

## **SANDIA REPORT**

SAND2008-6182  
Unlimited Release  
Printed September 2008

# **Sulimar Queen Environmental Restoration Project Closure Package - Sandia Environmental Stewardship Exemplar**

Jack B. Tillman

Prepared by  
Sandia National Laboratories  
Albuquerque, New Mexico 87185 and Livermore, California 94550

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# **Sulimar Queen Environmental Restoration Project Closure Package Sandia Environmental Stewardship Exemplar**

Jack B. Tillman

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## **Abstract**

In March 2008, Sandia National Laboratories (Sandia), in partnership with the Bureau of Land Management, Roswell Field Office, completed its responsibilities to plug and abandon wells and restore the surface conditions for the Sulimar Queens Unit, a 2,500 acre oil field, in Chaves County, Southeast New Mexico. Sandia assumed this liability in an agreement to obtain property to create a field laboratory to perform extensive testing and experimentation on enhanced oil recovery techniques for shallow oil fields. In addition to plugging and abandoning 28 wells, the project included the removal of surface structures and surface reclamation of disturbed lands associated with all plugged and abandoned wells, access roads, and other auxiliary facilities within unit boundaries. A contracting strategy was implemented to mitigate risk and reduce cost. As the unit is an important wildlife habitat for prairie chickens, sand dune lizards, and mule deer, the criteria for the restoration and construction process were designed to protect and enhance the wildlife habitat. Lessons learned from this project include: (1) extreme caution should be exercised when entering agreements that include future liabilities, (2) partnering with the regulator has huge benefits, and (3) working with industry experts, who were familiar with the work, and subcontractors, who provided the network to complete the project cost effectively.



# CONTENTS

	<b>Page</b>
1. INTRODUCTION .....	7
2. PROJECT ACTIVITIES.....	8
2.1 SITE ASSESSMENT AND PROJECT REQUIREMENTS .....	8
2.2 CONTRACTING STRATEGY .....	8
2.3 CLOSURE AND ACCEPTANCE .....	9
2.4 COST SUMMARY.....	10
3. CONCLUSIONS AND LESSONS LEARNED.....	10
3.1 MAJOR ACCOMPLISHMENTS.....	10
3.2 LESSONS LEARNED.....	12
ATTACHMENT I SULIMAR QUEEN WELLS DESCRIPTIONS .....	13
ATTACHMENT II SHOEMAKER TO MAURER MEMORANDUM.....	19
ATTACHMENT III BUREAU OF LAND MANAGEMENT SULIMAR QUEEN UNIT PROJECT REQUIREMENTS AND EXPECTATIONS.....	25
ATTACHMENT IV SULIMAR QUEEN WELLS UNIT PROJECT SUMMARY .....	35
ATTACHMENT V BUREAU OF LAND MANAGEMENT SULIMAR QUEEN UNIT PROJECT FORM 3160-5, SUNDRY NOTICES AND REPORTS ON WELLS .....	41
ATTACHMENT VI PHOTOGRAPHS OF SANDIA SULIMAR QUEEN UNIT RECLAMATION PROJECT RESULTS .....	47
ATTACHMENT VII BUREAU OF LAND MANAGEMENT CONGRATULATORY LETTER TO SANDIA.....	57



**SULIMAR QUEEN ENVIRONMENTAL RESTORATION PROJECT  
CLOSURE PACKAGE  
SANDIA ENVIRONMENTAL STEWARDSHIP EXEMPLAR**

**1. INTRODUCTION**

In June 1988, the participants of the New Mexico Tech Research Cooperation including the New Mexico Petroleum Recovery Research Center (a division of the New Mexico Institute of Mining and Technology), the Petroleum Engineering Department of the New Mexico Institute of Mining and Technology, Sandia National Laboratories (Sandia), and Los Alamos National Laboratories signed an agreement to obtain property to create a field laboratory for the purpose of extensive testing and experimentation on enhanced oil recovery techniques for shallow oil fields.

Agreement paragraphs 5 and 6 specifically assigned to Sandia the liability for abandoning the site and plugging all wells as follows:

5. Prior to Tech [New Mexico Tech Research Cooperation] acquiring the site and subject to limitations set forth in paragraph 6 herein, Sandia will make arrangements to assume the liability of adequately plugging all wells at the site and abandoning the site when the Project is terminated without regard to whether any individual well is utilized in the Project.
6. All of the costs of designing, contracting, operating, and abandoning the site will be included in the plan and proposal for the Project. In the event that the solicited funds are not obtained, Sandia will pay all of the costs of abandoning the site as explained in paragraph 5 herein. Capital equipment acquired with the site by any party to this agreement will be used to offset the costs of abandonment. Sandia's obligation hereunder will be to condition all wells for proper abandonment, to restore the leased lands upon completion of any drilling operations as prescribed in the lease.

On September 1, 1989, New Mexico Tech Research Cooperation obtained ownership of the Sulimar Queen Unit from the McClellan Oil Corporation, and the New Mexico Oil Conservation Division designated the New Mexico Institute of Mining and Technology as the Successor Unit Operator. The Sulimar Queen Unit is in Chaves County and located on Bureau of Land Management (BLM) land about 11 miles north of Loco Hills, New Mexico. The unit is a 2,500-acre field consisting of 31 wells (Attachment 1), of which three had already been plugged. The wells in the unit were drilled in the late 1970s and early 1980s. The reservoir is about 8 feet thick and around 2,000 feet deep.

The first production was in 1969 and on May 4, 1972, McClellan Oil Corporation was approved to operate the Sulimar Queen Unit as a secondary recovery project (waterflood) to recover additional oil and gas. Wells within the Sulimar Queen Unit were used for the production or injection of brine, water, air, gas, oil, or other substances, and were governed by standards of good geologic and petroleum engineering practices.

In 2003, New Mexico Tech Research Cooperation concluded the Sulimar Queen Unit was no longer economical to produce and maintain. Therefore, Sandia was requested to proceed with its responsibilities under the 1988 agreement to plug and abandon the Sulimar Queen Unit. As documented in a May 11, 2005 memorandum from Paul Shoemaker to Mike Maurer (Attachment 2), Sandia attempted unsuccessfully to transfer the wells to other oil and gas exploration firms. In the memo, Mr. Shoemaker suggested the cost of this project would be about \$1 million.

## **2. PROJECT ACTIVITIES**

### **2.1 SITE ASSESSMENT AND PROJECT REQUIREMENTS**

On 11/18/04, Larry D. Bray, Assistant Field Manager for Land and Minerals, Roswell Field Office, BLM sent New Mexico Tech Research Cooperation the requirements and expectations of the plugging and abandonment project (Attachment 3). The BLM letter stated that the wells must be plugged in accordance with requirements stated in Code of Federal Regulations (CFR) 43 Part 3160, Onshore Oil and Gas Operations; Federal and Indian Oil and Gas Leases; Drilling Operations; Final Rule, dated November 18, 1988 and reported on Form 3160, Sundry Notice, filed by API number. The letter also required removal of all structures, electrical apparatus, production equipment, and associated storage facilities, and oil saturated soils. It required the removal of caliche, closure of roadways, reconstruction of natural landform, and reseeded of the disturbed areas. Subsequently, the Carlsbad Project Group performed a detailed assessment of the project and prepared a project summary dated 6/10/05 and revised 7/27/05 (Attachment 4), including a detailed estimate of cost and risk assessment.

Surface restoration was required because the unit is an important wildlife habitat and the restoration will benefit the prairie chickens, sand dune lizards, and mule deer found on the unit. The criteria for the restoration and construction process were designed to protect and enhance the wildlife habitat. The removal of the caliche was required, not only to promote the growth of desirable plants but also because caliche is known to be an undesirable habitat for the sand dune lizard. Construction operations were limited from March 15 through June 15 annually because of the known impact on the lesser prairie chicken. During this period, activities that produced noise or involved human activity, such as well plugging and reclamation of roads and well pads were limited.

### **2.2 CONTRACTING STRATEGY**

A contracting strategy was implemented to mitigate risk and reduce cost. The primary cost element for the project was the plugging of the wells. A fixed-priced contract was competitively awarded for plugging the 28 wells. Because the wells were old, many unexpected conditions were discovered requiring an increase to the fixed price. Many of the structures and debris were removed for their salvage value and a \$25K fixed-price contract was awarded for trash and non-salvageable debris removal. Negotiations with the electric power provider for the area, Central Valley Electric, resulted in removal of the electrical equipment at no cost. A contract was negotiated with the BLM Force Account to remove the caliche, close the roads, reconstruct the natural landform, and reseed the disturbed area.

### 2.3 CLOSURE AND ACCEPTANCE

In March 2008, Sandia, in partnership with the Bureau of Land Management, Roswell Field Office, completed its responsibilities to plug and abandon wells and restore the surface conditions for the Sulimar Queen Unit.

The unit comprises six different Federal leases, each of which had approved the drilling of 31 wells within the unit. Three of the wells were plugged and abandoned in 1987 and 1992. Sandia plugged and abandoned the remaining 28 wells in 2007 (Figure 1) in accordance with an approved plug design and New Mexico Oil Conservation Division and BLM procedures. On December 17, 2007, the Assistant Field Manager, Lands and Minerals BLM, approved each well for final abandonment using the completed and approved Forms 3160-5, Sundry Notices and Reports on Wells. The forms can be found by entering their respective API Number at <http://www.emnrd.state.nm.us/ocd> (Attachment 5-Form 3160-5 example).



Figure 1. Well Plugging Operation

Figures VI-1 to VI-13 present photographs depicting the landscape before and after performing reclamation efforts.

## 2.4 COST SUMMARY

The budgeted cost for this project, as outlined in Attachment 1 was estimated to be \$1 million. However, by utilizing local contactors familiar with the oil and gas industry, capitalizing on salvage value of material, disposing material in local disposal facilities and fixed price contracting, the final cost of the project was approximately \$680K, resulting in nearly \$320K savings from the initial estimate. The major cost elements were \$373K for plugging the 28 wells and \$107K for caliche removal, road closure, reconstruction of natural landform, and reseeded.

## 3. CONCLUSIONS AND LESSONS LEARNED

### 3.1 MAJOR ACCOMPLISHMENTS

In addition to plugging and abandoning 28 wells, Sandia also removed surface structures, and reclaimed 31 acres of disturbed land surfaces associated with all plugged and abandoned wells, access roads, and other auxiliary facilities within the unit boundaries. The following structures were removed from the unit:

- 50 power poles and associated anchors (Figure 2)
- 28,000+ feet of electric wire
- 3 metal buildings plus small buildings at each well head
- 6-500 barrels, 2-750 barrels, 1-300 barrel steel tanks
- 2-fiber-glass tanks
- 2-separators (heater-treater).



Figure 2. Removal of Electrical Poles and Apparatus

Two surface production pits were also remediated. Free petroleum liquids and contaminated soils were removed and disposed of in the Loco Hills Disposal Facility, which was specifically approved by the New Mexico Oil Conservation Division.

Reclamation of these disturbed lands included removing 3.83 miles of roadway (Figure 3) from service; resurfacing 2.1 miles of roadway with recycled caliche, and closure of three caliche pits. The remediation process began with the removal of caliche that was used as surfacing material when the well pad structures and access roads were built.



Figure 3. Access Road Closure to Sulimar Queen Unit Well Pads

Because caliche is known to inhibit the growth of desirable plant species, which in turn prevents the soil medium from providing the necessary components for successful reclamation efforts, the material was either transported to an existing caliche pit, or re-used to build other well pads, roads, locations, or ranch improvements, etc. This relieved Sandia of any further liability or obligations associated with this material.

After removing the caliche, the BLM task force under contract to Sandia ripped each site to a maximum depth of 16 inches then contoured the sites to blend with the surrounding areas. Most sites were reseeded in accordance with BLM specifications to enhance successful reclamation. In some instances, a temporary four-strand barbed-wire fence was built to promote reclamation and reseeded (Figure 4).



Figure 4. Reseeding Disturbed Well Pad

At the conclusion of the project, the BLM wrote Sandia a letter of congratulations for its work on the Sulimar Queen (Attachment 7). The letter, in part, stated, “BLM would like to offer our sincere gratitude and appreciation to Sandia for the restoration and reclamation efforts...these lands have begun to heal. In conclusion, Sandia has proven to be a cooperative and responsible partner in the oil field land restoration and BLM is proud to have been able to work with the Sandia National Laboratories in this complex reclamation project.”

### 3.2 LESSONS LEARNED

1. Extreme caution should be exercised when entering agreements that include future liabilities. It is common to understate the magnitude of the liability in order to justify the desired action or program.
2. Partnering with the regulator has huge benefit. It proved to be very helpful to develop a trust relationship with the regulator. Understanding the goals and desires of the customer for this project was the key element for successful project completion.
3. Working with the industry experts familiar with the work provided the network of vendors to complete the project cost effectively.

**ATTACHMENT I**  
**SULIMAR QUEEN WELLS DESCRIPTIONS**



Table I-1. Sulimar Queen Unit Well Descriptions

Well Number	Location	API Number
LC-069280-A	Sulimar Queen Tr. 1, #9, T. 15 S., R. 29 E., Sec. 13, 330' FSL & 990' FWL, Chaves County, NMPM	30-005-60121
LC-069280-A	SulimBr Queen Tr. 1, #15, T. 15 S., R. 29 E., Sec. 24, 990' FSL & 2310' FWL, Chaves County, NMPM	30-005-61745
LC-069280-A	Sulimar Queen Tr. 1, #16, T. 15 S., R. 29 E., Sec. 24, 585' FNL & 2570' FWL, Chaves County, NMPM	30-005-62790
LC-069280-A	Sulimar Queen Tr. 2, #3, T. 15 S., R. 29 E., Sec. 13, 330' FSL & 1650' FEL, Chaves County, NMPM	30-005-60056
LC-069280-A	Sulimar Queen Tr. 2, #4, T. 15 S., R. 29 E., Sec. 13, 660' FSL & 660' FEL, Chaves County, NMPM	30-005-60058
LC-069280-A	Sulimar Queen Tr. 1, #2, T. 15 S., R. 29 E., Sec. 24, 1980' FNL & 1980' FWL, Chaves County, NMPM	30-005-60068
LC-069280-A	Sulimar Queen Tr. 1, #3, T. 15 S., R. 29 E., Sec. 24, 660' FNL & 2310' FWL, Chaves County, NMPM	30-005-60073
LC-069280-A	Sulimar Queen Tr. 1, #4, T. 15 S., R. 29 E., Sec. 24, 2310' FSL & 2310' FWL, Chaves County, NMPM	30-005-60077
LC-069280-A	Sulimar Queen Tr. 1, #5, T. 15 S., R. 29 E., Sec. 24, 660' FSL & 1980' FWL, Chaves County, NMPM	30-005-60081
LC-069280-A	Sulimar Queen Tr. 1, #6, T. 15 S., R. 29 E., Sec. 24, 1650' FSL & 660' FWL, Chaves County, NMPM	30-005-60085
LC-069280-A	Sulimar Queen Tr. 1, #7, T. 15 S., R. 29 E., Sec. 24, 330' FSL & 660' FWL, Chaves County, NMPM	30-005-60091
LC-069280-A	Sulimar Queen Tr. 1, #12, T. 15 S., R. 29 E., Sec. 24, 810' FNL & 1490' FWL, Chaves County, NMPM	30-005-60385
LC-069280-A	Sulimar Queen Tr. 1, #13, T. 15 S., R. 29 E., Sec. 24, 990' FSL & 150' FWL, Chaves County, NMPM	30-005-60433
LC-069280-A	Sulimar Queen Tr. 1, #14, T. 15 S., R. 29 E., Sec. 24, 1345' FSL & 1450' FWL, Chaves County, NMPM	30-005-60612
LC-069280-B	Sulimar Queen Tr. 2, #2, T. 15 S., R. 29 E., Sec. 18, 660' FSL & 660' FWL, Chaves County, NMPM	30-005-20258
LC-069280-B	Sulimar Queen Tr. 2, #7, T. 15 S., R. 29 E., Sec. 19, 660' FSL & 660' FWL, Chaves County, NMPM	30-005-20461
LC-069280-C	Sulimar Queen Tr. 3, #1, T. 15 S., R. 29 E., Sec. 24, 660' FNL & 660' FEL, Chaves County, NMPM	30-005-60042
LC-069280-C	Sulimar Queen Tr. 3, #2, T. 15 S., R. 29 E., Sec. 24, 1650' FNL & 1980' FEL, Chaves County, NMPM	30-005-60064
LC-069280-C	Sulimar Queen Tr. 3, #3, T. 15 S., R. 29 E., Sec. 24, 1980' FNL & 760' FEL, Chaves County, NMPM	30-005-60066
LC-069280-C	Sulimar Queen Tr. 3, #4, T. 15 S., R. 29 E., Sec. 24, 1980' FSL & 1980' FEL, Chaves County, NMPM	30-005-60070
LC-069280-C	Sulimar Queen Tr. 3, #6, T. 15 S., R. 29 E., Sec. 24, 990' FSL & 2310' FEL, Chaves County, NMPM	30-005-60318
NM-0458656	Sulimar Queen Tr. 4, #1, T. 15 S., R. 29 E., Sec. 26, 330' FNL & 330' FEL, Chaves County, NMPM	30-005-60095
NM-0458656	Sulimar Queen Tr. 4, #2, T. 15 S., R. 29 E., Sec. 26, 990' FNL & 1650' FEL, Chaves County, NMPM	30-005-60101
NM-0493370-A	Sulimar Queen Tr. 5, #1, T. 15 S., R. 29 E., Sec. 26, 1650' FNL & 990' FEL, Chaves County, NMPM	30-005-60115
NM-0493370-A	Sulimar Queen Tr. 5, #2, T. 15 S., R. 29 E., Sec. 26, 2310' FNL & 1650' FEL, Chaves County, NMPM	30-005-60120

Table I-1. Sulimar Queen Unit Well Descriptions (Continued)

<b>Well Number</b>	<b>Location</b>	<b>API Number</b>
NM-0493370-A	Sulimar Queen Tr. 5, #3, T. 15 S., R. 29 E., Sec. 26, 2310' FSL & 2310' FEL, Chaves County, NMPM	30-005-60217
NM-0518428	Sulimar Queen Tr. 6, #1, T. 15 S., R. 29 E., Sec. 25, 330' FNL & 660' FWL, Chaves County, NMPM	30-005-60087
NM-0558684	Sulimar Queen Tr. 8, #1, T. 15 S., R. 29 E., Sec. 24, 330' FNL & 1680' FEL, Chaves County, NMPM	30-005-60054

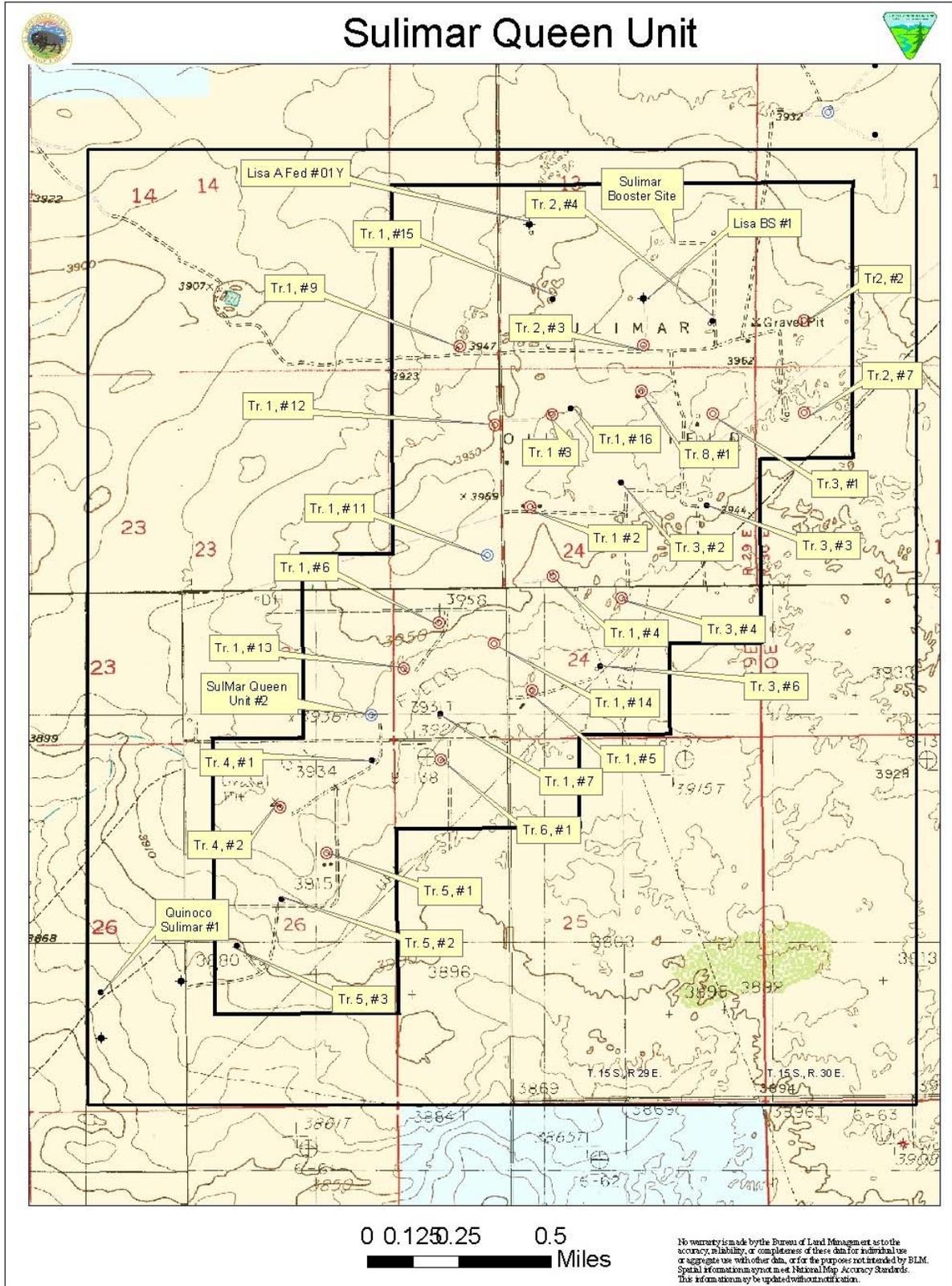


Figure I-1. Sulimar Queen Unit Well Locations Map

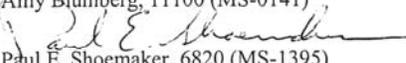


**ATTACHMENT II**  
**SHOEMAKER TO MAURER MEMORANDUM**



date: May 11, 2005

to: Mike Maurer, 6030 (MS-0724)  
Denise Krupka, 10036 (MS-0918)  
Amy Blumberg, 11100 (MS-0141)

  
from: Paul E. Shoemaker, 6820 (MS-1395)

subject: Plugging and Abandoning of Oil and Gas Wells on the Sulimar Queen Unit

Since my last set of official communications with you on the responsibility Sandia seems to have to plug and abandon oil and gas wells on the Sulimar Queen Unit in southeastern New Mexico, my staff and I have worked diligently to understand the scope and magnitude of the work before us. Two of my staff have visited the Unit and have visually examined all of the wells there. It would appear, by the way, that the number of wells to be plugged and abandoned is 33 rather than 28. You should also know that there exists a substantial number of so-called vertical structures (pump-jacks, shacks, tanks, power poles, etc.) on the pads at which these wells are located. A collection of digital photos is available for your examination if you would like to see them. In addition, there are a number of pipelines crossing the Unit, some of which seem to be connected to the wells in question and some of which seem to belong to operations not associated with the wells for which we bear some responsibility. In order to determine which pipelines are ours to dispose of and which are not, we will have to locate and follow each of pipeline to its origin or termination (except for those pipelines that obviously belong to organizations such as Navajo Refining, which differ substantially in diameter and construction from the pipelines connected to the wells we have to attend to).

Hoping to find alternative ways for Sandia to discharge its obligations in this matter, we talked to Alex Thyssen at New Mexico Tech (the contact person Tech's lawyers advised us to use if we had technical questions to pose) about the possibility of transferring the wells to an oil and gas exploration firm, if one could be found that would like to take the wells on for exploration and production purposes. New Mexico Tech had no objection to us trying that approach. Unfortunately, a number of firms have considered and for various reasons turned down the opportunity to taken on the wells in question.

That seems to leave us with no option but to proceed with plugging and abandoning, and the associated BLM-governed environmental restoration and waste disposal activities. Recall that in November, 2004 New Mexico Tech secured from Eddie Seay Consulting a cost estimate for these activities. That estimate, inclusive of BLM-compliant environmental restoration, is \$12,000 per well. For 28 wells, the total estimated cost for the contractor to do its work is \$336,000. Eddie Seay charged \$5,943 to generated the estimate. The total estimated price for all this work passed along to us by New Mexico Tech is therefore \$341,943.

*Exceptional Service in the National Interest*

From the earliest days of our involvement in this matter, my staff believed the Eddie Seay estimate was too low by a sizeable amount. We have contacted experienced and reliable experts on this process with whom we work on the WIPP project, and their estimates run much closer to \$1 million for the entirety of the work we are facing. That view was reconfirmed just this morning in a phone conversation with one such expert who had just examined the photos we took of many of the well-pads in question.

The path we should probably now go down includes, but is not necessarily limited to, the following steps:

- Identify a qualified Sandia technical staff member or manager to serve as the technical overseer for the Sulimar work.
- Clarify/confirm the number of wells to be plugged and abandoned (28, 33, or some other number?)
- Identify firms in the region that do this kind of work. (We are already in the process of doing this.)
- Prepare a plugging and abandoning/environmental restoration plan and review that plan with cognizant officials in BLM offices in Roswell or Carlsbad (and with New Mexico's OCD, if necessary).
- Request proposals from firms that do this kind of work, hoping to receive reasonable offers for comprehensive, turn-key services.
- Prepare for the possibility that multiple contracts will have to be placed for different aspects of the work in question.
- Conduct a "pre-bid" conference with interested bidders so that firms can actually see the wells to be plugged and abandoned and the extent of vertical structure removal and other environmental restoration work to be done.
- Place contracts with one or more firms to do the work; resort to firm-fixed price contracts, if possible. Emphasize in our contract negotiation approach the possibility that the direct cost to Sandia could be reduced if the contracting organization doing the work could retain and sell (either for re-use or for scrap) all vertical structures, pipe, etc. located on the well-pads in question. Such a contracting strategy may reduce the cost of the contracted work. A possible glitch all this may arise as a result of the existence at one or more of the well-pads in question of fluids standing in pits on the surface. If the pits are unlined, or if linings have rotted or are otherwise compromised, we may be obligated to "chase plumes"; i.e., we may have to remove and treat for disposal some quantity of soil saturated by the fluids we now see on the surface. In addition, there may be electrical transformers (probably containing PCBs) at some of the well-pads – hopefully with intact structural and containment integrity – and those will have to be disposed of properly.
- Proceed with the work and oversee the work.
- Arrange for BLM/OCD inspection and certification that the plugging and abandoning and environmental restoration work was properly and completely done.
- Communicate the results of that inspection and certification to New Mexico Tech.

In addition to the money we are likely to have to spend on firms to perform the work, we will of course have to allow access to an appropriate project/task number for Sandia's who oversee this work to charge. To plan for a total project cost for this endeavor of less than \$1 million would seem risky to me. More refined cost estimates can and will be developed as

we go, but I thought it prudent to offer this information as early as I felt confident enough to do so.

Please let me know if you have additional questions. Otherwise, I will see to it that we begin to move through the work I've outlined above with some dispatch in order to show good faith with New Mexico Tech.

Copy to:

MS-0771	6800	Dennis Berry
MS-1395	6821	Dave Kessel
MS-1395	6822	Mark Rigali
MS-1395	6822	Rick Beauheim
MS-1395	6822	Randy Roberts
MS-1395		Department 6820 Day File



**ATTACHMENT III**  
**BUREAU OF LAND MANAGEMENT SULIMAR QUEEN WELLS**  
**UNIT PROJECT REQUIREMENTS AND EXPECTATIONS**





United States Department of the Interior  
BUREAU OF LAND MANAGEMENT

Roswell Field Office  
2909 West Second Street  
Roswell, New Mexico 88201

IN REPLY REFER TO:  
NM-82050X

CERTIFIED MAIL--RETURN RECEIPT REQUESTED  
7000 1530 0003 7687 1077

New Mexico Tech

RE: Sulimar Queen Unit:

LC-069280-A, Sulimar Queen Tr. 1, #8, T. 15 S., R. 29 E., Sec. 13, 2310' FWL & 330' FSL,  
Chaves County, NMPM  
LC-069280-A, Sulimar Queen Tr. 1, #9, T. 15 S., R. 29 E., Sec. 13, 330' FSL & 990' FWL,  
Chaves County, NMPM  
LC-069280-A, Sulimar Queen Tr. 1, #15, T. 15 S., R. 29 E., Sec. 24, 990' FSL & 2310' FWL,  
Chaves County, NMPM  
LC-069280-A, Sulimar Queen Tr. 1, #16, T. 15 S., R. 29 E., Sec. 24, 585' FNL & 2570' FWL,  
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LC-069280-A, Sulimar Queen Tr. 2, #3, T. 15 S., R. 29 E., Sec. 13, 330' FSL & 1650' FEL,  
Chaves County, NMPM  
LC-069280-A, Sulimar Queen Tr. 2, #4, T. 15 S., R. 29 E., Sec. 13, 660' FSL & 660' FEL,  
Chaves County, NMPM  
LC-069280-A, Sulimar Queen Tr. 1, #2, T. 15 S., R. 29 E., Sec. 24, 1980' FNL & 1980' FWL,  
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LC-069280-A, Sulimar Queen Tr. 1, #3, T. 15 S., R. 29 E., Sec. 24, 660' FNL & 2310' FWL,  
Chaves County, NMPM  
LC-069280-A, Sulimar Queen Tr. 1, #4, T. 15 S., R. 29 E., Sec. 24, 2310' FSL & 2310' FWL,  
Chaves County, NMPM  
LC-069280-A, Sulimar Queen Tr. 1, #5, T. 15 S., R. 29 E., Sec. 24, 660' FSL & 1980' FWL,  
Chaves County, NMPM  
LC-069280-A, Sulimar Queen Tr. 1, #6, T. 15 S., R. 29 E., Sec. 24, 1650' FSL & 660' FWL,  
Chaves County, NMPM  
LC-069280-A, Sulimar Queen Tr. 1, #7, T. 15 S., R. 29 E., Sec. 24, 330' FSL & 660' FWL,  
Chaves County, NMPM  
LC-069280-A, Sulimar Queen Tr. 1, #10, T. 15 S., R. 29 E., Sec. 24, 50' FSL & 1450' FWL,  
Chaves County, NMPM  
LC-069280-A, Sulimar Queen Tr. 1, #11, T. 15 S., R. 29 E., Sec. 24, 2615' FSL & 1370' FWL,  
Chaves County, NMPM

LC-069280-A, Sulimar Queen Tr. 1, #12, T. 15 S., R. 29 E., Sec. 24, 810' FNL & 1490' FWL,  
Chaves County, NMPM

LC-069280-A, Sulimar Queen Tr. 1, #13, T. 15 S., R. 29 E., Sec. 24, 990' FSL & 150' FWL,  
Chaves County, NMPM

LC-069280-A, Sulimar Queen Tr. 1, #14, T. 15 S., R. 29 E., Sec. 24, 1345' FSL & 1450' FWL,  
Chaves County, NMPM

LC-069280-B, Sulimar Queen Tr. 2, #2, T. 15 S., R. 29 E., Sec. 18, 660' FSL & 660' FWL  
Chaves County, NMPM

LC-069280-B, Sulimar Queen Tr. 2, #7, T. 15 S., R. 29 E., Sec. 19, 660' FNL & 660' FWL,  
Chaves County, NMPM

LC-069280-C, Sulimar Queen Tr. 3, #1, T. 15 S., R. 29 E., Sec. 24, 660' FNL & 660' FEL,  
Chaves County, NMPM

LC-069280-C, Sulimar Queen Tr. 3, #2, T. 15 S., R. 29 E., Sec. 24, 1650' FNL & 1980' FEL,  
Chaves County, NMPM

LC-069280-C, Sulimar Queen Tr. 3, #3, T. 15 S., R. 29 E., Sec. 24, 1980' FNL & 760' FEL,  
Chaves County, NMPM

LC-069280-C, Sulimar Queen Tr. 3, #4, T. 15 S., R. 29 E., Sec. 24, 1980' FSL & 1980' FEL,  
Chaves County, NMPM

LC-069280-C, Sulimar Queen Tr. 3, #6, T. 15 S., R. 29 E., Sec. 24, 990' FSL & 2310' FEL,  
Chaves County, NMPM

NM-0458656, Sulimar Queen Tr. 4, #1, T. 15 S., R. 29 E., Sec. 26, 330' FNL & 330' FEL,  
Chaves County, NMPM

NM-0458656, Sulimar Queen Tr. 4, #2, T. 15 S., R. 29 E., Sec. 26, 990' FNL & 1650' FEL,  
Chaves County, NMPM

NM-0493370-A, Sulimar Queen Tr. 5, #1, T. 15 S., R. 29 E., Sec. 26, 1650' FNL & 990' FEL,  
Chaves County, NMPM

NM-0493370-A, Sulimar Queen Tr. 5, #2, T. 15 S., R. 29 E., Sec. 26, 2310' FNL & 1650' FEL,  
Chaves County, NMPM

NM-0493370-A, Sulimar Queen Tr. 5, #3, T. 15 S., R. 29 E., Sec. 26, 2310' FSL & 2310' FEL,  
Chaves County, NMPM

NM-0518428, Sulimar Queen Tr. 6, #1, T. 15 S., R. 29 E., Sec. 25, 330' FNL & 660' FWL,  
Chaves County, NMPM

NM-0518428, Sulimar Queen Tr. 6, #2, T. 15 S., R. 29 E., Sec. 25, SW $\frac{1}{4}$ NW $\frac{1}{4}$ , Chaves  
County, NMPM

NM-0558684, Sulimar Queen Tr. 8, #1, T. 15 S., R. 29 E., Sec. 24, 330' FNL & 1680' FEL,  
Chaves County, NMPM

An inspection was conducted on November 4, 2004, at the above referenced locations. Following plugging, surface restoration shall be completed in accordance with the following stipulations:

1. At least 3 days prior to commencing restoration activities, you are required to notify Jessica Rubado at (505) 627-0240.
2. All production equipment and storage facilities shall be removed from these locations.
3. All electrical apparatus that are no longer necessary for the service of these wells shall be removed, including the power poles and transmission lines that extend from the location to the main electrical distribution line. Any main distribution line installed to service this unit shall be removed.

4. All surface pipeline that serviced these wells shall be removed from the locations and adjacent areas. This includes any exposed pipeline that was previously buried located anywhere in the unit.
5. The anchors shall be cut and removed from these locations.
6. The locations and the immediate area surrounding the locations shall be cleaned of all trash and debris. The trash and debris (buildings, meterhouses, pipeline, barrels, thread protectors, barbed wire, cable, anchors, etc.) shall be disposed of at an authorized disposal site.
7. The oil and saturated soils located anywhere on the unit shall be excavated and removed. This includes the entire profile of saturation. Excavated areas shall be recontoured to mirror the contours of the surrounding terrain. The oil and saturated soils shall be disposed of at an authorized disposal facility.
8. The permanently abandoned well locations shall be marked with a permanent monument (dry hole marker). The monument is to be of a steel pipe, not less than 4 inches in diameter, cemented permanently in the ground, and extend a minimum of four feet above ground level. The top of the steel pipe shall be welded secure with a steel cap or cemented shut with a cement plug. The following information shall be inscribed with a beaded weld on the monument:
  - OPERATOR NAME
  - LEASE NUMBER
  - WELL NAME AND NUMBER
  - LEGAL DESCRIPTION
9. Caliche shall be removed from these locations and all unnecessary access roads. This unit is located in critical areas for the lesser prairie chicken. Restoration of this area to a natural biotic community is critical for the persistence of these species. There is approximately 5-9 inches of compacted caliche on the subject locations. As the underlying soil horizon in some of the unit is only about 24 inches in depth, careful removal is critical to achieve desired results. Removal activities shall limit the mixing of caliche with underlying soils. The removed caliche can be used on existing roads in need of maintenance, or hauled to a material pit for disposal. If the caliche is to be hauled to the material pit, contact Jerry Dutchover at (505) 627-0272 for possible additional requirements.
10. The locations shall be returned to a natural landform. This includes constructing dunes, undulations, and slope consistent with the surrounding terrain.
11. Following caliche removal, the locations shall be ripped to a approximately 14" in depth, with the rips approximately 8" to 10" apart. Ripping of the locations shall be on the contour. Ripping of the locations will leave furrows that can be used for cultivation during seeding of the disturbed areas.
12. The locations shall be seeded with the prescribed method and mixture demonstrated in exhibit A.
13. Earthen barricades shall be constructed to prevent vehicular entry to the access roads that serviced this unit.

Upon completion of the above stipulations submit a Final Abandonment Notice on Form 3160-5, Sundry Notice and Reports on Wells (original and 6 copies), stating the surface restoration is complete and ready for inspection. Liability under bond is retained until surface restoration is completed.

Approval of the Final Abandonment Notice for this well shall be contingent upon compliance with all existing regulations (i.e., 43 CFR 3162.3-4(c) and Onshore Oil and Gas Order No. 1).

These requirements shall be completed within 90 days after all of these wells are plugged.

You have the right to an administrative review of these requirements in accordance with the provisions in 43 CFR 3165.3.

Should you have any questions or concerns regarding this or any other matter please do not hesitate to contact Jessica Rubado at (505) 627-0240.

Sincerely,

Larry D. Bray  
Assistant Field Manager  
Land and Minerals

Enclosures: Exhibit A: Seeding Requirements  
 Aerial Photograph depicting locations and roads to be reclaimed  
 Exhibit A: Seeding Requirements

SEED MIX FOR

- LC-069280-A, Sulimar Queen Tr. 1, #6, T. 15 S., R. 29 E., Sec. 24, 1650' FSL & 660' FWL, Chaves County, NMPM
- LC-069280-A, Sulimar Queen Tr. 1, #7, T. 15 S., R. 29 E., Sec. 24, 330 FSL & 660' FWL, Chaves County, NMPM
- LC-069280-A, Sulimar Queen Tr. 1, #11, T. 15 S., R. 29 E., Sec. 24, 2615' FSL & 1370' FWL, Chaves County, NMPM
- LC-069280-A, Sulimar Queen Tr. 1, #13, T. 15 S., R. 29 E., Sec. 24, 990' FSL & 150' FWL, Chaves County, NMPM
- LC-069280-A, Sulimar Queen Tr. 1, #14, T. 15 S., R. 29 E., Sec. 24, 1345' FSL & 1450' FWL, Chaves County, NMPM
- NM-0458656, Sulimar Queen Tr. 4, #1, T. 15 S., R. 29 E., Sec. 26, 330' FNL & 330' FEL, Chaves County, NMPM
- NM-0458656, Sulimar Queen Tr. 4, #2, T. 15 S., R. 29 E., Sec. 26, 990' FNL & 1650' FEL, Chaves County, NMPM
- NM-0493370-A, Sulimar Queen Tr. 5, #1, T. 15 S., R. 29 E., Sec. 26, 1650' FNL & 990' FEL, Chaves County, NMPM
- NM-0493370-A, Sulimar Queen Tr. 5, #2, T. 15 S., R. 29 E., Sec. 26, 2310' FNL & 1650' FEL, Chaves County, NMPM
- NM-0493370-A, Sulimar Queen Tr. 5, #3, T. 15 S., R. 29 E., Sec. 26, 2310' FSL & 2310' FEL, Chaves County, NMPM
- NM-0518428, Sulimar Queen Tr. 6, #1, T. 15 S., R. 29 E., Sec. 25, 330' FNL & 660' FWL, Chaves County, NMPM

Soil: Sotim-Simona association, moderately undulating  
 Ecological Site: Shallow Sand SD-3  
 Ecological Site: Sandy SD-3  
 March 19, 2001

<u>Common Name and Preferred Variety</u>	<u>Scientific Name</u>	<u>Pounds of Pure Live Seed Per Acre</u>
Black grama or Blue grama, var. Lovington	<i>(Bouteloua eriopoda)</i> <i>(Bouteloua gracilis)</i>	5.0
Sideoats grama var. Vaughn or El Reno	<i>(Bouteloua curtipendula)</i>	1.0
Sand dropseed or Mesa dropseed or Spike dropseed	<i>(Sporobolus cryptandrus)</i> <i>(S. flexuosus)</i> <i>(S. contractus)</i>	0.5

Desert or Scarlet Globemallow	( <i>Sphaeralcea ambigua</i> ) or ( <i>S. coccinea</i> )	1.0
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Croton	( <i>Croton</i> spp.)	1.0
<b>TOTAL POUNDS PURE LIVE SEED PER ACRE</b>		<b>8.5</b>

SEED MIX FOR

- LC-069280-A, Sulimar Queen Tr. 1, #8, T. 15 S., R. 29 E., Sec. 13, 2310' FWL & 330' FSL, Chaves County, NMPM
- LC-069280-A, Sulimar Queen Tr. 1, #9, T. 15 S., R. 29 E., Sec. 13, 330' FSL & 990' FWL, Chaves County, NMPM
- LC-069280-A, Sulimar Queen Tr. 1, #15, T. 15 S., R. 29 E., Sec. 24, 990' FSL & 2310' FWL, Chaves County, NMPM
- LC-069280-A, Sulimar Queen Tr. 1, #16, T. 15 S., R. 29 E., Sec. 24, 585' FNL & 2570' FWL, Chaves County, NMPM
- LC-069280-A, Sulimar Queen Tr. 2, #3, T. 15 S., R. 29 E., Sec. 13, 330' FSL & 1650' FEL, Chaves County, NMPM
- LC-069280-A, Sulimar Queen Tr. 2, #4, T. 15 S., R. 29 E., Sec. 13, 660' FSL & 660' FEL, Chaves County, NMPM
- LC-069280-A, Sulimar Queen Tr. 1, #2, T. 15 S., R. 29 E., Sec. 24, 1980' FNL & 1980' FWL, Chaves County, NMPM
- LC-069280-A, Sulimar Queen Tr. 1, #3, T. 15 S., R. 29 E., Sec. 24, 660' FNL & 2310' FWL, Chaves County, NMPM
- LC-069280-A, Sulimar Queen Tr. 1, #4, T. 15 S., R. 29 E., Sec. 24, 2310' FSL & 2310' FWL, Chaves County, NMPM
- LC-069280-A, Sulimar Queen Tr. 1, #5, T. 15 S., R. 29 E., Sec. 24, 660' FSL & 1980' FWL, Chaves County, NMPM
- LC-069280-A, Sulimar Queen Tr. 1, #10, T. 15 S., R. 29 E., Sec. 24, 50' FSL & 1450' FWL, Chaves County, NMPM
- LC-069280-A, Sulimar Queen Tr. 1, #12, T. 15 S., R. 29 E., Sec. 24, 810' FNL & 1490' FWL, Chaves County, NMPM
- LC-069280-B, Sulimar Queen Tr. 2, #2, T. 15 S., R. 29 E., Sec. 18, 660' FSL & 660' FWL, Chaves County, NMPM
- LC-069280-B, Sulimar Queen Tr. 2, #7, T. 15 S., R. 29 E., Sec. 19, 660' FNL & 660' FWL, Chaves County, NMPM
- LC-069280-C, Sulimar Queen Tr. 3, #1, T. 15 S., R. 29 E., Sec. 24, 660' FNL & 660' FEL, Chaves County, NMPM
- LC-069280-C, Sulimar Queen Tr. 3, #2, T. 15 S., R. 29 E., Sec. 24, 1650' FNL & 1980' FEL, Chaves County, NMPM
- LC-069280-C, Sulimar Queen Tr. 3, #3, T. 15 S., R. 29 E., Sec. 24, 1980' FNL & 760' FEL, Chaves County, NMPM
- LC-069280-C, Sulimar Queen Tr. 3, #4, T. 15 S., R. 29 E., Sec. 24, 1980' FSL & 1980' FEL, Chaves County, NMPM
- LC-069280-C, Sulimar Queen Tr. 3, #6, T. 15 S., R. 29 E., Sec. 24, 990' FSL & 2310' FEL, Chaves County, NMPM
- NM-0518428, Sulimar Queen Tr. 6, #2, T. 15 S., R. 29 E., Sec. 25, SW $\frac{1}{4}$ NW $\frac{1}{4}$ , Chaves County, NMPM
- NM-0558684, Sulimar Queen Tr. 8, #1, T. 15 S., R. 29 E., Sec. 24, 330' FNL & 1680' FEL, Chaves County, NMPM

RPD  
 Roswell fine sand, 2-25% slope  
 Jalmar fine sands, 0-2% slope

FMA  
 Faskin, loamy fine sands, 0-2% slope  
 Malmstrom loamy fine sand, 0-2% slope

Sandy Plains CP-2 Ecological Site  
 Sand hills CP-2 Ecological Site

August 27, 1998

<u>Common Name and Preferred Variety</u>	<u>Scientific Name</u>	<u>Pounds of Pure Live Seed Per Acre</u>
Sand bluestem, var. Woodward	<i>Andropogon hallii</i>	2.0
Little bluestem var. Pastura	<i>Schizachyrium scoparium</i>	1.0
Sideoats grama, var. Vaughn or El Reno	<i>Bouteloua curtipendula</i>	1.5
Sand dropseed	<i>Sporobolus cryptandrus</i>	0.33
Plains bristlegrass	<i>Setaria macrostachya</i>	2.0
Desert or Scarlet Globemallow	<i>Sphaeralcea ambigua</i> or <i>S. coccinea</i>	0.67
<u>Buckwheat</u>	<u><i>Eriogonum spp.</i></u>	<u>1.5</u>
<b>TOTAL POUNDS PURE LIVE SEED PER ACRE</b>		<b>9.00</b>

**Certified Weed Free Seed.**

**If one species is not available  
 Increase ALL others proportionately**

**A minimum of 4 species is required, including 1 forb species.**

A.) Because prevailing weather conditions in southeastern New Mexico could inhibit the vegetation growth for several years, the seeding requirement shall be accomplished as early as possible. The

operator shall contact Jessica Rubado at (505) 627-0240 at least 3 days prior to seeding operations. A seed card shall be provided to the authorized officer that demonstrates the species assemblage applied to the location. Final abandonment approval will coincide with confirmation of seeding and the establishment of vegetation on the disturbed areas.

**The recommended time to seed is from June 15th through August 15th. The optimum seeding time is in mid-July.** Successive seeding should be done either late in the fall (September 15 - November 15, before freeze up) or as early as possible the following spring to take advantage of available ground moisture.

B.) SEEDING OPERATION: Seeding will be done with a disc-type drill with two boxes for various seed sizes. The drill rows will be eight to ten inches apart. The seed will be planted not less than one-half inch deep or more than one inch deep. The seeder will be followed with a drag, packer, or roller to ensure uniform coverage of the seed and adequate compaction. Drilling will be done on the contour where possible, not up and down the slope. Where slopes are too steep for contour drilling, a "cyclone" hand seeder or similar broadcast seeder shall be used. **If seeds are broadcast, double the pounds of pure-live-seed per acre.** The seed will then be covered to the depth described above by whatever means is practical.

It may be necessary to mix small seeds, such as Lovegrass, Sacaton, or Dropseed, with sand or rice hulls to obtain uniform coverage. Rice hulls are generally available from seed dealers for this purpose.

**ATTACHMENT IV**  
**SULIMAR QUEEN WELLS UNIT PROJECT SUMMARY**



## Project Summary

It is the intent of this document to summarize the history of the project, and introduce pertinent information relative to the stakeholders, risks and financial information. From this document sub-contracting work scope statements, schedules, cost estimates, risk mitigation plans for completing this work can be developed.

Background

In 1988, SNL agreed to clean up a field containing 32 wells leased by New Mexico Institute of Mining and Technology (NM Tech) in the Sulimar Queen District of Southeast NM. NM Tech is the Operator of Record for the Sulimar Queen Site according to the NM State Oil Conservation Division web site.<sup>1</sup> Early in 2005, NM Tech contacted Sandia National Laboratories (SNL) legal department asking about when we would fill our obligation.<sup>2</sup> Paul Shoemaker, then the manager of the SNL Carlsbad Programs Group (CPG) engaged the technical staff at CPG to visit the site and revise earlier cost estimates.<sup>3</sup> The set of pictures taken by SNL/CPG scientists during a site visit on March 8<sup>th</sup> 2005 is enclosed. On June 9<sup>th</sup>, 2005 Andrew Orrell, the acting SNL/CPG Level II manager asked Chad Twitchell to develop a project plan and a risk assessment to do so.

The objective is to clean up this site, meeting all the regulatory requirements set by the appropriate government agencies at a minimum cost and to maintain SNLs reputation. The requirement from the Memorandum of Understanding (MOU), paragraphs 5 and 6 is specifically, "...adequately plugging all wells at the Site and abandoning the Site....(and) restore the leased lands upon completion of any drilling operations as prescribed in the lease".<sup>4</sup>

Customers/Regulators and Stakeholders

The most important stakeholder is NMTech in Socorro NM. Their desire is to sell the lease, and they are prohibited from doing it until the regulators are satisfied that the area is cleaned to the applicable standards. It is essential therefore to understand the regulators expectations and criteria for completion as early as possible. It is proposed that specific criteria be documented and agreed to, in writing, from the stakeholders and the regulatory decision makers IN ADVANCE of sub-contracting the work. This might include who will inspect, who has authority to sign off for completion, and what measures will be in place to assure that no future liability exists. Both the Bureau of Land Management (BLM) Roswell office and the NM State Oil Conservation Division (OCD) will be involved.

There is some question about the role of the BLM offices. The office in Roswell is clearly the one in charge of this activity as indicated by a November 2004 letter to NM Tech regarding this field. It specifies the work to be done, and provides clear guidance about well locations, seeding requirements and other work. They reportedly work well with the Carlsbad office, and have given SNL permission to work with the Carlsbad office, but want to maintain control of the clean up. They have also indicated a desire to work with SNL, and potentially allow us to use some of their resources to complete the

### Project Summary

project. One of the key positions in the Roswell BLM Office for oversight of this type of project is currently vacant.<sup>5</sup>

On June 24, 2005 Chad Twitchell spoke with Jerry Dutchover of the Roswell BLM Office to obtain an electronic copy of the instruction letter. He also met the Carlsbad BLM Office Field Manager (Tony Herrell), and Eddie Bateson, the Roswell Field Manager on June 25<sup>th</sup> at a Townhall meeting at the Pecos River Conference center and spoke briefly with each in private on this matter. The purpose of this meeting was only to introduce myself, and acquaint each of them of the project.

### Financials

An initial estimate of about \$330,000 was provided, to do the Plugging and Abandonment (P&A) for all of the wells on the site.<sup>6</sup> This estimate was later misinterpreted to include the site clean up. An estimate of \$1M was provided by SNL scientists in the CPG Office for the whole job.. Attachment 1 is a summary of the most current cost estimate, along with some assumptions.

Project 83.03.05 was initially set up with a tentative budget of \$1,000,000 by Paul Shoemaker<sup>7</sup> and changed on June 16<sup>th</sup> to project # 92952 by Chad Twitchell and Denise Krupka Task 1.1 for the initiation and planning activities.<sup>8</sup> Denise, speaking for the Integrated Enabling Systems (IES) organization prefers that as much of this money be spent this FY as possible, as there is some uncertainty as to whether the money will be available in FY06.

### Risk Assessment and Mitigation Plan

Attachment 2 to this summary is a list of risks, and possible mitigation plans associated with each risk. They are divided into major and minor risks. Ultimately, more money can cover most of the risks. Due to the preliminary nature of the document, additional information and risk mitigation plans will need to be developed as more information about the work to be done is discovered.

### Path Forward/Staffing/Administration

The project plan consists of the description of the tasks described in Paul Shoemaker's May 11 letter. They include better defining the scope, cost, schedule, risk assessment and mitigation plans and staffing considerations. There will need to be a full time person to oversee the successful completion. Fran Nimick, (dept 6140, phone 284-2577) should be consulted as well as the two Environmental Restoration (ER) departments (organizations 6146 or 6147) led by Dwight Stockham and Dick Fate respectively. One idea is to relocate a technical expert to Carlsbad for a year or so to help with this.

Almost all of the work will be sub-contracted out to either a number of speciality firms or one firm to perform all the work in a turnkey fashion. Regardless of the approach, success requires careful delineation of the requirements to sub-contractors, close

## Project Summary

monitoring and oversight of the work and good coordination among the regulators and stakeholders. Once the project is authorized to proceed from SNL management, regular progress reports, status meetings will commence. The files for this project are the possession of SNL/CPG and currently reside on the SNL/SRN at \\watermelon\common\sulimar clean up\. Questions about the details of current status of the project should be addressed to Chad Twitchell, Acting Project Manager SNL/CPG at (505) 844-5027 (ABQ) and (505) 234-0042 (Carlsbad), [catwite@sandia.gov](mailto:catwite@sandia.gov).

<sup>1</sup> See <http://octane.nmt.edu/data/ongard/operator.asp> Type in New Mexico Institute of Mining and Technology. 30 wells are listed and provide the production data for each of the wells.

<sup>2</sup> See January 21, 2005 letter from Mark Adams of the law firm of Rodey, Dickason to Charlie Pechewlys, SNL Legal. It is clear from this letter that correspondence in 2003 and prior regarding this issue expects us to take care of our obligation in a timely manner. It is apparent that the SNL people involved are now retired, and are unavailable for additional information. Some attempt has been made to contact such individuals with no success. Attempts were also made to explore all feasible options not to do this work or to transfer this work (i.e. sell the lease, transfer the work etc.) all to no avail. SNL asked that the Rodey Law Firm provide cost estimates for this work and they contracted to do so.

<sup>3</sup> See Paul Shoemaker letter of May 11, 2005.

<sup>4</sup> MOU approved and accepted on September 2, 1988, executed by Dan Hartley on behalf of SNL, John Whetten(?) LANL, and Laurence H. Lattman for NM Tech (both the Research Foundation and the Institute of Mining and Technology). While the intention of the MOU was for "Capital equipment with the Site by any party ... be used to offset the cost of abandonment" this now seems secondary, given the amount of time past since the MOU was executed.

<sup>5</sup> The BLM letter of Nov 18, 2004 makes reference to a Jessica Rubado, who has since left the office.

<sup>6</sup> See Amy Blumberg's Email of Tues Feb 1, 2005 @ 1:26 PM. Taken from a 9 page printout of a chain of emails. See also endnote 1. It appears SNL requested this estimate be done. In the process of developing the estimate \$5,943.00 of costs were incurred by the Rodey Law Firm.

<sup>7</sup> This and the other project number are "infrastructure/indirect" funded project types to cover legal liabilities and are controlled by the Integrated Enabling Services (IES) group at SNL.

<sup>8</sup> Cost transfers for Rick Beauheim, Randy Roberts and Chad Twitchell were done by Dina Howell during the first two weeks of July 2005. Paul Shoemaker has charged 83.03.05 for the time he worked on it. Neither his nor Andrew Orrell's time spent has been charged to 92952.



**ATTACHMENT V**  
**BUREAU OF LAND MANAGEMENT SULIMAR QUEEN UNIT**  
**PROJECT FORM 3160-5, SUNDRY NOTICES**  
**AND REPORTS ON WELLS**



Form 3160-5  
(April 2004)

N.M. Oil Cons. DIV-Dist. 2  
 UNITED STATES DEPARTMENT OF THE INTERIOR  
 BUREAU OF LAND MANAGEMENT  
 1601 W. Grand Avenue, NM 88210

FORM APPROVED  
 OMB No. 1004-0137  
 Expires: March 31, 2007

**SUNDRY NOTICES AND REPORTS ON WELLS**  
 Do not use this form for proposals to drill or to re-enter an abandoned well. Use Form 3160-3 (APD) for such proposals.

**SUBMIT IN TRIPLICATE- Other instructions on reverse side.**

1. Type of Well <input checked="" type="checkbox"/> Oil Well <input type="checkbox"/> Gas Well <input type="checkbox"/> Other		5. Lease Serial No. LC0699280-A
2. Name of Operator NEW MEXICO INSTITUTE OF MINING & TECHNOLOGY		6. If Indian, Allottee or Tribe Name
3a. Address 601 W Illinois Av., Hobbs NM 88240	3b. Phone No. (include area code) 505-392-2236	7. If Unit or CA/Agreement, Name and/or No. SULIMAR QUEEN UNIT
4. Location of Well (Footage, Sec., T., R., M., or Survey Description) 330 FSL 990 FWL    U/L M Sec 13 T15S R29E		8. Well Name and No. SULIMAR QUEEN UNIT TR 1 # 9
		9. API Well No. 30-005-60121
		10. Field and Pool, or Exploratory Area Sulimar Queen
		11. County or Parish, State Chaves County, New Mexico

**12. CHECK APPROPRIATE BOX(ES) TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA**

TYPE OF SUBMISSION	TYPE OF ACTION		
<input checked="" type="checkbox"/> Notice of Intent	<input type="checkbox"/> Acidize	<input type="checkbox"/> Deepen	<input type="checkbox"/> Production (Start/Resume)
<input type="checkbox"/> Subsequent Report	<input type="checkbox"/> Alter Casing	<input type="checkbox"/> Fracture Treat	<input type="checkbox"/> Reclamation
<input type="checkbox"/> Final Abandonment Notice	<input type="checkbox"/> Casing Repair	<input type="checkbox"/> New Construction	<input type="checkbox"/> Recomplete
	<input type="checkbox"/> Change Plans	<input checked="" type="checkbox"/> Plug and Abandon	<input type="checkbox"/> Temporarily Abandon
	<input type="checkbox"/> Convert to Injection	<input type="checkbox"/> Plug Back	<input type="checkbox"/> Water Disposal
			<input type="checkbox"/> Water Shut-Off
			<input type="checkbox"/> Well Integrity
			<input type="checkbox"/> Other

13. Describe Proposed or Completed Operation (clearly state all pertinent details, including estimated starting date of any proposed work and approximate duration thereof. If the proposal is to deepen directionally or recomplete horizontally, give subsurface locations and measured and true vertical depths of all pertinent markers and zones. Attach the Bond under which the work will be performed or provide the Bond No. on file with BLM/BIA. Required subsequent reports shall be filed within 30 days following completion of the involved operations. If the operation results in a multiple completion or recompletion in a new interval, a Form 3160-4 shall be filed once testing has been completed. Final Abandonment Notices shall be filed only after all requirements, including reclamation, have been completed, and the operator has determined that the site is ready for final inspection.)

- POH w/ rods & tubing
- Spot 25 sx class "C" neat cement @ 1938 on top of existing packer
- RIH tag cmt
- Option A
- Perf @ 370'
- Spot 100' plug (50' in & 50' out 8 5/8 shoe @ 317) and tag plug
- Spot 30' plug from 30' to surface
- Cut off well head install dry hole marker
- Option B
- Cut & pull 5 1/2 @ 340 + or -
- RIH spot 100' plug (50' in stub to 50' in 8 5/8 shoe @ 317) and tag
- Spot 30' plug from 30' to surface
- Cut off well head install dry hole marker

SEE ATTACHED BEFORE & AFTER WELLBORE SCHEMATIC

RECEIVED

NOV 11 2004

OGD-ARTESIA

*See attached changes to plugging procedure*

14. I hereby certify that the foregoing is true and correct  
 Name (Printed/Typed)

Signature Eddie Seay	Title Agent
Date 10/21/04	

**THIS SPACE FOR FEDERAL OR STATE OFFICE USE**

Approved by RFE	Title PE	Date 11/9/04
Conditions of approval, if any, are attached. Approval of this notice does not constitute or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.	Office RFO	

Title 18 U.S.C. Section 1001 and Title 43 U.S.C. Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

(Instructions on page 2)

N.M. Oil Cons. Div-Dist. 2  
1301 W. Grand Avenue

Form 3160-5  
(February 2005)

UNITED STATES OF AMERICA  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT

FORM APPROVED  
OM B No. 1004-0137  
Expires: March 31, 2007

Month - Year  
MAR 23 2007  
OCD - ALBUQU, NM

**SUNDRY NOTICES AND REPORTS ON WELLS**  
Do not use this form for proposals to drill or to re-enter an abandoned well. Use Form 3160-3 (APD) for such proposals.

**SUBMIT IN TRIPLICATE- Other instructions on reverse side.**

1. Type of Well <input checked="" type="checkbox"/> Oil Well <input type="checkbox"/> Gas Well <input type="checkbox"/> Other		5. Lease Serial No. LC069280-A
2. Name of Operator NEW MEXICO INSTITUTE OF MINING & TECHNOLOGY		6. If Indian, Allottee or Tribe Name
3a. Address D.Cox, SNL MS 0778, Box 5800, Albuquerque, NM 87185-0778	3b. Phone No. (include area code) 505-284-3871	7. If Unit or CA/Agreement, Name and/or No. SULIMAR QUEEN UNIT
4. Location of Well (Footage, Sec., T., R., M., or Survey Description) 330' FSL, 990' FWL UNIT LETTER M SEC 13, T15S, R29E		8. Well Name and No. SULIMAR QUEEN UNIT TR 1 # 9
		9. API Well No. 30-005-60121
		10. Field and Pool, or Exploratory Area SULIMAR QUEEN
		11. County or Parish, State CHAVES COUNTY, N.M.

12. CHECK APPROPRIATE BOX(ES) TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

TYPE OF SUBMISSION	TYPE OF ACTION			
<input type="checkbox"/> Notice of Intent	<input type="checkbox"/> Acidize	<input type="checkbox"/> Deepen	<input type="checkbox"/> Production (Start/Resume)	<input type="checkbox"/> Water Shut-Off
<input checked="" type="checkbox"/> Subsequent Report	<input type="checkbox"/> Alter Casing	<input type="checkbox"/> Fracture Treat	<input type="checkbox"/> Reclamation	<input type="checkbox"/> Well Integrity
<input type="checkbox"/> Final Abandonment Notice	<input type="checkbox"/> Casing Repair	<input type="checkbox"/> New Construction	<input type="checkbox"/> Recomplete	<input type="checkbox"/> Other
	<input type="checkbox"/> Change Plans	<input checked="" type="checkbox"/> Plug and Abandon	<input type="checkbox"/> Temporarily Abandon	
	<input type="checkbox"/> Convert to Injection	<input type="checkbox"/> Plug Back	<input type="checkbox"/> Water Disposal	

13. Describe Proposed or Completed Operation (clearly state all pertinent details, including estimated starting date of any proposed work and approximate duration thereof. If the proposal is to deepen directionally or recomplete horizontally, give subsurface locations and measured and true vertical depths of all pertinent markers and zones. Attach the Bond under which the work will be performed or provide the Bond No. on file with BLM/BIA. Required subsequent reports must be filed within 30 days following completion of the involved operations. If the operation results in a multiple completion or recompletion in a new interval, a Form 3160-4 must be filed once testing has been completed. Final Abandonment Notices must be filed only after all requirements, including reclamation, have been completed, and the operator has determined that the site is ready for final inspection.)

SEE ATTACHMENT

Accepted for record  
NMOC D.

APPROVED AS TO PLUGGING OF THIS WELL BORE. LIABILITY UNDER BOND IS RETAINED UNTIL SURFACE RESTORATION IS COMPLETED

14. I hereby certify that the foregoing is true and correct  
Name (Printed/Typed) Jack B. Tillman Title SNL Field Representative  
Signature [Signature] Date 03/16/07

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

Approved by /S/ DAVID R. GLASS Title PETROLEUM ENGINEER Date MAR 20 2007  
Conditions of approval, if any, are attached. Approval of this notice does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon. Office

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(Instructions on page 2)

MAYO MARRS CASING PULLING INC.  
BOX 863  
KERMIT, TEXAS 79745

NEW MEXICO INSTITUTE OF MINING & TECHNOLOGY

Lease: SULIMAR QUEEN UNIT TR 1 # 9

Project: P & A - CEMENTING REPORT

API # 30-005-60121

02-16-06 - SPOT 25 SXS @ 1921'-1715' TAGGED  
02-17-06 - PERFORATE @ 1193' - TEST TO 800#  
02-17-06 - SPOT 40 SXS @ 1243'-848' & TAG  
02-17-06 - PULL 406' OF 5 1/2" CASING  
02-17-06 - SPOT 60 SXS @ 465'-237' & TAG  
02-20-06 - SPOT 20 SXS @ 60' TO SURFACE

INSTALL DRY HOLE MARKER  
CIRCULATE 10# MUD



N.M. Oil Cons. DIV-Dist. 2  
1301 W. Grand Avenue  
Artesia, NM 88210  
UNITED STATES DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT

FORM APPROVED  
OMB No 1004-0137  
Expires March 31, 2007

**SUNDRY NOTICES AND REPORTS ON WELLS**  
**Do not use this form for proposals to drill or to re-enter an abandoned well. Use Form 3160-3 (APD) for such proposals.**

5 Lease Serial No. LC069280-A  
6. If Indian, Allottee or Tribe Name

SUBMIT IN TRIPLICATE - Other instructions on page 2.

1. Type of Well  
 Oil Well     Gas Well     Other  
 2. Name of Operator: NEW MEXICO INSTITUTE OF MINING & TECHNOLOGY  
 3a. Address: D Cox, SNL MS 0778, Box 5800, Albuquerque, NM 87185-0778  
 3b. Phone No. (include area code): (505) 284-3871  
 4 Location of Well (Footage, Sec., T., R., M., or Survey Description): 330' FSL 990' FWL U/L M SEC 13 T15S R29E  
 7. If Unit of CA/Agreement, Name and/or No.: SULIMAR QUEEN UNIT  
 8. Well Name and No.: Sulimar Queen Unit TR 1 # 9  
 9. API Well No.: 30-005-60121  
 10. Field and Pool or Exploratory Area: SULIMAR QUEEN  
 11. Country or Parish, State: CHAVES COUNTY, NEW MEXICO

12. CHECK THE APPROPRIATE BOX(ES) TO INDICATE NATURE OF NOTICE, REPORT OR OTHER DATA

TYPE OF SUBMISSION	TYPE OF ACTION				
<input type="checkbox"/> Notice of Intent	<input type="checkbox"/> Acidize	<input type="checkbox"/> Deepen	<input type="checkbox"/> Production (Start/Resume)	<input type="checkbox"/> Water Shut-Off	
<input type="checkbox"/> Subsequent Report	<input type="checkbox"/> Alter Casing	<input type="checkbox"/> Fracture Treat	<input type="checkbox"/> Reclamation	<input type="checkbox"/> Well Integrity	
<input checked="" type="checkbox"/> Final Abandonment Notice	<input type="checkbox"/> Casing Repair	<input type="checkbox"/> New Construction	<input type="checkbox"/> Recomplete	<input type="checkbox"/> Other _____	
	<input type="checkbox"/> Change Plans	<input checked="" type="checkbox"/> Plug and Abandon	<input type="checkbox"/> Temporarily Abandon		
	<input type="checkbox"/> Convert to Injection	<input type="checkbox"/> Plug Back	<input type="checkbox"/> Water Disposal		

13. Describe Proposed or Completed Operation: Clearly state all pertinent details, including estimated starting date of any proposed work and approximate duration thereof. If the proposal is to deepen directionally or recomplete horizontally, give subsurface locations and measured and true vertical depths of all pertinent markers and zones. Attach the Bond under which the work will be performed or provide the Bond No. on file with BLM/BIA. Required subsequent reports must be filed within 30 days following completion of the involved operations. If the operation results in a multiple completion or recompletion in a new interval, a Form 3160-4 must be filed once testing has been completed. Final Abandonment Notices must be filed only after all requirements, including reclamation, have been completed and the operator has determined that the site is ready for final inspection.)

SURFACE REMEDIATION COMPLETED

ACCEPTED FOR RECORD

JAN 02 2008

Gerry Guye, Deputy Field Inspector  
NMOC-District II ARTESIA

14 I hereby certify that the foregoing is true and correct  
 Name (Printed/Typed): Jack B. Tillman  
 Title: SNL Field Representative  
 Signature: *Jack B. Tillman*  
 Date: 10/24/2007

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

Approved by: *151 Angel Mayes*  
 Assistant Field Manager, Lands And Minerals  
 Date: DEC 17 2007  
 Office: ROSWELL FIELD OFFICE

Conditions of approval, if any, are attached. Approval of this notice does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.

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(Instructions on page 2)

**ATTACHMENT VI  
PHOTOGRAPHS OF SANDIA SULIMAR QUEEN UNIT  
RECLAMATION PROJECT RESULTS**





(a) Before Reclamation



(b) After Reclamation

Figure VI-1. Tank Battery on New Mexico Highway 217 (facing North-West)



(a) Before



(b) After

Figure VI-2. Well Site Track 3 #2 Facing North



(a) Before



(b) In Process



(c) After

Figure VI-3. Water Flood Support Structure and Tanks at Well Site Track 1 #2 Facing West



(a) Before



(b) In Process



(c) After

Figure VI-4. In-Ground Production Pit Located at Tank Battery on New Mexico Highway 217 Facing South-East



(a) Before



(b) In Process



(c) After

Figure VI-5. In-Ground Production Pit at Well Site Track 1 #2 Facing West



(a) Before



(b) In Process



(c) After

Figure VI-6. Tank Battery Located at Well Site Track 5 #1 Facing South-East



(a) Before



(b) In Process



(c) After

Figure VI-7. Well Site Track 1 #3 Facing North-East



(a) Before



(b) In Process



(c) After

Figure VI-8. Well Site Track 1 #9 Facing West



(a) Before



(b) In Process



(c) After

Figure VI-9. Well Site Track 1 #16 Facing North-East



(a) Before



(b) After

Figure VI-10. Well Site Track 1 #16 Facing North-East



(a) Before



(b) Before



(c) Before



(d) Before



(e) In Process



(f) Final

Figure VI-11. Debris at Well Site Track 2 #2 Facing East



(a) Before



(b) After

Figure VI-12. Well Site Track 8 #1 Facing West



(a) Before



(b) After

Figure VI-13. Caliche Pit Located Near Track 4 #2 Facing North



ATTACHMENT VII  
BUREAU OF LAND MANAGEMENT  
CONGRATULATORY LETTER TO SANDIA





IN REPLY REFER TO:

3100 (920)

## United States Department of the Interior

### BUREAU OF LAND MANAGEMENT

New Mexico State Office

1474 Rodeo Rd.

P.O. Box 27115

Santa Fe, New Mexico 87502-0115

[www.nm.blm.gov](http://www.nm.blm.gov)



May 21, 2008

Les E. Shephard  
VP (6000) Energy, Security, & Defense Technologies Division  
Sandia National Laboratories, New Mexico  
PO Box 5800, (MS 0724)  
Albuquerque, NM 87185

Re: Sulimar Queen Unit Agreement

Gentlemen:

The Bureau of Land Management (BLM) would like to offer our sincere gratitude and appreciation to Sandia National Laboratories (Sandia) for the restoration and reclamation efforts performed on the Sulimar Queen Oil and Gas Unit Agreement (Sulimar Queen) located in Chaves County, New Mexico.

The Sulimar Queen was formed in May of 1972 as a secondary recovery project in order to effect the additional recovery of oil and gas to prevent waste and conserve natural resources. Production ceased in the mid 1980's. This unit consisted of approximately 30 production and injection wells, multiple tank battery sites, three caliche pits, miles of roads, and miles of pipelines and power lines. Years of production had left these lands with hard packed caliche devoid of vegetation, non-functional oilfield equipment, oil contaminated soils, miles of oilfield pipe, and miles of associated powerlines and poles. Sandia, working in cooperation with the BLM Roswell Field Office has effectively and efficiently restored this oil field to a condition by which the lands can and have begun to heal themselves.

Sandia, initiated clean up by plugging all wells, removing many dump truck loads of oilfield equipment, removing associated pipelines, powerlines and poles. Sandia had all contaminated soils removed and disposed of to appropriate facilities. Upon completion of oilfield clean-up, Sandia then worked in close cooperation with the BLM to have all compacted caliche roads and pads rehabbed by removing caliche and disposing of by deep burial or by hauling the caliche to existing pits. Three caliche pits were also rehabbed and reclaimed. Sites were then ripped and seeded.

As of this date, these lands have begun to heal. Diverse and mixed vegetation has now begun to establish itself on lands that were once devoid of plant life or contained only non-desirable species such as snakeweed and mesquite.

In conclusion, Sandia has proven to be a cooperative and responsible partner in oil field land restoration and BLM is proud to have been able to work with the Sandia National Laboratories in this complex reclamation project.



Linda S.C. Rundell  
State Director

## Distribution

1	MS0701	Gutierrez, Sidney	06700
1	MS0724	Shephard, Les	06000
2	MS0771	Orrell, Stanley A.	06800
1	MS0778	Cox, J. Delene	06035
1	MS0612	Corporate Archivist	09532
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