil and Gas Workgroup (which includes DOGGR, BLM and industry) and interacts with WSPA [Western States Petroleum Association] and CIPA [California Independent Petroleum Association]; has made presentations at West Coast PTTC workshops; regularly interacts with staff and management of the DOGGR offices in Bakersfield, Coalinga and Sacramento; served on the Exploration and Production Industry Regulation Reform Task Force in 1995; served on the Sump Closure Subcommittee with interested agencies and industry in the development of the "Oilfield Surface Impoundment Closure Guidelines" subsequently adopted by U.S. Department of the Interior, BLM; served on the committee with DOGGR and the Department of Fish and Game in the development of the San Joaquin Valley Oil Spill Reporting Field Rule; and served with the Regulatory Task Force Road Mix Working Group on the issues relating to the beneficial use of road mix and in 1998 served on an NPDES ad hoc government/industry committee which developed a resource guide for industry entitled "NPDES Permit Compliance and Enforcement – A Resource Guide for Oil and Gas Operators."*

#### **FOLLOW-UP REVIEW FINDING I.9a**

The primary agencies involved in oil and gas E&P waste issues are actively involved in outreach and education programs for the regulated community and the public, and are partially meeting the goals of this recommendation. The DOGGR, particularly, is to be commended for its efforts with the oil and gas work groups, the bi-annual oil and gas conference, and development of the Department's database and web site. However, industry representatives on the review team remarked that "there is still no one single source" for regulatory information, and that this makes it more difficult and expensive for industry in its day-to-day attempts to meet regulatory requirements. The broader goal of clarifying and communicating the roles and responsibilities of the involved state agencies needs to be addressed.

#### **FOLLOW-UP REVIEW RECOMMENDATION I.9a**

The review team recommends that industry and involved state agencies develop a formal "roadmap" which explains the structure and responsibilities of the agencies involved in all aspects of the program. (Guidelines 3.1.e and 4.4).

#### **INITIAL REVIEW RECOMMENDATION I.9.b.**

A user-friendly guide to the various E&P [exploration and production] waste requirements of all the principal state, regional, and local agencies should be published and distributed widely. Given the Division's previous efforts in producing user-friendly documents and their field presence (see discussion below regarding funding and resources), the Division should take the lead in producing such a document in close consultation with the other agencies.

#### **CALIFORNIA RESPONSE:**

DOGGR – The development and publishing of a guideline would be difficult and expensive because of the frequent changes to regulatory and statutory requirements from each agency. The effort to maintain a comprehensive, up-to-date, user-friendly guide to E&P waste management requirements

would require substantial staff time, which would be better spent performing more direct E&P waste-management functions.

**However, the DOGGR, SWRCB and DTSC each have developed Internet home pages. For example, the DOGGR Internet home page provides information on its programs, access to statutes and regulations, reports and publications, maps, production and injection data, an information and resource directory, and links to district offices, other agencies and organizations. The DTSC home page includes information on its programs and program requirements, including access to statutes and regulations. Also, DTSC's home page includes a status report on proposed legislation and regulations, an information and resource directory, and links to the different programs. The SWRCB home page includes a directory list of Regional Offices, public information files, application forms, the Water Code and regulations, hearing transcripts and meeting schedules. Persons needing information and assistance from the various agencies can access these home pages for immediate information and, in some cases, e-mail their requests.**

#### **FOLLOW-UP REVIEW FINDING I.9b**

The state response above indicates that the agencies have only partially met this recommendation. In lieu of producing a user-friendly printed document, the agencies have instead focused on the development of comprehensive Internet web sites. The review team commends the state agencies for these efforts. Public interest stakeholders would also benefit from a “single source” printed document. The DOGGR did provide the review team with a copy of a pamphlet it had produced several years ago for public dissemination; however, this document is outdated and seems to have a more general focus than was the original intent of this recommendation. It should also be noted that California state agencies, such as the Department of Conservation and SWRCB, have their own in-house printing and publishing shops, and that other possible sources of funding for producing a printed document may be available.

#### **FOLLOW-UP REVIEW RECOMMENDATION I.9b**

For the benefit of the general public, Cal-EPA and the California Resources Agency should pursue the publication and distribution of a basic, user-friendly printed guide to the various E&P waste requirements of the principal state, regional, and local agencies, in close consultation with those agencies. (Guidelines 3.1.e, 4.2.2.2, and 4.4)

#### **INITIAL REVIEW FINDING I.10.**

*The present lack of coordination in data gathering, and the resulting data gaps, potentially affect many aspects of state and local E&P waste programs, including regulatory development, allocating resources, and implementing waste management hierarchies mandated by state law.*

#### **INITIAL REVIEW RECOMMENDATION I.10.**

A comprehensive examination of data needs and mechanisms for information sharing should be conducted and involve the relevant state and local agencies. The Division should lead this effort, given the activities it has already conducted and the efforts underway to improve its data processing capabilities.

**CALIFORNIA RESPONSE:**

**DOGGR – The DOGGR’s WellStat data management system is used to manage monthly production and injection reports submitted by operators. The information includes a list of all active wells, production and injection volumes, production and injection days, pressures, etc. The information is posted monthly on the DOGGR’s web page and printed in the Annual Report.**

DOGGR is developing an Internet-based electronic bi-directional permitting system (ePermit) to streamline the permitting process. The ePermit is nearing completion and is being tested before releasing it to the oil and gas industry.

Furthermore, expansion of the WellStat data management system will include well permitting and field inspection data.

*SWRCB – Region 3 through the Guadalupe mitigation fund provided resources for the Santa Maria DOGGR office to obtain historic air photos of oil field operations for public, industry and agency access. The Bakersfield DOGGR office provides electronic database files on leases, sumps, and other oilfield information regularly to the Region 5 Fresno office*

**FOLLOW-UP REVIEW FINDING I.10**

This recommendation has been partially met: state agencies are making commendable progress in their data collection processes. However, a comprehensive examination of data needs and mechanisms for information sharing related to management of E&P wastes has not been conducted, and individual agencies are not now working with the other agencies to share data in order to fill specific data gaps. Pending state legislation would provide for a search of multiple state databases through one “portal,” and would add GIS capabilities. This legislation would also provide significant funding for this effort (\$3 million each year for three years).

**FOLLOW-UP REVIEW RECOMMENDATION I.10**

The review team recommends that state agencies continue to search for information sharing mechanisms in order to fill gaps in their individual data. (Guidelines 3.1.e and 4.2.8)

**INITIAL REVIEW FINDING I.11.**

*While some of the agencies involved in E&P waste regulation coordinate certain activities, the current level of coordination is not commensurate with the division of responsibilities among the agencies. Greater coordination is necessary to optimize resources and ensure consistent policy direction and enforcement. The need not only exists across agency lines, but within agencies, including RWQCBs.*

**INITIAL REVIEW RECOMMENDATION 1.11.**

*The review team recommends the continuation of streamlining and coordination efforts while retaining the substantive strengths of the various programs. IOGCC Guidance section 4.4.*

**CALIFORNIA RESPONSE:**

DOGGR – Communication among the DOGGR's district offices continues to deliver a coordinated program. Also, contacts between the DOGGR and other agencies have expanded.

SWRCB – State and Regional Board staff created a draft process to categorize contaminated soils.

Scientific peer review requirements and the need to pursue a formal rulemaking has kept the process draft.

#### **FOLLOW-UP REVIEW FINDING I.11**

The State agencies have made significant progress on this recommendation. There is currently much more day-to-day communication between the agencies than existed in 1993. In addition, some previous areas of duplication of agency responsibility have been eliminated. There have been specific improvements in four areas: roadmix authority and responsibility; oilspill reporting; the idle/orphaned well program; and emergency response.

#### **FOLLOW UP REVIEW RECOMMENDATION I.11**

Given the complexity of the California regulatory system, the review team recommends that the agencies continue streamlining and coordination efforts while retaining the substantive strengths of the various programs. (Guidelines 3.1.e and 4.4). See also Follow-up Review Finding and Recommendation 1.9a, above.

#### **INITIAL REVIEW FINDING I.12.**

*The 1982 MOU between DOGGR and SWRCB needs updating in areas, including, but not limited to, the coordination of activities involving drilling and other temporary pits.*

#### **INITIAL REVIEW RECOMMENDATION I.12.**

*The MOU between DOGGR and SWRCB should be revised and updated, closely following DOGGR's revisions of its pit rules and other relevant requirements. DOGGR should also consult with SWRCB and RWQCB staff regarding water quality issues to be addressed in its revised rules. IOGCC Guidance section 4.4.*

#### **CALIFORNIA RESPONSE:**

DOGGR – The DOGGR has discussed possible MOU revisions and other water-quality issues with the SWRCB and RWQCBs. An MOU between the DOGGR, SWRCB, and the Department of Fish and Game was developed to outline the procedures for modifying notification requirements for onshore drilling and production oil spills (Attachment 2).

Coordination between DOGGR and DTSC is needed because some E&P exempt wastes are regulated as hazardous waste in California. Areas of particular importance include the routine sharing of information, such as notification to DTSC when certain materials like oil-based drilling muds or solvents are used at a lease site, the sharing of inspection information related to waste management, and the gathering of information that can help DTSC ensure E&P wastes are classified appropriately as hazardous or nonhazardous.

#### **FOLLOW-UP REVIEW FINDING I.12**

This recommendation has been partially met. DOGGR, the SWRCB, and the RWQCB's discuss water quality issues on a frequent basis, or at least as the need arises. The agencies should be commended for the 1998 MOU between the DOGGR, SWRCB, and the Department of Fish and Game regarding requirements for onshore drilling and production oil spills. However, the "gray area" concerning workover and reserve pits/sumps between DOGGR and SWRCB and the RWQCB's discussed in Initial Review Recommendation I.1 still exists and is dealt with only in an informal fashion. For further discussion of this issue, see findings and recommendations concerning the technical criteria for pits in III. Technical Criteria (pp. 35-38, 42-43).

#### **INITIAL REVIEW FINDING I.13.**

*Greater coordination is needed between DTSC and DOGGR.*

#### **INITIAL REVIEW RECOMMENDATION I.13.**

*An MOU between DOGGR and DTSC should be prepared, outlining areas of coordinated activities. In addition, DOGGR should revise Section 1775(a) of its rules to reference DTSC requirements. IOGCC Guidance section 4.4.*

#### **CALIFORNIA RESPONSE:**

DOGGR – The DOGGR explored the possibility of developing an MOU between the agencies to address waste disposal of certain RCRA-exempt E&P hazardous wastes that could be injected in a Class II disposal well. Recently, however, the MOU was determined not necessary because most, if not all, RCRA-exempt E&P hazardous wastes that may be injected in a Class II disposal well are considered exempt from DTSC oversight. The exemption, Title 22 CCR, Section 66261.24, incorporates the federal exemption in 40 CFR 261.4, but with the following limitation: The exemption is valid if toxicity is determined solely due to TCLP. If toxicity is established by criteria other than TCLP, or if the waste meets other characteristics of hazardous waste (ignitability, corrosivity, reactivity), the exemption does not apply.

#### **FOLLOW-UP REVIEW FINDING I.13**

This recommendation has been substantially met. The purpose of the recommendation for amendment of Section 1775(a) would be better achieved with the "roadmap" recommended in Finding and Recommendation 1.9a. Although there has not been an MOU developed, there is

good communication between DOGGR and DTSC. While there is still the possibility for such an MOU, neither agency feels that there is a need to develop one at this time. The statutory division of jurisdiction is very clear and an MOU would likely not add anything to the relationship between the agencies.

#### **INITIAL REVIEW FINDING I.16**

*California's emphasis on the waste management hierarchy is one of the strengths of the regulatory program. Greater coordination is needed between all the agencies to achieve this important policy directive.*

#### **INITIAL REVIEW RECOMMENDATION I.16**

*The review team recommends that all agencies develop a mechanism to share information regarding source reduction, recycling, and treatment technologies applicable to E&P wastes. IWMB should encourage LEAs to incorporate these techniques into their waste management plans to complement DTSC program development. IOGCC Guidance sections 4.4 and 5.1e.*

#### **CALIFORNIA RESPONSE:**

**DOGGR – Further evaluation is necessary.**

#### **FOLLOW-UP REVIEW FINDING I.16**

The original finding is still applicable. See further discussion of waste management hierarchy in this section, below.

## **Supplemental Review Findings and Recommendations**

#### **GUIDELINE 3.2**

*...When establishing regulations and policies for E&P waste management, states should use the waste minimization hierarchy set forth in Section 5 to encourage waste minimization and source reduction.*

#### **SUPPLEMENTAL REVIEW FINDING I.1**

Section 5.3 of the Guidelines suggests that “the choice of an E&P waste management option should be based upon the following hierarchy of preference”:

- a. Source Reduction
- b. Recycling
- c. Treatment
- d. Proper Disposal

Unfortunately, the current Questionnaire For Follow-Up And Supplemental Review of state E&P waste management programs contains no questions relating specifically to this Guideline. The logical question to ask might be simply: “Describe your agency’s waste minimization hierarchy as set forth in Section 5 of the Guidelines.” Lacking a specific question, the review team considered responses to other portions of the Questionnaire and to questions asked during the follow-up review meetings.

Both DOGGR and SWRCB have mission statements and strategic plans that contain the goals and objectives of the State’s waste management programs, including E&P wastes. In addition, DOGGR includes technical criteria for E&P waste management practices in its Manual of Instructions (MOI),

while technical criteria for E&P waste management practices for SWRCB are contained in multiple formal documents. It is unclear whether or not a specific waste minimization hierarchy is included in any of the above noted documents or has been formally established by either of these agencies.

**Responses to questions during the follow-up review meetings clearly demonstrate that DOGGR and the RWQCBs increasingly include “beneficial use” (or recycling) as a significant waste management option. Examples include the re-use of produced water, clean drilling muds, clean oil, and “lightly contaminated” soils. However, Region 3 RWQCB in particular has encountered some difficulties along the way, particularly regarding reuse of lightly contaminated soils for road base. Region 3 believes that “lightly contaminated soils” have not been adequately defined and that appropriate engineering has not always been used in implementing some projects. To some degree this may be due to regional variances: for example, soils contaminated with KD distillate are a problem in Region 3, but apparently not a problem in Region 5. WSPA (industry association) and state and local agencies have developed a road-mix protocol for Region 5. Region 3 says it is interested in developing a road-mix protocol, but the KD distillate issue complicates matters. Also see Follow-up Review Finding I.16, above (p.16).**

#### *SUPPLEMENTAL REVIEW RECOMMENDATION I.1*

DOGGR, SWRCB and the RWQCBs should establish formal waste management hierarchies as set forth in Section 5.3 of the Guidelines to encourage waste minimization and source reduction. These hierarchies should then be integrated into the normal waste management programs of each agency. These agencies, along with DTSC and IWMB, should continue to explore ways to work cooperatively in these efforts. (Guideline 3.2).

## II. Administrative Criteria (Guidelines Section 4)

### Follow-up to Initial Review Recommendations

#### INITIAL REVIEW FINDING I.18.

*Given the primary role the RWQCBs assume in regulating E&P wastes, resource deficiencies in those agencies impair the effectiveness of E&P waste regulation, generally. Since general revenues are not a likely source of additional funds, other sources of agency funding must be examined to alleviate current shortfalls. In particular, the discharge fees are now capped by statute at \$10,000 for the largest facilities. This cap prevents the RWQCBs from recouping the actual cost of issuing WDRs for very large and complex facilities, and forces SWRCB to raise the fees for smaller dischargers, resulting in disproportional fee allocations.*

#### INITIAL REVIEW RECOMMENDATION I.18.

*SWRCB should obtain the resources necessary to fully discharge its responsibilities. One option is to remove or raise the statutory cap on discharger fees, so that SWRCB may restructure its fee system to improve its equity and cure substantial resource shortcomings. IOGCC Guidance section 4.3.2.*

#### CALIFORNIA RESPONSE:

*SWRCB – Region 5 Fresno has allocated 2-3 staff annually to the resolution of oilfield issues. The Governor has proposed raising the cap on discharger fees. However, additional program funding would not be available.*

#### FOLLOW-UP REVIEW FINDING I.18

While staffing and funding seems to vary from region to region, the fact remains that SWRCB has not obtained the necessary resources to meet this recommendation. In addition, there is currently a state government hiring freeze in effect.

#### FOLLOW-UP REVIEW RECOMMENDATION I.18

The review team recommends that the SWRCB continue efforts to obtain and/or allocate the resources necessary to fully discharge its responsibilities. (Guidelines 3.1.d, 4.3.1, and 4.3.2).

#### INITIAL REVIEW FINDING I.19.

*A significant number of production pits have not received WDRs from the RWQCBs due to resource shortfalls. While the operators of these pits are subject to basin plan and Chapter 15*

*requirements, their actual permits or approvals to operate are decades old, and RWQCBs cannot verify whether they are in compliance. Landspreading operations may not be receiving applicable WDRs, either. The review team believes this backlog in WDR issuance is a very serious program deficiency that warrants priority attention.*

**INITIAL REVIEW RECOMMENDATION I.19.**

*Facilities without WDRs should be evaluated and issued WDRs as soon as possible. Additional resources should be devoted to this task if necessary to complete the work. IOGCC Guidance sections 4.1. and 5.3.2.a.*

**CALIFORNIA RESPONSE:**

*SWRCB – Regions have made progress toward this recommendation. Region 3 has entered into a MOU with Santa Barbara County to implement part of this requirement but Region 3 is unaware of substantial activity related to this recommendation.*

*Resources in Region 5 Fresno are focused on resolving outdated WDRs in the region. As a result numerous sumps have been closed, disposal converted to injection wells, and the WDRs rescinded. New WDRs for facilities subject to Title 27 (not in compliance with Basin Plan limitations) contain time schedules to come into compliance and generally choose to close rather than construct lined sumps and groundwater monitoring wells. Others have opted to conduct a site-specific hydro-geologic study to describe conditions, or have determined that the wastewater meets Basin Plan numerical limitations, which to date have resulted in adoption of several Non-Chapter 15 WDRs where no particular threat to groundwater is perceived but monitoring of the facility operations and wastewater characteristics are appropriate.*

**FOLLOW-UP REVIEW FINDING I.19**

*See Follow-up Review Finding and Recommendation II.7, below (p. 23).*

**INITIAL REVIEW FINDING I.20.**

*Thirteen in-house attorneys provide legal advice to State/Regional Water Boards. When litigation is commenced, the Boards rely upon the Attorney General's office. SWRCB staff indicated resource constraints at the Attorney General's office can produce delays in conducting necessary litigation.*

**INITIAL REVIEW RECOMMENDATION I.20.**

*Additional legal support through the Attorney General's office, or other means, should be provided to address delays in conducting litigation. IOGCC Guidance section 4.3.1.2.*

**CALIFORNIA RESPONSE:**

SWRCB – Region 3 has used the Attorney General’s staff at the Guadalupe oil field and the large spill between the tank battery and ship loading facility at Avila Beach. Region 5 Fresno has no issues. SWRCB legal staff has increased.

**FOLLOW-UP REVIEW FINDING I.20**

This recommendation has been met. The situation has apparently improved. The SWRCB has sufficient legal staffing. However, water board attorneys cannot litigate, so the boards must rely on the Attorney General’s office to pursue legal action. While the review team was told by one agency official that there is “not enough staff at the Attorney General’s office,” there were no specific instances cited where this created problems for the water boards.

**INITIAL REVIEW FINDING I.21.**

*The training programs of DOGGR and the Water Boards are positive features of their E&P waste programs. However, those training programs tend to focus on only their own programs, ignoring the interrelationship between their programs and the requirements of other state and local agencies. Moreover, DTSC, APCD, LEA and relevant county personnel, should be provided training that covers the complete picture of E&P waste management. In short, personnel training is an important area where greater coordination is required.*

**INITIAL REVIEW RECOMMENDATION I.21.**

*Cross-training should be provided for those officials substantially involved in the regulation of E&P wastes. IOGCC Guidance section 4.4.*

**CALIFORNIA RESPONSE:**

**DOGGR – In 1994, the DOGGR conducted a broad-based workshop that included the SWRCB, DTSC, and other state and federal agencies. This effort was funded through the IOGCC/DOE.**

*SWRCB – Region 3 has some cross-training with Santa Barbara County and the Santa Maria DOGGR office, but none with DTSC, APCD or the LEA.*

**FOLLOW-UP REVIEW FINDING I.21**

This recommendation has been largely met. DOGGR describes the 1994 workshop as effective. However, there are still concerns over funding future workshops and training sessions.

**FOLLOW-UP REVIEW RECOMMENDATION I.21**

The review team recommends that the agencies continue to provide inter-agency training as funding is available. (Guidelines 3.1.d, 4.3.1, 4.3.1.3, 4.3.1.5, and 4.4).

**INITIAL REVIEW FINDING I.22.**

*Resources devoted to E&P waste activities, particularly at the field level, are not always proportional to agency responsibilities. For example, DOGGR's field presence is at a more appropriate level than RWQCBs, even though RWQCBs bear a larger permitting and enforcement role in regulating E&P wastes.*

**INITIAL REVIEW RECOMMENDATION I.22.**

*In addition to revising the MOU with SWRCB, as discussed previously, DOGGR should explore with the various affected state and local agencies, including APCDs, LEAs, DTSC and county governments, mechanisms by which DOGGR inspectors can provide information and reporting of suspected violations to these agencies. IOGCC Guidance section 4.4.*

**CALIFORNIA RESPONSE:**

**DOGGR – The DOGGR has a number of MOUs with other state and federal agencies (see Attachment).**

*SWRCB – Region 5 Fresno staff interacts on a regular basis regarding complaints, enforcement and inspections with DOGGR field inspectors with the Bakersfield and Coalinga offices; the field staff with the BLM office in Bakersfield; US F&WS and California F&G staff; and occasionally with APCD, LEAs and DTSC.*

**FOLLOW-UP REVIEW FINDING I.22**

This recommendation has been met. DOGGR inspectors provide information and reporting of suspected violations to other jurisdictional agencies.

**INITIAL REVIEW FINDING II.4.**

*DOGGR is currently reviewing its program and may request legislation to strengthen operator financial assurance requirements.*

**INITIAL REVIEW RECOMMENDATION II.4.**

*The review team encourages DOGGR to undertake a comprehensive review of its financial assurance program to determine if it is adequate to provide an incentive for proper plugging of a well and reclamation of a site. IOGCC Guidance section 4.2.3.*

#### **CALIFORNIA RESPONSE:**

**DOGGR – Legislation was passed in 1998 that gave operators a set of options to cover the liability for their long-term idle wells. First, an operator could take out a \$1 million blanket bond to cover all its operations, including idle wells. Second, operators could choose to pay the annual idle well fee, but on an increased scale reflecting relative hazard potential: a per well fee would be \$100 for wells idle less than 10 years; \$250 for wells idle 10-15 years; and \$500 for wells idle for more than 15 years. Third, operators may take out a \$5,000 bond for each individual idle well; fourth, operators may establish an escrow account for each idle well that must be worth \$5,000 after 10 years (any interest earned in the escrow account will be returned to the operator); and fifth, operators may establish an idle-well management plan that requires operators to eliminate a certain percentage of long-term idle wells (10 years or longer) on an annual basis. For purposes of the plan, eliminate means to return to production, plug and abandon (clean-up), or turn that well into an injection or observation well. An operator choosing the plan option would not be subject to any additional idle well fees or bonding requirements. If the operator failed to meet the annual goals outlined in its plan, the operator would immediately be required to secure idle well bonds or establish an escrow account for the wells.**

**The DOGGR also increased bonding amounts for active wells by \$5,000. Individual well bonds increased to \$15,000 for wells less than 5,000 feet in depth; \$20,000 for wells between 5,000 and 10,000 feet; and \$30,000 for wells in excess of 10,000 feet. Furthermore, the blanket bond amount was increased to \$250,000 for operators with more than 50 wells. The 1998 change was necessary to ensure adequate funding for continued plugging and abandoning operations because costs had increased. The previous rates were established in statute in 1976.**

#### **FOLLOW-UP REVIEW FINDING II.4**

This recommendation has been met. DOGGR completed the review of its financial assurance program, and obtained legislation defining plugging liabilities and establishing new financial assurance requirements. Over time, increased costs and other developments may necessitate further adjustments in the financial assurance requirements. See also Supplemental Review Finding IV.4 (p. 52).

#### **FOLLOW-UP REVIEW RECOMENDATION II.4**

DOGGR should periodically review the amount of financial assurance required to determine if it is adequate to provide incentive for proper plugging of a well and reclamation of a site, and to assure proper management of E&P wastes. (Guidelines 4.2.4. and 6.4).

#### **INITIAL REVIEW FINDING II.5.**

*RWQCBs do not have a permit (WDR) application guidance document to assist an operator in determining the information needed for a "complete" application. RWQCBs encourage*

*applicants to hold a pre-application meeting with their staff to identify the required information.*

**INITIAL REVIEW RECOMMENDATION II.5.**

*The team recommends RWQCBs develop a WDR application guidance document to help expedite the permitting process. IOGCC Guidance section 4.2.2.2.*

**CALIFORNIA RESPONSE:**

*SWRCB – No general guidance specific to E&P exists.*

**FOLLOW-UP REVIEW FINDING II.5**

This recommendation has not been met, however, no further action is recommended at this time. Given the relatively small number of E&P activities requiring a WDR, the development of an application guidance document is not a high priority for the SWRCB or the RWQCBs. The need for guidance is met through telephone communications and pre-application meetings between the applicant and the RWQCB staff.

**INITIAL REVIEW FINDING II.7.**

*Due to resource constraints, some discharges do not have WDRs issued by RWQCBs. These discharges may be in violation of basin plans or Chapter 15 requirements.*

**INITIAL REVIEW RECOMMENDATION II.7.**

*The review team recommends RWQCBs evaluate and issue WDRs for all discharges subject to their permitting authority. IOGCC Guidance sections 4.1.1. and 5.3.2.*

**CALIFORNIA RESPONSE:**

**SWRCB – There are not enough resources to implement this recommendation at Region 3 or 5.**

**FOLLOW-UP REVIEW FINDING II.7**

Region 5 has redirected resources to meet this recommendation. As a result, the backlog of WDRs in Region 5 has been reduced from 300 to 125. Little has changed in Region 3 in response to the recommendation. Region 3 reports having only four pending applications for WDRs, but many others may be required for remediation and restoration projects. E&P waste issues such as the remediation of abandoned sumps and the beneficial use of contaminated soils appear to be straining Region 3's resources.

**FOLLOW-UP REVIEW RECOMMENDATION II.7**

All regions should evaluate and issue timely and appropriate WDRs for the E&P activities subject to their permitting authority. The SWRCB should ensure that the RWQCBs address E&P waste

management activities in their annual work plans and that the RWQCB budgets provide the necessary staffing and other resources to meet work plan commitments related to E&P activities. (Guidelines 4.1.1. and 5.5.2.)

**INITIAL REVIEW FINDING II.9.**

*DOGGR is empowered to deny permits or permit renewals based on the compliance history of the applicant.*

**INITIAL REVIEW RECOMMENDATION II.9.**

*The review team recommends DTSC and SWRCB obtain statutory authority to deny permits based on compliance history. IOGCC Guidance section 4.1.1.*

**CALIFORNIA RESPONSE:**

**SWRCB – Regions 3 and 5 are unaware of any activity related to this recommendation.**

**DTSC – DTSC checks compliance history before issuing permits and may deny permits based on compliance history. DTSC also coordinates with sister agencies on compliance issues during the permitting process.**

**FOLLOW-UP REVIEW FINDING II.9**

The intent of this recommendation has been met. Both the SWRCB and DTSC reported that they have authority to deny an application based upon the applicant's compliance history.

**INITIAL REVIEW FINDING II.10.**

*The review team found a need for all permitting agencies to access the compliance history of an applicant from the other agencies.*

**INITIAL REVIEW RECOMMENDATION II.10.**

*The review team recommends regulations be revised or a mechanism be established to enable a permitting agency to access compliance histories from other agencies when evaluating a permit application. IOGCC Guidance section 4.1.1.*

**CALIFORNIA RESPONSE:**

**DOGGR – This information is available from the DOGGR, which, upon request, will research its files for the inquiring agency.**

*SWRCB – Region 3 is unaware of any activity related to this recommendation except incidental conversations with the Department of Fish & Game. Region 5 Fresno staff works closely with the DOGGR offices and the US BLM regarding these issues. SWRCB database on permitting and enforcement is public information and therefore available to other agencies at their request.*

**FOLLOW-UP REVIEW FINDING II.10**

This recommendation has been met. Mechanisms exist for the interagency exchange of information on the compliance history of E&P operators. DOGGR, BLM and at least one RWQCB routinely share such information with one another.

**INITIAL REVIEW FINDING II.13.**

*Permits (WDRs) issued by RWQCBs are valid for the life of the discharge; however, they are reviewed and may be revised on a fixed schedule, or when the nature of the discharge has changed. The fixed review schedule is based on risk and is seen by the team as an effective use of limited manpower resources. Lack of resources has prevented RWQCBs from reviewing all WDRs according to schedule.*

**INITIAL REVIEW RECOMMENDATION II.13.**

*The team recommends SWRCB seek the necessary resources from the legislature or use some other mechanism to enable RWQCBs to evaluate all existing WDRs according to their schedule. IOGCC Guidance section 4.1.1. WDRs for commercial or centralized facilities should be issued for a fixed term and reviewed at least once every five years. IOGCC Guidance section 5.7.2.1.a.*

**CALIFORNIA RESPONSE:**

*SWRCB – WDRs are reviewed in accordance with a fixed schedule of 5, 10, and 15 years based on threat to water quality.*

**FOLLOW-UP REVIEW FINDING II.13**

The resource issue raised in this recommendation is addressed in Follow-up Review Finding and Recommendation II.7 above (p. 23).

As for the schedule of reviews for centralized and commercial facilities, the RWQCBs review all WDRs periodically. WDRs are reviewed on a 5-, 10-, or 15-year schedule, depending on the risk category of the facility. The SWRCB rules establish the risk categories.

Though the review process does not precisely follow the Guidelines with respect to review of commercial and centralized waste management facilities, the RWQCBs have articulated a rational basis for believing that their approach to the periodic review of WDRs protects the waters of the state. The state therefore meets the Guidelines criteria.

**INITIAL REVIEW FINDING II.14**

*Permits issued by DTSC are valid for ten years.*

**INITIAL REVIEW RECOMMENDATION II.14**

*The review team recommends that DTSC review and revise, if necessary, commercial hazardous waste facility permits at least once every five years. IOGCC Guidance section 4.1.1.*

**CALIFORNIA RESPONSE:**

**DTSC – RCRA hazardous waste permits issued are valid for ten years, with a five year review by DTSC.**

**FOLLOW-UP REVIEW FINDING II.14**

This recommendation has been met. DTSC permits for hazardous waste facilities are valid for ten years with a five-year review. This provision also meets Guideline 4.1.1.

**INITIAL REVIEW FINDING II.15.**

*The review team is concerned that the lack of resources at RWQCBs, and the 120 day provision, may result in discharges which pose a threat to human health or the environment.*

**INITIAL REVIEW RECOMMENDATION II.15.**

*The review team recommends SWRCB seek adequate resources from the legislature or use some other mechanism to enable RWQCBs to process applications for WDRs in a timely manner. IOGCC Guidance section 4.1.1.*

**CALIFORNIA RESPONSE:**

**SWRCB – Region 3 has attempted unsuccessfully to augment. Region 5 Fresno has been able to process applications for WDRs relating to the oilfield industry in a timely manner.**

**FOLLOW-UP REVIEW FINDING II.15**

See Follow-up Review Findings and Recommendations I.18 and II.7, above (pp. 18, 23).

**INITIAL REVIEW FINDING IV.6.**

*Records of E&P waste activities are maintained for at least three years as suggested in IOGCC Guidance section 4.2.2.1. However, SWRCB's statutes and regulations do not provide for extension of this time for any reason.*

**INITIAL REVIEW RECOMMENDATION IV.6.**

*SWRCB should adopt regulations whereby the minimum recordkeeping time for operators is automatically extended while any unresolved enforcement action regarding the regulated activity is pending. IOGCC Guidance section 4.2.2.1.*

**CALIFORNIA RESPONSE:**

*SWRCB – Regions 3 and 5 are unaware of any activity related to this recommendation.*

**FOLLOW-UP REVIEW FINDING IV.6**

This recommendation goes beyond the scope of the Guidelines in addressing the record-retention requirements for operators. The SWRCB and RWQCBs maintain their records indefinitely in satisfaction of the record-retention provisions of the Guidelines.

**INITIAL REVIEW FINDING IV.8.**

*The agencies make use of ad hoc advisory groups to address specific issues or activities. In addition, SWRCB uses staff workshops for the development of certain issues.*

**INITIAL REVIEW RECOMMENDATION IV.8.**

*The agencies should use advisory groups of industry, government, and public representatives to obtain input and feedback on the effectiveness of the E&P waste management programs. Provision should be made for education or training, as appropriate, to provide the advisory groups with a sound basis for performing their functions. IOGCC Guidance section 4.2.2.3.*

**CALIFORNIA RESPONSE:**

*SWRCB – Region 3's attempts to meet with the industry during their regular meetings with the local DOGGR staff and Santa Barbara County staff have been unsuccessful. Region 3 staff has met with government and public members about orphaned sumps, but industry was not represented.*

*For Region 5 Fresno, see Recommendation 1.9a.*

**FOLLOW-UP REVIEW FINDING IV.8**

This recommendation has not been met, and is not likely to be met, because neither the State nor the agencies are going to commit the resources to support a standing advisory committee for program review. However, the agencies continue to use ad hoc committees and work groups to address issues such as idle wells, spill reporting, and roadspreading. The membership of these committees includes state and federal agencies, industry, and interested citizens. The CEQA also provides opportunity for public participation in the assessment and mitigation of environmental impacts of proposed projects. In addition, California volunteered for review of its programs under both the STRONGER State Review Process and the GWPC UIC Peer Review Process.

**INITIAL REVIEW FINDING V.2.**

*Spills reported to OES must also be reported to various other agencies, depending on the circumstances. The statutory and regulatory reporting requirements are complex and*

*sometimes inconsistent. Also, the timing and content of the reports vary from agency to agency and from case-to-case.*

**INITIAL REVIEW RECOMMENDATION V.2.**

*The State of California should review its spill and release notification requirements and revise them as necessary for clarification and consistency. To the extent possible, the notification requirements should be simplified and streamlined. IOGCC Guidance section 4.4.*

**CALIFORNIA RESPONSE:**

**DOGGR – In 1994, the Office of Emergency Services (OES) was statutorily designated as the central reporting point in the State for spill reporting. In turn, OES notifies the proper regulatory agencies. In 1996, legislation was passed to address the oil spill threshold reporting requirements and simplify reporting. This legislation was a product of a Cal-EPA regulatory reform effort.**

*SWRCB – Region 3 contacts other agencies to assess details of OES reports. Region 5 Fresno has implemented the new Oilfield Spill Reporting Rules which in effect have reduced the number of minor spill reporting incidents to OES by the industry. OES reports all spill reports received to all interested agencies via fax. Staff responds as appropriate, and involves other appropriate agencies such as, BLM, F&G or USF&WS.*

**FOLLOW-UP REVIEW FINDING V.2**

This recommendation has been met. Since the initial review, the state has designated the Office of Emergency Services (OES) as the agency responsible for receiving all spill reports. OES in turn notifies affected regulatory agencies. The state has also reviewed and revised the threshold for San Joaquin Valley oil spill reporting.

**INITIAL REVIEW FINDING V.3.**

*DOGGR is the only agency keeping a complete computerized database of spill incidents.*

**INITIAL REVIEW RECOMMENDATION V.3.**

*The state should establish a computerized database or expand the existing databases to facilitate the sharing and analysis of information on spills of oil and E&P waste for prevention and planning purposes. These capabilities would enable the state agencies to identify problem areas warranting additional preventive measures, and provide information and assistance to operators concerning the use of technologies to reduce leaks and spills. IOGCC Guidance section 4.2.7.*

**CALIFORNIA RESPONSE:**

DOGGR – The OES maintains a comprehensive database to record and store all reported emergencies, including oil spills. The DOGGR, Department of Fish and Game's Office of Oil Spill Prevention and Response (OSPR), State Lands Commission's (SLC) Mineral Resource Management and Marine Facilities Management Divisions, California Coastal Commission, and the State Fire

Marshal formed a committee to coordinate statewide development of a comprehensive database of oil spill information. The committee recommended that OSPR develop a database and post the information on its web page.

The DOGGR maintains a spill database and provides the information upon request.

### **FOLLOW-UP REVIEW FINDING V.3**

This recommendation has not been met. The OES receives comprehensive data on spill volumes, materials, locations, sources, and causes. A committee of the various state agencies involved in spill prevention and response has discussed creating an oil-spill database and making this data available over the Internet. This committee has not met in recent years.

### **FOLLOW-UP REVIEW RECOMMENDATION V.3**

To support cost-effective, risk-based decisions and to provide data useful in evaluating program performance, the state agencies are encouraged to resume their efforts to develop a web-based system for the oil-spill data reported to the OES, and to provide the information in another usable format on request. (Guideline 4.2.8.)

### **INITIAL REVIEW FINDING VII.1**

*None of the state agencies have waste hauler certification programs for training drivers of trucks that transport non-hazardous E&P wastes to commercial and/or centralized disposal facilities.*

### **INITIAL REVIEW RECOMMENDATION VII.1**

*The review team recommends an appropriate state agency develop waste hauler certification programs for training drivers of trucks that include emphasis on proper record-keeping, the need to deliver the waste to the designated facility, and emergency response and notification procedures. An appropriate agency should have the authority to require the registration of all vehicles used to transport non-hazardous E&P waste and of all non-hazardous E&P waste haulers. IOGCC Guidance section 4.2.4.*

### **CALIFORNIA RESPONSE:**

**No response.**

### **FOLLOW-UP REVIEW FINDING VII.1**

This recommendation has not been met. Waste hauling vehicles are required to be registered by the California Department of Transportation. Training programs exist for haulers of hazardous wastes. There is, however, no specific training program for E&P non-hazardous waste haulers.

### **FOLLOW-UP REVIEW RECOMMENDATION VII.1**

The appropriate agency or agencies of the State of California should meet the requirements of section 4.2.5. of the Guidelines with regard to training of drivers and certification of waste haulers.

## **INITIAL REVIEW FINDING VII.2**

*None of the state agencies have a waste tracking program or a comparable alternative method to document the movement of non-hazardous E&P wastes from the site of origin to final disposition at commercial or centralized disposal facilities. Rather, the agencies rely on the operators of such facilities to keep any records that may be necessary for their own protection.*

## **INITIAL REVIEW RECOMMENDATION VII.2**

*The review team recommends an appropriate state agency develop a waste tracking program or comparable alternative method for tracking the transportation of non-hazardous E&P wastes from well sites to commercial or centralized disposal facilities. The waste generator, waste hauler, and operator of the disposal facility should retain, and make available for inspection, all necessary waste tracking information for a minimum of three years from the date of shipment. IOGCC Guidance sections 4.2.5 and 5.7.2.3.*

## **CALIFORNIA RESPONSE:**

**No response.**

## **FOLLOW-UP REVIEW FINDING VII.2**

Although DOGGR tracks the disposal of Class II fluids at commercial disposal facilities, other non-hazardous E&P wastes are not tracked by any state agency.

## **FOLLOW-UP REVIEW RECOMMENDATION VII.2**

The appropriate agency or agencies of the State of California should meet the requirements of section 4.2.6 and 5.10.2.3 of the Guidelines with regard to waste tracking.

## **INITIAL REVIEW FINDING VIII.1.**

*The data management capabilities of the various state agencies generally meet all criteria of the IOGCC Guidance.*

## **INITIAL REVIEW RECOMMENDATION VIII.1.**

*The review team recommends agencies responsible for E&P waste management in California consider development and implementation of an interagency data management program. The system should include the necessary data elements (i.e., permitting, operating, monitoring, and compliance information) to make cost-effective, risk-based management decisions. The ability to sort and track E&P waste volumes by waste type, and to perform spill analyses from appropriate data, would enhance the program. IOGCC Guidance section 4.2.7.*

## **CALIFORNIA RESPONSE:**

**DOGGR – See response to RECOMMENDATION I.10.**

## **FOLLOW-UP REVIEW FINDING VIII.1**

This recommendation has not been specifically met. The projected development and maintenance costs make the recommended interagency database infeasible at this time. However, the agencies' individual efforts to develop integrated data management systems with GIS capabilities will essentially meet the intent of the recommendation.

DOGGR has made great strides in automating its record keeping and other business processes and in posting data on its website. DOGGR needs additional programming support to complete its ePermit system and to fully integrate the district office databases. It also needs funding to scan

the files and logs on the state's 187,000 wells and make the resulting images available over the Internet.

The SWRCB is currently seeking funding to integrate its data management systems and scan its hard-copy files.

**FOLLOW-UP REVIEW RECOMMENDATION VIII.1**

To support cost-effective, risk-based decisions and provide data useful in evaluating program performance, DOGGR and SWRCB are encouraged to continue their efforts to develop management systems for their E&P waste data that incorporate ePermitting functions, GIS

capabilities and images of hard-copy files. (Guideline 4.2.8.) Also see Follow-up Review Finding and Recommendation I.10.

**INITIAL REVIEW FINDING IX.1.**

*While RWQCBs have broad authority to inspect a facility at any time, their normal procedure includes contacting a facility in advance to scheduled inspections. This practice could lead to failure to detect improper discharges inconsistent with the facilities' waste discharge requirements (WDR).*

**INITIAL REVIEW RECOMMENDATION IX.1.**

*The review team recommends that RWQCBs use both announced and unannounced inspections. IOGCC Guidance section 4.1.2.1.e.*

**CALIFORNIA RESPONSE:**

*SWRCB – Regions 3 & 5 have always used both announced and unannounced inspections.*

**FOLLOW-UP REVIEW FINDING IX.1**

This recommendation has been met.

**INITIAL REVIEW FINDING X.1.**

*IWMB lacks authority to assess administrative penalties.*

**INITIAL REVIEW RECOMMENDATION X.1.**

*The review team recommends IWMB seek authority to assess administrative penalties and develop a mechanism for calculating penalties. IOGCC Guidance section 4.1.3.*

**CALIFORNIA RESPONSE:**

**None.**

**FOLLOW-UP REVIEW FINDING X.1**

IWMB has not responded to inquiries concerning its response to this recommendation.

**FOLLOW-UP REVIEW RECOMMENDATION X.1**

If it has not already done so, IWMB should seek authority to assess administrative penalties and develop a mechanism for calculating penalties. Guideline 4.1.3

**Supplemental Review Findings and Recommendations**

**GUIDELINE 4.1.1**

*Where the operator responsible for E&P waste management changes, state requirements should address the new operator's financial responsibility and compliance history.*

**SUPPLEMENTAL REVIEW FINDING II.1a**

In California, a change of operator is treated similarly to an application for a new operation. DOGGR, SWRCB and RWQCBs therefore have authority to deny transfer of existing or issuance of new permits based on financial responsibility and compliance history, consistent with Guideline 4.1.1.

**GUIDELINE 4.1.1**

*An effective state program should provide that a state permit does not relieve the operator of the obligation to comply with federal, local, or other state permits or regulatory requirements.*

**SUPPLEMENTAL REVIEW FINDING II.1b**

The State of California meets the provision of Section 4.1.1 of the guidelines concerning an operator's obligation to comply with all applicable federal, state, or local regulatory requirements. A permit from one state agency in California does not relieve the operator of the obligation to comply with the regulatory requirements of other state agencies, federal agencies, or local governments. The state and federal agencies and local governments in California coordinate their E&P waste management activities to ensure that applicable requirements are met.

**GUIDELINE 4.2.1.1.a**

*The state should develop and adopt a state contingency plan for responding to spills and releases. The plan should define the volume of a spill or release of a petroleum product or waste which triggers implementation of the spill contingency plan and response requirements as well as the types of spills and/or releases covered by the program requirements, the time in which notification and subsequent clean-up should occur, and guidance or criteria relating to final remedial verification provisions to ensure that appropriate remediation has been accomplished.*

**SUPPLEMENTAL REVIEW FINDING II.2**

The State of California's oil spill contingency plan defines the types and volumes of spills that trigger the plan, sets time limits for notification and cleanup, and provides cleanup standards. This plan meets or exceeds Section 4.2.1.1.a of the guidelines.

**GUIDELINE 4.2.1.1.b**

*The state contingency plan should also contain funding provisions which enable the state agency to undertake immediate response actions for significant spills or releases which constitute a threat to human health or the environment in the event that a responsible operator cannot be located or is unwilling or unable to respond to the spill or release. In addition, state program requirements should contain provisions allowing the state agency to pursue a responsible operator for reimbursement for state monies expended in responding to such a spill or release.*

**SUPPLEMENTAL REVIEW FINDING II.3**

Both DOGGR and SWRCB have access to funds that may be used to control, contain, or cleanup a spill that threatens human health or the environment in the event the responsible operator does not respond. The Office of Oil Spill Prevention and Response in the Department of Fish and Game also has access to emergency response funds. The California spill contingency program meets Section 4.2.1.1.b of the guidelines.

**GUIDELINE 4.2.3**

*States should have a sound regulatory development process which includes both short-term and long-term strategic planning for defining goals and objectives, setting priorities, and evaluating the effectiveness of the E&P waste management program. In formulating waste management regulations, states should use the best available scientific and technical information and should consider the economic and energy impacts of the regulations.*

**SUPPLEMENTAL REVIEW FINDING II.4**

Both DOGGR and SWRCB have mission statements and strategic plans that contain both short-term and long-term goals and objectives for the state's E&P waste management programs. The RWQCBs also prepare basin water quality plans that constitute tactical plans for accomplishment of specific objectives. On the whole, the strategic plans establish targets for completion of identified activities, and do a good job of tracking tasks. In addition, DOGGR includes technical criteria for E&P waste management practices in its MOI, while technical criteria for E&P waste management practices for SWRCB are contained in multiple formal documents.

However, the SWRCB strategic plan appears to be driven from the top down. It is unclear how the RWQCBs are involved in the strategic planning process. And for all the agencies it is also unclear that the planning processes provide for evaluation of the effectiveness of the E&P waste management program.

**SUPPLEMENTAL REVIEW RECOMMENDATION II.4**

In order to evaluate whether the E&P waste management program is meeting the goal of protecting human health and the environment, DOGGR, the SWRCB and the RWQCBs should more fully integrate performance measures into their strategic planning processes. (Guidelines 3.2, 8.1, and 4.2.3).

The SWRCB should more fully involve the RWQCBs in the strategic planning process. (Guidelines 3.2, 8.1, and 4.2.3).

See also Supplemental Review Findings and Recommendations in VI. Performance Measures (pp. 63-64).

**GUIDELINE 4.2.4**

*In the case of commercial and centralized facilities as defined in section 5.10, including those that manage oil-field NORM, state financial assurance requirements should be sufficient to cover the costs of appropriate facility decontamination, reclamation, and closure, and should extend through any post-closure care, monitoring, or control period.*

**SUPPLEMENTAL REVIEW FINDING II.5**

Under RWQCB requirements, the operator must demonstrate financial assurance for corrective actions for known or reasonably foreseeable releases from the site and for the closure and post-closure maintenance of the site where closed with wastes remaining in place in accordance with an approved closure/post-closure plan developed by the operator. California meets the requirements of Guideline 4.2.4.

**GUIDELINE 4.2.8.1**

*States should develop policies for data access, data dissemination, and the allocation of cost of services to governmental and non-governmental users.*

**SUPPLEMENTAL REVIEW FINDING II.7**

The data management policies of the various State agencies generally meet the criteria of the Guidelines.

**GUIDELINE 4.2.8.3**

*Agencies should provide for the capture of data and images as appropriate, and for both protecting the quality of data collected and the long-term protection and backup of captured information through measures such as off-site duplicate storage, archiving, and/or data retention and destruction policies. Agencies should consider including public outreach and industry data support in their data management systems.*

*Most program data are available to the public under various sunshine rules. Some records may be retained as confidential files for a defined period of time. Certain confidential types of data may also be discoverable. States should develop policies that define data sets to be made available to the public and/or industry.*

**SUPPLEMENTAL REVIEW FINDING II.8**

California State agencies have policies for the collection, protection, archiving and back-up of captured data, and that information is available pursuant to California Public Records Act. Also see Follow-up Review Findings and Recommendations I.10 and VIII.1 (pp. 13, 29).

### **III. Technical Criteria (Guidelines Section 5)**

#### **Follow-up to Initial Review Recommendations**

##### **INITIAL REVIEW FINDING I.4.**

*DTSC lacks current information on the types and quantities of E&P wastes considered hazardous under California law.*

##### **INITIAL REVIEW RECOMMENDATION I.4.**

*DTSC should conduct field sampling activities and review available data to verify generator waste classifications and obtain better information on the waste types that may trigger a hazardous waste designation. IOGCC Guidance section 5.1.f.*

##### **CALIFORNIA RESPONSE:**

SWRCB – In March 2000, DTSC and Region 5 Fresno staff collected approximately 40 wastewater and sludge samples from 15-18 ponds at 6-7 of the facilities operated by Valley Waste Disposal in western Kern County. No hazardous constituents or concentrations were determined present.

##### **FOLLOW-UP REVIEW FINDING I.4**

DTSC has partially met the recommendation in that DTSC did conduct field sampling activities to obtain better information. However, analysis of this information is still in draft form, and it would be difficult to term this study as “exhaustive.” DTSC has information on types of E&P wastes considered hazardous through the waste manifest information system.

##### **FOLLOW-UP REVIEW RECOMMENDATION I.4**

The review team recommends that DTSC review the waste manifest information already provided by generators, obtain waste characterization information already collected by operators, and conduct additional field sampling if necessary for assessment and use in waste classification and implementation of the state waste management program. (Guideline 5.2.2.a)

##### **INITIAL REVIEW FINDING I.14.**

*A consistent policy on roadspreading of E&P wastes is needed across all the affected agencies.*

##### **INITIAL REVIEW RECOMMENDATION I.14.**

Cal-EPA should establish a task force or use another mechanism to examine whether and under what circumstances the roadspreading of nonhazardous E&P wastes should be allowed. Representatives from DTSC, CARB, State/Regional Water Boards, the Division, APCDs, and LEAs should be involved and the results should include recommendations to the various agencies for consistent rules or policies protecting the various environmental media.

##### **CALIFORNIA RESPONSE:**

DOGGR – The Cal-EPA E&P Regulatory Reform Task Force formed a Roadmix Working Group to respond to the recommendation. The group's objective was to find the best approach for regulatory oversight of the industry's practice of reusing crude oil tank bottoms and similar substances as road paving materials, commonly referred to as "road mix". The Working Group included representatives from the DOGGR, Western States Petroleum Association, CalResources, McFarland Energy, Chevron, the SWRCB, Central Valley RWQCB, DTSC, IWMB, San Joaquin Valley Unified Air Pollution Control District, and the Air Resources Board (CARB).

The working group met over a two-year period and developed short- and long-range plans. The first goal of the working group was to determine the appropriate regulatory oversight for roadmix application in the San Joaquin Valley. The minimum oversight requirements for the waste, water, and air agencies were assessed next. A report was produced that serves as a basis to determine where roadmix may be used.

*SWRCB – Regions 3 and 5 have dealt with this issue, without the involvement of other agencies. Region 5 Fresno has had no adverse impacts to water quality as a result of the application of off-spec road mix.*

**FOLLOW-UP REVIEW FINDING I.14**

This recommendation has been met in Region 5. See further discussion under Finding and Recommendation VI.12, below.

**INITIAL REVIEW FINDING I.15.**

*While the Chapter 15 SWRCB rules provide procedural requirements for the closure of these pits, there is no consistent policy in place regarding how the production pits should be closed.*

**INITIAL REVIEW RECOMMENDATION I.15.**

*The relevant RWQCBs should develop a consistent policy governing the closure of production pits. (See also Section VI of this report.) IOGCC Guidance section 4.4.*

**CALIFORNIA RESPONSE:**

*SWRCB – Within Region 5 Fresno, the BLM closure guidelines have been applied by industry with relative success in reducing the number of sources of wastewater surface disposal that threaten the waters of the state.*

**FOLLOW-UP REVIEW FINDING I.15**

Region 5 RWQCB has met the recommendation by informally adopting BLM standards, while Region 3 RWQCB has not. Region 5 has not formally adopted the BLM standards for a variety of reasons, including lack of flexibility to address individual site differences and inability of small operators to subsume the costs. However, the door is still open to formal adoption of the BLM standards in Region 5. In Region 3, in Santa Barbara County most pit closures are handled by the County Fire Department Protective Services Division (PSD); in the other counties in the region the RWQCB is the lead agency. In those counties there are abandoned sumps on private property, but there is very limited funding to address them. Region 3 is currently in the process of inventorying these sites, some of which pose a threat to water quality.

**FOLLOW-UP REVIEW RECOMMENDATION I.15**

The team recommends that both Region 3 and Region 5 formally adopt the BLM standards for pit closure or develop their own pit/sump closure guidelines. (Guidelines 3.1.a, b, d, and e, and 4.4).

**INITIAL REVIEW FINDING III.1.**

*DOGGR is currently revisiting its pit rules, and the revisions being considered include siting restrictions. Simultaneously, the SWRCB is reviewing siting issues for mud pits that are exempt from regulation under Chapter 15. DOGGR and SWRCB are consulting and coordinating with one another in these efforts.*

**INITIAL REVIEW RECOMMENDATION III.1.**

*The review team encourages these efforts and urges DOGGR and SWRCB to address pit siting issues such as fluid makeup; depth to and quality of groundwater; floodplains; wetlands; surface contours; and proximity to drinking water supplies and wells, surface water, residential or commercial buildings, geologic hazards, or other environmentally sensitive areas. IOGCC Guidance section 5.3.3.*

**CALIFORNIA RESPONSE:**

**SWRCB – The SWRCB is the primary regulatory authority for pits but has not established minimum standards for exempt Chapter 15 pits because it has been shown that they are not a significant threat to groundwater. The DOGGR does not wish to pursue overlapping regulations.**

#### **FOLLOW-UP REVIEW FINDING III.1**

*The objective of this recommendation has been met. The DOGGR and RWQCBs have evaluated the need for further regulations pertaining to pit siting issues. Based on their evaluation they decided no further regulation was necessary. See also the discussion of technical criteria for pits, below.*

#### **INITIAL REVIEW FINDING VI.4**

*Technical criteria for mud and workover pit construction and operation are lacking.*

#### **INITIAL REVIEW RECOMMENDATION VI.4.**

*The review team recommends DOGGR establish minimum standards for the construction and operation of mud and workover pits exempt from Chapter 15 requirements, including inspection requirements. The team understands DOGGR and SWRCB are developing rules to address these issues, and endorses these activities. IOGCC Guidance section 5.1.a and 5.1.c.*

#### **CALIFORNIA RESPONSE:**

**DOGGR – Section 1779 of CCR provides the DOGGR with broad powers to establish additional requirements for facilities or operations under its jurisdiction.**

#### **FOLLOW-UP REVIEW FINDING VI.4**

This recommendation has not been met. The state has specific technical criteria in place for construction of the following types of pits: reserve pits, production pits (which would include skimming and settling pits), produced water pits, evaporation pits, blowdown pits, flare pits, emergency pits and workover pits. However, siting and operational criteria for reserve (mud) and workover pits are lacking.

#### **FOLLOW-UP REVIEW RECOMMENDATION VI.4**

The review team believes the construction criteria for the above listed pits are adequate. The State should develop criteria for siting and operation of reserve and workover pits. (Guidelines 5.1.a and 5.1.c).

#### **INITIAL REVIEW FINDING VI.9.**

*There are no consistent RWQCB requirements for E&P waste facilities.*

#### **INITIAL REVIEW RECOMMENDATION VI.9.**

*The RWQCBs should develop consistent technical criteria for similar waste stream and site conditions. IOGCC Guidance section 5.3.6.*

#### **CALIFORNIA RESPONSE:**

*SWRCB – The RWQCB soil disposal workgroup developed recommendations. However, because the recommendations are not in regulation RWQCB's must take individual actions.*

**FOLLOW-UP REVIEW FINDING VI.9**

This recommendation has not been met. However, E&P waste facilities are subject to numerous State and local regulations including regulations pertaining to air impacts, land surface impacts, impacts to water and impacts to groundwater. They are also subject to local zoning ordinances regulating where and how they can be constructed. Because of the site specific nature of E&P waste facilities and unique nature of most waste streams the review team believes the development of uniform RWQCB requirements is not necessary.

**INITIAL REVIEW FINDING VI.10.**

*There are no established time limits for mud and workover pits regulated by DOGGR, although, their informal policy is to require closure within 30 days of completion of work.*

**INITIAL REVIEW RECOMMENDATION VI.10.**

*The team recommends DOGGR formalize its closure policy in order to meet IOGCC Guidelines. IOGCC Guidance section 5.3.6.b.*

**CALIFORNIA RESPONSE:**

DOGGR – The Division has no formal time frame for closure of pits, other than within 60 days of plugging and abandonment of an associated well. This issue has not been a problem because most operators close pits quickly to obtain release of drilling bonds. Also, many local land-use agency permits have time constraints.

**FOLLOW-UP REVIEW FINDING VI.10**

This recommendation is generally met in practice. Closure of pits in many areas of the state is regulated by local agencies, such as the county or city, and on federal lands by the BLM. In those areas of the state where pit closures are not otherwise regulated most operators close pits quickly in order to obtain release of their drilling bonds. DOGGR reports that pit closures are not a problem.

**FOLLOW-UP REVIEW RECOMMENDATION VI.10**

The team recommends the DOGGR adopt regulations establishing specific requirements for pit closure consistent with Guideline 5.5.5.b.

**INITIAL REVIEW FINDING VI.11.**

*There are no requirements for an operator to submit analyses of mud pit and workover pit residuals left in earthen pits to DOGGR. Operators are required to analyze representative samples, and self-certify that the pit contents are nonhazardous and do not contain halogenated solvents.*

**INITIAL REVIEW RECOMMENDATION VI.11.**

*The team recommends the pending DOGGR pit rule revisions address representative sampling requirements for pH, organic content, salinity, hydrogen sulfide content, and ignitability. IOGCC Guidance section 5.1.f.*

**CALIFORNIA RESPONSE:**

DOGGR – Although the DOGGR has the authority to request the sampling of pits for content identification, the DOGGR regulations specifically require pit operators to comply with SWRCB requirements for the testing, management, and closure of pits.

**FOLLOW-UP REVIEW FINDING VI.11**

The objectives of this recommendation have been met by SWRCB requirements. Although the DOGGR has not established requirements for the testing of mud and workover pit residuals, the SWRCB has established such requirements. They require the operator to analyze representative samples to ensure they are non-hazardous under California testing criteria and that they do not contain halogenated organics. The current state requirements are consistent with Guideline 5.5.5.c.

**INITIAL REVIEW FINDING VI.12.**

*A consistent policy for landspreading, roadspreading, and roadmixing of E&P wastes is needed across all affected agencies.*

**INITIAL REVIEW RECOMMENDATION VI.12.**

The review team recommends RWQCBs, DTSC, DOGGR, and APCDs develop a landspreading and roadspreading/roadmix policy and enforcement mechanism. Such a policy should require representative material analysis and appropriate operational controls. Use of maps to track roadspreading and roadmix applications is a good idea. IOGCC Guidance sections 5.4. and 5.6. FINDING VIII.1.

**CALIFORNIA RESPONSE:**

**DOGGR – See response to RECOMMENDATION I.14.**

SWRCB – The Regions have attempted to develop guidelines. Region 3 is unaware of any Cal-EPA activity related to this recommendation. Region 5 requires sampling and material analysis and other information regarding requests for roadmixing.

**FOLLOW-UP REVIEW FINDING VI.12**

*This recommendation has been met. The Cal-EPA E&P Regulatory Reform Task Force formed a Roadmix Working Group which developed guidelines for the use of hydrocarbon bearing*

materials (such as tank bottoms and soils) as roadmix. The review team commends the joint agency/industry task force for development of the roadmix guidelines. The roadmix guidelines have been adopted in Region 5. Landspreading of any E&P wastes and roadspreading of any material other than that which meets the requirements of roadmix is subject to RWQCB WDR requirements.

#### **FOLLOW-UP REVIEW RECOMMENDATION VI.12**

*The Team encourages the SWRCB to consider adopting the roadmix guidelines state-wide, with flexibility to address regional conditions. (Guideline 5.8.1).*

## **Supplemental Review Findings and Recommendations**

### **GUIDELINE 5.1 – General**

- e. Siting Criteria (New subsection)*
  - i. States should incorporate siting requirements in statewide rules for pits, landspreading, landfilling and burial, and waste reclamation facilities. Areawide rules or site-specific permits may contain additional siting conditions.*
  - ii. No E&P waste management facility should be located in a flowing or intermittent stream.*
  - iii. Where necessary to protect human health, new E&P waste management facilities should not be located in close proximity to existing residences, schools, hospitals or commercial buildings. The need for minimum distance criteria from residences or other buildings to the boundary of E&P waste management facilities should be considered.*
  - iv. Generally, applicable siting requirements should address such factors as depth to and quality of groundwater, wetlands, floodplains, topography, proximity to existing drinking water supplies and wells, geology, geologic hazards, and other environmentally sensitive areas.*
  - v. Siting of E&P waste management facilities should be consistent with applicable land-use requirements.*

### **SUPPLEMENTAL REVIEW FINDING III.1**

In addition to the oversight provided by the DOGGR and SWRCB, other state and regional agencies also regulate the siting of E&P waste management facilities including the Department of Toxic Substances Control (DTSC) and the Integrated Waste Management Board (IWMB) at the state level, air pollution control districts (APCD) at the regional level, and local planning agencies. Few distinctions are made between onsite, offsite and commercial facilities used to manage E&P wastes.

The review team finds the siting of E&P waste management facilities in California generally meets the requirements of Guideline 5.1

## **5.2 WASTE CHARACTERIZATION (New section)**

### **GUIDELINE 5.2.1 - Purposes**

*Waste characterization should support at least the following functions of a state's E&P waste management program:*

- a. ensuring E&P waste management practices are suited to the particular wastes involved and in compliance with applicable program requirements; and*
- b. ensuring commercial E&P waste facilities are managing only wastes they are authorized to*

handle.

#### **GUIDELINE 5.2.2 – Sampling and Analysis**

- a. *State waste characterization requirements should include appropriate testing of E&P wastes prior to disposal for such characteristics as organic content, pH, salinity, and sulfur compounds, including hydrogen sulfide content. Testing must be appropriate for the type of waste, method of disposal, and the potential for adverse health and environmental effects. In addition, while nothing in these criteria mandates testing for every hazardous constituent in E&P wastes, it is recognized that waste management practices and regulatory requirements would be improved by obtaining a more complete knowledge, through sampling and analysis, of the range of hazardous and toxic constituents in E&P wastes. Accordingly, waste characterization requirements should provide data necessary to meet the purposes of waste characterization described in section 5.2.1 and to administer and enforce state program requirements effectively.*
- b. *State requirements for the assessment of E&P wastes for Naturally Occurring Radioactive Material (NORM) should meet the criteria of this section and of sections 7.3.3. and 7.3.9. Such requirements should address all types of radiation expected in E&P wastes.*
- c. *These guidelines do not address all the details of a waste characterization program, such as testing methods, frequencies, or parameters. The details are expected to vary depending upon the waste, the proposed management practice, and other state program requirements.*

#### **GUIDELINE 5.2.3 – Quality Control**

- a. *State programs should contain provisions that any required waste sampling follow appropriate sampling procedures, and any required laboratory analysis be performed by qualified laboratories in order to produce valid and reliable results. A state may rely on field testing to satisfy waste characterization requirements where it can be determined that such testing will produce valid and reliable results.*
- b. *Testing methods should produce data that are valid for the purpose intended. For example, EPA's Toxicity Characteristic Leaching Procedure (TCLP) may not accurately predict the leachability of oily E&P wastes.*

#### **SUPPLEMENTAL REVIEW FINDING III.2**

E&P wastes in California are not necessarily exempt from the state hazardous waste regulations and are managed as hazardous if they exhibit one or more of the hazardous waste characteristics (ignitability, reactivity, corrosivity or toxicity) as defined by the DTSC. Disposal of NORM contaminated material is regulated by the Department of Health Services and when the waste is injected in a Class II well by DOGGR. The placement of all wastes on the ground is regulated by regional water quality control boards. UIC Class II wastes are regulated by DOGGR. Each agency establishes testing procedures as part of their permitting process for the disposal of wastes. The State program is consistent with Guideline 5.2. See also Follow-up Review Finding and Recommendation I.4 (p. 34).

#### **GUIDELINE 5.3 – WASTE MANAGEMENT HEIRARCHY**

### **GUIDELINE 5.3.3 – State program elements**

*State programs should contain mechanisms to encourage waste management consistent with the hierarchy of this section. A variety of mechanisms may be used, such as:*

- a. Program requirements or policies that encourage source reduction and recycling;*
- b. Improved training of state personnel so they can identify source reduction opportunities;*
- c. Technical assistance or incentives to operators; and*
- d. Educational activities aimed at informing facility operators of the options available.*

*The waste management hierarchy should be integrated into the other elements of a state program. For example, spill and release prevention should be incorporated into facility management regulations. Similarly, state requirements should address the segregation of waste streams that have a higher pollution potential from those with a lower pollution potential. State information program elements should include a component related to hierarchy planning and implementation.*

*State program planning activities should include goals and objectives that provide for substantial progress in this area over a reasonable time. States should have sufficient information to evaluate whether the mechanisms used to encourage source reduction and recycling are achieving those goals and objectives. State program requirements should be reviewed for consistency with the waste management hierarchy and the established goals and objectives. State agencies should also coordinate their efforts with other agencies that are responsible for waste management.*

### **SUPPLEMENTAL REVIEW FINDING III.3**

See Supplemental Review Finding I.1 (p. 16).

### **SUPPLEMENTAL REVIEW RECOMMENDATION III.3**

The state agencies should continue to explore mechanisms for encouraging waste management consistent with the hierarchy. They should also establish goals and objectives that provide for substantial progress in this area over a reasonable time. (Guideline 5.3.3.)

### **GUIDELINE 5.5 – TECHNICAL CRITERIA FOR PITS (Amended sections)**

#### **GUIDELINE 5.5.2.d, 5.5.2.e**

- .....
- d. Construction and use of rule-authorized pits should require prior notification of the appropriate regulatory agency to ensure that proper construction, operation, and closure methods are used to protect human health and the environment.*
  - e. State programs should include provisions to accommodate approval of pits for emergency situations.*

### **SUPPLEMENTAL REVIEW FINDING III.4**

In some areas of the state there is no requirement to notify an agency prior to the construction and operation of reserve, workover or emergency pits.

### **SUPPLEMENTAL REVIEW RECOMMENDATION III.4**

The review team recommends DOGGR consider developing regulations requiring notification prior to the construction and operation of reserve, workover and emergency pits. (Guidelines 5.5.2.d., 5.5.2.e).

### **GUIDELINE 5.5.3**

*General standards for construction of pits should be included in area or statewide regulations and should address the following items:*

- e. Construction standards for pits may differ depending upon the wastes they receive, the length of time they are used, and site-specific conditions.*
- i. The use of production pits is declining nationally because of concerns about potential contamination of air, soils, and groundwater. In many instances, equipment consolidation, process modifications, or tanks can be used in lieu of pits. The use of alternatives is generally encouraged. Where production pits are used, they should generally be lined, except as provided below in subsection 5.5.3.e.v.*
- ii. In the case of reserve and workover pits, liners should be required in certain instances based upon fluid type and site-specific characteristics (e.g., unconsolidated soils and/or hydrogeologic conditions that create a potential for adverse impact to surface water or groundwater, and proximity to environmentally sensitive areas).*
- iii. Special purpose pits and other pits such as dehydration, tank drain, pipeline drip collector, and compressor scrubber pits should be lined.*
- iv. Blowdown, flare and emergency pits may be unlined where the removal requirement of section 5.5.4.k. will prevent adverse groundwater quality impacts.*
- v. Variances to the above liner requirements should only be provided, and percolation pits should only be used, where it is clearly demonstrated there is minimal potential to affect adversely groundwater quality.*
- vi. Liners can consist of natural or synthetic materials, should meet accepted engineering practices, and should be compatible with expected pit contents.*

### **SUPPLEMENTAL REVIEW FINDING III.5**

Pit construction is regulated jointly by DOGGR and the regional water boards. The California program meets the Guidelines for pit construction standards.

### **GUIDELINE 5.6 – TECHNICAL CRITERIA FOR LANDSPREADING (Amended sections)**

#### **GUIDELINE 5.6.1.a**

- a. E&P wastes should be subject to loading rates, location restrictions, and/or other appropriate requirements that promote biodegradation of organic constituents; will not result in waste pooling, ponding, or runoff; will prevent the contamination of groundwater or surface waters; and will protect air quality.*

### **SUPPLEMENTAL REVIEW FINDING III.6**

Landspreading operations are subject to the requirements of CCR Titles 23 and 27. All placement of E&P wastes on the ground for purposes of disposal requires issuance of a WDR by the RWQCB. In most areas of the state landspreading of E&P wastes would also be subject to county or city oversight. Local Air Pollution Control Districts (APCDs) regulate all sources of emissions, including hydrocarbon emissions for landspreading operations. The California program meets the Guidelines.

### **GUIDELINE 5.8 – TECHNICAL CRITERIA FOR ROADSPREADING (Amended sections)**

#### **GUIDELINE 5.8.1**

*Roadspreading is the placement on roads of E&P wastes that exhibit properties similar to commercial road oils, mixes, dust suppressants, or road compaction or deicing materials. Roadspreading of E&P wastes that do not exhibit such properties should be prohibited. Roadspreading of E&P wastes containing NORM above regulatory action levels should be prohibited.*

#### **SUPPLEMENTAL REVIEW FINDING III.7**

The California program for roadspreading meets the Guideline requirements as outlined under Follow-up Review Finding and Recommendations VI.I2 (p. 39).

#### **GUIDELINE 5.9 - TECHNICAL CRITERIA FOR TANKS (New section)**

##### **GUIDELINE 5.9.2 – General Requirements**

- a. *States should have information, where available, on the locations, use, capacity, age and construction materials (e.g., steel, fiberglass, etc.) of tanks as needed to administer and enforce state program requirements effectively. Such information may be obtained through registrations, inventories, or other appropriate means.*
- b. *Tanks covered by this section should not be located in a flowing or intermittent stream and should be sited consistent with applicable local land-use requirements.*
- c. *Tanks should be subject to spill-prevention, preventive maintenance and inspection requirements, including those of sections 5.3.1.c. and 5.3.3. of these guidelines.*

##### **GUIDELINE 5.9.3 – Construction and Operation**

- a. *A principal goal of construction and operation standards for tanks is to minimize the occurrence of and the environmental impacts from spills and leaks.*
  - i. *New tanks should be constructed in a manner that provides for corrosion protection consistent with the intended use of the tanks. All tanks covered by this section should be operated in a manner that provides for corrosion protection consistent with the use of the tanks.*
  - ii. *Tanks should exhibit structural integrity consistent with their intended use. Wooden tanks should receive increased scrutiny in this regard.*
  - iii. *Tanks should be operated in a manner that protects against overtopping.*
  - iv. *Secondary containment systems or other appropriate means, such as leak detection, should be employed to minimize environmental impacts in the event of releases.*
- b. *Covered tanks are preferred to open tanks. Open E&P waste and product tanks should be equipped to protect migratory birds and other wildlife in a manner consistent with the wildlife-protection criterion of section 5.5.3.f.*
- c. *Tanks located in populated areas where emissions of hydrogen sulfide can be expected should be equipped with appropriate warning devices.*

##### **GUIDELINE 5.9.4 – Tank Removal and Closure**

- a. *Tanks should be emptied prior to their retirement and the resulting materials should be managed properly.*
- b. *Tanks and associated above ground equipment should be removed upon cessation of operations. For good cause, a state may allow tanks to be removed as soon as practical thereafter. Site reclamation should meet all landowner and lease obligations and any other applicable requirements.*

- c. *Prior to removal, closure, or release for unrestricted use, tanks and associated piping and equipment should be surveyed for NORM as provided for in Sec.7. When regulatory action levels are exceeded, NORM and the equipment containing NORM should be managed in accordance with the state's NORM regulatory program (see Section 7 of these guidelines).*

#### **SUPPLEMENTAL REVIEW FINDING III.8**

Local air districts have completed inventories of E&P waste tanks containing materials that emit VOCs. DOGGR has adopted regulations for secondary containment, leak detection, and periodic inspection and has completed an inventory of tanks. Local emergency response agencies have location and inventory information for all tanks containing listed hazardous substances including hydrocarbons and other E&P wastes. Local APCD regulations address the potential emissions of H<sub>2</sub>S. (Guideline 5.9.3.c.) The extent to which California specifically regulates construction and operation of all E&P waste tanks is unclear. The combination of state and local agency oversight of E&P waste tanks meets the requirements of Guidelines 5.9.2.b and c.

#### **SUPPLEMENTAL REVIEW RECOMMENDATION III.8**

The review team recommends that DOGGR evaluate the need for further regulation of tank construction and operation, and the need to acquire information on the location, use, capacity, age and construction materials of E&P waste tanks. See Guidelines 5.9.2.a and 5.9.3.

### **GUIDELINE 5.10 – TECHNICAL CRITERIA FOR COMMERCIAL AND CENTRALIZED DISPOSAL FACILITIES (Amended sections)**

#### **GUIDELINE 5.10.2.2.d**

- d. *Operating Plan ..... The need for groundwater, air, or other monitoring at commercial or centralized disposal facilities where wastes are placed on the land should be evaluated by the state as part of this program development and implementation, and should depend upon the nature and size of the disposal activities. At facilities that manage oil-field NORM, monitoring should be sufficient to determine compliance with maximum permissible doses to workers and to members of the public in unrestricted areas. The Operating Plan should contain the following information:*
  - iii..... *At commercial and centralized facilities where wastes are placed on the land, such as in pits or landfarms, groundwater monitoring should be required in the absence of site-specific or facility-specific conditions that minimize the potential for adverse impacts to groundwater. Specific plans for preventing or minimizing air emissions from sources such as (1) the volatilization of organic materials in the waste; (2) particulate matter (dust) carried by the wind; and (3) chemical reactions (e.g., production of hydrogen sulfide from sulfur-bearing wastes) should be considered. ...*
  - ix. *A community relations or public information plan should be considered; and*
  - x. *Environmental, Health, and Safety Plan. Where applicable, an environmental, health, and safety plan should be developed for commercial disposal facilities. Such plan should describe site sampling methods and procedures to determine the potential risks to human health and the environment posed by the site. State regulatory programs should take into consideration the size and nature (treatment and disposal processes) of each facility when determining whether or not this environmental, health, and safety plan is applicable.*

**SUPPLEMENTAL REVIEW FINDING III.9**

The state program to permit commercial Class II injection sites and E&P waste management facilities meets the siting requirements of Guideline 5.10.2.2.d.

**GUIDELINE 5.10.2.2 e ii**

*e.... ii. For commercial disposal facilities and centralized disposal facilities of comparable nature or size, the plan should describe the site sampling methods that will be used to determine the risks to human health and the environment posed by the site, if any, once closure is completed; and any further measures that may be necessary to address the remaining site contamination at that time. The plan should also include post-closure monitoring and maintenance requirements where the wastes remaining on-site after closure may adversely affect groundwater or surface waters or otherwise pose a risk to human health and the environment. The duration of the post-closure care period and the nature of the post-closure requirements should correspond to the continuing risks posed by the facility after closure.*

**GUIDELINE 5.10.2.3**

*To assure that only acceptable wastes are disposed of at commercial or centralized facilities, a waste tracking system that documents the movement of wastes from the site of their origin to their final disposition should be implemented. The following elements should be included in the waste tracking system:*

*c. Attest to No Illegal Dumping: ....The disposal facility operator should certify in writing that the facility is authorized to receive the waste for disposal.*

**SUPPLEMENTAL REVIEW FINDING III.10**

No state agency requires the centralized/commercial facility operator to certify in writing that the facility is authorized to receive the waste for disposal.

**SUPPLEMENTAL REVIEW RECOMMENDATION III.10**

The appropriate agency or agencies of the State of California should meet the requirements of section 5.10.2.3.c of the Guidelines. See also Follow-up Finding and Recommendation VII.2 (p. 29).

## **IV. Abandoned Sites (Guideline Section 6 – All New)**

### **Follow-up to Initial Review Recommendations**

#### **INITIAL REVIEW FINDING I.24.**

*While \$350,000 per year is a substantial sum for an abandoned well program and is a positive feature of DOGGR's program, additional resources will be required to complete the plugging program within a reasonable time frame.*

#### **INITIAL REVIEW RECOMMENDATION I.24.**

*Although outside the scope of the IOGCC Guidelines, DOGGR should obtain the necessary resources to complete the plugging program within a reasonable time frame.*

#### **CALIFORNIA RESPONSE:**

**DOGGR – Since the peer review, the DOGGR worked for and received authority to increase the yearly plugging and abandonment fund. In 1994, the fund increased from \$350,000 to \$500,000. In 1998, the annual funding amount increased to \$1 million, for a 5-year duration.**

**Also, the Division organized an orphaned/idle well committee, comprised of industry, DOGGR, and BLM representatives. The committee has been very proactive in developing new legislation that should reduce significantly the number of orphaned wells in the state.**

#### **FOLLOW-UP REVIEW FINDING I.24**

Although outside the scope of the initial review, this recommendation has been met under the current Guidelines.

### **Supplemental Review Findings and Recommendations**

#### **GUIDELINE 6.1 – ABANDONED OIL AND GAS SITES INTRODUCTION**

*States with current or historic oil and gas operations should develop and implement a program to inventory, prioritize, and remediate, as necessary, abandoned sites. The purpose of this section is to provide guidance for that program. It is not the intent of these Guidelines to preclude an abandoned site from being returned to operation in accordance with state requirements.*

#### **DISCUSSION**

California has developed and implemented a program to inventory, prioritize, and plug, as necessary idle and orphaned wells. DOGGR has responsibility for idle and orphaned wells and abandoned sites associated with wells. The RWQCBs have responsibility for abandoned sites that have the potential to impact water quality. DOGGR determined that it needed to enhance its idle and orphaned well programs because of increased well or environmental damage, an increased number of orphaned wells, and a plugging liability of about \$7 million. Increases resulted from economic downturns, oil company reorganizations, and at times permissive state laws. For instance, there were 20,732 wells idle 5 years or longer in 1997 up from 12,043 in 1983; 11,222 wells idle 10 years or longer in 1997 up from 8,778 in 1988; yet 4,984 wells idle 15 years or longer in 1997 down from 5,061 in 1991. There are a total of 700 plus wells that are orphaned

wells. DOGGR would need 10 years to complete its program if no new wells are added. DOGGR is now, and has been for some time, aggressively identifying idle wells and plugging orphaned wells.

DOGGR's three sources of funding for plugging wells are bonds (an operator may be defunct, but a bond may still be in force), the hazardous and idle-deserted well fund (currently set at \$1 million), and the special fund which is derived from the idle well fees collected by the DOGGR. These funding mechanisms may be used to plug hazardous and idle-deserted wells or orphaned wells.

#### **SUPPLEMENTAL REVIEW FINDING IV.1**

The Review Team was very pleased with DOGGR's overall idle and orphaned well program. The RWQCBs have no comparable program, however, for abandoned sites not associated with a well, including pits and sumps.

#### **SUPPLEMENTAL REVIEW RECOMMENDATION IV.1**

**The Review Team recommends that the RWQCBs, in coordination with local agencies, identify a process to develop a statewide inventory of abandoned sites. The state should also develop a funding mechanism to allow RWQCBs to promptly remediate abandoned sites. When an abandoned sites program is established, a system for setting goals and prioritizing remediation should be developed. The program should include remediation standards that minimize or remove the threat to public health and the environment and that restore the land to an appropriate condition.**

#### **GUIDELINE 6.2 - DEFINITIONS**

*The terms "Oil and Gas Site" and "Abandoned Site," as used herein, have the following meanings:*

- a. An Oil and Gas Site is land or equipment, including a wellbore, that is now or has been used primarily for oil or gas exploration or production, or for the management of oil and gas wastes from exploration and production.*
- b. An Oil and Gas Site is considered an Abandoned Site if the site:*
  - i. Was not adequately plugged or closed at conclusion of operations such that it constitutes or may constitute a threat to public health or the environment; and*
  - ii. Has no owner, operator, or other responsible person (hereinafter called "responsible party") who can be located, or such responsible party has failed or refused to undertake actions, where required by law, to abate the threat. A responsible party cannot be located, among other circumstances, where no liability for remedial actions is imposed by the state upon past or current owners and operators.*

#### **DISCUSSION**

Definitions are contained in Sections 3237, 3250, 3251, and 3251.5 of the PRC. Removal and disposal of tanks, pipelines, and other attendant facilities may be included in the idle and orphaned well program as well.

An idle well is defined as any well that has not produced or injected for 6 consecutive months of continuous operation during the last five years. A long-term idle well is defined as any well that has not produced or injected for six consecutive months of continuous operation during the last 10 or more years. An orphaned well is a well that has no viable operator or owner.

## **SUPPLEMENTAL REVIEW FINDING IV.2**

Definitions are clear and fully described in statute in accordance with Guideline 6.2.

### **GUIDELINE 6.3 - IDENTIFICATION OF ABANDONED SITES**

*A state should have a procedure for identifying sites which may constitute a threat to public health or the environment and for determining whether a responsible party exists. The state should develop and maintain an inventory of abandoned sites. Examples of elements that may be considered in identifying sites which may constitute a threat to public health or the environment include agency reviews or inspections, referrals by other agencies, or citizen or landowner inquiries. Classifications or rankings may be used to separate these sites into relative risk categories. Examples of elements that may be considered in determining whether a responsible party exists include the failure to file required data or reports, the failure to respond to agency inquiries, tax defaults, information in public records, or landowner or public inquiries. In developing an inventory of abandoned sites, the state should have procedures for attempting to notify the last known responsible party, and providing legal notice.*

*Emergency protocols should be included, so that remedial action can be initiated prior to legal notice on sites that are judged to present an immediate threat to the public health or environment. Where there are agencies with overlapping jurisdiction for abandoned sites, inventory procedures should be coordinated among these agencies as further discussed in section 4.4. of these guidelines.*

## **DISCUSSION**

DOGGR has a thorough procedure for identifying sites that may constitute a threat to public health and safety or the environment, and for determining whether a responsible party exists. To track the number of idle and orphaned wells in the state, the DOGGR has developed and maintains an inventory of idle and orphaned wells, which may be downloaded from the DOGGR web page. DOGGR determines the following quantities of wells and well types from the monthly Well Production and Injection Reports: # of wells operated, # of idle wells, # of long-term idle wells (both 10-year and 15-year inventories), and # of observation wells. When a new well is identified, it is prioritized into the list. DOGGR also responds to all referrals by other agencies and citizen complaints. Procedures are in place for attempting to notify the last known responsible party, and providing legal notice. In cases where there may be overlapping jurisdictions, agency activities are coordinated and emergency protocols are in place if instant remedial action is required.

However, the RWQCBs do not appear to maintain an inventory of abandoned sites not associated with wells. During the 70's and again in the 80's, the DOGGR and the Department of Fish and Game inventoried all hazardous sumps (those that pose a threat to the environment and public) and then remediated or closed the sumps. In addition, DOGGR has recorded every visible sump located in oilfields. The oilfield areas have been canvassed using over flights and field inspectors. However, the Region 3 RWQCB expressed concern over the potential numbers of abandoned sites not associated with wells. Often abandoned sites are found when a property is being sold for development purposes and undergoes detailed review of past and present practices as part of an environmental review. The actual buyer and seller often agree to remediate the site.

In large part, landowners bear the primary responsibility for identifying and remediating abandoned sites not associated with wells. When development projects are proposed to local governments, those local governments often forward the proposals to DOGGR for its review to determine whether oil and gas operations existed on the development site. In addition, developers

may employ firms to perform environmental assessments of properties before undertaking new projects. As indicated by RWQCB staff during the in-state reviews, these procedures are not always effective due to incomplete records, and development sometimes occurs on unremediated abandoned sites. Unremediated abandoned sites may present a problem in California since urban development is spreading into former production areas.

#### **SUPPLEMENTAL REVIEW FINDING IV.3**

There does not appear to be a specific inventory of abandoned sites not associated with wells, although some effort is being made in the central coastal region by DOGGR and RWQCB Region 3 to develop an air photo library as a means of identifying abandoned sites.

#### **SUPPLEMENTAL REVIEW RECOMMENDATION IV.3**

The local agency may wish to consider requiring the identification of a well or site as part of property deeds. See also Supplemental Review Recommendation IV.1 (p. 48).

#### **GUIDELINE 6.4 - FUNDING FOR ABANDONED SITE REMEDIATION**

*An effective state program to address abandoned sites should have adequate funds available to permit the state to undertake any necessary assessment, plugging, closure, or remediation of such sites.*

*Adequate funding involves the development of a financial assurance program as provided in section 4.2.4. To ensure the continuity of financial assurance in the event of a change of operator, notice to the state of any such change should be required. Any financial assurance provided by the previous operator should remain in effect until the new operator's compliance with the state's financial assurance program is verified.*

*Section 4.2.4. describes some of the types of financial assurance a state should consider in designing a program to provide it with the necessary economic resources while facilitating operator compliance. As part of a financial assurance program, a state should consider establishing a special purpose fund to plug, close, or remediate an abandoned site. The state should have the authority to recover costs from the responsible party, where such party exists. The state should evaluate its needs and establish such funding mechanisms as are appropriate to satisfy those needs. A wide variety of funding mechanisms have been employed to support existing special purpose funds in various states. Those mechanisms include bond forfeitures; legislative appropriations to the responsible state agency; a percentage of the taxes on oil and gas production; fines and penalty assessments; equipment salvage; and a host of fees, among them fees or charges based on the value of oil and gas, fees or charges based on units of production of oil and gas, operator fees, supplemental fees in lieu of bonds, inactive well fees, permit fees, and waste generation fees.*

#### **DISCUSSION**

In 1976, DOGGR was given authority to plug certain hazardous and idle-deserted wells (Article 4.2 of the PRC). Most of the wells that fall into this category are orphaned wells. From 1977 to 2002, the DOGGR plugged 768 wells at a total cost of \$10.9 million. The average cost to plug a well is about \$20,000. In the 1990's, well bonding requirements had become insufficient to provide for the DOGGR to plug orphaned wells.

Two pieces of legislation were passed to enhance DOGGR's ability to plug wells and ensure wells were addressed appropriately in the future: SB2007, effective January 1, 1997, and most

importantly SB1763, effective January 1, 1999. These pieces of legislation increased industry commitment to manage idle wells and assume a defined responsibility for idle wells, and made changes in the PRC on definitions, bonds, acquisition of idle wells, and idle well requirements, and increased.

Previously, where no operator could be located and the DOGGR had determined a well to be orphaned, statute identified a \$500,000 fund for the DOGGR to access in contracting for the plugging. In 1994, the Legislature had approved an increase from \$350,000 to \$500,000. The 1998 legislation increased the annual funding amount the DOGGR can spend for the plugging of orphaned wells from \$500,000 to \$1 million for 5 years (Section 3258). After five years, a Report to the Legislature must be prepared to describe the progress made in plugging orphaned wells and recommend any funding needs.

DOGGR has acknowledged that the inventory of orphaned wells is increasing in spite of the plugging progress. When the plugging fund for orphaned wells was increased from \$500,000 to \$1,000,000 in 1998, the state had 630 orphaned wells. Today, the State has almost 900 orphaned wells. Although DOGGR is plugging 65 to 85 wells per year, the number of wells orphaned each year continues to grow.

A list of prospective well abandonment contractors is maintained and companies on this list are sent bid packages when their services are needed by DOGGR to plug wells. The contract goes to lowest responsible bidder and salvaged equipment credit can offset costs.

In addition, the SWRCB maintains a State Water Cleanup and Abatement Account, which it can access to address abandoned pits and other E&P waste sites when a responsible party cannot be found. In the case of a hazardous surface condition, U.S.EPA may be requested to join DOGGR by paying for the surface clean up while DOGGR pays for the well plugging.

*The 1998 legislation also allowed the DOGGR to increase drilling bond amounts by \$5,000. Individual well bonds increased to \$15,000 for wells less than 5,000 feet in depth; \$20,000 for wells between 5,000 and 10,000 feet; and \$30,000 for wells in excess of 10,000 feet. The basis for this 1998 change was that plugging costs for a well had increased. The previous rates were established in statute in 1976. A drilling bond may be released after 6 months of continuous production.*

The DOGGR has a program to reduce the number of idle wells by encouraging operators to reactivate or plug and abandon their idle wells. Several options are provided for operators to cover the liability of their long-term idle wells. First, an operator could take out a \$1 million blanket bond to cover all their operations, blanket performance bonds of \$100,000 if less than 50 wells, or \$250,000 if greater than 50 wells, or \$100,000 cash blanket bonds for greater than 50 wells increased \$30,000/year for 5 years. Second, operators could choose to pay the annual idle-well fee, but on an increased scale reflecting relative hazards: for wells idle less than 10 years the fee is \$100; for wells idle 10-15 years the fee is \$250; and for wells idle for over 15 years, the fee is \$500. Third, operators may take out a \$5,000 bond for each individual idle well; fourth, operators may establish an escrow account for each idle well that must be worth \$5,000 after 10 years (any interest earned in the escrow account will be returned to the operator and the money is released when well is plugged or returned to service); and fifth, operators may establish an idle well management plan that requires operators to eliminate a certain percentage of long-term idle wells (10 years or longer) on an annual basis. For purposes of the plan, eliminate means to return to production, plug and abandon (clean-up), or turn that well into an injection or observation well.

An operator choosing the plan option would not be subject to any additional idle well fees or bonding requirements. If the operator failed to meet its annual goals for plan implementation, the operator would immediately be required to secure idle well bonds or establish an escrow account for the wells.

#### SUPPLEMENTAL REVIEW FINDING IV.4

**The State presently has adequate funds to cover orphaned well plugging. However, the State does not have a process for RWQCBs to easily obtain funds to remediate abandoned sites not associated with wells. Continuing the success of the orphaned well program may require additional financial resources. Although DOGGR has an aggressive orphaned well plugging program, targets are not being met as a result of particular wells requiring more funds than expected, slowing down the number of wells being plugged.**

#### SUPPLEMENTAL REVIEW RECOMMENDATION IV.4

The Review Team recommends that DOGGR evaluate the need to extend the \$1 million fund for plugging orphaned wells to an appropriate time in the future. The Team recommends that DOGGR evaluate its orphaned well performance targets and adjust them accordingly. DOGGR should also evaluate the causes of newly inventoried orphaned wells to determine whether new regulation is necessary to prevent wells from becoming orphaned. Even given the adjustments, the team is pleased with the progress made since the last review. The Team also recommends continuing good coordination with the federal BLM, which provides support and bonds for orphaned wells.

**The State should also develop a funding mechanism to allow RWQCBs to promptly remediate abandoned sites. When an abandoned sites program is established, a system for prioritizing remediation should be developed.**

#### **GUIDELINE 6.5 - CRITERIA FOR PRIORITIZING REMEDIATION**

*The state program should include criteria for determining whether an abandoned site constitutes a threat to public health or the environment and the site's priority for remediation. Among other things, the following criteria may be used: (1) the occurrence of or potential for an imminent release from the site; (2) the nature, extent, and degree of contamination; (3) the proximity of the site to populated areas, surface water, and/or groundwater; (4) whether the site is in an environmentally sensitive area; and (5) wellbore lithology and condition. Where appropriate, the state should perform a more detailed site evaluation. The state agency should have flexibility and discretion to consider the factors associated with the individual sites, including cost savings associated with simultaneous remediation of multiple sites that otherwise would have different priorities or similar financial considerations, in assigning them a priority on the inventory of abandoned sites.*

#### **DISCUSSION**

DOGGR prioritizes plugging taking under consideration sites that constitute a threat to public health or the environment, the occurrence or potential of release from the site, the degree of contamination, any environmental sensitivities or proximity to populated areas.

Wells that require formal action fall into two general categories: (a) damaging (section 3224, PRC) or deserted wells (Section 3237, PRC); and (b) hazardous or idle-deserted wells (sections 3250-3259, PRC). These wells may be either unbonded or bonded in varying amounts. The procedures for handling these two categories of wells differ slightly.

The DOGGR requires operators to file monthly electronic or hardcopy reports on well production and/or injection that are entered into the data management system (WellStat). Information available includes a list of all active production and injection wells, idle wells, volume injected, pressure, days producing or injecting, shut in, and the source of fluid (production records tell amount of fluid and disposition). The information is posted monthly on the DOGGR's web page and printed in the Annual Report.

Wells that are deemed hazardous have the highest priority for being plugged. These are followed by wells that are still bonded. The next priority is deserted wells the district deems necessary to plug, pending available funding. In 2001, the DOGGR spent \$850,000 to plug oil and gas wells of defunct operators.

#### **SUPPLEMENTAL REVIEW FINDING IV.5**

DOGGR's system for prioritizing well plugging meets the Guidelines requirements.

#### **GUIDELINE 6.5.1 - GOAL FOR REMEDIATION**

*A goal of the state program should be to remediate the abandoned sites on its inventory in a manner which assures that reasonable and measurable progress is made.*

#### **DISCUSSION**

DOGGR's program goal is to reduce California's orphaned well inventory and its current and potential well plugging financial and environmental liability through adequate financial assurances from California's long-term idle wells. In this manner, the state's resources and environment are protected from harm.

The object of the DOGGR's idle-well program is to elevate an operator's awareness of its idle-well inventory and return to production such wells or plug any idle wells that have no apparent future use. If the operator does not have specific plans for the well or wells, does not respond to DOGGR inquiries, has wells located in unstable terrain, or has junked holes, the wells are ordered plugged and abandoned.

Despite the DOGGR's idle well program and higher bonding levels to increase operator responsibility, a number of orphaned wells still remain.

DOGGR has set performance measurements to track progress against identified goals. Performance targets were 8% of the 630-well inventory in 1999, 24% in 2000, and 40% in 2001. At the time of the review, DOGGR was working on 25 wells and anticipating work on 33 more, totaling 58 in 2002. The target for 2002 is 56% (353 of 630), and actually performance at the end of 2002 is projected to be 42%.

Although DOGGR is below its target goals, there are legitimate reasons for the delay in reaching program goals including a contract overrun on a problem well; unanticipated emergency lease clean-up; budget uncertainties; and higher average well-plugging costs.

#### **SUPPLEMENTAL REVIEW FINDING IV.6**

DOGGR has identified plugging goals and has made significant progress in the plugging and management of idle and orphaned wells in all aspects. DOGGR has met the Guideline standard.

## **GUIDELINE 6.5.2 - LIABILITY FOR REMEDIATION**

*The state should establish a liability scheme that will ensure that the goals of its abandoned sites program will be achieved. States should consider a range of options with respect to liability for remediation, which may include among others: (1) liability for all current and past owner(s) and operator(s); (2) liability for the owner(s) and operators(s) found to be responsible for the contamination at an abandoned site; or (3) no liability for past or current owner(s) and operator(s) should the state choose to finance the abandoned sites program.*

*Any liability scheme established by a state should clearly define the responsibility for remediation. A state should allow remediation of an abandoned site by a party which would not otherwise be responsible for the remediation.*

## **DISCUSSION**

DOGGR has a liability scheme that clearly defines the responsibility for plugging.

The State's potential future liability for oil and gas wells is decreased by increased oil and gas well financial assurance requirements, a defined chain of responsibility for transferred wells, and incentives for an operator to rework an orphaned well in an attempt to regain production.

DOGGR maintains a list of orphaned wells that are available for adoption under the "adopt a well" program. The well list may be downloaded from the DOGGR web page. This program allows prospective operators to enter into a three-way agreement with DOGGR and the mineral owner to test an orphaned well for up to 90 days without incurring the liability for plugging the well or having to post a bond. If the test is successful, the prospective operator can adopt the well by posting a bond and become its permanent operator. An idle well that is put back into production gets a 10-year abatement of the "assessment." If the test is unsuccessful, the prospective operator can walk away from the agreement with no liability incurred.

Various circumstances including, failure of an operator to comply with the idle-well provisions of the PRC constitute conclusive evidence of well desertion and DOGGR may order deserted wells plugged (Sections 3206 and 3237). DOGGR has been successful with ensuring operator responsibility by expanding the definition of "credible evidence" under section 3237 of the PRC, which may have prevented wells from becoming wards of the state.

## **SUPPLEMENTAL REVIEW FINDING IV.7**

DOGGR's liability criteria meet the requirements of the Guidelines.

## **GUIDELINE 6.6 - STANDARDS FOR REMEDIATION**

*The state should ensure that abandoned wells, including the associated well site, are plugged in a cost-effective manner that removes any threat to public health and the environment and restores the land to an appropriate condition.*

### **6.6.1. Wellbore Remediation**

The state should consider existing rules and regulations when determining proper plugging procedures for abandoned sites. However, the state should have the flexibility to modify those plugging procedures, while maintaining mechanical integrity of the wellbore adequate to ensure that public health and the environment are protected.

In carrying out wellbore remediation, the state should use existing information from well records including depth of well, depth of any old plugs, presence of casing and tubing and depths set, perforations, existence of groundwater and hydrocarbon-bearing zones, existence of over-pressured zones, and any junk in the hole to determine the condition of the well and the proper plugging procedure. In the absence of the above information, data such as existing geological and engineering field studies, water well records, interviews with nearby landowners, corporate records, and historical literature can be reviewed.

#### 6.6.2. Site Remediation

The extent of surface remediation of an abandoned site should be determined based on surface and subsurface resources and land use. Consultation by the state regulatory agency with the surface owner, surface tenant, and other federal, state and local agencies, as appropriate, should take place prior to remediation.

As appropriate, abandoned sites should be re-vegetated in accordance with state regulatory agency rules, and with consideration given to recommendations from the surface owner, surface tenant, and federal and local agencies. As appropriate, soil should be evaluated to determine if hydrocarbons, chemicals, or NORM were spilled or leaked, and to determine remediation.

Surface equipment or materials on an abandoned site should be removed, and salvaged when possible, unless the state determines otherwise. Procedures should be identified for handling NORM, if present. Due to the expense and potential damage to the land, there may be situations where equipment or materials would not be removed, e.g., a gathering system might be abandoned in place with appropriate protection. When reclaiming a pit, the state should determine the contents of the pit and how the pit can best be remediated. Once emptied, cleaned and tested as appropriate, pits should be backfilled and contoured to prevent erosion from or ponding of surface water. Monitoring wells at an abandoned site should be as necessary to protect groundwater resources. The state should develop additional remediation criteria for commercial disposal sites, as appropriate.

### **DISCUSSION**

*The state considers surface and subsurface resources and land use when determining the extent of remediation of an abandoned site.*

After all down-hole plugs are in place, the surface casings and all annuli are plugged at the surface with at least a 25-foot cement plug and all well casing is cut off at least 5 feet below the surface of the ground.

**Because future land-use issues fall under the purview of the local governments, local governments are the “lead agency” and the DOGGR acts as a “responsible agency” in determining the level of remediation at abandoned sites. The CEQA was enacted in 1970 in**

**order to ensure that state and local agencies consider the environmental impact of their decisions when approving a public or private project, such as remediation of an abandoned site. The lead agency solicits and receives comments from other public agencies ("responsible agencies") that have a role in permitting or approving a project.**

**The DOGGR works closely with all local agencies where oil and gas wells have been drilled and comments on land-use project proposals that include those wells. When construction is proposed over or near any previously plugged and abandoned well that does not meet current plugging and abandonment requirements, DOGGR may order the well to be re-plugged. The cost of re-plugging operations is normally the responsibility of the owner of the property upon which the structure will be located (see Section 3237 for exemptions).**

#### **SUPPLEMENTAL REVIEW FINDING IV.8**

**DOGGR has very defined criteria for wellbore plugging and less defined criteria for site remediation. DOGGR relies on local entities to make these determinations. There was discussion that additional work is required to determine appropriate levels of site cleanup. The lack of clarity in this regard can result in delays of site clean up.**

#### **SUPPLEMENTAL REVIEW RECOMMENDATION IV.8**

**The review team recommends that the state consider establishing a set of minimum criteria for site remediation. Criteria should include standards as outlined in Section 6.6.2 of the Guideliness. The Central Coast local entity has developed draft oilfield lease restoration guidelines, which might serve as a basis for statewide guidelines for site remediation.**

## **GUIDELINE 6.7 - PUBLIC PARTICIPATION**

*The state abandoned sites program should provide for public participation. At a minimum, the public should have: (1) access to information about the program; (2) the opportunity to participate in any rulemakings associated with the program; and (3) a statutory or regulatory mechanism to petition the state agency to change a site's status on the inventory and/or the level of remediation required on a site.*

### **6.7.1. Access to Information**

*The state should maintain and make available to the public, records related to the abandoned sites inventory, including: (1) the location of an abandoned site; (2) the extent and degree of contamination of the abandoned site; and (3) the method of remediation that has been or will be required for an abandoned site. In addition, the state should maintain public records on the state's progress with respect to implementing the abandoned sites program.*

### **6.7.2. Participation in Rulemaking**

*The state program should provide an opportunity for the public to participate in any rulemakings associated with the program.*

### **6.7.3. Participation Regarding Priority on the Inventory and Level of Remediation**

*The state program should include a mechanism by which an affected person could petition the state to: (1) add a site to the abandoned sites inventory; (2) change the priority for remediation of a site on the inventory; and (3) conduct or require additional remediation of a site.*

## **DISCUSSION**

The basic purpose of CEQA is to inform state agencies and the public about potential, significant environmental effects of proposed activities and to provide for public participation. In addition, regulations are adopted only after public notice and opportunity for comment is provided. Furthermore, the DOGGR notifies affected landowners prior to plugging orphaned wells. DOGGR is making all attempts to increase public outreach and operator contacts.

DOGGR maintains and makes available to the public records related to idle and orphaned wells and DOGGR's progress with respect to implementing the idle and orphaned wells program.

DOGGR provides opportunities for the public to participate in any rulemaking associated with the program. Such opportunities are notices (in various newspapers) via the State's Office of Administrative Law.

DOGGR is very open and responsive to requests to add a site to the orphaned well inventory or consider reasons to re-prioritize plugging of a particular well.

## **SUPPLEMENTAL REVIEW FINDING IV.9**

The State program meets the requirements of the Guidelines for public participation for its orphaned well program.

## **GUIDELINE 6.8 - AVOID FUTURE ABANDONED SITE PROBLEMS**

*Since abandoned sites may constitute a threat to public health and the environment, the state should:*

- a. Establish and implement an abandoned site program consistent with the guidance in this section; and*
- b. Enforce its existing regulatory program, with modifications, if necessary, consistent with this guidance.*

## **DISCUSSION**

In addition to the idle and orphaned well program previously discussed, DOGGR has strengthened the law by giving the State Oil and Gas Supervisor the authority to seek a court order directing that production from a well operation be discontinued until an unresolved violation is remedied and the civil penalty has been paid (PRC section 3236.5) and to deny proposed well operations if the operator has outstanding civil penalties or other charges (PRC section 3203).

## **V. Naturally Occurring Radioactive Materials (Guidelines Section 7 – All New)**

### **Follow-up to Initial Review Recommendations**

#### **INITIAL REVIEW FINDING I.23.**

*A thorough evaluation of the NORM survey data by the appropriate state agency is necessary before DOGGR or other state agencies should conclude NORM is not a problem in California. The review team applauds the efforts of the regulated community to voluntarily conduct extensive NORM sampling, and the need for such an independent evaluation should not be construed as a criticism of those efforts.*

#### **INITIAL REVIEW RECOMMENDATION I.23.**

*Although outside the scope of the IOGCC Guidelines, a thorough evaluation of the NORM survey data obtained by the regulated community should be conducted by the relevant agencies before conclusions regarding the nature of the NORM problem in California can be drawn.*

#### **CALIFORNIA RESPONSE:**

**DOGGR – The DOGGR and the Department of Health Services Radiologic Health Branch completed an independent NORM survey that was published in October 1996. The study confirmed most of the findings of the 1987 survey. Elevated levels of NORM were found in material from some of the production facilities; however, the elevated levels were not high enough to be of immediate health concern. Significantly, about 78 percent of the meter measurements from this study indicated radiation at background levels only.**

#### **FOLLOW-UP REVIEW FINDING I.23**

Although outside the scope of the initial review, this recommendation has been met under the current Guidelines.

### **Supplemental Review Finding and Recommendations**

#### **GUIDELINE 7.2 - General**

*States should adopt an oil field NORM regulatory program that addresses identification, use, possession, transport, storage, transfer, decontamination, and disposal to protect human health and the environment. States may choose not to adopt such a program if they find, based on field monitoring data and other scientific information, that no NORM is present in oil and gas operations in the State, or that the levels of NORM present in oil and gas operations in the State do not present such a risk to human health or the environment to warrant a regulatory program. States that make such a finding should periodically reevaluate the basis for the determinations.*

*If a state determines that a regulatory program is necessary, it should tailor its program to NORM occurrence in the oil and gas E&P industry and an assessment of risks to human health and the environment. The program should include the elements listed in section 7.3. Oil-field NORM should be managed in accordance with the pollution prevention and waste management hierarchy provisions of these guidelines. In addition, the other sections of these guidelines apply, where applicable, to NORM as a constituent of E&P waste.*

#### **SUPPLEMENTAL REVIEW FINDING V.1**

The Department of Health Services (DHS), Radiologic Health Branch is responsible for monitoring, evaluating and overseeing NORM levels and disposal of waste containing radioactive

materials. DOGGR is also responsible for overseeing the disposal of NORM waste if it is designated a Class II-type fluid. DOGGR and DHS completed an independent study of NORM in 1996. The study confirmed most of the findings of a 1987 industry survey which indicated that NORM released in the production of oil and gas is not posing a threat to public health, in that highly radioactive materials with long half-lives that can accumulate in soil and water are not being released.

DHS has chosen not to develop a specific program for oilfield NORM at this time.

#### **SUPPLEMENTAL REVIEW RECOMMENDATION V.1**

DHS should continue to monitor the need for an oilfield NORM regulatory program.

### **GUIDELINE 7.3 – ELEMENTS OF AN OILFIELD NORM PROGRAM**

#### **7.3.1 Definition**

*States should develop a definition for NORM that is consistent with that which occurs in the oil and gas E&P industry. For purposes of these guidelines, NORM is defined as any naturally occurring radioactive materials (not including byproduct, source or special nuclear material, or low level radioactive waste) not subject to regulation under the Atomic Energy Act, whose radionuclide concentrations have been enhanced by human activities such that potential risk to human health or the environment are increased.*

#### **7.3.2 Action Levels**

*States should establish risk-based numerical action levels above which NORM is regulated taking into consideration the risk of exposure to human health and the environment. Such action levels should also be used to regulate the transfer or release of equipment, materials, and sites.*

#### **7.3.3 Surveys**

*States should develop standards for survey instruments and procedures for identifying and documenting equipment, materials, and sites that may contain NORM above the action levels. States should consider the types of facilities to be surveyed, when surveys should be performed, when survey results should be reported to the state regulatory agency, and any necessary training of surveyors. State survey requirements should provide data necessary to meet the purposes described in section 5.2.1 and to administer and enforce state program requirements effectively.*

#### **7.3.4 Worker Protection**

*State regulatory programs should include applicable state and federal standards for worker protection from exposure to radiation, including worker protection plans, and other standards necessary for the protection of workers from exposure to NORM. States should establish NORM training or certification requirements based upon oil-field work related duties and their associated NORM exposure risk (i.e., NORM awareness training may be sufficient for many common oil-field work activities).*

#### **7.3.5 Licensing/Permitting**

- a. General licensing/permitting: Persons who possess oil-field NORM in concentrations or at exposure rates that exceed state-adopted action levels should be generally licensed or permitted.*
- b. Specific licensing/permitting: Specific licenses or individual permits should be required for commercial storage, removal, decontamination, remediation, treatment or disposal of oil-*

*field NORM. A state may require specific licenses or individual permits for the management of oil-field NORM at centralized facilities as defined in section 5.10.*

#### *7.3.6 Removal/Remediation*

*States should consider performance standards for removal, decontamination, and remediation that are protective of human health and the environment.*

#### *7.3.7 Storage*

*States should establish standards for storage of NORM that are protective of human health and the environment. NORM storage facilities should be constructed to prevent or minimize releases. Tanks used to store oil-field NORM should meet the requirements of section 5.9 of these guidelines. A state should consider adoption of limits on the amount of time NORM that exceeds action levels can be stored, depending on factors such as quantity, radioactivity, climate, proximity to the public, and protective controls.*

#### *7.3.8 Transfer for Continued Use*

*State regulatory programs should allow for the transfer of land and equipment containing NORM for continued operations in the production of crude oil and natural gas, with appropriate notification to affected parties.*

#### *7.3.9 Release of Sites, Materials, and Equipment*

*State regulatory programs should address the levels below which, and conditions under which, equipment, materials, and sites containing NORM may be released. State regulatory programs should authorize the release of equipment, materials, and sites for unrestricted use only if NORM is below action levels. Such regulations should provide for appropriate notification to affected persons.*

#### *7.3.10 Disposal*

*State regulatory programs should authorize disposal alternatives within the state's jurisdiction for various E&P wastes containing NORM, including contaminated equipment, and should include regulatory requirements for NORM disposal that are protective of human health and the environment. Landowner or other notification may be required as a condition of disposal. Commercial and centralized NORM disposal facilities should meet the criteria of section 5.10.*

#### *7.3.11 Interagency Coordination*

*State radiation programs, oil and gas programs, and waste management programs are frequently distributed among separate agencies. Therefore, in many states, multiple agencies may regulate NORM. The various agencies should coordinate their regulatory and enforcement activities under the guidance given in section 4.4 of these guidelines.*

#### *7.3.12 Public Participation*

*State regulatory programs for NORM should meet the public participation guidelines established in section 4.2.2.*

### **SUPPLEMENTAL REVIEW FINDING V.2**

The State generally meets the guidelines for an oilfield NORM program. The greatest threat is the exposure of workers to radon released in production and NORM accumulated in tank bottoms, sludge, pipe scale and soil. The 1996 NORM Study by DHS, in cooperation with DOGGR, provided recommendations (p.5 of the Study) that provide guidelines for future evaluation.

## **SUPPLEMENTAL REVIEW RECOMMENDATION V.2**

In accordance with Guidelines 7.3.4, DOGGR and DHS should encourage industry to continue to monitor and minimize worker exposure. The recommendations in the 1996 study should be reviewed in future STRONGER evaluations. These recommendations recognized where NORM may pose a threat of contamination, especially to workers, and provide a basis for future review.

## **GUIDELINE 7.4**

*The Conference of Radiation Control Program Directors has prepared suggested state regulations for NORM, and a number of states have developed or are in the process of developing NORM regulations. States that are developing their own NORM programs are encouraged to consult these sources as well as applicable federal radiation guidance and requirements for information and assistance. In addition, states should encourage and keep abreast of ongoing and future research on NORM, including risk assessment.*

## VI. Performance Measures (Guidelines Section 8 - New Section)

The Performance Measures section was added to the Guidelines adopted in June, 2000. In its most basic sense, performance measurement is simply a management tool used to assist an organization in meeting its goals and objectives. Effective performance measurement should evaluate not only how well the work is being done within an organization, but also how well that work is contributing to meeting the organization's goals and objectives.

### GUIDELINE 8.1

*Beyond the general, technical and administrative criteria set forth elsewhere in this guidance document, an effective program for the regulation of E&P waste should periodically evaluate whether the program is meeting the goal of protecting human health and the environment in accordance with section 3.2.*

*Performance measures may be of a wide variety, may require the development of a process and methodology, and may include both input parameters and output parameters. Performance measures should include positive indicators as well as negative indicators. States should evaluate the selection and use of all types of parameters to determine what is an appropriate method to evaluate the effectiveness of their E&P waste program.*

*The documentation of the selected parameters and the ability to support the data utilized in the development of the measures is a critical part of any performance measure.*

### SUPPLEMENTAL REVIEW FINDING VI.1

***While all the agencies involved in E&P waste management have performance measures, it is unclear how DOGGR, the SWRCB and the RWQCBs evaluate whether the E&P waste management program is meeting the goal of protecting human health and the environment. The component pieces of a measurement system -- planning, objectives and selected targets -- are in place; however, the process hasn't been formalized and institutionalized. In addition, it is unclear how frequently such evaluations are made.***

### SUPPLEMENTAL REVIEW RECOMMENDATION VI.1

DOGGR, the SWRCB and the RWQCBs should institute a more formalized process to periodically evaluate whether the E&P waste management program is meeting the goal of protecting human health and the environment. (Guidelines 3.2 and 8.1).

### SUPPLEMENTAL REVIEW FINDING VI.2

The agencies have identified some parameters, both positive and negative, that indicate whether program activities are resulting in an improvement to human health and the environment. DOGGR, for example, has established program targets for remediation of orphaned wells. For the RWQCB's the closure of sumps represents the elimination of potential pollution sources. The State's system for reporting and addressing spills has potential for providing a measure of success in reducing the volumes of wastes escaping into the environment. The review team notes, however, that insufficient information exists for the tracking of some parameters: for example, none of the agencies know the extent or volume of contaminated soils; and there is currently no monitoring of the status of groundwater to demonstrate long-term improvement or change.

### SUPPLEMENTAL REVIEW RECOMMENDATION VI.2

DOGGR, the SWRCB and the RWQCBs should consider additional parameters for evaluating whether program activities are resulting in an improvement to human health and the environment. For example, the RWQCBs might consider how many abandoned facilities that impact waters of the state have been remediated. DOGGR might consider how many oil spills have affected waters of the state. As a waste minimization measure, the agencies might consider what percent of E&P wastes is being reduced or reused/recycled annually. These are offered only as examples; the review team recognizes that the individual state agencies are in the best position to determine the measures most relevant and useful to their operations. (Guidelines 3.2, 8.2.1 and 8.2.2). However, the Review Team recommends that DOGGR consider tracking of the wells that become orphaned and the causes for that change in status. (Guidelines 8.2.1.f).

### **GUIDELINE 8.3**

*The evaluation of a state program should be conducted both to determine consistency with the goals set forth in section 3.2 and to create a benchmark against which to compare itself in future assessments.*

*A state program is encouraged to conduct periodic self-assessments in addition to those assessments conducted in the State Review Process. These self-assessments should document successes as well as identified weaknesses. This will allow for continual improvement of a state's program, while recording its successes. Because the State Review Process is dependent on benchmarking and shared learning, documentation by states is critical in allowing states to learn from each other outside of the State Review Process.*

*The utilization of performance measures and a continual improvement process will demonstrate the state's efforts to adapt to changes in technology, and concerns of the public and regulated community, and to provide both for the documentation of successes of the states' programs, and identification of program areas requiring further review and improvement.*

### **SUPPLEMENTAL REVIEW FINDING VI.3**

**The agencies appear to use the parameters discussed above for benchmarking future agency performance. Additional opportunities may exist to evaluate the effectiveness of the state's program in reducing violations that adversely affect human health and the environment using benchmarks such as: the numbers of orphaned wells in the state's inventory, the types and frequencies of other violations, and the numbers of violations corrected in a timely manner. See the other parameters discussed above.**

## VII. Underground Injection Control

### Part I: GENERAL

The California underground injection control (UIC) program was initially reviewed in 1989. At that time, the California Division of Oil, Gas and Geothermal Resources (DOGGR) was known as the Division of Oil and Gas. DOGGR continues to implement a well-managed UIC Program that is protective of underground sources of drinking water (USDW). The review team was impressed by the high level of detail in all program areas. Statewide, the DOGGR is responsive to the changes in industry and because of well trained, qualified and experienced personnel, performs timely and efficient reviews of all types of UIC-related permit applications. Under a comprehensive MOU, the DOGGR coordinates permitting requirements and field activities with RWQCBs. In addition, the UIC program interfaces well with Bureau of Land Management (BLM) on UIC-related activities on BLM managed land.

The state's data management system has greatly improved since 1989. The database is now centralized. Interested parties may view a myriad of well information on the internet (DOGGR web site). For internal use, the system now tracks wells (API numbers, GPS locations, etc.), inspection reports, operator-submitted reports, etc. Approximately 90% of monthly injection data from operators is received in electronic format. Production and injection data from 1977 to present is stored electronically.

#### **FINDING VII.1**

The DOGGR strategic plan for the oil and gas and UIC programs contains objectives and performance measures that are generally applicable to both programs.

#### **RECOMMENDATION VII.1**

Specific objectives for the UIC program should be mentioned in the DOGGR portion of the Department Strategic Plan.

#### **FINDING VII.2**

To date, the DOGGR (state government) has contributed over 80 percent of the funding necessary to conduct California's UIC program. The Cooperative Agreement established with EPA in 1983 established a cost share agreement of 25 percent state funds (recipient) and 75 percent federal funds.

#### **RECOMMENDATION VII.2**

**DOGGR should continue petitioning EPA, Region 9 (San Francisco) and continue participating with efforts of other UIC primacy states to petition EPA Headquarters (Washington, DC) for increased federal participation in UIC funding for California and for other state UIC programs.**

#### **FINDING VII.3**

**DTSC waste testing and classification rules require certain E&P wastes to be injected into Class I wells. Under the Federal UIC program, such wastes could be injected into Class II wells.**

### RECOMMENDATION VII.3

**To gain flexibility in the disposal of E&P wastes and to reach consistency with most other states, the Department of Toxic Substances Control (DTSC) should re-evaluate its program to determine if federal RCRA-exempt waste under DTSC's jurisdiction can be managed more effectively through the Class II program.**

## **Part II: PERMITTING/FILE REVIEW**

As indicated in the 1989 peer review, the permitting process continues to be well thought out and logically conducted. Exclusive of the changes in the data management system, there have been no major regulatory or policy changes to the permitting/file review program since 1990. However, DOGGR is in the final stages of beta testing an electronic permitting system (e-Permit).

DOGGR is mandated to respond to each well permit application within 10 working days from the date of receipt. Due to a staff that is composed of well-trained and qualified personnel, DOGGR is able to meet this requirement. Each injection project is reviewed annually with the operator. During the reviews, the entire project (including all wells) is reviewed for compliance with permit conditions and project performance. Each year, approximately 80 percent of total UIC permits receive a file (compliance) review. File reviews are documented on the DOGGR database. Public notice of project applications must run for 3 days in a local newspaper of general circulation. The public review and comment period is 15 days.

**Although cement behind casing is not required across a USDW (10,000 mg/l TDS), all intervals behind casing not filled with cement must be filled with mud. There must be cement behind casing through the injection interval, 500' above the injection interval and 100' across the 3,000 mg/l TDS interface. DOGGR requirements comply with EPA standards that require wells be cased and cemented to prevent movement of fluids into USDW's.**

**A conservative injection pressure gradient is used to determine the fracture gradient of each well permitted. If the operator wants a higher injection pressure, a step-rate test is conducted. The maximum allowable surface injection pressure (MASIP) would then be less than the fracture pressure. The Division's injection manual lists established fracture gradients for different areas in California.**

**Operators are required to file cash or indemnity bonds to cover drilling, re-drilling, deepening, or operations permanently altering casing. Bond amounts range from \$15,000 to \$30,000 depending on drill depth of the well. Each commercial produced water disposal**

**well must be covered with a \$50,000 life-of-the-well bond unless the operator has submitted a \$250,000 blanket bond.**

#### **FINDING VII.4**

The permitting/file review portion of the California UIC program meets or exceeds EPA's federal UIC primacy requirements.

### **Part III: INSPECTIONS**

**The 1989 peer review found that the inspection program conducted under the California UIC program was designed to provide for the early detection of noncompliance actions and other UIC related problems. The current peer review confirms the effectiveness of the DOGGR UIC inspection program. To maintain consistency, an Associate Oil and Gas Engineer accompanies field inspectors in the field at least once each year to observe and critique their work. The MOI was formerly utilized as the state's UIC regulations. Among other things, it now provides excellent guidance to field inspectors in how to conduct field inspections and perform required tasks. The MOI is amended as necessary to address inconsistencies or changes in technology.**

**The DOGGR attempts to inspect each UIC wells annually while performing environmental lease/well inspections. Random samples are taken at some well sites for water analysis whenever necessary to check compliance. Sampling procedures have been established and are described in the DOGGR's EPA-approved Quality Assurance Plan.**

**A major accomplishment since the 1989 review is implementation of an electronic database which is used to track MIT's, inspections, deficiencies, violations, etc. The DOGGR's main database file contains over 150,000 well identifications, keyed on API number. Such information is available to inspectors for conducting field investigations and for addressing emergency situations. DOGGR is conducting a beta testing program that allows engineers to electronically enter data collected in the field using handheld computers.**

**Emergency response is primarily controlled by the Office of Emergency Services. The Oil Spill Prevention and Response arm of the Department of Fish and Game is responsible for oil spills in or threatening marine environments. DOGGR works with these agencies on spills relating to oil and gas activities, including those related to the UIC program. Complaint response procedures are spelled out in DOGGR's MOI.**

One concern expressed in the 1989 review appears to have been resolved. The prior review team found that while emergency and citizen complaint response time is reportedly very prompt (within 24 hours), there appeared to be no established internal time limit for responses to the various categories of emergencies and complaints. Today, response time is greatly diminished, but still depends upon the nature of the complaint and whether DOGGR field engineers are available. If a complaint is received during working hours, the inspection is usually done the same the day. If the complaint is received after hours, the inspector on call will determine the severity of the complaint. If severe, he/she will inspect the site immediately; if not severe, the incident will be

investigated the following workday.

#### **FINDING VII.5**

Although oil and gas operators do not receive a copy of completed inspection reports from DOGGR inspectors, a letter of noncompliance is sent to the operator when violations or deficiencies are noted.

#### **FINDING VII.6**

**In response to concerns in the 1989 peer review, DOGGR indicated follow-up inspections are now conducted on a more frequent basis to determine if cleanup activities for E&P waste spills are proceeding in an appropriate and timely manner. Coordination with several other federal, state and local governmental agencies is frequently required.**

### **Part IV: MECHANICAL INTEGRITY TESTING**

**The DOGGR continues to have excellent guidelines for performing mechanical integrity pressure tests. DOGGR relies on a combination of RA (RTS), temperature and spinner surveys to demonstrate internal and external mechanical integrity. At least two of these three tests must be employed for a complete MIT. Tracer surveys are required on steam injection wells every 5 years, every 2 years on waterflood wells and every year on disposal wells. Cement records are never used to determine MIT. In 1996, the regulations were amended to include mechanical integrity testing of the casing-tubing annulus every five years.**

#### **FINDING VII.7**

**Although new regulations in 1996 amended testing requirements to include mechanical integrity testing of casing tubing annulus every five years, DOGGR continues to rely primarily on a combination of RA (RTS) temperature and spinner surveys to demonstrate external mechanical integrity.**

### **Part V: COMPLIANCE/ENFORCEMENT**

The compliance/enforcement component of the California UIC program, as implemented by DOGGR, is adequately administered and requires compliance with state rules, regulations and directives. Field engineers are well trained and knowledgeable in DOGGR regulatory and legal requirements. Operations found to be out of compliance are brought to the attention of the operator on an informal basis. Civil penalties are considered, usually, after other attempts to obtain compliance have failed. DOGGR may deny permits for new wells if the operator fails to pay a civil penalty and other charges that are required, such as the oil and gas production assessment. The DOGGR may also seek a court order shutting in production on a well where an unresolved violation is occurring.

DOGGR may coordinate enforcement activities with EPA if unable to achieve compliance or coordination with the operator. In addition, the MOA with the SWRCB outlines the procedures for reporting proposed oil, gas and geothermal field discharges.

Bonds are forfeited when an operator fails to P&A a well or wells, but can be forfeited for other reasons, such as failure to clean up a spill or screen a sump associated with a well.

#### **FINDING VII.8**

The compliance/enforcement component of the California UIC program is adequate to determine operator compliance with applicable rules and regulations and is therefore protective of USDWs.

### **Part VI: ABANDONMENT/PLUGGING**

DOGGR has extensive and comprehensive plugging and abandonment regulations. About 80% of all plugging jobs are witnessed. Some local governmental agencies require life-of-the-well bonds. DOGGR sends copies of formal plugging and abandonment orders to these agencies as well as a letter inquiring as to the existence of a bond. If a bond exists, it is pursued as a source of funds to cover the cost of work performed by the DOGGR.

Since 1990, legislation was passed (1998) that gave operators a set of options to cover liability for their long-term idle wells. For more information about the orphaned and idle well program, see Section 6 of this report.

In 1989, the review team was concerned that the 2-year idle-well time frame may be too long for adequate regulatory action. Although the time frame has been increased to 5 years, the bonding requirements have more than alleviated the concern shown in the 1989 review. Funding is available to plug and abandon such wells. Bonding is tracked in each DOGGR district office.

#### **FINDING VII.9**

The plugging and abandonment component of the UIC program in the State of California is protective of USDW's and provides appropriate mechanisms to administer and fund an idle well program.

### **Part VII: PUBLIC OUTREACH**

**With regard to permitting activities, the California UIC program has a good public outreach program in place. Mailing lists are used as necessary and include local, regional and national interest groups. Interest groups were most recently involved in legislation that improved funding options for idle wells. No one has ever requested a public hearing for an injection or disposal well application. EPA is provided an opportunity to review and comment on proposed UIC regulations before they are submitted for public review. In accordance with the DOGGR/SWRCB MOA, DOGGR informs SWRCB of any UIC program changes if it significantly modifies the MOA. There have been no major changes in the DOGGR public outreach program since 1990.**

#### **FINDING VII.10**

**There appears to be no lack of effort by DOGGR personnel to increase public awareness and knowledge of the UIC program in California. A comprehensive description of the**

**program is posted on the DOGGR website, pamphlets are distributed which describe the program, notices are posted in newspapers, DOGGR personnel visit schools regularly to explain the oil and gas and UIC programs, and a Department of Conservation booth is manned at the annual state fair and on the Capitol grounds during Earth Day. In addition, various public outreach functions have been attended to increase public awareness.**

RECOMMENDATION VII.10

**DOGGR should continue to attempt to increase public awareness of the California UIC program.**

## APPENDICES (will include)

Appendix I: **Completed California Follow-up Review Questionnaire**

Appendix II: **Strengths, Other Considerations and Conclusions from the 1989 UIC review**

Appendix III: **Glossary of Acronyms**







