

STATE OF NEW MEXICO  
DEPARTMENT OF ENERGY, MINERALS AND NATURAL RESOURCES  
OIL CONSERVATION COMMISSION

IN THE MATTER OF THE APPLICATION  
OF DUKE ENERGY FIELD SERVICES, LP FOR  
APPROVAL OF AN ACID GAS INJECTION WELL  
LEA COUNTY, NEW MEXICO

CASE NO. 13589

**APPLICATION FOR REHEARING**

Randall Smith, Dean "Beach" Snyder, AC Ranches Partnership, Madison M. Hinkle, Randolph M. Richardson, Morris E. Schertz, Rolla R. Hinkle, III, Oscura Resources, Inc., and R.R. Hinkle Company, Inc. ("Opponents"), apply pursuant to NMAC 19.15.14.1223 for the entry of the Commission's order granting rehearing in this matter. Certain of the determinations, findings and conclusions in Order No. R-12546 entered by the Commission on May 5, 2006 are erroneous for the reasons set forth below:

**BACKGROUND SUMMARY**

AC Ranch Partnership is engaged in the ranching business and is the owner of State of New Mexico Agricultural Lease No. GS-1547 which includes, among other lands, the E/2NE/4 and the S/2 of Section 30, T18S, R37E, NMPM in Lea County, New Mexico. Randy Smith is the owner of the surface and subsurface of, among other lands, the W/2NE/4 and the NW/4 of Section 30, T18S, R37E. His house is also located to the north of the proposed injection well and surface facility. Madison M. Hinkle, Randolph M. Richardson, Morris E. Schertz, Rolla R. Hinkle, III, Oscura Resources, Inc., and R.R. Hinkle Company, Inc. are the owners of the mineral interests in the W/2 NE/4, NW/4 of Section 30, T18S, R37E.

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On approximately September 12, 2005 Duke Energy Field Services, L. P., (“Duke Energy” or “DEFS”), made application to the New Mexico Oil Conservation Division (NMOCD) for authorization to inject acid gas into the Brushy Canyon and Lower Bone Springs formations through a well to be drilled at a location 1980’ from the south and west lines (Unit K) of Section 30, T18S, R37E. The source of the acid gas is from Applicant’s Linam Ranch Gas Processing Plant located in Section 6, T19S, R37E, NMPM, in Lea County. In its application to the NMOCD, Duke Energy proposes to inject an average of 2200 barrels of acid gas per day over an initial thirty-five year period resulting in cumulative injection volumes of 28,105,000 barrels. Applicant proposes to inject the acid gas volumes at pressures of between 2,600 to 2,800 psi. The acid gas will be injected in the form of a fluid comprised of carbon dioxide and hydrogen sulfide, along with lesser volumes of water and traces of hydrocarbons.

Duke Energy is currently authorized to dispose of hydrogen sulfide and carbon dioxide gas processing by-products through a sulfur recovery unit and through burning of waste gas by flare pursuant to Air Quality Operating Permit No. P094 issued by the State of New Mexico Environment Department Air Quality Bureau on December 3, 2004.

Hydrogen sulfide is classified by the New Mexico Environment Department as a “Hazardous Pollutant”. The U.S. Occupational Safety and Health Administration (OSHA) include both carbon dioxide and hydrogen sulfide on its list of “Hazardous Chemicals”. Hydrogen sulfide is ranked at 193 on the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) Priority List of Hazardous Substances. Hydrogen sulfide is included on that list of “Extremely Hazardous Substances” set forth at 40 C.F.R. § 355, Appendix A. As an Extremely Hazardous Substance, hydrogen sulfide is subject to the

emergency planning requirements under the Emergency Planning and Community Right to Know Act (EPCRA).

By its application to the NMOCD, Applicant initially sought administrative approval, without hearing, for authorization to inject on the NMOCD's standard form C-108 form that is normally applicable to Class II saltwater disposal wells. At the direction of the Division Director, the matter was set for hearing before the Commission. By setting the matter directly before the Commission, the opportunity for an initial adjudicatory hearing before a Division examiner was bypassed.

By correspondence dated September 16, 2005, the NMOCD directed Duke Energy to provide notice of its application to all affected parties within a one mile radius of the well, including well operators, oil and gas lessees, and if no lessees then the mineral interest owners. The NMOCD also directed that the surface owner and the surface lessee be notified. The Applicant was also directed to advertise legal notice of its application in the Hobbs newspaper. DEFS failed to notify AC Ranch Partnership of its application to the NMOCD. Applicant also failed to notify Petitioner Randy Smith. In addition, Applicant failed to provide notice to Madison M. Hinkle, Randolph M. Richardson, Morris E. Schertz, Rolla R. Hinkle, III, Oscura Resources, Inc., or R.R. Hinkle Company, Inc., the owners of the mineral interest underlying the W/2 NE/4 and the NW/4 of Section 30.

In none of the Applicant's published notices or legal advertisements did it provide any notification to the public or otherwise that its proposed facility is to handle hydrogen sulfide, carbon dioxide or hazardous wastes of any type. Those notice referred only to "acid-gas".

DEFS proposes to locate its facility within approximately one quarter mile of the Xcel Energy Maddox Station Power Plant. The roadway by which Petitioner Randy Smith uses for

access to his farmhouse is located immediately adjacent to the Applicant's proposed compression and injection facility. The proposed injection facility is also within approximately three quarters of a mile from the Maddox Lake State Wildlife Area that is managed by the New Mexico Department of Game and Fish for public fishing and boating.

The Applicant's acid gas injection facility is comprised of three components: (1) pipelines; (2) a compression facility; and (3) an injection well. Applicant has proposed to construct its acid gas injection facility in any one of three possible configurations: (1) compression at the Linam Ranch Gas Plant; (2) compression at Linam and at the acid gas injection well site (the "split-compression" option); or (3) compression at the acid gas injection well site. DEFS has selected the third option as the final configuration for its injection facility with the result that substantial compression and treating facilities will be constructed at the well site in Section 30.

In its original Application, it does not appear that DEFS fully informed the Division of all of the equipment and facilities that would be required in order to complete its compression facility at the well site on Section 30. Included among these facilities are transformers, a compressor building and three attendant buildings, air coolers, chemicals storage facilities, processing vessels, contaminated water storage and pipeline facilities and a 100' high flare tower for burning waste gases.

A hearing on the merits on Duke Energy's application was held before the Commission on March 13, 2006. Subsequently, on May 3, 2006, the opponents filed their Second Motion to Dismiss addressing the defective notice. The Commission entered Order No. R-12546 on May 5, 2006. Duke Energy responded to the Second Motion to Dismiss on May 16, 2006. On May

18, 2006, the mineral interest owners, Madison Hinkle, et al., filed their Notice Of Intervention and their Joinder In Second Motion To Dismiss.

The Notice Provided In This Case Does Not Satisfy Due Process.

Finding ¶ 15 refers to DEFS witness testimony that notice had been furnished “to all affected persons”. Such a finding is clear error and is not supported by the evidence. It is undisputed that DEFS did not conduct the due diligence required to determine the owners of interests affected and that the requisite notice was not given as a result. (TR pg. 180.) As a consequence, these affected persons were denied the opportunity to present their objections and evidence in opposition to the Application. Further, the published notice was inadequate.

The lack of notice was not apparent until the hearing on Duke Energy’s Application . The identity of the un-notified interest owners was not determined until after the hearing. By correspondence dated March 24, 2006, after the March 13, 2006 hearing on the Application, the following mineral interest owners in the W/2 NE/4, NW/4 of Section 30, T18S, R37E notified the Commission’s chairman of their objection to Duke Energy’s Application and the lack of notification to them: Madison M. Hinkle, Randolph M. Richardson, Morris E. Schertz, Rolla R. Hinkle, III, Oscura Resources, Inc., and R.R. Hinkle Company, Inc. (See correspondence dated March 24, 2006, Exhibit A.) These mineral interest owners stated their mineral interests have value for oil and gas development that would necessarily be adversely affected by the intrusion of hydrogen sulfide and carbon dioxide acid gas from Duke Energy’s injection well proposed to be located only 660’ from their acreage. As a consequence of the lack of notification to them, these mineral interest owners were denied the opportunity to participate in the Commission hearing and to protect their interests. The Applicant’s failure to provide the requisite notice is the subject of the Second Motion To Dismiss which has also been adopted by the Intervenors. As

explained in that motion, under these circumstances, the Division's rules and applicable agency precedent require the dismissal of the Application. *See* Order No. R-11855; Case No. 12905, *Application of Pronghorn Management Corporation for Approval of a Salt Water Disposal Well, Lea County, New Mexico.*

Further, in none of Duke Energy's published notices or legal advertisements did it provide any notification to the public that its proposed facility is to handle hydrogen sulfide, carbon dioxide or hazardous wastes of any type. Only the phrase "acid-gas" was used. Duke Energy's geologist witness testified that it could be assumed that the general public in the area would know by the use of the phrase "acid-gas" that the handling and disposal of hydrogen sulfide was involved. (TR pg. 197.) This assumption is baseless. The involvement of hazardous substances requires more comprehensive and descriptive notice.

In the instance of both the actual and the published notice, the requirements of due process have not been satisfied. ("An elementary and fundamental requirement of due process in any proceeding which is to be accorded finality is notice reasonably calculated, under all the circumstances, to apprise interested parties of the pendency of the action and afford them an opportunity to present their objections." *Uhden v. New Mexico Oil Conservation Commission*, 112 N. M. 528, 817 P.2d 721 (1991), citing to *Mullane v. Central Hanover Bank and Trust Co.*, 339 U. S. 306, 70 S.Ct. 652, 94 L.Ed. 865 [1950].) Adherence to effective notice and due process is a "rigid" requirement. ("When government agencies adjudicate or make binding determinations which directly affect legal rights of individuals, it is imperative that those agencies use procedures which have traditionally been associated with the judicial process." *Reid v. New Mexico Board of Examiners in Optometry* 92 N. M. 414, 589 P. 2d 198 [1979].)

The inadequate notice in this case is clear error requiring dismissal, or at the very least, rehearing.

Utilization of the Class II Salt Water Disposal Well Approval Process is Inadequate and Results in Piecemeal Adjudication.

Duke Energy's Application for Authorization to Inject Hazardous Waste was presented to the Agency under the procedures set forth for approvals of Class II Salt Water Disposal Wells and Division Rule 701-E. Yet, it is undisputed that Duke Energy's transportation, compression and injection facilities propose to handle and dispose of hazardous waste. Correspondingly, Duke's well would otherwise be classified as a Class IV well for the injection of fluids containing any radioactive or hazardous waste as defined in NMSA 1978 § 74-4-3. However, Class IV injection wells are now prohibited. (TR pg. 313.) *See* N.M.A.C. 20.6.2-5004(A)(3)(b).

As has been pointed out by the Commission's counsel, the approval of Duke Energy's 701 permit authorizes more than just the drilling of an injection well. It also constitutes a permit to inject. (TR pg. 343.) As a necessary consequence of the issuance of Order No. R-12546, the Commission has also, by direct implication, preliminarily approved of the proposed pipeline transportation facilities and the surface compression facilities. These compression facilities will occupy approximately eleven acres on the surface.

In approving of the proposed transportation and compression implicitly, and the injection of hazardous waste expressly, it must be established that the Agency's actions are consistent with its authority. *See, Fasken v. Oil Conservation Comm.*, 87 N.M. 292, 532 P.2d 588 (1975). However, Order No. R-12546 is devoid of any findings sufficient to clearly establish the jurisdiction over all of the subject matter at issue here. ("[B]asic jurisdictional findings, supported by evidence, are required to show that the Commission has heeded the mandate and the standard set out by statute. Administrative findings by an expert administrative commission

should be sufficiently extensive to show not only the jurisdiction but the basis of the commission's order." *Continental Oil Co. v. Oil Conservation Division*, 70 N.M. 310, 373 P.2d 809 [1962]).

While Finding ¶ 25 of Order No. R-12546 provides that the surface installations of the proposed system are subject to Division approval through those procedures applicable to modifications of discharge permits granted to the separate Linam Gas Plant pursuant to the Water Quality Act, Order No. R-12546 does not make sufficiently clear that all of the reviews and approvals provided for pursuant to that process are sufficient to discharge all of the Agency's mandates, including protection of public health, safety and the environment.

Similarly, Order No. R-12546 does not establish the Commission's jurisdiction to assume regulation and approval of the construction and operation of the acid gas pipeline system (Decretal ¶ P), or the mandated installation of hardwired alarm systems at the Xcel Maddox Station or in the private home of Randy Smith (Decretal ¶ O). This provision of the order is also inconsistent with the jurisdictional determination made under Finding ¶ 26.

It appears that Order No. R-12546 exceeds or is inconsistent with the agency's jurisdiction.

The Scope and Extent of the Authorizations Granted by Order No. R-12546 are Vague.

Order No. R-12546 clearly authorizes the Applicant to conduct injection operations. What is less clear are the ancillary approvals necessary to conduct such operations. At Decretal ¶¶ N & O, the Applicant is directed to obtain approval of an appropriate modification of the discharge permit for the Linam Gas Plant and for a hydrogen sulfide contingency plan that complies with Rule 118. Approval of the actual surface compression facilities is not sufficiently

addressed. As a consequence, their construction and operation are essentially unregulated activities.(See, TR pp. 335, 336.)

Finding ¶ 25 recites that the surface installations are subject to Division approval under the Water Quality Act but, as discussed above, the extent and adequacy of that review process is not addressed by the Order. During the course of the hearing on the matter, the witness from the Division's Environmental Bureau, Mr. Price, testified that the WQCC regulations would not apply to the surface facilities at the wellsite. (TR pp. 325, 326.) He also testified that it was not known whether any form of air quality review would be required. (TR pg. 335.) Further, the process for the review and approval of the ancillary permits does not provide for public notice or participation by affected persons. In fact, Decretal ¶ Q seems to avoid public notification and participation altogether by providing for an administrative order acknowledging compliance with the requirements for obtaining the ancillary permits. This is inconsistent with the recommendations of the Divisions' Environmental Bureau staff. (TR pg. 338.)

Also unclear is the scope of the approval, if any, for the construction and operation of the pipeline facilities. Order No. R-12546 is devoid of any findings or conclusions addressing the safety of the pipelines. The evidence before the Commission established that the pipeline design proposed by Duke Energy is identical to one installed by Navajo Refining Company that experienced a total failure of the system which required it to be abandoned. (TR pg. 327.) Yet Decretal ¶ P, Order No. R-12546 appears to approve and authorize the construction and operation of the pipeline facilities.

The Division's Protocols Under Rule 118 Have Been Disregarded Resulting in Further Piecemeal Adjudication.

Order No. R-12546 is premature. It approves hazardous waste injection operations before the review and approval of a hydrogen sulfide contingency plan. Under Rule 118, a hydrogen

sulfide contingency plan is a pre-condition to approval of any sort. Yet, the DEFS Application is incomplete. As a consequence, Order No. R-12546 allows for the piecemeal adjudication of an application for a larger overall project.

Knowing full well that its proposed compression facility and injection well would be handling hydrogen sulfide, Applicant failed to submit a hydrogen sulfide contingency plan as required by NMOCD Rule 118 D (5). According to NMOCD Rule 118, review and approval of a hydrogen sulfide contingency plan is necessary “to protect public safety”. As defined by NMOCD rules, a “Potentially Hazardous Volume” of hydrogen sulfide includes concentrations of (a) a 100 ppm radius of exposure that includes any public area; (b) a 500 ppm radius of exposure that includes any public road; or (c) a 100 ppm radius of exposure exceeding 3000’. (19.15.3.118.B.11) Under OSHA guidelines, the acceptable maximum peak concentration of hydrogen sulfide exposure over an eight hour period is 50 ppm (parts per million) for a single maximum duration of ten minutes. According to the Applicant’s own chemical analysis, its acid gas contains hydrogen sulfide in concentrations of 235,378.0 ppm. Under these circumstances, NMSA 1978 §70-2-12 B(21) and (22) demand that the agency take a complete and comprehensive approach to the review and approval of the overall project in order to assure that public health and the environment are adequately protected. Piecemeal adjudication is inconsistent with these statutory mandates.

The failure of Order No. R-12546 to require DEFS to submit an application that is complete in all respects, including the submission of a H2S contingency plan does not allow for an efficient and orderly review of the project as a whole. The Commission cannot approve of injection operations before it has conducted a complete and thorough review of an H2S Contingency Plan. That review must also provide for notice and opportunity for interested

parties to comment. That was not done in this case. As a consequence, the agency is not fulfilling its statutory duties.

The Order Does Not Approve a Facility Configuration Posing the Least Risk to Public Health and the Environment.

Finding ¶ 24 of Order No. R-12546 provides that “[t]he proposed injection operation can be conducted without undue risk...”. However, the Order necessarily pre-supposes the configuration of the entire system, with a substantial surface compression facility located at the well.

Duke Energy proposed to construct its acid gas injection facility in any one of three possible configurations: (1) compression at the Linam Ranch Gas Plant; (2) compression at the Linam plant and at the acid gas injection well site (“split-compression”); or (3) compression at the acid gas injection well site. DEFS has selected the third option as the final configuration for its injection facility with the result that all of the compression and treating facilities will be constructed at the well site in Section 30.

Duke Energy’s witness testimony and exhibits establish that of the three facility configuration options considered, Duke *failed* to select the “split compression” option, the option that results *in the least risk* to the exposed public. That same evidence also establishes that the hazards and overall risks posed by all possible acid gas treatment options would be minimized by the expansion of the existing sulfur recovery unit at the Linam Gas Plant. (See Exhibit B, excerpts from Comparative Quantitative Risks Analysis dated October 28, 2005). These circumstances require further consideration of why the option posing the least risk to public health and the environment was not chosen. Otherwise, the Commission will have authorized the construction and operation of facilities that does not expose the public and the environment to the least risk. Therefore, finding ¶ 24 is in error.

Finding 20 of Order No. R-12546 Misconstrues the Agency's Jurisdiction.

At finding 26, the Commission determines that it need not address the migration of injection fluids beyond the lateral limits of the particular tract on which the injection facility will be located. This is a clearly erroneous construction of the agency's jurisdiction.

First, as set forth above, in the first year of injection operations, the "acid-gas front" will migrate into the mineral lands owned by Madison Hinkle, et al. As those interest owners have pointed out in their Notice of Intervention, the escape of acid gas will cause the destruction of hydrocarbon reserves owned by them, resulting in waste. The Commission has an unequivocal duty to assert jurisdiction to prevent waste under, *inter alia*, NMSA 1978 §70-2-11. To say that the Commission's jurisdiction ends at the boundary of the injection tract is clear error. Accordingly, rehearing must be granted in order for the Commission to make a proper determination that will prevent waste.

Finding ¶ 26 is also inconsistent with pre-existing interpretations of the agency's jurisdiction to act to regulate drilling and completion operations in areas where "it is reasonably expected that a potentially hazardous volume of hydrogen sulfide will be encountered". The Division defines concentrations of 100ppm or more as "potentially hazardous volumes". (See Excerpts from NMOCD "Hydrogen Sulfide: Issues and Answers Workshop", Exhibit C, attached. See, also, Rule 118 B(11).) In this case, injection of acid-gas volumes in the reservoir surrounding the proposed injection well will result in concentrations of 235,378 ppm. According to Duke Energy's witnesses and exhibits, by the year 2025, significant volumes of hazardous wastes will have extended more than 1,900' from the injection well. In addition to the obvious safety hazard in this extended area, injection operations will result in the creation of a new corrosive zone where none existed before. (TR pg. 188.) Operators will be exposed to new costs

and risks in drilling and completing wells that penetrate the zone. However, there is presently no regulatory mechanism in place to guard against unknowing penetrations or provide for appropriate casing and cementing programs. This is obviously an area where the agency has primary jurisdiction. Rehearing is necessary in order to determine (1) the propriety of allowing the extra-lateral migration of hazardous substances in the first place, and (2) the appropriate regulation of drilling and completion activities, if injection is allowed.

The Commission Erred By Not Allowing Xcel Energy Representatives to Provide Expert Testimony.

Xcel Energy's Maddox Power Station is located less than one-quarter mile away from the proposed injection well. On an average day, Xcel will have approximately 14 employees at the Maddox Station at any given time. At the March 13, 2006 hearing on the DEFS application, Mr. Gale Henslee, Principal Environmental Analyst for Xcel Energy, and Bobby Gonzales and Bill Parham, Xcel's Safety Consultants, appeared and attempted to offer technical testimony with respect to the merits of the Duke Energy Application, including, specifically, safety issues.

Counsel for Duke Energy objected to the presentation of technical evidence by these obviously well qualified individuals. The sole basis for Duke Energy's objection was the failure of the Xcel representatives, who were acting without the benefit of counsel, to file pre-hearing statements and exhibits five business days in advance of the hearing. At the hearing, it was pointed out that under the provisions of Rule 1208(C), the Commission has the discretion to allow anyone to present technical evidence at the hearing, for good cause. In this instance, Gale Henslee is the Principal Environmental Analyst for Xcel Energy. He testified that he is familiar with the treatment and disposal of hazardous waste and the regulation of such waste under the UIC program. Mr. Bobby Gonzales testified that he is the Safety Consultant for Xcel Energy at Xcel's Cunningham and Maddox Station Plants near Hobbs. Mr. Gonzales indicted his

willingness and ability to offer technical testimony on the operation and monitoring of the safety systems associated with Duke Energy's proposed facility, including emergency response and evacuation plans. Mr. Parham proposed to offer testimony of the risks associated with an emergency shut-down of the Maddox generating facility. It is indisputable that Mr. Henslee, Mr. Gonzales and Mr. Parham would qualify as experts capable of rendering opinion testimony in the ordinary course of any other Division or Commission proceeding.

The scope of the technical testimony attempted to be offered by Xcel Energy representatives is clearly within the subject matter of Order No. R-12546, in a number of respects, including, Finding ¶ 23, (Protection of the Environment) and ¶¶ 24 and O (Risk Mitigation). Consideration of the expert technical testimony offered by the Xcel Energy representatives would have assisted the Commission in formulating findings and conclusions in Order No. R-12546. Consequently, the refusal of the technical testimony is an abuse of discretion and calls into question whether these findings and conclusions are supported by substantial evidence. *See, Snyder Ranches v. Oil Conservation Comm.*, 110 N.M. 637, 798 P.2d 587 (1990).

#### CONCLUSIONS

For the foregoing reasons, the Opponents request the Commission enter its order providing for the rehearing of this matter.

Respectfully submitted,

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CERTIFICATE OF SERVICE

I hereby certify that a true and correct copy of the foregoing was hand-delivered or faxed to counsel of record on the 25th day of May, 2006 as follows:

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**MADISON M. HINKLE**  
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March 24, 2006

New Mexico Oil Conservation Commission  
Attn: Mr. Mark Fesmire, Chairman  
1220 South St. Francis Drive  
Santa Fe, NM 87505

Re: NMOCC Case No. 13589; Application of Duke Energy Field Services, LP for Approval of an Acid Gas Injection Well, Lea County, New Mexico

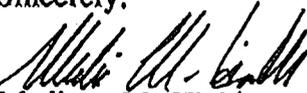
Dear Mr. Fesmire:

We are the owners of 91.1667% of the mineral interest underlying the W1/2NE1/4, NW1/4 of Section 30 T-18-S, R-37-E and the NE1/4, E1/2NW1/4 Section 25 T-18-S, R-36-E in Lea County. We are also Petroleum Landman by profession and are very familiar with the industry. We only this week became aware of the proposal of Duke Energy Field Services to inject hydrogen sulfide and carbon dioxide acid-gas in to the Bone Spring formation through a well located only 660' from our property in the SW/14 of Section 30 T-18-S, R-37-E. Although we are interest owners of record, Duke Energy Field Services did not notify us of their proposal or communicate with us in any way. We feel that we have been denied the opportunity to participate in the Commissions hearing and to protect our interests.

We understand that the significant volumes of acid-gas Duke Energy proposes to inject underground will necessarily trespass onto our mineral interests in Section 30. We believe the area definitely has potential for further oil and gas development and that our mineral interests will be adversely affected by Duke Energy's proposed operation if approved by the Commission. We specifically deny that Duke Energy has the right to utilize our lands in any way.

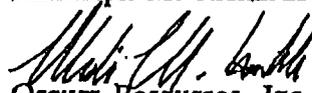
We strenuously object to Duke Energy's application for underground injection of hazardous substances and ask that it be denied.

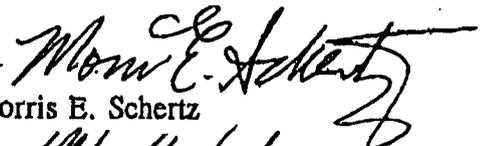
Sincerely:

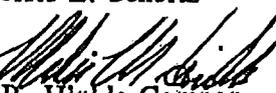
  
Madison M. Hinkle

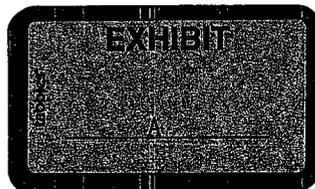
  
Rolla R. Hinkle III

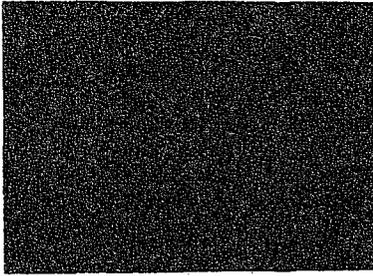
  
Randolph M. Richardson

  
Oscura Resources, Inc.

  
Morris E. Schertz

  
R.R. Hinkle Company, Inc.





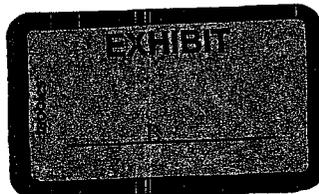
**COMPARATIVE QUANTITATIVE  
RISK ANALYSIS (QRA)  
FOR LINAM RANCH GAS PLANT  
GAS PROCESSING AND REINJECTION OPTIONS**

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**D**

October 28, 2005  
05-10-6567



QUEST

**Table 2-3  
Amine Unit Physical and Operating Data**

Stream	Phase	Flowrate (MMSCFD)	Pressure (psig)	Mole Percent H <sub>2</sub> S
Gas Inlet to Amine Unit	Gas	86	243	0.1
Amine Contactor Bottoms	Aqueous Liquid	115	243	0.60
Vapor From Amine Still	Gas	226	27	7.57
Acid Gas to SRU or Injection System	Gas	120	26.5	25.20

### 2.5 Sulfur Recovery Unit

The acid gas stream from the amine unit is currently processed in the SRU. In this unit, the acid gas is first mixed with air and burned in a reaction furnace to convert hydrogen sulfide into sulfur dioxide. With expansion to 200 mmSCFD, the gas stream will be passed through a series of four converters to convert the remaining sulfur dioxide into elemental sulfur. After each converter, the stream passes through a condenser where liquid sulfur is removed before the gas stream and is passed to another reheater/converter/condenser stage. After the final condenser, the remaining gas stream is sent to an incinerator. A summary of equipment operating data for this unit is presented in Table 2-4.

**Table 2-4  
Sulfur Recovery Unit Physical and Operating Data**

Stream	Flowrate (MMSCFD)	Pressure (psig)	Mole Percent SO <sub>2</sub>	Mole Percent H <sub>2</sub> S
Gas From Reaction Furnace	481	17.7	5.45	10.75
Inlet to Converter #2	386	16.7	1.04	1.80
Inlet to Converter #3	375	15.9	0.26	0.22
Inlet to Converter #4	339	15.4	0.10	0.15
SRU Tail Gas	258	15.4	0.10	0.38

### 2.6 Injection Options

#### 2.6.1 Compression at Linam Ranch (Reinjection Option #1)

The first option under consideration for handling acid gas from the gas plant is to compress the acid gas to 2,000 psig at the Linam Ranch gas plant, transport the gas via a 3-inch pipeline to the acid gas injection (AGI) well site, and inject the gas into the reservoir.

### 2.6.2 Split Compression (Reinjection Option #2)

A second option under consideration for handling acid gas from the gas plant is to compress the acid gas to 90 psig at the Linam Ranch gas plant, transport the gas via an 8-inch pipeline to the AGI well site, then compress the gas to 2,250 psig and inject the gas into the reservoir.

### 2.6.3 Compression at Injection Wellsite (Reinjection Option #3)

The final option under consideration for handling acid gas from the gas plant is to transport the acid gas via an 18-inch pipeline to the AGI wellsite, compress it to 2,250 psig at the wellsite, and inject the gas into the reservoir.

## 2.7 Population Data

The gas plant and the majority of the Linam Ranch pipeline system are located in rural areas that are sparsely populated. None of the facilities associated with the current gas plant and the proposed reinjection pipeline have any residential or business structures within 2,000 feet. Because of these factors, the potential for the public to being exposed to an accidental release of gas is low.

## 2.8 Meteorological Data

Meteorological data for wind speed, wind direction, and Pasquill-Gifford atmospheric stability class used in this study were gathered from the Midland, Texas airport for the years 1995 through 2004. This was the nearest available reporting station with a complete data set and is approximately 70 nautical miles southeast of Hobbs, New Mexico. Figure 2-2 presents the annual wind rose data for all stability classes. The length and width of a particular arm of the rose define the frequency and speed at which the wind blows from the direction the arm is pointing. As an example, reviewing Figure 2-2 shows that the most common wind blows from south to north.

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In summary, the hazards and overall risks posed by the four acid gas treatment and reinjection options evaluated in this work are minimized with the expansion of the existing Sulfur Recovery Unit to treat the acid gas. Of the three injection options, option #2, the split compression option, results in the least risk to the exposed public.

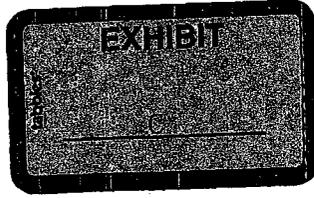


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# New Mexico Oil Conservation

## Division Rule 118

- For a well being drilled, completed, recompleted, worked over or serviced in an area where insufficient data exists to calculate a radius of exposure but where hydrogen sulfide could reasonably be expected to be present in concentrations in excess of 100 ppm in the gaseous mixture, a 100-ppm radius of exposure equal to 3,000 feet shall be assumed.



# New Mexico Oil Conservation

## Division Rule 118

- Hydrogen sulfide detection and monitoring equipment must be provided and must be made operational during drilling when drilling is within 500 feet of a zone anticipated to contain hydrogen sulfide and continuously thereafter through all subsequent drilling.

# New Mexico Oil Conservation

## Division Rule 118

- Flare System.
  - For drilling and completion operations in an area where it is reasonably expected that a potentially hazardous volume of hydrogen sulfide will be encountered, the person, operator or facility shall install a flare system to safely gather and burn hydrogen-sulfide-bearing gas.

# New Mexico Oil Conservation

## Division Rule 118

- Well Control Equipment.
  - When the 100 ppm radius of exposure includes a public area, the following well control equipment shall be required:
    - Completion, Workover and Well Servicing. A remote controlled pressure and hydrogen sulfide-rated well control system that meets or exceeds API specifications or other specifications approved by the division shall be installed and shall be operational at all times during completion, workover and servicing of a well.

# New Mexico Oil Conservation

## Division Rule 118

- Mud Program. All drilling, completion, workover and well servicing operations involving a hydrogen sulfide concentration of 100 ppm or greater shall use a hydrogen sulfide mud program capable of handling hydrogen sulfide conditions and well control, including de-gassing.