

GT - 1

WORK PLAN

DATE:

2008 - Present

PLAN OF OPERATIONS
LIGHTNING DOCK GEOTHERMAL NO. 1 HI-01, LLC
HIDALGO COUNTY, NEW MEXICO

Los Lobos Renewable Power, L.L.C.
5151 North Edgewood Drive Suite 375
Provo, Utah 84604

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Rotary Drill Rig Specifications

LIGHTNING DOCK GEOTHERMAL NO. HI-01, L.L.C.

SITE LOCATION

The Proposed Action area consists of approximately 2,592 acres of a private land lease located on all or portions of Section 7, 18, 11, 12, 13, 14, and 23 Township 25 South, Range 19 West (N.M.P.N.). Bureau of Land Management administers the geothermal rights of approximately 2,500 acres under lease number NM-108801 and NM-034790. The area is located in Hidalgo County, New Mexico.

LAT : 32° 8' 43"
LONG: 108° 49' 55"

ELEVATION

4, 100 Feet

LAYOUT

See Proposed Action Map (Figure 1)

LEASE IDENTIFICATION

(See also Figure 2)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

FORM APPROVED
OMB NO. 1004-0034
Expires: April 30, 2009

**ASSIGNMENT OF RECORD TITLE INTEREST IN A
LEASE FOR OIL AND GAS OR GEOTHERMAL RESOURCES**

Mineral Leasing Act of 1920 (30 U.S.C. 181 et seq.)
Act for Acquired Lands of 1947 (30 U.S.C. 351 - 359)
Geothermal Steam Act of 1970 (30 U.S.C. 1001 - 1025)
Department of the Interior Appropriations Act, Fiscal Year 1981 (42 U.S.C. 6508)

Lease Serial No.
NM34790

Lease Effective Date
(Anniversary Date)
02/01/1979

New Serial No.

Type or print plainly in ink and sign in ink.

PART A: ASSIGNMENT

1. Assignee* **Lightning Dock Geothermal HI-01, LLC**
Street **5152 N. Edgewood Dr.**
City, State, Zip Code **Provo, UT 84604**

1a. Assignor **Lightning Dock Geothermal, Inc.**

*If more than one assignee, check here and list the name(s) and address(es) of all additional assignees on page 2 of this form or on a separate attached sheet of paper.

This record title assignment is for: (Check one) Oil and Gas Lease, or Geothermal Lease

Interest conveyed: (Check one or both, as appropriate) Record Title, Overriding Royalty, payment out of production or other similar interests or payments

2. This assignment conveys the following interest:

Land Description Additional space on page 2, if needed. Do not submit documents or agreements other than this form; such documents or agreements shall only be referenced herein.	Percent of Interest			Percent of Overriding Royalty Similar Interests	
	Owned	Conveyed	Retained	Reserved	Previously reserved or conveyed
	b	c	d	e	f
a T25S, R19W, N.M.P.M. Sec. 6: Lots 3, 4, 5, 6, 7, SE1/4NW1/4 Sec. 6: E1/2SW1/4 Sec. 7: Lots 1, 2, 3, 4, S1/2NE1/4, SE1/4NW1/4, E1/2SW1/4, SE1/4, NW1/4NE1/4, NE1/4NW1/4 Sec. 18: Lot 1, N1/2NE1/4, NE1/4NW1/4 and T25S, R20W, N.M.P.M. Sec. 1: NW1/4SW1/4, S1/2SW1/4, SW1/4SE1/4 Sec. 11: NE1/4, S1/2 Sec. 12: ALL Sec. 13: N1/2N1/2 Containing 2,500.96 acres, more or less	100%	100%	-0-	-0-	Those of record

FOR BLM USE ONLY - DO NOT WRITE BELOW THIS LINE

UNITED STATES OF AMERICA

This assignment is approved solely for administrative purposes. Approval does not warrant that either party to this assignment holds legal or equitable title to this lease.

Assignment approved for above described lands;

Assignment approved for attached land description

Assignment approved effective January 1, 2008

Assignment approved for land description indicated on reverse of this form

By Edward Acum
Bureau of Land Management (BLM)

SUPERVISORY MULTI-RESOURCE SPECIALIST 12/17/08
(Title) (Date)

(Continued on page 2)

PART B - CERTIFICATION AND REQUEST FOR APPROVAL

1. The Assignor certifies as owner if an interest in the above designated lease that he/she hereby assigns to the above assignee(s) the rights specified above:
2. Assignee certifies as follows: (a) Assignee is a citizen of the United States; an association of such citizens; a municipality; or a corporation organized under the laws of the United States or of any State or territory thereof. For the assignment of NPR-A leases, assignee is a citizen, national, or resident alien of the United States or association of such citizens, nationals, resident aliens or private, public or municipal corporations, (b) Assignee is not considered a minor under the laws of the State in which the lands covered by this assignment are located; (c) Assignee's chargeable interests, direct and indirect, in each public domain and acquired lands separately in the same State, do not exceed 246,080 acres in oil and gas leases (of which up to 200,000 acres may be in oil and gas options), or 300,000 acres in leases in each leasing District in Alaska of which up to 200,000 acres may be in options, if this is an oil and gas lease issued in accordance with the Mineral Leasing Act of 1920, or 51,200 acres in any one State if this is a geothermal lease; (d) All parties holding an interest in the assignment are otherwise in compliance with the regulations (43 CFR Group 3100 or 3200) and the authorizing Acts; (e) Assignee is in compliance with reclamation requirements for all Federal oil and gas lease holdings as required by sec. 17(g) of the Mineral Leasing Act; and (f) Assignee is not in violation of sec. 41 of the Mineral Leasing Act.
3. Assignee's signature to this assignment constitutes acceptance of all applicable terms, conditions, stipulations and restrictions pertaining to the lease described herein.

For geothermal assignments, an overriding royalty may not be less than one-fourth (1/4) of one percent of the value of output, nor greater than 50 percent of the rate of royalty due to the United States when this assignment is added to all previously created overriding royalties (43 CFR 3241).

I certify that the statements made herein by me are true, complete, and correct to the best of my knowledge and belief and are made in good faith.

Executed this 27th day of November 2007 Executed this 29th day of November 2007

Name of Assignor as shown on current lease Lightning Dock Geothermal, Inc.
(Please type or print)

Assignor [Signature] per. [Signature]
or (Signature)

Assignee [Signature]
or (Signature)

Attorney-in-fact [Signature]
(Signature)

Attorney-in-fact [Signature]
(Signature)

925 Bush St., 16th Fl.
(Assignor's Address)
San Francisco CA 94109
(City) (State) (Zip Code)

for Lightning Dock Geothermal H-01, LLC.

Title 18 U.S.C. Sec. 1001 makes 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.

SURFACE ACCESS AND USE AGREEMENT

This SURFACE ACCESS AND USE AGREEMENT ("Agreement") is executed effective January 10, 2008, by and between ROSETTE, INC., with an address of 26 Rose Land, Animas, NM 88020 ("Owner"), and LIGHTNING DOCK GEOTHERMAL HI-01, LLC, with an address of 5152 North Edgewood Drive, Suite 375, Provo, Utah ("LDG").

RECITALS:

A. Owner owns record title to the surface estate of certain real property located in Hidalgo County, State of New Mexico, more particularly described on Exhibit A hereto (hereinafter the "Subject Lands"). The United States of America, through the Bureau of Land Management (the "BLM"), owns the reserved mineral estate, which includes the geothermal estate. Owner owns greenhouse operations which are warmed during the winter months by heat supplied by the utilization of geothermal resources near, on, or around the Subject Lands.

B. LDG is the current owner of a Federal Geothermal Lease NM-34790, issued February 1, 1979 ("Subject Lease"), wherein the BLM has granted the holder of the Subject Lease the right to explore for and develop the geothermal resources underlying the lands covered by the Subject Lease, which includes the Subject Lands. Amax Exploration, Inc. ("Amax"), a prior owner of the Subject Lease, and a predecessor of Owner entered into a letter agreement dated December 14, 1978 ("1978 Agreement"), whereby Amax was granted access to the Subject Lands to develop the Subject Lease. The 1978 Agreement granted Owner's predecessor the right to drill to a depth of 1000 feet below the surface and extract geothermal resources therefrom for use in its greenhouse operation. After litigation with the BLM, Owner abandoned use of the geothermal resources from the Subject Lease and Subject Lands, and, pursuant to the settlement agreement with the BLM, Owner has certain plugging and abandoning, and reclamation responsibilities.

C. LDG intends to utilize certain existing geothermal wells on the Subject Lands and to drill additional geothermal wells or reinjection wells (such existing and initially proposed wells, as depicted on Exhibit B, and all future wells that may be proposed and drilled by LDG are defined herein collectively as the "Subject Wells") on a portion of the Subject Lands (such initial proposed well-sites, as depicted on Exhibit B, and all future well-sites that may be required for future wells, are referred to herein collectively as the "Well-Sites"), which Well-Sites will include typical geothermal energy exploration production or reinjection equipment and facilities. In connection with accessing, drilling and operating the Subject Wells and access to power generation facilities, LDG requires a portion of the Subject Lands to construct and maintain access roads crossing the Subject Lands, including, without limitation, existing roads on the Subject Lands (an "Access Road ROW" and collectively the "Access Road ROWs"). In addition, LDG requires or may require a portion of the Subject Lands to construct and maintain power plants, utilities, transmission lines, water pipelines, water storage and other facilities related to the production, extraction, transportation and reinjection of geothermal resources and the generation and transportation of electricity therefrom (all such improvements constructed or to be constructed by LDG on the Subject Lands are referred to herein collectively as the "Improvements"). LDG shall attempt to locate all such Improvements that require linear rights-of-way within the boundaries of the Access Road ROWs when and where economically and operationally feasible, and Owner herein grants Access Road ROWs of sufficient length and width to accommodate any necessary or contemplated Improvements. Furthermore, it may become necessary for LDG to obtain other rights-of-way to accommodate Improvements that cannot be located within an Access Road ROW, including without limitation, the Power Plant ROW, defined below, water storage areas, temporary construction easements, and other non-

linear surface uses (an "Other ROW" and collectively the "Other ROWs"). The rights-of-way for the necessary Well-Sites (a "Well Site ROW" and collectively the "Well Site ROWs"), the Access Road ROWs and the Other ROWs, including the Power Plant ROW (defined below), are referred to herein individually as a "ROW" and all such rights-of-way granted or to be granted hereunder shall be collectively referred to as the "ROWs."

D. Given the changed circumstances recited above, LDG and Owner desire to cancel and terminate the 1978 Agreement and enter into a new surface use and access agreement that memorializes their discussions and agreements regarding LDG's access to and use of the surface estate of the Subject Lands, and consideration provided therefore, for the drilling of the Subject Wells, the construction of the ROWs and the development of the Improvements on the Subject Lands. The 1978 Agreement shall terminate upon the execution of this Agreement.

E. LDG and Owner have also agreed that LDG shall have access to and use of certain water rights that are owned by Owner, as more particularly described below.

AGREEMENT:

NOW THEREFORE, in consideration of the mutual promises set forth herein and for other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the parties hereto incorporate the recitals above herein and agree as follows:

1. Term of Agreement. The rights, including all ROWs, granted by this Agreement shall continue until the rights of LDG, its successors or assigns, to explore for, develop, extract or produce geothermal energy from the Subject Lease, or from lands pooled with the Subject Lease, permanently and irrevocably terminates; provided that the rights granted to LDG herein shall survive the termination of the Subject Lease, so long as the power plant and related facilities on the Subject Lands are capable of producing electricity.

2. Existing Wells. Owner hereby grants LDG, its employees and designated agents, and its successors and assigns, the right to access, re-open, re-drill, utilize, deepen, or to plug and abandon, when and if LDG deems it necessary in furtherance of its operations on the Subject Lands, the following wells and any other geothermal wells which exist on the Subject Lands: TFD 55-77, EGS 12-7, GRED 52-7, GRED 36-7, GRED 57-7, and EGS 56-14 (collectively, the "Existing Wells"); provided however that the Existing Wells shall not include Well #16 on Exhibit B, which is a water well that is being used by Owner. Owner grants LDG access to and the right to conduct any necessary operations with respect to the Existing Wells, as and where depicted on Exhibit B, except for monitoring purposes, subject to modification by LDG upon a final inspection and survey of the Subject Lands. The Well-Site ROWs for the Existing Wells (and all future wells) shall be initially large enough to accommodate drilling operations, not to exceed 6 acres, but shall contract upon completion of the wells to area sufficient for operation and maintenance of the well, not to exceed 3 acres. One or more of the Existing Wells are close to existing structures or equipment that is stored on the Subject Lands, that may impede access, and LDG agrees to pay for the costs of repairing any damage caused by LDG's access or to pay the costs of removing or relocating any structures or equipment, in coordination with Owner. Owner hereby also grants LDG Access Road ROWs, with the right to use and expand existing roads, or construct and maintain new roads, as determined by LDG, to and for the development of the Existing Wells (the "Initial Access Road ROWs") as and where depicted on Exhibit B, subject to modification by LDG upon a final inspection and survey of the Subject Lands. Owner and LDG agree that the Initial Access Road ROWs, the centerline of which is approximately depicted on Exhibit B, subject to modification by LDG upon a final inspection and survey of the Subject Lands, shall initially be sixty (60) feet wide. LDG shall have the right to install additional pipelines, utilities, transmission lines and other Improvements along the Initial Access Road ROWs if it becomes necessary in its operations of the Existing Wells (or

future wells either on or adjacent to the Subject Lands). Owner grants to LDG certain Other ROWs that LDG may require for development of the Existing Wells, for other Improvements or uses that cannot be placed within the boundary of the Initial Access Road ROWs, including, without limitation, water storage areas, permanent or temporary construction areas, and the other rights-of-way needs and uses, as depicted on Exhibit B, or as requested by LDG subsequent to the execution of this Agreement. Once the Well-Sites for the Existing Wells, the Initial Access Road ROWs, and any other initial Other ROWs granted hereunder have been surveyed and precisely identified by legal description, Owner and LDG shall execute written rights-of-way, in form sufficient for recording in Hidalgo County, that conclusively identify the initial ROWs described herein.

3. Power Plant ROW. As noted above, LDG intends to construct a power plant and related facilities, including geothermal pipeline and utility connections to the plant and transmission facilities out of the plant (the "Power Plant"), which power plant site and connections shall require and constitute a "Power Plant ROW." The Owner hereby grants to LDG an exclusive Power Plant ROW to survey, inspect, construct, develop and operate the Power Plant and any related or necessary facilities or Improvements. The Power Plant ROW shall be evidenced by a recorded right-of-way, with a term that extends for as long as the power plant facilities are capable of production of electricity, and for a period of time thereafter for dismantling and remediation, as described below. LDG and Owner shall cooperate to locate the Power Plant ROW in a manner that minimizes the effect on Owner's existing surface uses; provided that, notwithstanding the foregoing, the Power Plant ROW shall be in a location on the Subject Lands that maximizes efficient access to and use of geothermal resources, and to electricity transmission infrastructure and markets. LDG has delivered to Owner a rough map of a possible Power Plant site, along with primary and alternate access roads for the Power Plant site, a copy of which is attached hereto as Exhibit C, and Owner and LDG mutually acknowledge and agree that the approximated rights-of-ways and Power Plant site set out on that rough map would be an example of an acceptable location. LDG agrees to fence and secure the Power Plant ROW. If the Power Plant is no longer capable of production of electricity or if LDG otherwise elects to permanently shut down the Power Plant facilities for any reason, LDG shall provide Owner with written notice of its intent to shut down the facilities. After giving notice of intent to shut down and dismantle the plant, LDG shall have three (3) years to dismantle and remove all infrastructure and improvements pertaining to the Power Plant, including all utilities and transmission facilities, and to remediate the underlying property to its natural condition. Upon the request of LDG, Owner agrees to grant LDG a lease, in a recordable form, with a term that lasts for as long as the Power Plant is in existence and a reasonable time thereafter for dismantling, removal and remediation, of approximately twenty (20) acres (subject to the needs of the Power Plant and the activities of LDG in connection therewith), for the land necessary for the Power Plant and related facilities, at an annual rental rate of \$60 per acre.

4. Future Subject Wells, ROWs, and Improvements. LDG intends to develop future Subject Wells on the Subject Lands (in addition to the Existing Wells) ("Future Wells"). Additionally, LDG intends to construct and maintain related pipelines, utilities, transmission lines, production facilities, power generation facilities, water storage areas, access roads and other Improvements for such future Subject Wells. Prior to the development of any future Subject Well (not one of the Existing Wells) or Improvements on the Subject Lands in connection therewith, LDG shall provide Owner, in writing, notification of the proposed location of the desired Subject Well(s), Access Road ROW(s), or Other ROW(s) necessary for contemplated Improvements, and a description of the Subject Well(s), Access Road ROW(s) or Other ROW(s) to be constructed (individually and collectively, as the context requires, any "Future ROWs"). Within fifteen (15) days of such written notice, LDG and Owner shall discuss the location of the necessary Future ROWs, in an attempt to locate any such Future ROWs in locations that reasonably minimize the impact to the current surface uses of Owner but that do not result in an undue economic or operational burden to LDG. The parties acknowledge and agree that such Well-Site ROWs (for Future Wells) and other Future ROWs shall be located in areas that will maximize recovery and

efficient use of geothermal resources. LDG and Owner agree to meet on the Subject Lands, at the request of either party, in connection with the location of Future ROWs, to discuss such locations. Once Future ROWs have been identified and surveyed for a precise legal description, Owner and LDG shall execute written rights-of-way, in form sufficient for recording in Hidalgo County, that conclusively identify the Future ROWs.

5. **1978 Agreement.** Owner and LDG mutually agree to terminate and cancel the 1978 Agreement as of the execution date herewith, and replace the 1978 Agreement with this Agreement. Owner agrees to release LDG of any obligations or claims arising under the 1978 Agreement, and LDG agrees to release Owner of any obligations or claims arising under the 1978 Agreement. Owner and LDG understand that this Agreement is intended to replace and supersede the 1978 Agreement.

6. **Consideration for Agreement.** As consideration for the execution of this Agreement, LDG shall provide the following to Owner:

(a) Upon execution of this Agreement, LDG shall pay to Owner a one-time payment in the amount of Three Hundred Twenty Thousand and No/100 Dollars (\$320,000.00).

(b) LDG shall pay Owner a minimum annual fee of \$1,000.00 as consideration for use of or access to Owner's existing cold water delivery infrastructure. Thereafter, LDG shall pay the \$1,000.00 fee prior to the anniversary date of this Agreement, provided that failure to make such payment shall not constitute an event of breach or default under this Agreement, until Owner has provided LDG with written notice of the failure to make such payment, and LDG fails to make such annual payment within twenty (20) days of such written notice. Moreover, in the event LDG fails to make such payment after such 20-days written notice, LDG's right to access Owner's cold water delivery infrastructure shall terminate, but the remainder of this Agreement shall remain in full force and effect (including all ROWs granted or to be granted hereby).

(c) For the use of cold water (see Section 14(b)) provided by Owner to LDG for cooling and other purposes, LDG has agreed to pay an annual payment equal to \$50 per acre foot of water to be used by LDG during the next year, less the \$1000.00 minimum fee set forth above (in other words, the \$1000 fee set forth in Section 6(b) above shall be included as part of, and not in addition to, the annual payment described in this Section 6(c)). LDG shall provide to Owner an estimate of the amount of acre feet of water that LDG shall use for the following year, and shall pay the annual payment based on such estimated amount, prior to the anniversary date of this Agreement. At the end of such year, if LDG's use of water for the prior year exceeded the estimate, then LDG shall remit the payment for such acre feet used in excess of the estimate for the prior year with the payment for the next year's estimated water uses. The consideration set forth in Section 6(a) above includes the first year's payment for water use under this Agreement. In the event LDG fails to make such payment after such 20-days written notice, LDG's right to access Owner's cold water shall terminate, but the remainder of this Agreement shall remain in full force and effect (including all ROWs granted or to be granted hereby).

7. **Cessation of Development or Abandonment of Lease.** LDG intends to explore for geothermal resources on the Subject Lease for the purpose of generating electricity. If LDG fails to take reasonable actions to commence exploration for or development of geothermal resources on the Subject Lease within two (2) years of the date of this Agreement, or if LDG determines at any time, either before or after such two (2) year period, to abandon development of geothermal resources on the Subject Lease (and provides Owner with written notice of such intent to abandon the Subject Lease), then LDG agrees to take such reasonable steps necessary to designate Owner as an operator (with the BLM) for purposes of operating shallower formations under the Subject Lease (down to 1000 feet, consistent with the historical operations of Owner), or, if LDG determines it is in its interest, to assign operating rights in the Subject Lease to

Owner from the surface down to 1000 feet. Notwithstanding the foregoing, if LDG determines that it intends to completely abandon the Subject Lease, and provides written notice of such intent to Owner, then LDG shall assign the entire lease over to Owner, upon assumption by Owner of all rights and responsibilities under the Subject Lease. Moreover, LDG agrees that in connection with such designation of operator, it shall agree to turn over to Owner the following Existing Wells, as shown on Exhibit B, unplugged and accessible: Well #10, Well #11, and Well #25, provided however that Owner shall assume all plugging, abandoning, reclamation and other responsibilities for such wells and shall post any required bonds in connection with the assignment and assumption of such wells. The foregoing agreement of LDG to designate Owner as an operator (or assign operating rights or all of the Subject Lease) is subject to the approval of the BLM. LDG's commitment to commence exploration and development activities on the Subject Lease is also subject to delay or suspension as result of events of Force Majeure. "Force Majeure" shall include, without limitation, the following: strikes; lockouts; riots; action of the elements, including but not limited to fire, explosion, flood, volcanic activity, earthquakes, or tidal waves; accidents; delays in transportation; inability to secure labor or materials in the open market; laws, rules or regulations of any Federal, State, County, Municipal or other governmental agency, authority or representative having jurisdiction, including failure or delay in issuance of necessary permits or approvals; war (whether declared or undeclared including terrorist acts); acts of God; litigation or administrative proceedings affecting title to lands covered hereby or operations thereon; inability to secure or absence of a market for commercial sale of geothermal resources or electricity generated therefrom, produced from the Subject Lease or of derivatives developed by LDG therefrom; or by other matters or conditions beyond the reasonable control of LDG, whether or not similar to the conditions or matters in this definition specifically enumerated.

8. Cooperation. Owner agrees to reasonably cooperate with LDG, in good faith, to support and promote the successful development of geothermal resources and the generation of electricity from the Subject Lease.

9. Pipelines, Utilities. LDG hereby agrees to locate all pipelines and other linear utilities at all points along an applicable Access Road ROW or Other ROW where reasonable and practical. However, there may be instances where pipelines, transmission facilities and other Improvements cannot be placed along an Access Road ROW, in which case LDG shall be granted separate Other ROW's for such uses. LDG shall not be required to bury pipelines or other utilities.

10. Access Road ROW's. LDG agrees that it shall construct and/or improve all currently contemplated new roads and existing roads along the center line(s) approximately depicted on the attached Exhibit B, subject to modification by LDG upon a final inspection and survey of the Subject Lands. During the construction or improvement of any road, under an Access Road ROW, including the installation of pipelines and other utilities, the right of way shall be sixty (60) feet wide, and LDG shall have a temporary license to use other portions of the Subject Lands during the construction phase of such roads (including the installation of pipelines and other utilities) to park equipment or store gravel or other supplies, provided that LDG shall replant and restore any temporary use areas to their natural condition prior to construction. Upon completion of construction of the road (or expansion or improvement of existing roads) and installation of pipelines and other utilities, the Access Road ROW's shall be forty (40) feet wide. The roads shall be graded and improved with gravel. LDG agrees that it shall maintain the Access Road ROW's to industry standards as a gravel road during the term of this Agreement. LDG shall not be obligated to remove snow that may accumulate on the road, and shall not be responsible for paving the road, providing curb and gutter, or otherwise improving the road to accommodate increased traffic from Owner's lands. The same provisions of this Section 10 shall apply to all future roads and Access Road ROW's to be constructed and maintained by LDG on the Subject Lands, including Access Road ROW's or Other ROW's to the Power Plant ROW.

11. Owner's Right to Use the ROWs. LDG shall have the exclusive right to use and maintain the Well Site ROWs and any Other ROWs (including the Power Plant ROW). LDG shall have the non-exclusive right to use and maintain the Access Road ROWs during the term of this Agreement for its purposes. LDG hereby agrees that Owner, and its successors, assigns, employees, agents, invitees and licensees, shall have the right to use the Access Road ROWs for access to the remainder of Owner's property as currently owned and used. Owner, and its successors, assigns, employees, agents, invitees and licensees shall not interfere with LDG's operations on the Subject Lands or the use or maintenance of the Access Road ROWs (or the other ROWs), and Owner shall be responsible for any cost of repairing damage to any road caused by Owner, or its successors, assigns, employees, agents, invitees and licensees. Any proposed use of or modification to an Access Road ROW by Owner, or its successors, assigns, employees, agents, invitees and licensees, which would or may be likely to injure, damage or interfere with the Access Road ROW, shall require the prior written consent of LDG, an express agreement of Owner to assume all costs and damages, and shall require, at LDG's option, the presence of LDG's agent or employee to monitor the activity. Owner, and its successors, assigns, employees, agents, invitees and licensees shall abide by all written safety and other instructions regarding use of the roads that are provided by LDG. When LDG no longer requires an Access Road ROW for its operations, LDG shall provide written notice of its intent to abandon use and Owner shall have the option to assume control and maintenance over the Access Road ROW by notifying LDG within thirty (30) days of receipt of such notice; otherwise, LDG shall remediate and restore the property covered by an Access Road ROW in accordance with applicable law.

12. Indemnification.

(a) Owner, its successors and assigns, does hereby agree to relieve, release, indemnify and hold LDG, its managers, members, successors, assigns, employees, agents, invitees and licensees, harmless and agree to defend LDG, its managers, members, successors, assigns, employees, agents, invitees and licensees, from any claim of damage to any person or property arising out of use of any ROW or other activities on the Subject Lands for damages proximately caused by Owner, its successors, assigns, invitees, and licensees, which damages include specifically but without limitation, all damages sounding in tort (whether by way of nuisance, trespass, ultrahazardous activity or otherwise) and/or involving environmental contamination and its incident response, compensation or liability, and also including all expenses, reasonable attorneys' fees, court costs, and witness fees, and other monies expended by or incurred by LDG or its agents, in the event it shall become necessary for LDG or its agents to defend themselves from any claims made by anyone as a result of the use of any ROW or other activities on the Subject Lands, by Owner, its successors, assigns, invitees, and licensees, but not otherwise.

(b) LDG, its successors and assigns, hereby agree to relieve, release, indemnify, and hold harmless and agree to defend Owner, its successors, assigns, employees, agents, invitees and licensees from any and all claim of damage to any person or property arising out of use of the Subject Lands for operations by LDG or its agents for damages proximately caused by LDG or its agents, which damages include specifically but without limitation, all damages sounding in tort (whether by way of nuisance, trespass, ultrahazardous activity or otherwise) and or involving environmental contamination and its incident response, compensation or liability, and also including all expenses, reasonable attorneys' fees, court costs, witness fees and other monies expended by or incurred by Owner, its successors, assigns, employees, agents, invitees and licensees in the event it shall become necessary for Owner, its successors, assigns, employees, agents, invitees and licensees to defend themselves from any claims made by anyone as a result of LDG's operations, on, across or over the Subject Lands, but not otherwise.

13. Confidentiality. Owner hereby agrees, unless compelled by court order or subpoena, that the terms and conditions of this Agreement, including but not limited to the payments referenced in Section 6

above, shall remain confidential and will not be disclosed or released to any other person(s) or third parties. LDG can disclose the existence and terms of this Agreement at its discretion.

14. **Water Rights.** Owner currently owns water rights that pertain to the Subject Lands, which are more particularly described in Exhibit D hereto. Owner is currently using a portion of its water rights for the operation of its commercial greenhouse business, for domestic consumption and some limited irrigation needs ("Current Water Usage"). Any water rights that Owner currently owns but is not currently using to satisfy the Current Water Usage shall be referred to herein as the "Excess Water Rights." LDG requires a minimum of approximately 600 acre-feet of water for the cooling and operational needs of the Power Plant, and Owner agrees that it shall make commercially reasonable efforts to meet those water requirements from the Excess Water Rights, and shall not lease or transfer any of its water rights until LDG's water requirements are being adequately met. Owner agrees to provide LDG access to and use of all Excess Water Rights as follows:

(a) Owner grants LDG the right to use Excess Water Rights for the drilling and testing of geothermal wells on the Subject Lands. LDG shall be responsible for all costs of connecting to Owner's water system.

(b) Owner hereby grants LDG the preferential right to the use of all Excess Water Rights for the development and operation of the Power Plant and the appurtenant geothermal resources. LDG shall install a metering system, at its own cost and expense, if necessary to comply with any requirements of any governmental agency or authority. LDG shall also bear the full cost of connections to Owner's water systems and infrastructure, and, if necessary, any upgrades to Owner's water system necessitated by LDG's use of the Excess Water Rights. LDG shall provide, free of cost, all electricity necessary for pumping any Excess Water Rights for LDG's use. LDG shall pay for any metering, studies or reports that may be required to establish a precise amount of Owner's available water rights, the amount of the Excess Water Rights and/or LDG's water needs for the Power Plant or geothermal resources development. Once the amount of LDG's water rights requirements are established, Owner and LDG agree to enter into a written water use agreement that evidences LDG's rights to the Excess Water Rights, which agreement shall be recorded in the county real property records ("Water Use Agreement"). Owner covenants and agrees not to transfer or sell any of the Excess Water Rights, until the Water Use Agreement is executed and recorded.

15. **Drilling of Water Wells on the Subject Lands.** LDG requires a certain amount of water to effectively produce geothermal energy from the Subject Wells. Owner understands that any drilling of water wells on the Subject Lands or land adjacent to the Subject Lands, under certain conditions, could significantly and adversely impact the ability of LDG to explore for and produce geothermal energy. Accordingly, Owner hereby agrees to not drill or construct any water wells on the Subject Lands or on adjacent property to the Subject Lands that Owner owns without first giving LDG written notice of its drilling plans to LDG. Owner agrees to use its best efforts to cooperate with LDG to obtain any additional water rights that LDG may need or apply for to drill the Subject Wells and/or generate electricity from the geothermal resources underlying or pooled with the Subject Lands.

16. **Notices.** Owner may give any notice or deliver any document hereunder to LDG by mailing the same by prepaid registered or certified mail addressed to LDG to the address set forth in the introductory paragraph above, attention General Counsel, or by delivering the same in person to the above-referenced address of LDG. LDG may give any notice or deliver any document hereunder to Owner by mailing the same by prepaid registered or certified mail addressed to Owner at the address set forth in the introductory paragraph above, attention Dale Burgett, or by delivering the same to Owner in person. For purposes of this paragraph, either party may change its address by written notice to the other. In case of any notice or document delivered by registered or certified mail, the same shall be deemed delivered when deposited in any U.S. Post Office, properly addressed as herein provided, with postage fully

prepaid. Notices shall be in writing and shall be given to LDG and Owner at the addresses set forth in the introductory paragraph hereto, or to such address as either party may designate to the other in writing not less than thirty (30) days before that event which triggers notices. Notices shall be effective the third day after the date of mailing, postage prepaid.

17. **Rehabilitation and Restoration.** Upon termination of this Agreement, LDG shall restore the Subject Lands near as possible to their original conditions prior to construction in accordance with acceptable industry practices and all applicable laws and regulations in effect at the time of restoration. To the extent there is any environmental remediation required for property surrounding any ROW, Owner grants LDG a temporary right-of-way to use as much of the Subject Lands as it may require for environmental remediation. LDG shall have the right to use necessary space outside of the right-of-way for repair of any roadway or facilities. If upon termination of this Agreement, or intended abandonment of an Access Road ROW or some other ROW hereunder, LDG agrees and Owner elects to assume ownership and use of any road, well, or other Improvements, then Owner shall expressly assume all liabilities or responsibilities, including without limitation all future reclamation (or plugging and abandoning, for wells) obligations, and shall hold harmless LDG upon assumption of responsibility for such road, well or other Improvements.

18. **No Storage or Repair of Equipment.** LDG shall not allow any construction equipment or materials to be stored on Owner's property outside the confines of the fenced Power Plant ROW beyond ninety (90) days after completion of construction of a ROW or Improvements, unless approved, in advance, by Owner. LDG shall endeavor to maintain clean, neat and orderly roads and facilities at all times. No construction equipment shall be repaired or maintained upon the property of the Owner outside the boundaries of the fenced Power Plant ROW, except in the case of emergencies to prevent damage to the Subject Lands or neighboring properties. No motor fluids will be disposed of on the property of Owner.

19. **Taxes.** Owner shall continue to be responsible for the payment of property taxes, if applicable. LDG agrees to pay all additional taxes that may be assessed against the Subject Lands by reason of improvements placed thereon by LDG. Owner shall provide LDG with written evidence that Owner has paid all property taxes on the Subject Lands at least thirty (30) days prior to when due. If Owner fails to pay property taxes on the Subject Lands, LDG shall have the right, but not the obligation, to pay such tax obligations on Owner's behalf, and such payment, with interest accruing at Eighteen Percent (18%) per annum, shall be due and payable by Owner to LDG within thirty (30) days of payment by LDG.

20. **Recorded Right-of-Way; ROW Map.** Upon the request of LDG or Owner, LDG shall prepare a written right-of-way, in recordable form, which can be recorded in Hidalgo County to provide constructive notice of the exact location of any right-of-way granted pursuant to this Agreement. Moreover, LDG shall maintain a map of the Subject Lands (starting with Exhibit B) which reflects all surface uses and ROWs used or required by LDG, and as new ROWs are obtained by LDG under this Agreement, LDG shall amend and maintain a current map and survey of ROWs, a copy of which shall be provided to Owner.

21. **LDG Financing.** Owner agrees to execute any documents reasonably required by any lender of LDG to permit LDG to obtain financing for LDG's activities on the Subject Lands. Such documents may include, without limitation, a certificate of Owner confirming the validity and enforceability of this Agreement, that there are no defaults under this Agreement, that this Agreement shall survive any foreclosure and may be assigned to subsequent purchasers at foreclosure, consent of Owner to the grant of LDG's rights in this Agreement to a lender for security purposes, and any other covenants and agreements that are typically required by institutional lenders. Moreover, if Owner has existing deeds of trust, mortgages, or other liens on the Subject Lands at the time of this Agreement, Owner agrees to obtain subordinations from its lenders and lienholders with respect to this Agreement, on the form to be provided

by LDG, either prior to execution or within thirty (30) days after execution, as elected by LDG. The subordination agreement may be recorded with the Memorandum described in Exhibit C or recorded separately.

22. **Governing Law.** The laws of the State of New Mexico shall control the rights of the parties under this contract.

23. **Waiver.** By signing this Agreement, neither party waives its statutory and common law rights to occupancy and enjoyment of their respective estates, except as expressly provided in this Agreement.

24. **Assignment of Rights.** All rights and obligations under this Agreement shall run with the Subject Lands and shall inure to the benefit of and be binding upon the heirs, successors, or assigns of each party. LDG may assign its rights in this Agreement without the prior written consent of Owner, including, without limiting the foregoing, assignments for purposes of providing security for any loans. Moreover, LDG shall have the right to assign all or any portion of the ROWs to another entity or person, separate from ownership of the Subject Lease. The parties hereto agree to execute a memorandum of this Agreement, which shall be in form sufficient to record in the Hidalgo County real property records, in the form provided by LDG.

25. **Amendment.** This Agreement constitutes the entire Agreement between the parties pertaining to the subject matter contained in it and supersedes all prior and contemporaneous agreements, representations, and understandings of the parties with respect thereto. No supplement, modification, or amendment of this Agreement shall be binding unless executed in writing by all parties.

26. **Counterparts.** This Agreement may be executed in counterparts. Each counterpart shall constitute an original and all counterparts together shall constitute one and the same document. Receipt by party hereto of an executed copy of this Agreement by facsimile shall constitute conclusive evidence of execution and delivery of the Agreement by the signatory thereto.

[Signatures on the following page]

Dated effective as of the date first written above.

OWNER:

ROSETTE, INC.

By: [Signature]
Name: [Signature]
Title: [Signature]

LDG:

LIGHTNING DOCK GEOTHERMAL HI-01, LLC

By: [Signature]
Name: Walter F. Peterson
Title: CFO

EXHIBIT A

Legal Description of the Subject Lands

- A. LDG is the owner of Federal Geothermal Lease NM -34790 ("Subject Lease"), granting LDG the right to explore for and develop geothermal resources underlying the lands covered by the lease, described as follows:

1.

T25S, R19W, N.M.P.M.
Sec. 6: Lots 3, 4, 5, 6, 7, SE1/4NW1/4
Sec. 6: E1/2SW1/4
Sec. 7: Lots 1, 2, 3, 4, S1/2NE1/4, SE1/4NW1/4, E1/2SW1/4, SE1/4,
NW1/4NE1/4, NE1/4NW1/4
Sec. 18: Lot 1, N1/2NE1/4, NE1/4NW1/4

and

T25S, R20W, N.M.P.M.
Sec. 1: NW1/4SW1/4, S1/2SW1/4, SW1/4SE1/4
Sec. 11: NE1/4, S1/2
Sec. 12: ALL
Sec. 13: N1/2N1/2

Containing 1,500.96 acres, more or less

2. LDG has applied for Federal Geothermal Lease NM 108801, which is pending final approval by the BLM and will be included with the Subject Lease upon approval, granting LDG the right to explore for and develop geothermal resources underlying the lands covered by the Subject Lease, described as follows:

T25S, R20W, N.M.P.M.
Sec. 14: All

Containing 640.00 acres, more or less

- B. Owner is the owner of the land ("Surface Lands") covering, in part, the Subject Lease, which is described as follows:

1. Sections 7 and 18
T25 S, R19 W, N.M.P.M

And

Sections 11, 12, 13, 14, and 23
T25 S, R20 W, N.M.P.M
Containing 2,592.473 acres, more or less

- C. "Subject Lands" shall be the surface area wherein LDG's Subject Lease underlies Owners Surface Lands.

EXHIBIT B

Initial Inventory of Existing Wells and Location of Initial Contemplated ROWs



Legend

Subcounty

State Federal/Geological Survey Well

Number, Label

- 1 - 4" casing - 10' depth
- 2 - 4" casing - 10' depth
- 3 - 4" casing - 10' depth
- 4 - 4" casing - 10' depth
- 5 - 4" casing - 10' depth

- 6 - Well No. 1 - State - 8' depth
- 7 - Well No. 2 - State - 8' depth
- 8 - 4" casing - 10' depth
- 9 - 4" casing - 10' depth
- 10 - Metered Production Well No. 1 - State - Federal
- 11 - Metered Production Well No. 2 - State - Federal
- 12 - 4" casing - 10' depth
- 13 - 4" casing - 10' depth
- 14 - 4" casing - 10' depth

- 15 - Abandoned Well/Facility
- 16 - Metered Production Well No. 1 - State - Federal
- 17 - Abandoned Well/Facility
- 18 - Metered Production Well No. 2 - State - Federal
- 19 - Abandoned Well/Facility
- 20 - 4" casing - 10' depth
- 21 - 4" casing - 10' depth
- 22 - Abandoned Well/Facility
- 23 - 4" casing - 10' depth
- 24 - 4" casing - 10' depth

- 25 - Metered Production Well No. 3 - State - Federal
- 26 - Abandoned Well/Facility
- 27 - Abandoned Well/Facility
- 28 - 4" casing - 10' depth
- 29 - 4" casing - 10' depth
- 30 - 4" casing - 10' depth
- 31 - 4" casing - 10' depth
- 32 - 4" casing - 10' depth
- 33 - 4" casing - 10' depth
- 34 - State Well - 8' depth

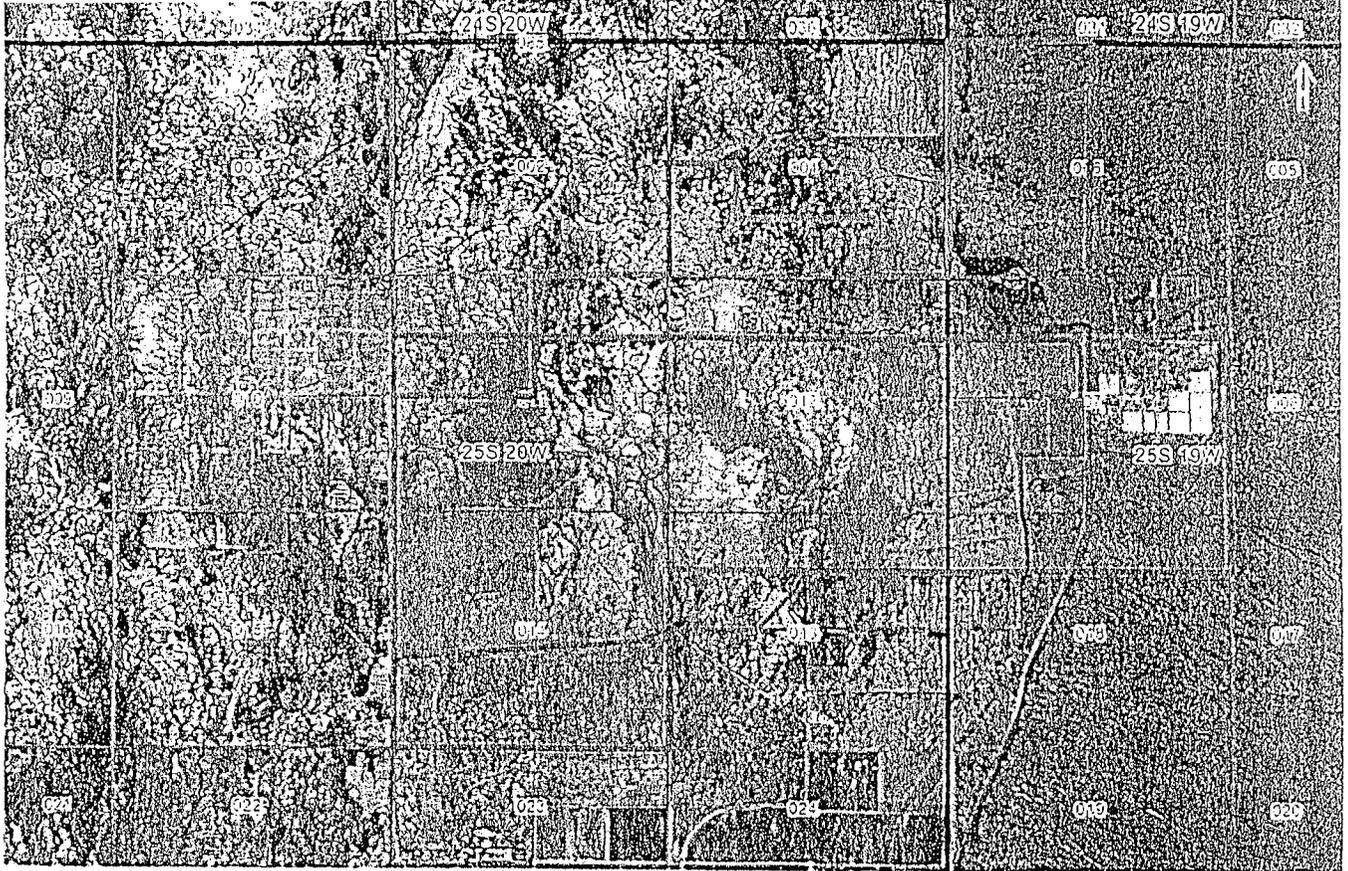
- 35 - State Well - 8' depth
- 36 - State Well - 8' depth
- 37 - Abandoned Well/Facility
- 38 - 4" casing - 10' depth
- 39 - 4" casing - 10' depth
- 40 - 4" casing - 10' depth
- 41 - 4" casing - 10' depth
- 42 - 4" casing - 10' depth
- 43 - 4" casing - 10' depth
- 44 - 4" casing - 10' depth

- 45 - State Well - 8' depth
- 46 - State Well - 8' depth
- 47 - Abandoned Well/Facility
- 48 - 4" casing - 10' depth
- 49 - 4" casing - 10' depth
- 50 - 4" casing - 10' depth
- 51 - 4" casing - 10' depth
- 52 - 4" casing - 10' depth
- 53 - 4" casing - 10' depth
- 54 - 4" casing - 10' depth

- 55 - State Well - 8' depth
- 56 - State Well - 8' depth
- 57 - Abandoned Well/Facility
- 58 - 4" casing - 10' depth
- 59 - 4" casing - 10' depth
- 60 - 4" casing - 10' depth
- 61 - 4" casing - 10' depth
- 62 - 4" casing - 10' depth
- 63 - 4" casing - 10' depth
- 64 - 4" casing - 10' depth

EXHIBIT C

Sample Power Plant ROW and Access Roads for a Power Plant



Legend

-  Secondary Access Route
-  Primary Access Route
-  Proposed Plant Location
-  Riser Federal Geothermal Lease
-  Burgett_Boundary

Lightning Dock Geothermal
Power Plant and
Access ROW
Hildago County, Nevada

Lightning Dock Geothermal HI-01, LLC
5152 North Edgewood Drive Suite 375
Provo, UT 84604

EXHIBIT D

Water Rights Description

A. Owner represents and warrants ownership of the following Water Rights identified by New Mexico Office of the State Engineer Numbers:

A-13, with points of diversion located in Section 13, Township 25 South, Range 20 West, N.M.P.M.

A-36-A, with points of diversion located in Sections 6 and 7, Township 25 South, Range 19 West, N.M.P.M., and Sections 4 and 12, Township 25 South, Range 20 West, N.M.P.M.

A-35-D, with points of diversion located in Section 7, Township 25 South, Range 19 West, N.M.P.M., and Section 4, Township 25 South, Range 20 West, N.M.P.M.

A-51, with points of diversion located in Section 10, Township 25 South, Range 20 West, N.M.P.M.

A-64-A, with points of diversion in Section 7, Township 25 South, Range 19 West, N.M.P.M.

A-384, with points of diversion in Section 12, Township 25 South, Range 20 West, N.M.P.M.

A-385, with points of diversion in Section 7, Township 25 South, Range 19 West, N.M.P.M.

A-386, with points of diversion in Section 7, Township 25 South, Range 19 West, N.M.P.M.

LIGHTNING DOCK GEOTHERMAL NO. 1, HI-01, L.L.C.

WELL AND PLANT LOCATIONS

Production Wells:

1. Well 13-07 Beginning at the southwest corner of Section 7, Township 25 South, Range 19 West, New Mexico Principle Meridian, Hidalgo County, New Mexico:
Thence, North, a distance of 3781.0' feet along the west section line;
Thence, East, a distance of 530.1 feet to the location of said well
2. Well 33-07 Beginning at the southwest corner of Section 7, Township 25 South, Range 19 West, New Mexico Principle Meridian, Hidalgo County, New Mexico:
Thence, North, a distance of 3721.2' feet along the west section line;
Thence, East, a distance of 2389.4 feet to the location of said well.
3. Well 53-07 Beginning at the southwest corner of Section 7, Township 25 South, Range 19 West, New Mexico Principle Meridian, Hidalgo County, New Mexico:
Thence, North, a distance of 3775.3' feet along the west section line;
Thence, East, a distance of 3052.1 feet to the location of said well.
4. Well 45-07 Beginning at the southwest corner of Section 7, Township 25 South, Range 19 West, New Mexico Principle Meridian, Hidalgo County, New Mexico:
Thence, North, a distance of 2510.0' feet along the west section line;
Thence, East, a distance of 2428.2 feet to the location of said well.
5. Well 47-07 Beginning at the southwest corner of Section 7, Township 25 South, Range 19 West, New Mexico Principle Meridian, Hidalgo County, New Mexico:
Thence, North, a distance of 1219.1' feet along the west section line;
Thence, East, a distance of 2416.3 feet to the location of said well.

Injection Wells:

1. Well 42-18 Beginning at the northwest corner of Section 18, Township 25 South, Range 19 West, New Mexico Principle Meridian, Hidalgo County, New Mexico:
Thence, South, a distance of 1307.0 feet along the west section line;
Thence, East, a distance of 2123.1 feet to the location of said well.

2. Well 62-18 Beginning at the northwest corner of Section 18, Township 25 South, Range 19 West, New Mexico Principle Meridian, Hidalgo County, New Mexico:
Thence, South, a distance of 1297.2 feet along the west section line;
Thence, East, a distance of 3350.4 feet to the location of said well.

3. Well 82-18 Beginning at the northwest corner of Section 18, Township 25 South, Range 19 West, New Mexico Principle Meridian, Hidalgo County, New Mexico:
Thence, South, a distance of 1278.3 feet along the west section line;
Thence, East, a distance of 4978.1 feet to the location of said well.

Plant Location (500' X 700')

NE Corner of Plant NE1/4 of SW1/4 of Section 07, Township 25 South, Range 19 West,
(N.M.P.M.)

DESCRIPTION OF TOOLS AND EQUIPMENT,
INCLUDING MAXIMUM CAPACITY AND DEPTH RATING

The drilling contractor will be Layne-Western, a Division of Layne Christensen Company. The applicant has included the following specifications for the drill rig and supporting equipment to complete the drilling operation in a safe and professional manner (See Attachment A)

Challenger 360-200 Portable Rotary Drill Rig – Rig Number 493

Draw Works – Challenger Model 36:

Double Stacked Drums

Hoisting Drum – 10 ½ in. X 22 ½ in.

Kelly Drum - 10 ½ in. X 22 ½ in.

Clutches – Wichita 24”, 3 plate

Single Line Pull 36,000#

LeBus Grooving with 7/8” line (1” swagged line)

PARMAC Hydromatic Twill Disc Water Brake

Hydraulic Wireline Drum

8 foot Elevated Rill Floor with Howard Turner 18” Rotary Table

200,000# Floor Capacity with 7.5 Foot Minimum under Floor Clearance for BOP use

Derrick – Challenger Model:

Top of Crown Height – 96 feet from Ground Level

Satellite Style Fluorescent Derrick Lighting

MD/TOTCO Weight Indicators

Rated Hook Load Capacity – 200,000# on 8 Lines

Working Line – McKissick 100 Ton, 4 Sheave Traveling Block

Drilling Line – McKissick 100 Ton, 4 Sheave Traveling Block and Hook Combination

Custom Hydraulic Lift, Roller and Guide System for Derrick Transport

Engine – Caterpillar C15, 540 HP Diesel Engine:

Enclosed Engine Compartment with Silencer Muffler

200 Gallon Fuel Storage on Rig Deck

Allison Transmission with Torque Converter

Mounting:

Triple Axle Trailer with 3-20,000 # Axles

Standard Support Equipment:

Hex Kelly and High Pressure Swivel

800 Gallon Diesel Fuel Storage and Electric Fueling Pump

*100 monitor
wind sock*

Geograph Double Pen Recorder (Drilling Rate and Weight on Bit):

3 or 6 Degree Deviation Survey Tool
Halliburton Survey Tool Wire Line
Hydraulically Raised Elevated Self
Contained Dog House
80 kW Quiet Site CAT Generator
250 Amp DC Welder
Bear Automatic Driller
Explosion Proof Electrical Connections
15 HP Mission 2 X 3 Mixing Pump
Caterpillar 4 X 4 Backhoe
Site Dedicated Winch Truck
Rig Smart Data System

Additional Support Equipment Available:

Triplex Pumps, Duplex Pumps
Air Compressors, High Pressure Booster Compressors
Hydraulic Power Tongs
Shale Shakers
Desanding and Desilting Equipment
Portable Circulation and Mixing Tanks

H₂S Manifolds
wind socks

EXPECTED DEPTH AND THICKNESS OF FRESH WATER ZONES

The expected depth and thickness of fresh water zones on the project site is between 40-60 feet.

The geothermal reservoir is expected to be between 250 and 300 degrees F. The pressure for the reservoir is about 20 psi.

The temperature gradient should be between 250 and 300 degrees f.

BOREHOLE DESIGN

Drill 26" hole to 90 feet

Set 20" conductor pipe

Drill 17.5" hole to 1,500'

Set 13.375" Surface String into the volcanics

Drill 12.25" hole to 3,400' using light mud or aerated fluids

Set 9.25" casing to 3,400 using stiff foam or aerated fluids

Hang 7" or similar perforated liner if needed

DRILLING PROCEDURES

Clear and level drill pad using standard earth moving equipment, and a reserve pit will be dug alongside. The anticipated drill pad size will be 300'X300', with a 250'X100'X 15' deep reserve pit. Each pad location will be adjusted to site conditions. (See Figure 3 – Typical Geothermal Well Drill Site Layout)

Move in suitable conductor rig and drill 26" hole to 90 feet and set 20" conductor pipe. The pipe will be cemented to the surface with standard ready mix and pumped from the top. Monitor for fall and perform top job if necessary.

WOC for 24 hours.

Dig cellar as needed and install flow lines.

Move in suitable conventional rotary drill rig and associated equipment. Completely rig up all accouterments prior to spud. (see Attachment A)

Drill 17.5" hole to 1,500' +/- using mud as the circulating medium (see Figure 4 – Proposed Geothermal Well Diagram). Treat losses with lost circulation material (LCM) or if severe, cement plugs if necessary.

- Monitor flow line temperatures at all times.
- Catch 10 foot samples from drill cuttings and monitor for hydrothermal alteration.
- Check returns for increases in salinity, chlorides, or gasses.
- To ensure drill hole is kept straight, deviation surveys will be run every 600 feet.
- Provide H₂S monitoring on the rig in compliance with state and federal requirements. Contractor will provide a portable H₂S detector on the floor of the rig.
- Provide a weather sock at an appropriate height to detect the prevailing wind.

Circulate hole clean .

- Keep hole full and check for excess flow.
- Measure out of hole.
- Be sure all casing running equipment is ready for use.

Rig up and run 1,500' +/- of 13.375" 54.5#, J-55 buttress casing equipped with float shoe and stabilizers. Centralize casing first 3 joints.

- Be sure casing is centered prior to cementing.
- Run casing at slow speed to prevent down surge.
- Fill casing as required to overcome buoyancy.
- Have casing sized to remain 10' off bottom.
- Spot weld lower three joints.

Cement casing using 13.0 ppg lead slurry and 15.8 ppg tail slurry

- Monitor cement for fall back
- If cement falls back, locate top of cement and prepare for top job.
- Wait on cement (WOC) for 24 hours.

Cut off casing and weld on casing head equipped with 2" flanged side outlets.
Install Blow Out Prevention (BOP) (double rams (blind & pipe), and rotating head or annular preventer) and rig up flow lines.

Test casing, blind rams, and choke lines to 500 psig. Make up 12.25" drilling assembly.

- RIH and test pipe rams and rotating head. Log results
- Have BLM or State witness BOP test.

Clean out cement shoe to TD and circulate hole clean.

Make up 5 to 10' of new hole and hold BOP drill.

Drill 12.25" hole to 3,400 feet +/- keeping the hole straight. Use LSND, or aerated fluids as conditions dictate.

- Catch 10 foot samples.
- Monitor well for increase or decrease in flow.
- Monitor flow line temperature.
- If increased flow or temperature are noted contact geological staff.
- Run deviation surveys every 500'.

After reaching 3,400 feet +/- circulate hole clean.

Run temperature log if directed by geology staff.

If hole is unstable rig up and run 7' or similar perforated liner.

Rig up for well test as per geologic staff directions.

Send 2 copies of all logs to BLM and State.

DRILLING PROGRAM

OVERVIEW

The following items should be considered in planning the location, construction and testing requirements for a Geothermal Well. Wells should be:

- Situated on a well-drained site not subject to inundation by flood within recurrence interval of 100 years.
- Sited in such a way to inject into a formation, separated from any underground source of drinking water by a confining zone, free of known open faults or fractures within the area of review.
- Sited for easy access to maintenance, repair, testing, or such other attention as may be necessary.
- Separated by a minimum horizontal distance of 50 feet from any watertight conduct, such as a cast-iron pipe which carries sewage or other liquid wastes.
- Separated by a minimum horizontal distance of 100 feet from any septic tank, drain field or other facility for the collection or disposal of other liquid waste.
- Separated by a minimum horizontal distance of 10 feet from the boundary of any adjoining property.
- Cased from the finished surface to the top of the injection zone, or to a zone within the same formation or confining zone, and constructed so no contamination can occur as a result of conditions on the surface surrounding the well.
- Cemented to prevent movement of fluid into or between underground sources of drinking water.
- Designed and constructed with casing and cement which will endure the life expectancy of the well.
- Checked for deviation at sufficiently frequent intervals to ensure that vertical avenues for the movement of fluids in the form of diverging holes are not created during drilling.
- Tested for mechanical integrity of the casing to show: 1) absence of leaks in casing and, 2) absence of fluid movement behind casing.
- Designed to include a description of cathodic protection from the well head to the last cemented casing shoe.
- The Division or its duly authorized representatives will have the right to entry onto any geothermal resources site for the purpose of inspecting wells and equipment and for the purpose of determining whether compliance with or violation of these rules is occurring.
- Adequate noise abatement equipment will be installed and maintained in good condition to reduce noise to a level approved by the Division or its representative on any drilling or producing geothermal resources well located within 1,500 feet of a habitation, school or church.
- The well site around any drilling or producing well will be kept clear of any rubbish or debris or fuel which may constitute a fire hazard. In any area where there is any likelihood of encountering unexpected hydrocarbons, the drilling mud and cuttings shall be stored in a pit a safe distance from the drilling rig. All waste will be disposed of in such a manner as to avoid creating a fire hazard.

- All well head equipment, surface production equipment, flowlines, pipelines and subsurface casing and tubing will be subject to periodic surveillance to prevent leakage or rupture and to safeguard human life and health, property and natural resources.
- After the completion of a geothermal resources well, all production from said well will be put to beneficial use. No production will be permitted unless beneficial use is made thereof except for authorized periods of testing, in which case proper disposition of produced liquids will be made.
- Each well will be identified by a sign, posted on the drilling rig or not more than 200 feet from the well. The sign will be of durable construction and lettering will be in legible condition. Lettering will be such that under normal conditions it will be legible at a distance of 500 feet. Each sign will show the name of the owner or operator of the well, the name of the lease, the number of the well, and the location of the well by quarter-quarter section, township and range. Each lease will have a different and distinctive name and the wells will be numbered in non-repetitive, logical sequence.
- No well will be drilled within the corporate limits of any city, town or village unless notice to drill such well has been given to the duly constituted governing body of the city, town, or village or its duly authorized agent.
- Rotary drilling equipment, adequately equipped to maintain underground pressures and prevent or control blowouts, will be used for the drilling of all geothermal resources wells.
- The operator will provide an adequate sized pit to hold the drilling fluid and receive drill cuttings, and the pit will be so constructed and maintained to prevent contaminants from overflowing on the surface of the ground and /or entering any water course.
- The temperature of the return mud will be monitored continuously during the drilling of the surface casing hole. Either a continuous temperature recording device will be installed and maintained in good working condition, or the temperature will be measured manually and recorded at least one time each hour.
- During the drilling of any well, all fresh water strata and salt water strata overlying the geothermal resources strata will be sealed or separated to prevent the migration of fluids from one stratum to the other.
- All waters of present or probable future value for domestic, commercial, agricultural or stock purpose will be confined to their respective strata and will be adequately protected by methods approved by the Division. Special precautions by methods satisfactory to the Division will be taken to guard against loss of artesian water from the strata in which it occurs, and to prevent the contamination of such artesian water strata by an objectional geothermal fluids.
- In areas where high subsurface pressures are known to exist, there is a history of lost circulation and/or blowouts, or where subsurface pressures are not known, all proper and usual precautions will be taken for keeping the well under control, including the use of blowout preventers and high pressure fittings attached to properly cemented casing strings.

DRILLING PROCEDURES

Clear and level drill pad using standard earth moving equipment, and a reserve pit will be dug alongside. The anticipated drill pad size will be 300'X300', with a 250'X100'X 15'deep reserve pit. Each pad location will be adjusted to site conditions. (See Figure 3 – Typical Geothermal Well Drill Site Layout)

Move in suitable conductor rig and drill 26" hole to 63 feet and set 20" conductor pipe. The pipe will be cemented to the surface with standard ready mix and pumped from the top. Monitor for fall and perform top job if necessary.

WOC for 24 hours.

Dig cellar as needed and install flow lines.

Move in suitable conventional rotary drill rig and associated equipment. Completely rig up all accouterments prior to spud. (see Attachment A)

Drill 17.5" hole to 1,500' +/- using mud as the circulating medium (see Figure 4 – Proposed Geothermal Well Diagram). Treat losses with lost circulation material (LCM) or if severe, cement plugs if necessary.

- Monitor flow line temperatures at all times.
- Catch 10 foot samples from drill cuttings and monitor for hydrothermal alteration.
- Check returns for increases in salinity, chlorides, or gasses.
- To ensure drill hole is kept straight, deviation surveys will be run every 600 feet.
- Provide H₂S monitoring on the rig in compliance with state and federal requirements. Contractor will provide a portable H₂S detector on the floor of the rig.

Circulate hole clean .

- Keep hole full and check for excess flow.
- Measure out of hole.
- Be sure all casing running equipment is ready for use.

Rig up and run 1,500' +/- of 13.375" 54.5#, J-55 buttress casing equipped with float shoe and stabilizers. Centralize casing first 3 joints.

- Be sure casing is centered prior to cementing.
- Run casing at slow speed to prevent down surge.
- Fill casing as required to overcome buoyancy.
- Have casing sized to remain 10' off bottom.
- Spot weld lower three joints.

Cement casing using 13.0 ppg lead slurry and 15.8 ppg tail slurry

- Monitor cement for fall back
- If cement falls back, locate top of cement and prepare for top job.
- Wait on cement (WOC) for 24 hours.

Cut off casing and weld on casing head equipped with 2" flanged side outlets.
Install Blow Out Prevention (BOP) (double rams (blind & pipe), and rotating head or annular preventer) and rig up flow lines.

Test casing, blind rams, and choke lines to 500 psig. Make up 12.25" drilling assembly.

- RIH and test pipe rams and rotating head. Log results
- Have BLM or State witness BOP test.

Clean out cement shoe to TD and circulate hole clean.

Make up 5to10' of new hole and hold BOP drill.

Drill 12.25" hole to 3,400 feet +/- keeping the hole straight. Use LSND, or aerated fluids as conditions dictate.

- Catch 10 foot samples.
- Monitor well for increase or decrease in flow.
- Monitor flow line temperature.
- If increased flow or temperature are noted contact geological staff.
- Run deviation surveys every 500'.

After reaching 3,400 feet +/- circulate hole clean.

Run temperature log if directed by geology staff.

If hole is unstable rig up and run 7' or similar perforated liner.

Rig up for well test as per geologic staff directions.

Send 2 copies of all logs to BLM and State.

DEVIATION TESTS AND DIRECTIONAL DRILLING

Any well which is deepened or drilled with rotary tools will be tested at reasonable frequent intervals to determine the deviation from the vertical. Such tests will be made at least each 500 feet or at the first bit change succeeding 500 feet. A tabulation of all deviation tests, sworn to and notarized, will be filed with form G-105, geothermal resources well log. When the deviation averages more than five degrees in a 500-foot interval, the Division director may require that a directional survey be run to establish the location of the producing interval(s)

The Division, at the request of an offset operator, may require any operator to make a directional survey of any well. Said directional survey and all associated costs will be at the expense of the requesting party and will be secured in advance by a \$5,000.00 indemnity bond posted with and approved by the Division. The requesting party may designate the well survey company, and said survey will be witnessed by a representative of the Division.

No well will be intentionally deviated except toward the vertical without prior permission from the Division. Permission to deviate a well other than toward the vertical will be on Division forms with copies of the form being furnished to all other operators owning leases offsetting the drilling tract, if there be any. Upon request of the Division any well which was intentionally deviated will be directionally surveyed. The Division may at its option witness such survey and the Santa Fe office will be notified of the date and hour all directional surveys are to be conducted. All directional surveys run on any well which was intentionally deviated in any manner for any reason will be filed with the Division upon completion of the well. The operator understands that the certificate of compliance and authorization to produce geothermal resources form will not be approved until the operator has submitted an affidavit that all such directional surveys have been filed.

Cement bot - surface

CEMENTING PROGRAM

- General

Cementing on wells is used for two main purposes: (1) It is first used to bond the casing to the formation, forming a seal to prevent movement of fluids from one formation to another; thereby preventing the casing from being pushed up out of the hole, similar to a large hydraulic ram; and (2) the second use is to control lost circulation by sealing off any zones with excessive amounts of drilling fluids escaping into the formation. All cementing will be performed by standard industry practices.

- Lost Circulation Control

The well will be drilled using a combination reverse circulation for the surface casing portion of the hole and using under-balanced aerated fluids for the remainder of the hole. No lost circulation problems are anticipated to develop with these two practices.

- Casing Cementing

- a. Conductor Pipe

The conductor pipe will be cemented by the standard practice of using ready mix, pumped in from the surface.

- b. Surface 13.375" String

The surface string will be cemented by circulating the cement slurry down the casing and up the annulus to the surface. The cement will first be led by a spacer of mud cleaner, then pumped in a lead slurry at around 13 pounds per gallon (ppg). The lower weight reduces the total hydraulic head on the casing and formation. The second cement, or tail slurry will be pumped in at around 15.8 ppg. This provides the maximum strength to the lower portion of the casing and shoe joint. The cement will then be displaced using fresh water and a wiper plug.

- c. Production 9.625" String

The production string will be cemented by circulating the cement slurry down the casing and up the annulus to the hanger. The cement will first be led by a spacer of mud cleaner, then pumping in lead slurry at around 13 ppg. The lower weight reduces the total hydraulic head on the casing and formation. The second cement, or tail, slurry will be pumped in at around 15.8 ppg. This provides the maximum strength to the lower portion of the casing and shoe joint. The cement will then be displaced using fresh water and a wiper plug.

- All casing strings will be run to the surface, monitored for fall back and top cemented if necessary.

- This and other portions of the well plans will be subject to change as conditions dictate in the field.
- Within the confines of designated geothermal fields, cement points will be determined by the Division on the basis of known field conditions.

Proposed Casing and Cement Program

SIZE OF HOLE	SIZE OF CASING	WEIGHT PER FOOT	COUPLING	GRADE	SETTING DEPTH TOP	SETTING DEPTH BOTTOM	QUANTITY OF CEMENT
26"	20"	3/8" Wall		PEBFM	GL	63'	150 Sacks
17.5"	13.375"	54.5 lb/ft		J55 BT&C	GL	1,500'	750 Sacks
12.25"	9.625"	36.0 lb/ft		K55 BT&C		3,400'	980 Sacks
	7" Liner	23.0 lb/ft					

CASING PROGRAM

- All wells will be cased in a manner to protect or minimize damage to the environment, usable ground and surface waters, geothermal resources, life, health and property. The permanent well head completion equipment shall be attached to the production casing, or to the intermediate casing if production casing does not reach the surface.
- The specifications on the casing strings will be determined on a well-to-well basis. All casing strings reaching the surface will provide adequate anchorage for blowout-prevention (BOP) equipment, hole pressure control and protection for all natural resources.
- A minimum of 90 feet and a maximum of 200 feet of conductor casing will be installed. The annular space is to be cemented solid to the surface. A 24 hour cure period for the grout will be allowed prior to drilling out the shoe, unless additives approved by the State Engineer are used to obtain early strength. An annular blowout preventer shall be installed on all geothermal wells when deemed necessary by the Division.
- The surface casing hole shall be logged with an induction electrical log or equivalent before running casing, or by gamma-neutron log. If the applicant has sufficient subsurface geologic data available, they may request the Division to omit this requirement.
- Within the confines of designated geothermal fields, the depth to which surface casing shall be set will be approved by the Division on the basis of known field conditions.
- All wells drilled for the production of geothermal resources will be cased and cemented in such manner as to protect surface waters, if any, usable ground waters, geothermal resources, and life, health and property.
- All casing strings reaching the surface will provide adequate anchorage for blowout prevention equipment, hole pressure control, and protection for all natural resources. Although specifications for casing programs will be determined on a well-to-well basis.
- The surface casing hole will be logged with an electrical or radioactivity log, or equivalent, before running the casing.
- In areas where subsurface geological conditions are variable or unknown, surface casing in general will be set at a depth equaling or exceeding 10 percent of the proposed total depth of the well. A minimum of 200 feet and a maximum of 1,500 feet if surface casing will be set.
- In areas where subsurface geological conditions are variable or unknown, surface casing will generally be set at depth of wells drilled in those areas. A minimum of surface casing will be set through a sufficient series of low permeability, competent lithologic units to ensure a solid anchor for blowout-prevention (BOP) equipment, and to protect usable ground and surface water from contamination. A second string or intermediate casing may be required if the first string has not been cemented through a sufficient series of low permeability, competent lithologic units, and a rapidly increasing geothermal gradient, or rapidly increasing formation pressures are encountered.

- Intermediate casing will be installed for protection against unusual pressure zones, cave-in, wash-outs, abnormal temperature zones, uncontrollable lost circulation zones or other drilling hazards. Intermediate casing strings will be cemented solid to the surface or top of the liner hanger, if run as a liner. The liner lap will be pressure tested prior to resumption of drilling.
- Production casing may be set above or through the producing or injection zone and cemented above the injection zones. Sufficient cement will be used to exclude overlying formation fluids from the geothermal zone, to segregate zones and to prevent movement of fluids behind the casing into zones that contain usable ground water. If run, production casing shall either be cemented solid to the surface or lapped into intermediate casing. If lapped into an intermediate casing, the casing overlap will be at least 100 feet and will be cemented solid. It will be pressure tested to ensure its integrity.
- All wells, except observation wells for monitoring purposes only, will be logged from the bottom of the hole to the bottom of the conductor pipe with an induction electrical log or equivalent, or by gamma-neutron log. This requirement will be modified or waived by the Division upon written request, if such request demonstrates sufficient existing data of surrounding wells.

BOP TESTING, INSPECTION, TRAINING, AND MAINTENANCE

- General Procedures
 - a. Blowout-Prevention Equipment (BOPE) installations will include high temperature-rated packing units and ram rubbers, when available, and will have a minimum working pressure rating as follows:
 - i. [Equal to] the product of the depth (ft.) of the BOPE anchor string times 1 psi per foot.
 - ii. [Equal to] the rated burst pressure of the BOPE anchor string.
 - iii. [Equal to] 2,000 psi.
 - b. A logging unit equipped to regularly record the following data will be installed and operated continuously after drilling out the shoe of the conductor pipe and until the well has been drilled to the total depth:
 - i. Drilling mud temperature.
 - ii. Drilling mud pit level.
 - iii. Drilling mud pump volume.
 - iv. Drilling mud weight.
 - v. Drilling rate.
 - vi. Hydrogen sulfide gas volume.
 - c. The owner understands that the Division may waive the requirement for installation of a logging unit on evidence that the owner or operator has engaged a qualified mud engineer to monitor, log and record the data specified in the above subparagraphs.
- Using Mud as the Drilling Fluid
 - a. In exploratory areas, unstable areas containing: fumaroles, geysers, hot springs, mud pots, and for fields with a history of lost circulation, a blowout, or zone pressures less than 1000 psi the applicant shall implement the following procedures:
 - i. An annular BOPE and a spool, fitted with a low-pressure safety pop-off and blow-down line, installed on the conductor pipe, may be used to ensure against possible gas blowouts during the drilling of the surface casing hole.
 - ii. Annular BOPE and pipe-ram BOPE with a minimum working pressure rating of 2,000 psi will be installed on the surface casing so the well can be shut in at any time. The double-ram preventer shall have a mechanical locking device.
 - iii. A hydraulic actuating system utilizing an accumulator of sufficient capacity and high pressure auxiliary backup system shall be equipped with dual controls; one at the driller's station and one at least 50 feet away from the wellhead.
 - iv. Kelly cock and standpipe valve.
 - v. A fill-up line installed above the BOPE.
 - vi. A kill line installed below the BOPE, leading directly to the mud pumps, fitted with a valve through which cement could be pumped if necessary.

- vii. A blow-down line fitted with two valves installed below the BOPE. The blow-down line will be operated in a manner to permit containment of produced fluids, and to minimize any safety hazard to personnel.
 - viii. All lines and fittings shall be steel and have a minimum working-pressure rating of at least that which is required of the BOPE.
 - ix. The temperature of the return mud during the drilling of the surface casing hole will be monitored regularly. Either a continuous temperature monitoring device will be installed and maintained in working condition, or the temperature will be read manually. The Mud temperatures will be logged after each joint of pipe is drilled down every 30 feet.
- Using Air as the Drilling Fluid
 - a. If it is known that dry steam exists at depth, or formation pressures are less than hydrostatic, the operator shall implement the following procedures:
 - i. A rotating-head will be installed at the top of the BOPE stack.
 - ii. A pipe-ram/blind-ram BOPE with a minimum working-pressure rating of 1,000 psi will be installed below the rotating-head, so the well can be shut in at any time.
 - iii. A banjo-box, or mud-cross steam diversion unit shall be installed below the double-ram BOPE, fitted with a muffler capable of lowering sound emissions to within state standards.
 - iv. A blind-ram BOPE with a minimum working-pressure of 1,000 psi, installed below the banjo-box or mud-cross, so the well can be shut in while removing the rotating-head during bit changes.
 - v. A master gate valve with a minimum working-pressure rating of 600 psi, installed below the blind-ram so the well can be shut in after being completed, prior to removal of the BOPE stack.
 - vi. A ram-type BOPE that will have a hydraulic actuating system utilizing an accumulator of sufficient capacity, and a high-pressure backup system.
 - vii. Dual control stations for hydraulic backup system: one at the driller's station and the other at least 50 feet away from the wellhead.
 - viii. Float and standpipe valves.
 - ix. A kill line installed below the BOPE, leading directly to the mud pumps, fitted with a valve through which cement could be pumped if necessary.
 - x. BOPE capable of shutting in the well during any operation will be installed on the surface casing maintained ready for use at all times.

- BOP Testing Procedure

The Annular, double gate, Hydraulic Control Remote Valve (HCR), Accumulator, and all auxiliary equipment will be tested when installed, and every 14 days thereafter. We will follow an overbearing program to protect all parties involved. Testing shall be as follows:

- a. When the BOP is installed after running casing (See Figure 6 and 7):
 - i. Fill hole, close blind rams, close standpipe, open kill line master and control valves, open choke line master and control valves, open HCR, open master valve on panic line, open inward choke valves, open chokes, close panic line control valve and isolation valves for chokes. Do low pressure test (200-300 psi) for 5 minutes. Do high pressure test (1000psi) for 30 minutes. Record in log book.
 - ii. All following tests will have the same pressures and time limits.
 - iii. Bleed pressure off at pump, see if check valve closes and what pressure is left. Record in Book. Bleed off pressure
 - iv. Close inward valves on chokes and master valve on panic line. Do low pressure test. Record. Do high pressure test and record. Bleed off.
 - v. Open blind rams and Run In Hole (RIH) with Bottom Hole Assembly (BHA) and drill pipe (no float), circulate out air.
 - vi. With the Kelly made up into string, close pipe rams, close master valve on Kelly and choke line. Disconnect kill line at check valve. Do low pressure test, record, do high pressure test, record, and bleed off.
 - vii. With pipe rams still closed, open master valves on Kelly, choke lines, close control valves on kill, choke lines, do low pressure test, record, close upper Kelly cock, bleed off at pump, and record. Open upper Kelly cock, do high pressure test, record, close upper Kelly cock, bleed off at pump, and record. Open Kelly cock and bleed off.
 - viii. With pipe rams closed, kill and choke lines closed, do low pressure test and close standpipe trapping pressure. Bleed off at pump and record. Same with high pressure test.
 - ix. Open pipe rams, close bag, close kill line, open control and master valves on choke line, close HCR valve. Do low pressure test, record, do high pressure test, record and bleed off.
 - x. Reconnect kill line, open both valves, and install Full Open Safety Valve (FOSV) drill pipe. Do low pressure test through kill line, record, do high pressure test, record and bleed off.
 - xi. Take off FOSV and install internal preventer. Do low pressure test through kill line, record, do high pressure test, record and bleed off.
 - xii. The auxiliary pump line valve will be tested every time, as well as most other valves.
 - xiii. Check all levels in accumulator and backup systems, record in log book.
- b. During normal operation, every 14 days:
 - i. Blind rams will be tested with a test plug when out of the hole.
 - ii. Pipe, bag, and HCR will be tested with a test plug while still inside the shoe (on trip in the hole.)

- iii. All low and high pressure tests will be the same.
- iv. All shall be recorded in log book.
- v. Upon installation, ram-type blowout preventers, bag-type blowout preventors, valves and manifolds will be tested to a minimum of 750 psi pressure. Test may be witnessed by a Division representative on all wells prior to drilling out the shoe of the surface casing, and the Division will be notified of the date and hour any such test is to be conducted sufficiently in advance of the test to allow a Division representative to travel to the well to witness the test.
- vi. Ram-type preventers will be operated at least once each 24 hours and bag-type preventers closed on the drill pipe at least once each week, provided however, that an exception to this provision may be granted by the Division's geothermal section to prevent undue wear and tear on the preventer rubbers when drilling drysteam wells.

- BOP Inspection and Actuation

All required BOP equipment will be actuated periodically to ensure operational readiness.

a. The following are to be performed every 12 hour shift:

- i. Check the accumulator pressure.
- ii. Check pressure of the emergency backup system.
- iii. Check hydraulic fluid level in the accumulator.
- iv. Check air pressure to support system.
- v. Record all of the above in IADC log book and well ledger.

b. Every trip, but not twice within a 24 hour period:

- i. Function test pipe rams (when inside shoe).
- ii. Function test blind rams (when inside shoe).
- iii. Operate all Kelly cocks.
- iv. Check Drill pipe safety valve.
- v. Function test HCR valve.
- vi. Record all of the above in International Association Drilling Contractors (IADC) log book and well ledger.

c. Every 7 days (1 week) actuate the following:

- i. Annular preventer.
- ii. All gate valves in the choke and kill system.
- iii. Inside BOP.
- iv. Record all of the above in IADC log book and well ledger.

- Crew Training and Drills

BOP Practice drills and training sessions will be conducted at least once a week for each crew. These drills will be performed with everyone on site, to provide training for each member to ensure:

- a. A clear understanding of the purpose and method of operation of each preventer, and all associated equipment.
 - b. The ability to recognize the warning signs that accompany a kick.
 - c. The crew shall be aware this is a shallow hole that reduces volume in the annulus and requires increased attention.
 - d. A clear understanding of each crew member station and duties, in the event of a kick while drilling, tripping, or out of the hole.
 - e. A clear understanding of the maximum allowable casing pressure (MACP), and the significance of the pressure for well conditions that exist at the time of the drill or training session.
- BOP Record Requirements
 - a. A record of all inspections and tests must be recorded in IADC log book and well ledger.
 - b. A record of all crew drills and training sessions must be kept in the IADC log book and well ledger.
- BOP Maintenance and Requirements
 - a. All equipment will be maintained in accordance with the manufacturer's recommendations.
 - b. All maintenance records will be kept for the past three years.

WELL HEADS AND PRODUCTION EQUIPMENT

Well heads and all fittings appurtenant thereto will be installed and maintained in good condition so that all necessary pressure tests may be readily made on flowing wells. The well head and related parts and fittings will have a test pressure equivalent to a least 150 percent of the calculated or known pressure in the reservoir from which production is obtained or expected.

Valves will be installed and maintained in good order to permit pressures to be obtained on the production casing and the annulus between the casing strings.

Flow lines will be of adequate pressure rating and capacity and will be sufficiently equipped with expansion bends to prevent leakage or rupture.

All separators, pumps, mufflers manifold, flowlines, and other equipment used for the production of geothermal resources will be of adequate pressure rating and capacity and will be maintained in good condition in order to prevent loss of or damage to human life and health or to property or natural resources.

CATHODIC/ CORROSIVE PROTECTION AND WELLHEAD DESIGN

- The applicant has made decisions to use cathodically protective and structural methods to protect the integrity and longevity of the wellhead, and internal and external surfaces of the casing. (See Figure 8 – Wellhead Design)

a. Wellhead Protection

Cathodic Protection will be installed on all production and injection wells. Cathodic protection will consist of a pre-packaged magnesium anode system made up of anode lead (No. 8 AWG), galvanized steel core inside of a magnesium ingot, surrounded by special enhancing material enclosed in a cloth bag. The anode lead will be connected with wires to the wellhead through a Testing Station (See Wellhead Diagram), and the Testing Station will be used to check the operation of the circuit on an annual basis. The wellhead will be protected from rust and deterioration by applying high temperature paint to all metal surfaces. The cellar will be kept dry by a drain pipe placed on the 6 inch cement floor. Paint will be applied on the surface and conductor casing, then a cement wedge will be cemented in place as shown on the Wellhead Diagram.

b. Internal and External Casing Protection

The geothermal reservoir is anticipated to produce fluids that cause a relatively low amount of corrosion. A sample of the geothermal fluid from the first completed production well will be collected and analyzed, using the Langier Index. This method measures individual components that may contribute to the corrosivity of the geothermal fluid. If it is determined that corrosive properties exist in the first production well, the casing specifications will be modified. The change may include using heat treated and enhanced casing, such as L-80 modified. If corrosive properties exist, the five proposed injection wells will follow the new casing specifications. An ultrasonic thickness gauge will be used to measure the thickness of the casing at the surface and wellhead on an annual basis. Casing integrity and cement bond logs will be run in the well as required by the State Engineer.

MECHANICAL INTEGRITY TESTING (MIT)

Mechanical integrity testing of the casing will be conducted prior to injection. The Division will be notified 48 hours before the date upon which a test for mechanical integrity is to be performed, so a representative may be on site to witness the test.

- MIT Tests
 - a. Internal Test - No leaks from casing or other casing components.
 - b. External Test - No movement of fluids/water behind the casing.
 - c. MIT Tests to demonstrate the internal and external test will be “Casing Integrity Tool” and “Cement Bond” respectively.
 - d. Pressure testing will be conducted before the casing shoe is drilled out.
 - e. Division will be notified a minimum of 48 hours before conducting MIT testing, so a representative may be on site to witness the test.
 - f. Drilling manager will be responsible in maintaining a pressure monitoring system. The system will record tests in real time and Division will be sent annotated graphics of the test.

- MIT Procedure
 - a. Casing Test Pressure – Test 4 hours up to 600 psi, or maximum authorized injection pressure.
 - b. A successful test is one in which pressure stabilizes within 10% of the required test pressure, and remains so for a minimum of 4 hours minutes.

- MIT Report
 - a. Within 30 days after completion of testing, a Summary Report will be compiled and submitted to Division with the following information:
 - i. Conditions of injection well(s) prior to test (e.g. static, injecting at ### gpm, etc)
 - ii. Conditions of well(s) during test(s), such as, but not limited to: operating conditions of the well; water level; changes in status/conditions of the well during test; anomalies witnessed prior to, or during test; gauge calibration; and conditions for any gauges used, etc.
 - iii. A static temperature, pressure, spinner log will be submitted.

NOTIFICATION OF FIRE BREAKS, LEAKS, SPILLS AND BLOWOUTS

The Division will be notified of any fire, break, leak, spill or blowout occurring at any geothermal drilling, producing, transporting, treating, disposal or utilization facility in the state of New Mexico by the person operating or controlling such facility.

Notification to the Division of such fire, break, leak, spill or blowout will be in accordance with the provisions set forth below:

Well Blowouts. Notification of well blowouts and/or fires will be "immediate notification" described below.

"Major" breaks, spills or leaks. Notification of breaks, spills, or leaks of wellheads, pipelines, or tanks, or drilling pits, slush pits or storage pits or ponds; the result of which 50 barrels or more of liquids containing hydrocarbons or hydrocarbon waters, salt water, strong caustics or strong acids or other deleterious substances reach a water course or enter a stream or lake, or in which noxious gases escape or any quantity of fluids are lost which may with reasonable probability endanger human health or result in substantial damage to property, shall be "immediate notification" described below.

"Minor" breaks, spills or leaks. Notification of breaks, spills or leaks of wellheads, pipelines, or tanks, or drilling pits, slush pits or storage pits or ponds; the result of which 25 barrels or more but less than 50 barrels of liquids containing hydrocarbons or hydrocarbon wastes, salt water, strong caustics or strong acids or other deleterious substances are lost or in which noxious gases escape, but in which there is no danger of human health nor of substantial damage to property will be "subsequent notice" described below.

Fires: Notification of fires at geothermal installations in which there is reasonable probability of danger to human health or substantial damage to adjoining properties or substantial loss of geothermal resources will be "immediate notice" describe below. Notification of fires of lesser magnitude but \$500.00 or more of property damage or \$500.00 or more geothermal resources loss will be "subsequent notice" described below.

"Immediate Notification" will be as soon as possible after discovery and will be in person or by telephone to the Santa Fe office of the nearest district office of the Division if the incident occurs during business hours. If the incident occurs after business hours, notification will be in accordance with the latest Division memorandum on the subject. A complete written report of the incident will be submitted to the Santa Fe office of the Division within ten days after discovery of the incident.

Immediate Notification Report. Any reports of fires, breaks, spills, leaks or blowouts, whether verbal or written, will identify the location of the incident by quarter-quarter, section, township and range, and by distance and direction from the nearest town or prominent landmark so that the exact site of the incident can be readily located on the ground. The report will specify the nature and quantity of the loss and also the general

condition prevailing in the area; including precipitation, temperature and soil conditions. The report shall also detail the measures that have been taken and are being taken to remedy the situation reported.

LOGGING, CORING AND TESTING PROGRAM

- The operator of the well will keep a careful and accurate log, core record, and history of the drilling of the wells. These records will be kept in the nearest office of the applicant or the well site, and will be subject to inspection by the Division during business hours with all other reports of the owner, regarding the well. All records, unless otherwise specified, will be filed with the Division within 90 days after completion of the well.
- The operator will prepare a well history that details, in chronological order, all daily significant operations carried out and equipment used during all phases of drilling, testing, completion, and abandonment of any well.
- The operator will prepare a well summary report that will accompany the core record and well history reports. It will be designed to show data pertinent to the condition of a well at the time of completion of work.
- Electric logs and direction surveys will be filed upon re-completion of any well.
- All production from completed geothermal resource will be accounted for by continuous metering or by other methods approved by the Division.
- The operator will make and keep appropriate books and records for a period of not less than five years, covering their geothermal resources in the state.
- The operator will keep a careful and accurate well log and history of the drilling of any well, including the lithologic characteristics and depth of formations encountered, and the depths, pressures, and temperatures of water-bearing and steam-bearing strata. These data, as well as such other tests, surveys and logs which may be taken on the well including the temperatures, chemical compositions and physical characteristics of fluids encountered in the well, deviation, directional and temperature surveys, logs (including electrical logs, physical logs and core logs), and tests (including potential tests), will be placed in the custody of the designated agent of the operator of the well and will remain in their custody within the state of New Mexico until all required forms and attachments pertaining to the well have been filed with the Division. The operator understands the data may be subject to inspection, during normal business hours, by the Division or its representatives, and by the state engineer or his representatives.
- After placing the geothermal wells in production, the operator will file a production report by the 20th day of each month to the Division office in Santa Fe.
- The operator will file a duplicate monthly purchaser's report, which report will be delivered to the Santa Fe office of the Division by the 15th day of each month and will show the purchase made from all leases and wells connected to the purchaser's facilities during the preceding calendar month.
- After placing the injection well in a geothermal resources field, the operator will file a duplicate monthly injection report, which report will be due in the Santa Fe office of the Division by the 20th day of each month and shall show the zone or formation into which

injection is being made, the volume injected, the average temperature of the injected fluid and the average injection pressure at the well head.

- Annual temperature and pressure tests will be submitted by the operator of each geothermal resource producing well in accordance with the annual testing schedule published by the Division. Flowing temperatures and flowing pressure tests at the wellhead will be recorded after at least 72 hours of continuous flow at normal producing rates. The well will be shut in for 24 hours and shut-in pressure at the wellhead recorded. Results of these tests will be submitted in duplicate to the Santa Fe office of the Division.
- All forms and reports required will be filed with the New Mexico Oil Conservation Division, Geothermal Section , Post Office Box 2088, Santa Fe, New Mexico. 87501.

On site Burial?
Liner mit thick 20 mit UDFE
and fill disposal prepared by
approval of Director

METHODS OF DISPOSAL OF WASTE MATERIALS

- The issuance of geothermal leases or permits will not have a direct impact on the generation of solid wastes, but could indirectly result in solid wastes being generated from subsequent geothermal resource development activities.
- Small quantities of solid wastes will be generated during all phases of the geothermal development. During geothermal well development, solid wastes, in the form of paper products and some garbage, will be collected and stored in a roll-off bin brought to the site by a waste contractor. These wastes will then be removed to an offsite disposal facility at the end of drilling operations, or as needed. The relatively small volume of solid wastes generated during geothermal drilling activities would not be expected to result in a substantive increase to the existing solid waste generated by the local communities.
- Drilling mud is circulated into the hole during drilling to lift cuttings to the surface and to cool the drill bit. The rock cuttings, and portion of drilling mud which cannot be re-circulated, are discharged into and temporarily stored in an earthen pit on the drill site. The pit contents are typically allowed to dry, and sampled and analyzed at the end of operations. These wastes are typically inert, and are usually buried in the sump on the site if testing demonstrates that they are non-hazardous. *Close out Loop Systems*
- Sanitary wastes are contained in portable toilets that are maintained during onsite activities, and removed from the site at the end of operations by a waste contractor.
- The Proposed Action area is undeveloped, and no hazardous materials are suspected to be present within, or adjacent to the Proposed Action area. There is no evidence to indicate that any hazardous material was stored on, disposed of, or released within, or adjacent to the proposed Action area. As such, the issuance of the geothermal permits will not result in any direct, hazardous, waste-related impacts. However, the issuance of geothermal permits could indirectly result in impacts from subsequent geothermal resource development activities.
- During geothermal exploration activities, hazardous substances that may be used on site could include bulk quantities of diesel fuel, lesser amounts of oil, and other lubricants. No hazardous drilling mud additives are typically used during the drilling of geothermal wells.
- For all geothermal operations, unintended leaks, small spills, or releases of petroleum hydrocarbon, or other materials stored on geothermal operations sites could occur. Significant spills are rare, and almost all spills or releases are restricted to the immediate area of the source of the spill. Subsequent approval of geothermal development operations typically requires onsite containment in areas where petroleum hydrocarbons and hazardous materials are stored.
- If a petroleum spill or release occurs, it will be abated in a timely manner. All reporting, clean up, and disposal will follow state and federal regulations.

- The disposal of highly mineralized waters produced from geothermal resource wells will be in such a manner as to not constitute a hazard to surface waters or underground supplies of useable water.

ABANDONMENT AND PLUGGING

- If it becomes necessary to abandon and seal a well, the following objective will be taken into consideration to block inter-zonal migration of fluids so as to:
 - a. Prevent contamination of fresh waters, or other natural resources.
 - b. Prevent damage to geothermal reservoirs.
 - c. Prevent loss of reservoir energy
 - d. Protect life, health, environment and property.

The operator will complete all New Mexico forms relative to the plugging and abandoning.

- Prior to commencement of plugging operations, notice of intention to plug shall be filed with the Division, and approval obtained by the operator of the well. This will be accomplished by filing the necessary Division forms, sundry notices and reports on geothermal wells; which notice will outline the casing and cementing program of the well, the casing which is to be pulled, the size of proposed cement plugs and the depth and other information as may be pertinent.
- For newly drilled wells which are to be plugged, verbal authority and instructions may be given by the Division to plug the well provided written notice to plug will be subsequently filed within 30 days and approval obtained. Written approval of the plugging program will include evidence that the plugging program for the well prevented damage to any producing zone, migration of fluids from one zone to another, the waste or contamination of useable underground waters or other natural resources and the leakage of any substance at the surface; all substantiated by the filing of the geothermal well summary report, with the request for approval of plugging program.
- Before any well is abandoned, it will be plugged in a manner that will permanently confine all fluids in the separate strata originally containing them. This operation will be accomplished by the use of mud-laden fluid, cement and plugs, used singly or in combination, as may be approved by the Division. In addition, an adequate cement plug at the surface will be installed to permanently prevent intrusion of any substance into the well.
- The exact location of abandoned wells will be shown by a steel marker at least four inches in diameter set in concrete and extending at least four feet above mean ground level. The name and number of the well and its location (quarter-quarter, section, township and range) will be welded, stamped or otherwise permanently engraved into the metal of the marker.
- No well will be temporarily abandoned for a period in excess of six months unless a permit for such temporary abandonment has been approved by the Division. Such permit will be for a period not to exceed six months and will be requested from the Santa Fe office of the Division by filing Division forms in duplicate. No such permit will be approved unless evidence is furnished that the condition of the well is such as to prevent damage to any producing zone, migration of fluids from one zone to another, the waste or contamination of useable underground waters or other natural resources and the leakage of any substance at the surface; all as substantiated by the filing of geothermal resources well log, and

geothermal resources well summary report, with the request from a temporary abandonment permit.

- Upon expiration of the permit for temporary abandonment and any extension, the well will be put into beneficial use or will be permanently plugged and abandoned, unless it can be shown to the Division after notice and hearing that good cause exists why the well should not be plugged and abandoned, and a permit for further temporary abandonment will be issued. No such permit for further temporary abandonment will be approved by the Division unless a one-well plugging bond for the well, in an amount satisfactory to the Division but not to exceed \$20,000, is on file with the Division to ensure future plugging of the well.
- Injection wells will be abandoned in the same manner as other wells.

SHOOTING AND CHEMICAL TREATMENT OF WELLS

If injury results to the producing formation, casing or casing seat from shooting or treating a well, the operator thereof shall proceed with diligence to use the appropriate method and means for rectifying such damage. If shooting or chemical treating results in irreparable injury to the well, the Division may require the operator to properly plug and abandon the well.

MAINTENANCE

- All wellheads, separators, pumps, mufflers, manifolds, valves, pipelines and other equipment used for the production of geothermal resources shall be maintained in good condition in order to prevent loss of or damage to life, health, property, and natural resources.
- All surface wellhead equipment, pipelines, and subsurface casing and tubing will be subject to periodic corrosion surveillance in order to safeguard health, life, property, and natural resources.
- The owner understands the Division may require tests or remedial work as it deems necessary for: the prevention of damage to life, health, property, and natural resources; the protection of geothermal reservoirs from damage; or the prevention of infiltration of detrimental substances into underground or surface water suitable for irrigation; or other beneficial uses to the best interest of the neighboring property owners and the public. Tests may include, but are not limited to casing tests, cementing tests and equipment test.

ENVIRONMENTAL

- The owner will conduct exploration and development operations in a manner that provides maximum protection of the environment: rehabilitate disturbed lands, take all necessary precautions to protect the public health and safety, and conduct operations in accordance with the spirit and objectives of all applicable environmental legislation and executive orders.
- Adverse environmental impact from geothermal-related activity will be prevented or mitigated through enforcement of applicable federal, state, and local standards and by the application of existing technology. Inability to meet these environmental standards, or continued violation of environmental standards due to operations of the lessee after notification, may be construed as grounds for the State Engineer to order a suspension of operations.
- The owner proposes the following minimum environmental measures to protect the environment in the proposed action area:
 - a. Prevent or Control Fires:
 - i. During operations and construction of the project, the operator will employ several strategies to prevent fires, and to suppress fires in the unlikely event they should occur.
 - ii. Areas affected by construction, such as the drilling pads will be cleared of all vegetation that can become dry, thereby preventing fire hazards. This clearing will minimize the potential for fires.
 - iii. Project operations and designs will comply with all federal, state and local fire laws and regulations. All reasonable measures to prevent and suppress fires in the area of operations will be employed by the operator.
 - b. Prevent Soil Erosion:
 - i. The lacustrine soils in the Proposed Action area are susceptible to severe wind erosion if disturbed, requiring coordination between engineering, soils and hydrology.
 - ii. All surface soil material (topsoil) will be removed from the entire cut and fill area, and temporarily stockpiled or reused during interim and final reclamation. The stockpiles will be located and protected so that wind and water erosion are minimized and reclamation potential is maximized.
 - iii. Roads will be constructed of granular material sufficient to stabilize soils, with low bearing strength to minimize rutting and water quality impacts.
 - iv. An approved seed/fertilizer mixture to stabilize roadway slopes and waste spoil areas will be used where appropriate.

- v. The following mechanical stabilization methods will be used where highly erodible soils are present: geotechnical materials, jute netting, punched straw or other proven technique.
- vi. In areas of highly erodible soils, window clearing debris will occur when necessary at the base of the fill slopes.
- vii. The cut slopes will be left as steep as possible to minimize the surface area subject to erosion.
- viii. For roads within erodible areas, insloped roads will be used where maintenance can be performed on a regular basis. All other roads should be outsloped.
- ix. For highly erodible soils, inslope and ditch fill sections with culverts in order to prevent water from flowing down the face of fills.
- x. Culvert headwalls, perennial or intermittent stream crossings will be constructed with riprap, soil cement and concrete to prevent erosion in highly erodible soil areas.
- xi. Energy dissipators will be used in areas of water concentration, where significant erosion will result.
- xii. In highly erodible soil areas, the larger and more critical fills should be compacted to 95 % of AASHTO T-99 specification, and fill slopes should be constructed with a 1.5:1. For fills compacted through layer placement along, fill slopes should be constructed with a 1.75:1. No fills will be constructed on side slopes exceeding 55 percent.
- xiii. For areas designed to have compacted fills and slopes exceeding 40%, the natural slope will be terraced to key in the fill.
- xiv. Care will be taken to compact the outer edge of the fill in highly erodible soil areas, using a sheep-foot type roller or other approved techniques.
- xv. In highly erodible soil areas, special attention will be paid to maintaining road drainages including: surface drainage configuration, culverts, and override drains for roads having all levels of maintenance. Cut slopes would not be undercut, and drainage would be kept open, clean, and functioning.
- xvi. For road construction in areas with highly erodible soils, fill (with stabilization), including the ditch, would be performed using aggregate, asphalt concrete, penetration oil treatment or other approved method that will achieve long term stabilization of the road. Stabilization methods would be designed to exceed normal use, so erosion control devices would remain effective well past the extended use. Stabilization would be considered for road segments adjacent to, or crossing sensitive streams, grades exceeding 6% and areas having side slopes in excess of 30 percent.

c. Protect Surface or Ground Water:

- i. Applicant will avoid constructing reserve pits in areas of shallow groundwater.
- ii. Reserve pits will not be constructed in natural water courses.
- iii. Reserve pits will be located on drill pads next to the high wall. If this is not possible, at least 50 percent of the reserve pit will be constructed below original ground level to help prevent failure of the pit dike.
- iv. If it becomes necessary to use a synthetic liner in the reserve pit, the liner will have a permeability of less than 10^{-7} cm/sec. The liner will be installed so as not to leak, and will be composed of materials compatible with all substances to be placed in the pit.
- v. The reserve pits will be designed to contain all anticipated drilling muds, cuttings, fracture fluids, and precipitation while maintaining a minimum of 2 feet of freeboard.
- vi. Storm water runoff from the undisturbed areas around the constructed drill pads would be directed into ditches surrounding the drill pad and back onto undisturbed ground, consistent with the best management practices of storm water.
- vii. The road will be designed in such a manner that surface drainage will provide for the interception, collection and removal of water from the surface of roads and slope areas.
- viii. Drainage dips, ditches, road crowning, culverts, and bridges will be properly located and designed to provide economical and efficient drainage.

d. Protect Fish:

There are no fish in the Project area.

e. Protect Cultural, Visual, and Other Natural Resources:

- i. The applicant will conduct a Cultural Status review, and at the direction of the State Engineers' Office, may require a field survey for the presence of Cultural resources.
- ii. When cultural or paleontological resources, including, but not limited to: historic ruins, prehistoric artifacts, and fossils are discovered in the Project areas, the resources shall be left intact and immediately brought to the attention of the proper authorized officer.
- iii. The applicant will reduce the potential for the short-term visual impacts of the drilling activities by limiting the drill lights to those required to safely conduct the

operations, and screening, shielding, or directing said lights in a manner which focuses direct light to the immediate work area.

- iv. The applicant will conduct a Special Status Species review, and at the direction of the Field Manager for the Utah Trust Land Administration, may require a field survey for the presence of Special Status Species (see Attachment).
- v. The applicant will be responsible for controlling all noxious weeds and other undesirable invading plant species in the disturbed operating and reclaimed area until the revegetation activities have been determined to be successful and accepted by the proper authorized officer.
- vi. The applicant will limit the disturbance and fragmentation to all known sage grouse habitat.
- vii. The applicant will avoid active leas by two miles during strutting season, approximately March 1-May 15; nesting and brood rearing habitat by a half mile during approximately April 1 - August 13; and sage grouse wintering habitat by a half mile while occupied.
- viii. The applicant will inventory the surface disturbing activities for the presence of invasive, nonnative species, and treat if present.
- ix. The operator will avoid surface waters, wetlands, and riparian areas. No activity will occur within 100 feet of surface waters, wetlands, or riparian areas.
- x. Vegetation will not be disturbed within 300 feet of waters designated by the authorized officer, except at approved stream crossings.
- xi. If disturbance causes a water source to become unavailable to wildlife or wild horses, the owner may provide for another water source to be constructed in the general area to provide adequate water for the wildlife or horses.

Is this based on BCD regs?

f. Air Quality and Noise Pollution:

Air Quality

- i. Fugitive dust would be generated from earth-moving activities, and by travel on unpaved roads during drill pad, road construction and drilling activities. The owner would apply water to ground as needed to control the fugitive dust.
- ii. Combustion emissions of criteria air pollutants (nitrogen dioxide [NO₂], sulfur dioxide [SO₂], carbon monoxide [CO], fine particulate matter [PM₁₀], criteria air pollutant precursors (volatile organic compounds [VOCs]), and air toxics (small quantities of diesel PM, acetaldehyde, benzene, and formaldehyde) would be released during drill pad, road construction and drilling activities from the use of diesel engines. The proposed Project is not expected to contribute to any

violation of Federal or New Mexico ambient air quality standards, and no residual air quality impacts are expected.

Noise Pollution

- i. Proposed Project-generated construction and drilling noise (estimated at 80-85 decibels (dBA) at a distance of 50 feet) could also keep some migratory birds away from areas containing such activities (typically areas of new surface disturbance). The proposed Project construction (regardless of season) would result in the direct loss of up to 5 acres of potential migratory bird habitat. Migratory birds would adjust and relocate to abundant similar habitat in the proposed 20 acre Project area and beyond.

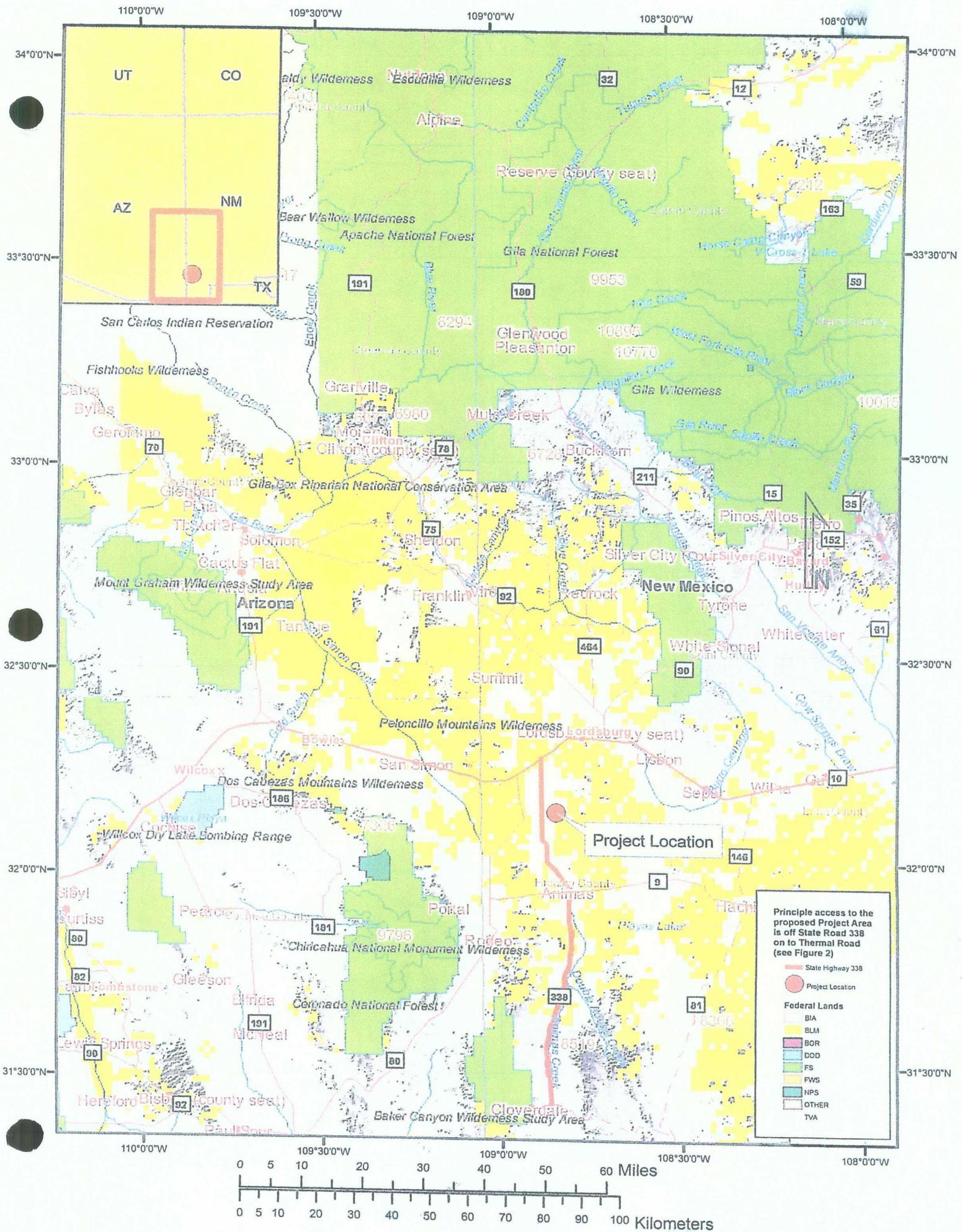
- g. Minimize Hazards to Public Health and Safety During Normal Operations:
 - i. Public health and safety hazards are minimal for this project. The small size, remote location, and lack of hazardous conditions associated with the project are factors minimizing hazards. The air emissions released from flow testing are within levels established by the New Mexico Division of Environmental Protection. All employees will be required to use safety equipment as needed, and will comply with appropriate safety rules and regulations.
 - ii. Equipment will be insulated where personnel protection is required. Ear plugs will be provided in areas where excessive noise is possible.
 - iii. All structures and facilities that may present a hazard or potential harm will be locked and/or fenced. All ponds will be fenced and secured.

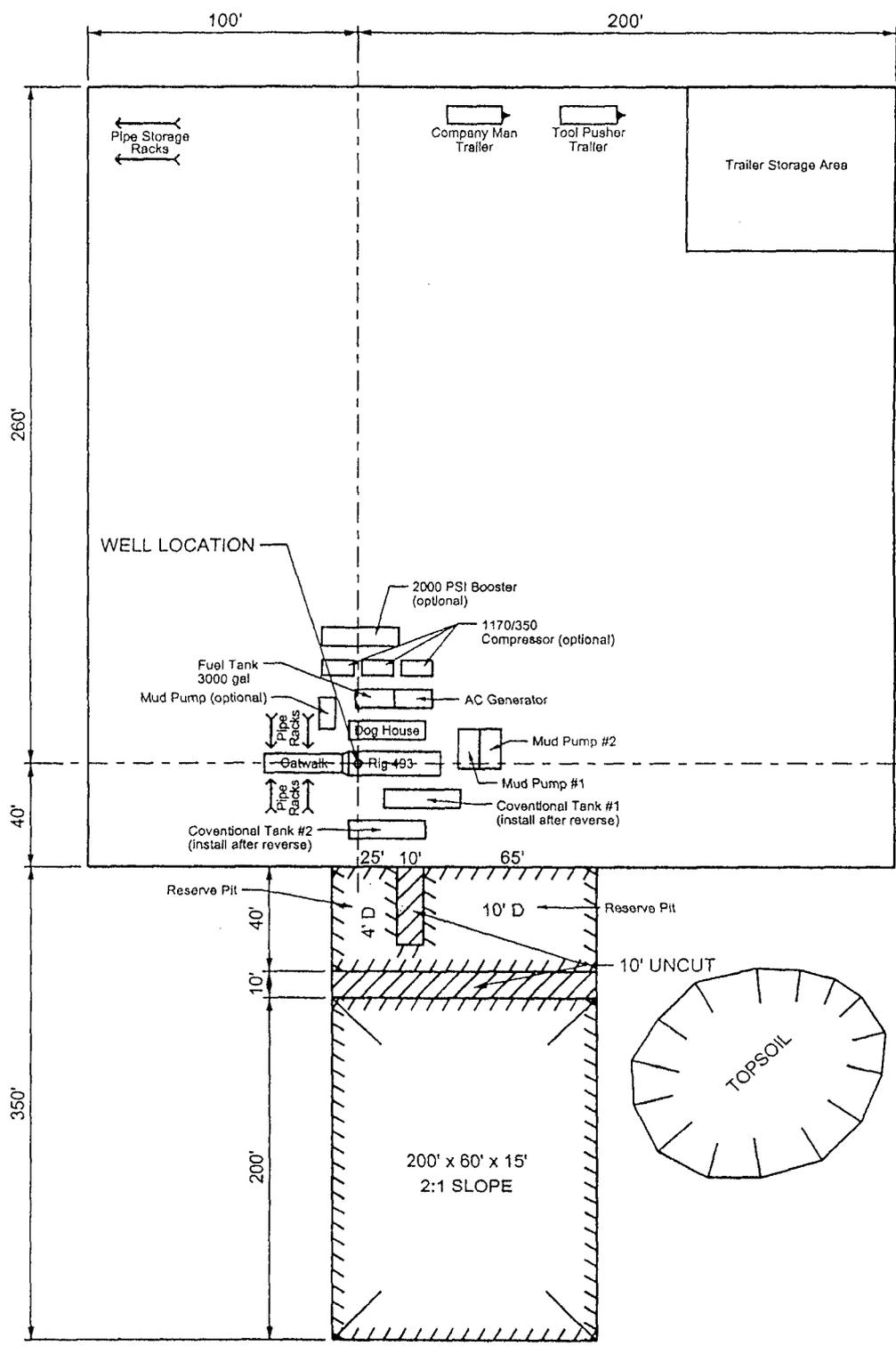
Rule 118 H2S CP ? H2S monitoring ?

Hydrogen Sulfide Monitoring Addressed

- Plan of Operation – Drilling Procedures
- Discharge Plan Application for Brine Extraction Facilities – Section VI, F-4

Injection Well Volume and Temperature – Discharge Plan Application for Brine Extraction Facilities – Section VI, F-4



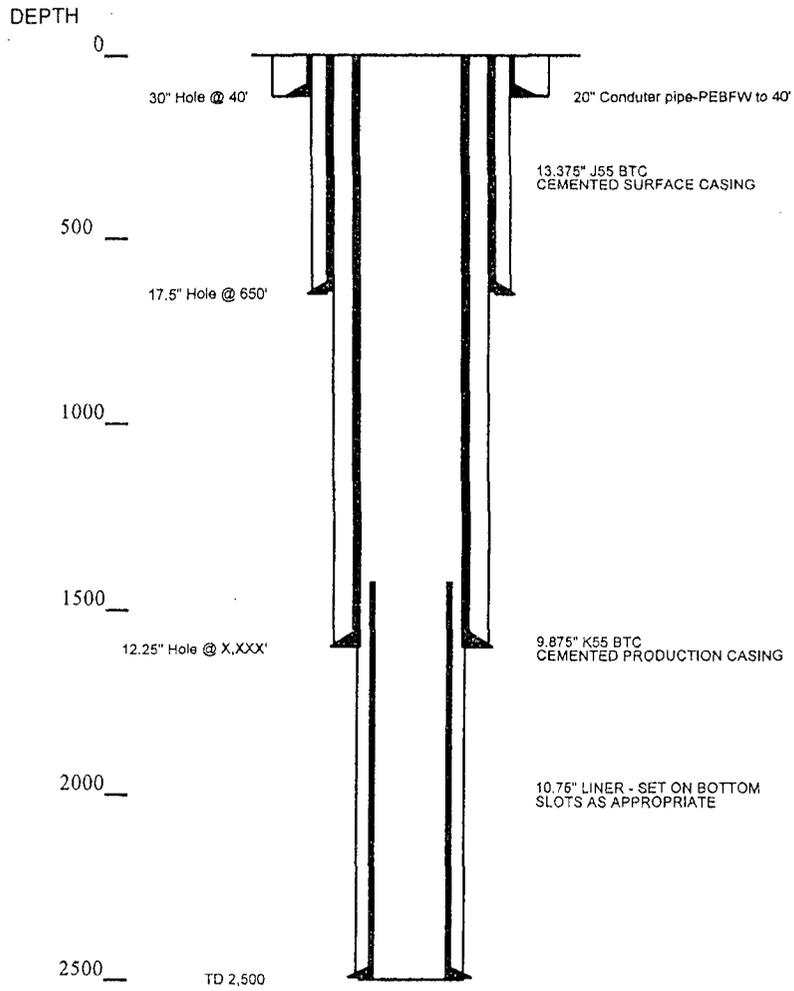


LIGHTNING DOCK GEOTHERMAL No. 1
 Los Lobos Renewable Power LLC
 5152 North Edgewood Drive
 Provo, Ut 84604

Figure 1
 Typical Geothermal Well Drill Site Layout

Please use Obied-Loop Systems

Diagram does not concur w/ C-1013



Geothermal Injection Well Completion Profile

LIGHTNING DOCK GEOTHERMAL No. 1
Los Lobos Renewable Power LLC
5152 North Edgemont Drive
Provo, Utah 84804

Figure 4
Geothermal Well Completion Profile

LEVA

FIGURE # 5 BJ Services Pacific Region Laboratory Report

Report #: CMT022207A
Date: April 30, 2007

Client/Well Information:

Company:	Western Renewable Power	Prepared for:	Richard Austin
Well:	Big Smokey Valley	Submitted by:	Scott Myers
District:	Bakersfield	Job Type:	Longstring
Depth MD:	1000 ft	TVD:	1000 ft
Hole Size:	17½	BHST:	250°F
Cement:	Class G	Lot #:	61-054-07
		Tested by:	Mike Walley
		Casing Size:	13 3/8"
		BHCT:	°F
		Water:	Fresh

Slurry Design Data:

Class G + 40% Silica Flour + 8#/sk Perfalite + 3% Gel + 0.5% FL-52 + 0.3% CD-32 + 1 ghs FP-6L

Slurry Properties:

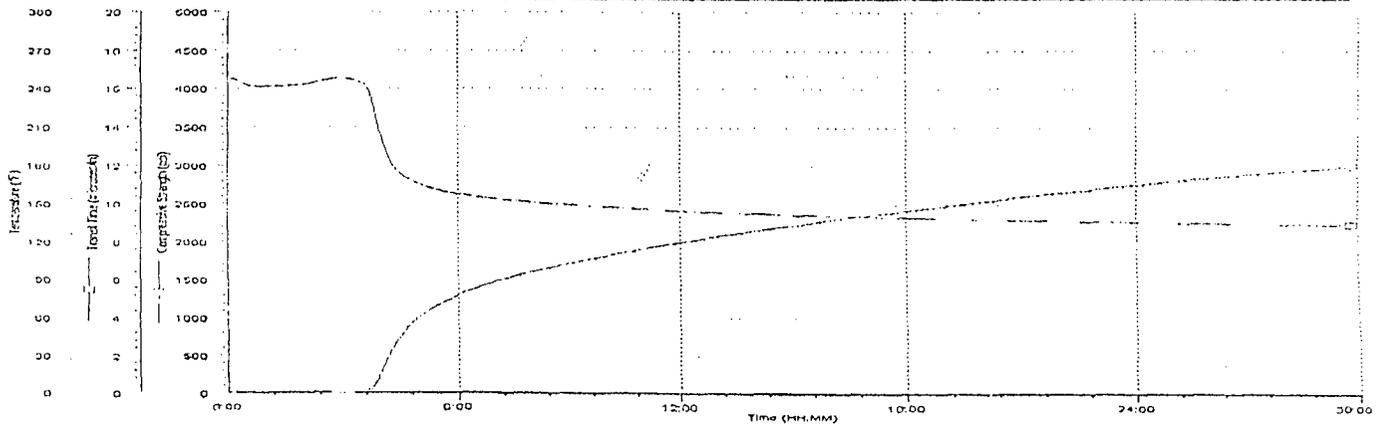
Density:	13.00 ppg	Yield:	2.460 ft ³ /sack	Mix Water:	11.510 gal/sack
Time to 70bc:	: hr:min	Fluid Loss:	cc/30 min		
Time to 100bc:	: hr:min	Free Water:	%		

Rheology:	600 rpm	300 rpm	200 rpm	100 rpm	6 rpm	3 rpm	PV	YP	Cal Strength	
Ambient									10 sec	10 min
°F										

Consistometer Recording of Bearden Consistency:

Compressive Strength Data (UCA):

Temperature	3:42 hrs	4:10 hrs	8 hrs	12 hrs	24 hrs	30 hrs
250°F	50 psi	500 psi	1611 psi	1987 psi	2736 psi	2995 psi



B.J. Walley
 2/27/07
 1/20/07

Notice: This report is presented in good faith based upon present day technology and information provided; but because of variable conditions and other information which must be relied upon, BJ Services makes no warranty, express or implied, as to the accuracy of the data or of any calculations or opinions expressed herein. You agree that BJ Services shall not be liable for any loss or damage, whether due to negligence or otherwise, arising out of or in connection with such data, calculations, or opinions.

FIGURE #6

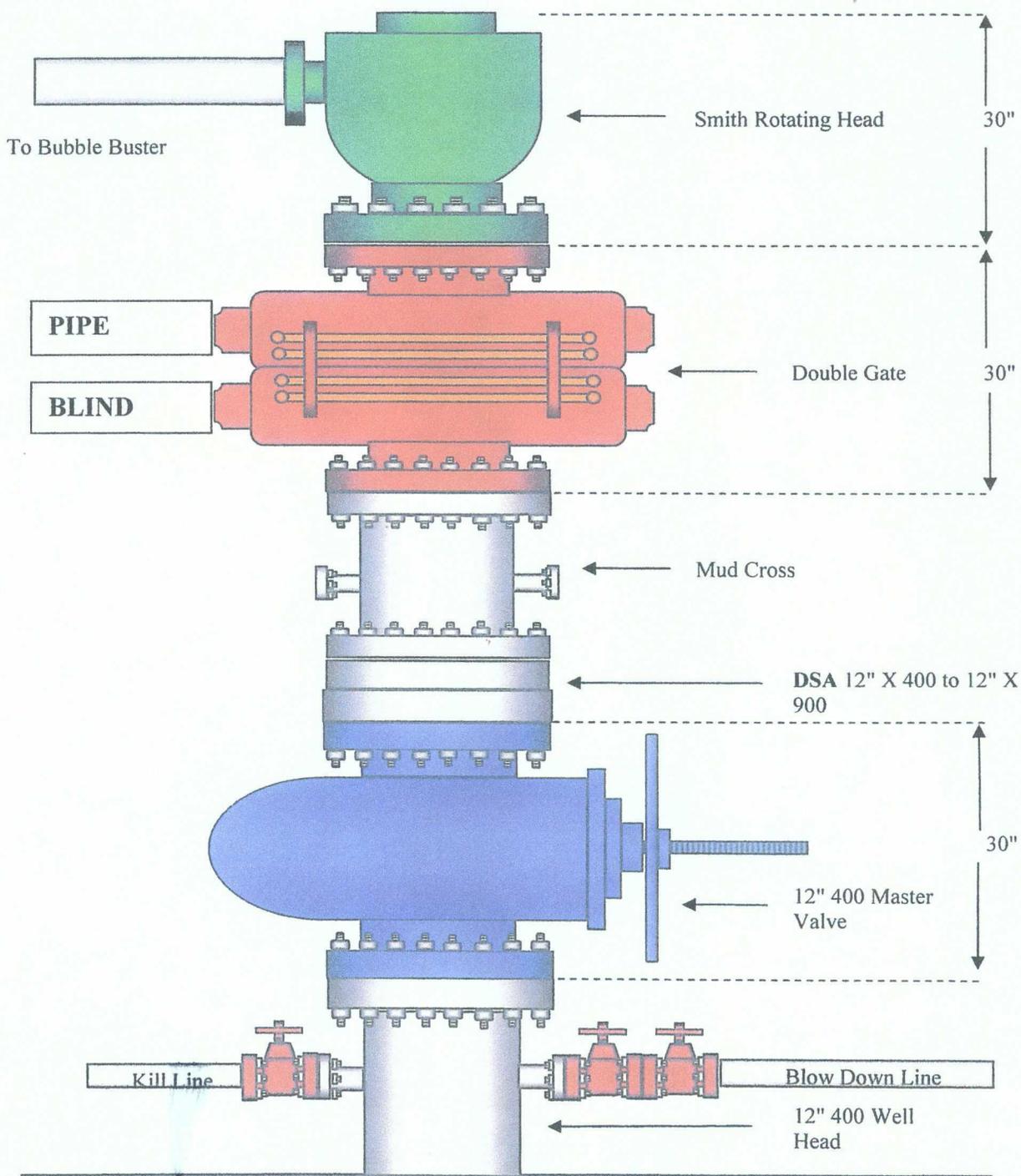
BPOE

LIGHTNING DOCK NO. 1

AIR DRILLING B.O.P.E. STACK

Mud drill?

*Can not air drill.
Closed loop could allow air drill*



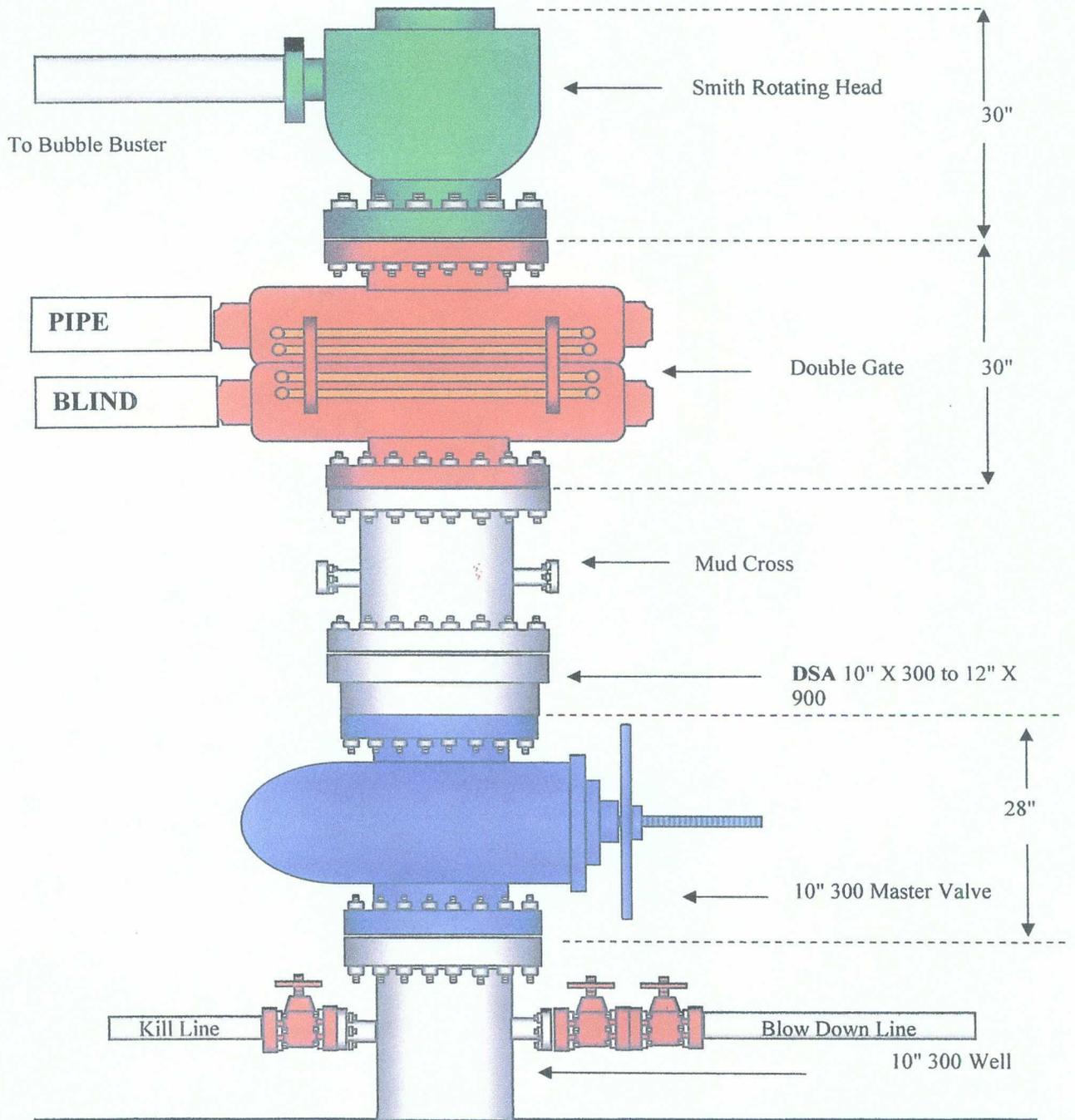
Ground Level

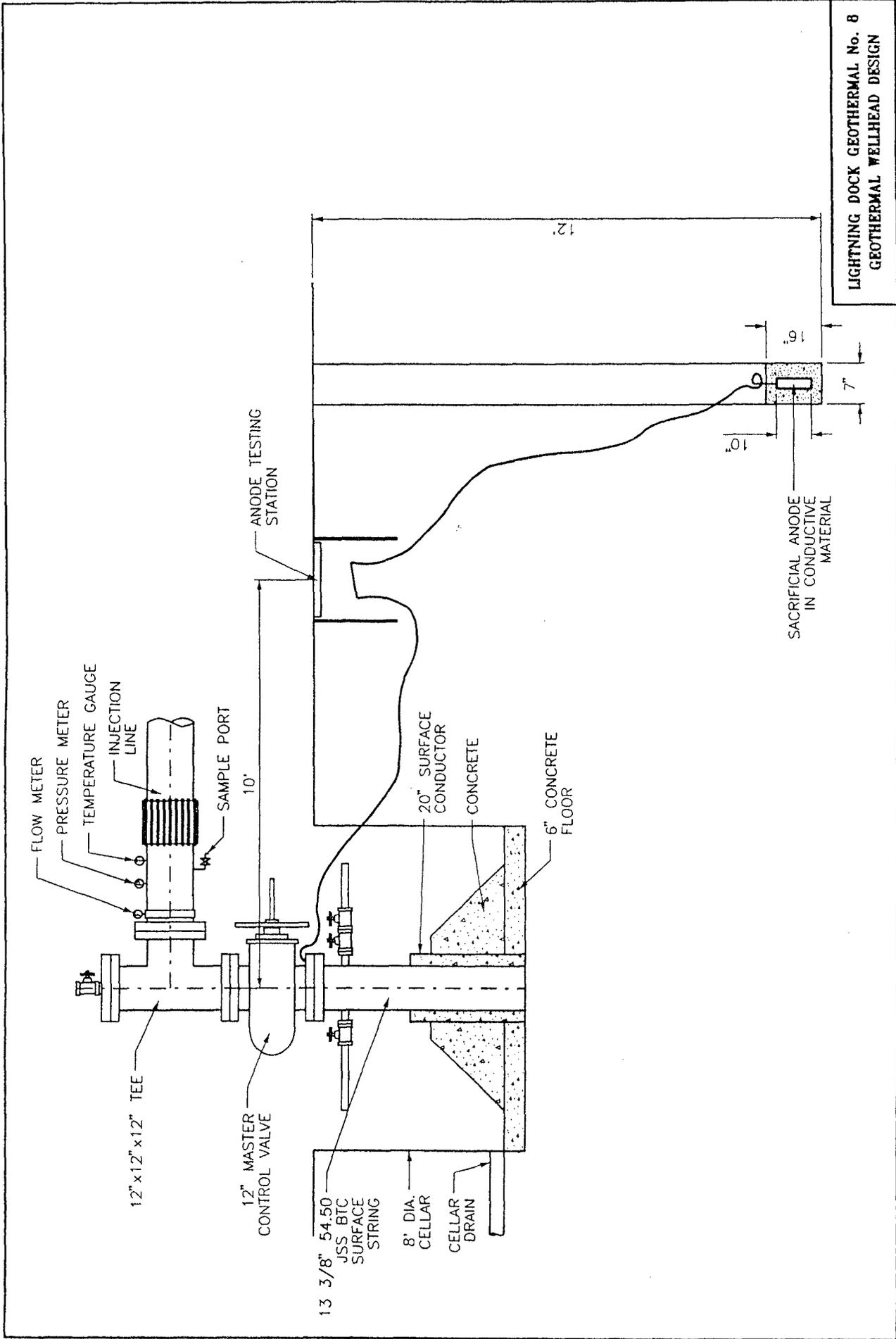
FIGURE # 7

BPOE

LIGHTNING DOCK NO. 1

AIR DRILLING B.O.P.E. STACK

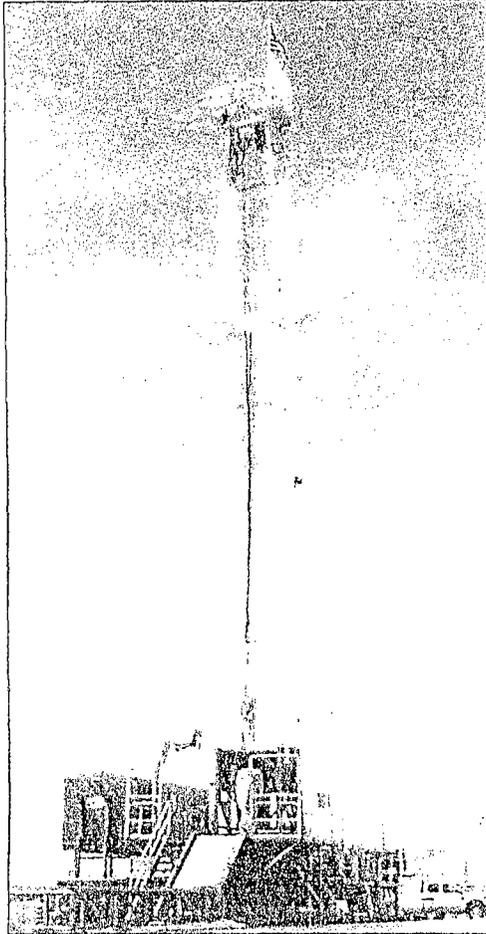






LAYNE-WESTERN, a division of Layne Christensen Company
 17800 East 22nd Avenue, Aurora, Colorado 80011 + Phone: (303) 755-1281 + Fax: (303) 755-1236

Challenger 360-200 Portable Rotary Drill Rig - Rig Number 493

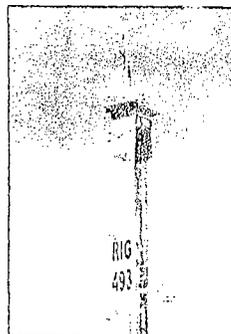
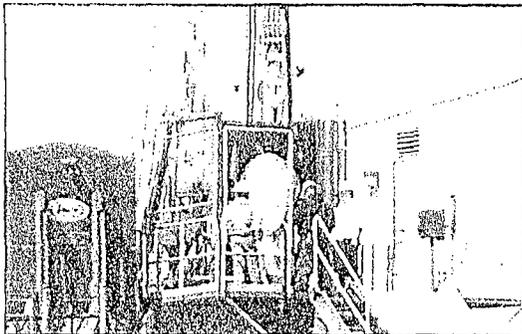


Draw Works - Challenger Model 36:
 Double Stacked Drums
 Hoisting Drum - 10-1/2" X 22-1/2"
 Kelly Drum - 10-1/2" X 22-1/2"
 Clutches - Wichita 24", 3Plate
 Single Line Pull 36,000#
 LeBus Grooving with 7/8" line (1" swaged line)
 PARMAC Hydromatic Twin Disc Water Brake
 Hydraulic Wireline Drum
 8 foot Elevated Drill Floor with
 Howard Turner 18" Rotary Table
 200,000# Floor Capacity with 7.5 Foot Minimum under
 Floor Clearance for BOP Use

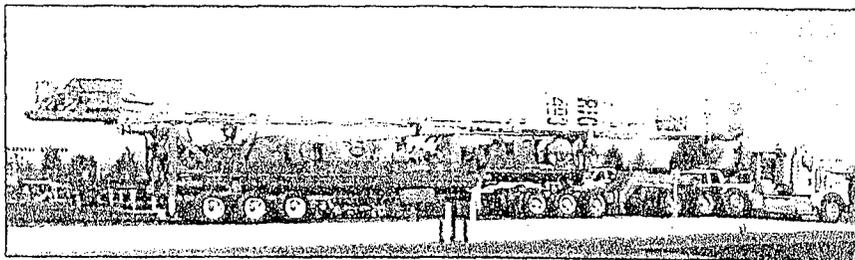
Derrick - Challenger Model 200:
 Top of Crown Height - 96 feet from Ground Level
 Satellite Style Fluorescent Derrick Lighting
 MD/TOTCO Weight Indicators
 Rated Hook Load Capacity - 200,000# on 8 Lines
 Working Line - McKissick 100 Ton,
 4 Sheave Traveling Block
 Drilling Line - McKissick 100 Ton,
 4 Sheave Traveling Block and Hook Combination
 Custom Hydraulic Lift, Roller and Guide System for Derrick Transport

Engine -Caterpillar C15, 540 HP Diesel Engine:
 Enclosed Engine Compartment with
 Silencer Muffler
 200 Gallon Fuel Storage on Rig Deck
 Allison Transmission with Torque Converter

Mounting:
 Triple Axle Trailer with 3-20,000# Axles



Standard Support Equipment:
 Hex Kelly and High Pressure Swivel
 800 Gallon Diesel Fuel Storage and
 Electric Fueling Pump
 Geograph Double Pen Recorder
 (Drilling Rate and Weight on Bit)
 3 or 6 Degree Deviation Survey Tool
 Halliburton Survey Tool Wire Line
 Hydraulically Raised Elevated Self
 Contained Dog House
 80 kW Quiet Site CAT Generator
 250 Amp DC Welder
 Bear Automatic Driller
 Explosion Proof Electrical Connections
 15 HP Mission 2 X 3 Mixing Pump
 Caterpillar 4 X 4 Backhoe
 Site Dedicated Winch Truck
 Rig Smart Data System



Additional Support Equipment

Available:
 Triplex Pumps, Duplex Pumps;
 Air Compressors, High Pressure
 Booster Compressors;
 Hydraulic Power Tongs;
 Shale Shakers; Desanding and Desilting Equipment; Portable Circulation and Mixing Tanks

From: M. Austin (red_willow@mindspring.com)
To: hamiltonenviro@yahoo.com
Date: Saturday, January 5, 2008 8:45:22 PM
Subject: NM Rare Species List

Dear Jay,

Attached is a list of rare species with element occurrence records reported for Hidalgo County, NM.

New Mexico has just under 600 rare plants and animals that are tracked by their Natural Heritage Program, with about 125 known for Hidalgo County. Some species, such as Ferruginous Hawk have been observed during our surveys in the general region, but do not appear on the Natural Heritage Program list for Hidalgo County. Same for a number of other rare species we have detected in the region.

This is largely because many of the more isolated parts of the west have not been adequately surveyed, so the potential for a variety of rare as well as common species exists even if no records have been reported to date.

Let me know if you need more detailed information, as I can research the potential habitats for one or more of the species on the list if desired- otherwise, the sensitive birds we have seen to date appear on our NM survey sheets, which I believe I have already sent to you, but can resend if needed.

We may need to talk to NM BLM to see if they have species for which special treatment in relation to power development is desired, other than for species generally avoided elsewhere in the west during critical periods such as Sage Grouse or Ferruginous Hawk.

Regardless, I hope this information is useful-

Miriam

Miriam L. Austin, PhD
Executive Director

Red Willow Research Inc.
780 Falls Avenue #390
Twin Falls, ID 83301-3316

208-316-2488 (field cell)
208-732-5933 (office/message)

From a search on: NM Heritage Program On-line data

Limit to taxa = True

County = Hidalgo

Number of Records Found: 125

County:

Tax Class	Family	Common Name	Scientific Name	Federal Status	State Status	GRank	SRank	Tracked	EOs
			<u>Eriogonum atrorubens</u> <u>var. atrorubens</u>		D	G3?T2?	S1	Yes	1
			<u>Castilleja laxa</u>		D	G3G4Q	S3?	Yes	1
			<u>Castilleja ornata</u>		D	G1	S1	Yes	4
			<u>Marsilea ancylopoda</u>		D	G5	SNR	Yes	1
			<u>Escobaria orcuttii</u> <u>var.</u> <u>macraxina</u>		E	G3?T2Q	S2	Yes	2
			<u>Sclerocactus intertextus</u>		D	G4G5	S3S4	Yes	2
			<u>Hymenoxys ambigens</u> <u>var. neomexicana</u>		S	G3?T2?	S2?	Yes	4
			<u>Escobaria orcuttii</u>		R	G3?	S3	Yes	6
			<u>Oxalis albicans</u> <u>ssp.</u> <u>pilosa</u>		D	G5T4T5	S2?	Yes	1
		A Milk-vetch	<u>Astragalus cobrensis</u> <u>var. maguirei</u>		S	G4T2	S2	Yes	1
		A Milk-vetch	<u>Astragalus vaccarum</u>		D	G4	S1	Yes	1
		Arizona Blue-curly	<u>Trichostema arizonicum</u>		D	G4	S3?	Yes	7
		Arizona Limestone Rosewood	<u>Vauquelinia californica</u> <u>ssp. pauciflora</u>		D	G4T3	S2	Yes	1

Tax Class	Family	Common Name	Scientific Name	Federal Status	State Status	GRank	SRank	Tracked EOs
		Arizona Swallow-wort	<u>Cynanchum arizonicum</u>		R	G3G4	S2?	Yes 1
		Bellflower Beardtongue	<u>Penstemon campanulatus</u>		D	GHQ	SH	Yes 1
		Bent-flowered Gilia	<u>Ipomopsis pinnata</u>		R	G3G4	S1	Yes 3
		Big-root Nettle-spurge	<u>Jatropha macrorhiza</u>			G5?	S2?	Yes 1
		Chihuahua Scurf Pea	<u>Pediometum pentaphyllum</u>		R	G1	S1	Yes 8
		Chiricahua Mountain Alum-root	<u>Heuchera glomerulata</u>			G3	S1	Yes 1
		Chiricahua Mountain Coyote-thistle	<u>Eryngium lemmonii</u>		D	G4	S3	Yes 2
		Chiricahua Mudwort	<u>Limosella pubiflora</u>		R	GUGHQ	SH	Yes 9
		Cliff Brittlebush	<u>Apacheria chiricahuensis</u>		S	G2	S2	Yes 1
		Cochise Sedge	<u>Carex ultra</u>		R	G3?	S3?	Yes 1
		Cochise Woodsia	<u>Woodsia cochisensis</u>		R	G3?	S1?	Yes 2
		Crested Coralroot	<u>Hexalectris spicata</u>		E	G5	S2	Yes 1
		Desert Night-blooming Cereus	<u>Peniocereus greggii var. greggii</u>		E	G3G4T2	S1	Yes 6
		Eared Phanerophlebia	<u>Phanerophlebia auriculata</u>		R	G4	S2	Yes 1
		Griffith's Saltbush	<u>Atriplex griffithsii</u>		S	G2G3	S2	Yes 6
		Huachuca Mountain Indian-paintbrush	<u>Castilleja patriotica</u>		D	G4	S3?	Yes 3

Tax Class	Family	Common Name	Scientific Name	Federal Status	State Status	GRank	SRank	Tracked	EOs
		Huachuca Rocktrumpet	<i>Macrosiphonia brachysiphon</i>		D	G3G4	S3?	Yes	1
		Leafy Lobelia	<i>Lobelia fenestratis</i>		D	G4	S3?	Yes	1
		Lemmon's Beggar-ticks	<i>Bidens lemmonii</i>		D	G4?	S2?	Yes	1
		Lemmon's Rock-daisy	<i>Perityle lemmonii</i>		D	G4	S2	Yes	4
		Macomb's Standing-cypress	<i>Ipomopsis macombii</i>		D	G3G4	S3?	Yes	3
		Mexican Star	<i>Milla biflora</i>		D	G5	S3?	Yes	4
		Organ Mountain Foxtail-cactus	<i>Escobaria organensis</i>	E		G2	S2	Yes	2
		Parish's Alkali Grass	<i>Puccinellia parishii</i>	E		G2	S1	Yes	1
		Pinos Altos Mountains Flameflower	<i>Talinum humile</i>		D	G2	S2	Yes	1
		San Carlos Wild Buckwheat	<i>Eriogonum capillare</i>		S	G4	S1	Yes	1
		Santa Fe Milk-vetch	<i>Astragalus feensis</i>		S	G3	S3	Yes	1
		Scheer's Pincushion Cactus	<i>Coryphantha scheeri</i> var. <i>scheeri</i>	E		G4T3?	S2?	Yes	1
		Scheer's Pincushion Cactus	<i>Coryphantha scheeri</i> var. <i>valida</i>		D	G4T4	S3	Yes	2
		Small Ballmoss	<i>Tillandsia recurvata</i>		D	G5	S1	Yes	1
		Sonoran Brickell-bush	<i>Brickellia simplex</i>		R	G3?	S3?	Yes	3
		Superb Beardtongue	<i>Penstemon superbus</i>		S	G3?	S2	Yes	3

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		Wilcox Fishhook Cactus	<u>Mammillaria wrightii</u> <u>var. wilcoxii</u>		E	G4T4	S2	Yes	7
		Wootton's Beggar-ticks	<u>Brickellia lemmonii</u> <u>woottonii</u>		R	G4?T3Q	S3	Yes	1
Actinopterygii	Catostomidae	Desert Sucker	<u>Catostomus clarki</u>			G3G4	S2	Yes	8
Actinopterygii	Catostomidae	Sonora Sucker	<u>Catostomus insignis</u>			G3	S2	Yes	10
Actinopterygii	Characidae	Mexican Tetra	<u>Astyanax mexicanus</u>		T	G5	S2	Yes	4
Actinopterygii	Cyprinidae	Longfin Dace	<u>Rhinichthys chrysogaster</u>			G4	SNA	Yes	9
Actinopterygii	Cyprinidae	Roundtail Chub	<u>Gila robusta</u>		E	G3	S2	Yes	1
Actinopterygii	Cyprinidae	Spikedace	<u>Meda fulgida</u>	LT	E	G2	S1	Yes	5
Actinopterygii	Ictaluridae	Channel Catfish	<u>Ictalurus punctatus</u>			G5	S5	Yes	10
Actinopterygii	Ictaluridae	Flathead Catfish	<u>Pylodictis olivaris</u>			G5	S2	Yes	8
Actinopterygii	Lepisosteidae	Longnose Gar	<u>Lepisosteus osseus</u>			G5	S2	Yes	1
Amphibia	Bufo	Colorado River Toad	<u>Bufo abvarius</u>		T	G5	S2	Yes	2
Amphibia	Ranidae	Chiricahua Leopard Frog	<u>Rana chiricahuensis</u>	LT		G3	S1	Yes	18
Amphibia	Ranidae	Yavapai Leopard Frog	<u>Rana yavapaiensis</u>		E	G4	S1	Yes	3
Aves	Accipitridae	Common Black-Hawk	<u>Buteogallus anthracinus</u>		T	G4G5	S2B,S3N	Yes	1
Aves	Accipitridae	Northern Goshawk	<u>Accipiter gentilis</u>			G5	S2B,S3N	Yes	2
Aves	Caprimulgidae	Buff-collared Nighthawk	<u>Caprimulgus ridgwayi</u>		E	G5	SNA	Yes	1
Aves	Cardinalidae	Varied Bunting	<u>Passerina versicolor</u>		T	G5	S1B,S1N	Yes	1
Aves	Charadriidae	Mountain Plover	<u>Charadrius montanus</u>			G2	S2B,S4N	Yes	1
Aves	Columbidae	Common Ground-	<u>Columbina passerina</u>		E	G5	S1B,S1N	Yes	2

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Aves	Emberizidae	Dove	<i>Pipilo aberti</i>		T	G3G4	S1B,S1N	Yes	1
Aves	Emberizidae	Arizona Grasshopper Sparrow	<i>Ammodramus savannarum ammoregus</i>		E	G5TU	S1B,S1N	Yes	12
Aves	Emberizidae	Baird's Sparrow	<i>Ammodramus bairdii</i>		T	G4	S1N	Yes	5
Aves	Emberizidae	Botteri's Sparrow	<i>Aimophila botterii</i>			G4	S1B,S1N	Yes	20
Aves	Emberizidae	Yellow-eyed Junco	<i>Junco phaeonotus</i>		T	G5	S2B,S2N	Yes	7
Aves	Falconidae	Northern Aplomado Falcon	<i>Falco femoralis septentrionalis</i>	LE	E	G4T2	S1B,S1N	Yes	8
Aves	Paridae	Mexican Chickadee	<i>Poecile sclateri</i>			G5	S2B,S2N	Yes	11
Aves	Picidae	Gila Woodpecker	<i>Melanerpes uropygialis</i>		T	G5	S2B,S2N	Yes	5
Aves	Strigidae	Mexican Spotted Owl	<i>Strix occidentalis lucida</i>	LT		G3T3	S2B,S2N	Yes	5
Aves	Strigidae	Western Burrowing Owl	<i>Athene cucularia hypugaea</i>			G4T4	S3B,S3N	Yes	1
Aves	Strigidae	Whiskered Screech-Owl	<i>Megascops trichopsis</i>		T	G5	S1B,S1N	Yes	1
Aves	Trochilidae	Broad-billed Hummingbird	<i>Cynanthus latirostris</i>		T	G4	S1B,S1N	Yes	2
Aves	Trochilidae	Costa's Hummingbird	<i>Calypte costae</i>		T	G5	S1B,S1N	Yes	3
Aves	Trochilidae	Violet-crowned Hummingbird	<i>Amazilia violiceps</i>		T	G5	S1B,S1N	Yes	1
Aves	Trochilidae	White-eared Hummingbird	<i>Hylocharis leucotis</i>		T	G5	SNA	Yes	2
Aves	Trogonidae	Elegant Trogon	<i>Trogon elegans</i>		E	G5	S1B,S1N	Yes	5
Aves	Tyrannidae	Northern Beardless-	<i>Camplostoma imberbe</i>		E	G5	S1B,S1N	Yes	1

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		Tyrannulet							
Aves	Tyrannidae	Southwestern Willow Flycatcher	<u>Empidonax traillii</u> <u>eximus</u>	LE	E	G5T1T2	S1B,S1N	Yes	1
Aves	Tyrannidae	Thick-billed Kingbird	<u>Tyrannus crassirostris</u>		E	G5	S1B,S1N	Yes	3
Aves	Vireonidae	Bell's Vireo	<u>Vireo bellii</u>		T	G5	S2B,S3N	Yes	3
Aves	Vireonidae	Gray Vireo	<u>Vireo vicinior</u>		T	G4	S4B,S3N	Yes	2
Gastropoda	Helminthoglyptidae	Animas Talussnail	<u>Sonorella animasensis</u>			G1	S1	Yes	8
Gastropoda	Oreohelicidae	Fringed Mountainsnail	<u>Radiocentrum ferrissi</u>			G1	S1	Yes	1
Gastropoda	Oreohelicidae	Hacheta Mountainsnail	<u>Radiocentrum hachetanum</u>			G1	S1	Yes	4
Gastropoda	Polygyridae	Animas Peak Woodlandsnail	<u>Ashmunella animasensis</u>			G1	S1	Yes	6
Gastropoda	Polygyridae	Big Hatchet Woodlandsnail	<u>Ashmunella mearnsii</u>			G1	S1	Yes	3
Gastropoda	Polygyridae	Hacheta Grande Woodlandsnail	<u>Ashmunella hebardei</u>		T	G1	S1	Yes	3
Gastropoda	Pupillidae	Apache Snaggletooth	<u>Gastrocopta cochisensis</u>			G3G4	S1	Yes	3
Gastropoda	Pupillidae	Heart Vertigo	<u>Vertigo hinkleyi</u>			G3	S1	Yes	2
Gastropoda	Pupillidae	Shortneck Snaggletooth	<u>Gastrocopta dalliana</u> <u>dalliana</u>		T	G4T1	S1?	Yes	4
Gastropoda	Urocoptidae	Cross Holospira	<u>Holospira crossi</u>			G2	S1	Yes	4
Mammalia	Bovidae	Desert Bighorn Sheep	<u>Ovis canadensis</u> <u>mexicana</u>		E	G4T3T4Q	S1	Yes	1
Mammalia	Canidae	Mexican Wolf	<u>Canis lupus baileyi</u>		E	G4T1	S1	Yes	25
Mammalia	Felidae	Jaguar	<u>Panthera onca</u>	LE		G3	S1	Yes	1

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Mammalia	Heteromyidae	Bailey's Pocket Mouse	<u>Chaetodipus baileyi</u>			G5	S3	Yes	4
Mammalia	Leporidae	White-sided Jackrabbit	<u>Lepus callotis gaillardi</u>		T	G3T3	S1	Yes	2
Mammalia	Mephitidae	Hooded Skunk	<u>Mephitis macroura</u>			G5	S2	Yes	3
Mammalia	Molossidae	Big Free-tailed Bat	<u>Nyctinomops macrotis</u>			G5	S3	Yes	2
Mammalia	Molossidae	Pocketed Free-tailed Bat	<u>Nyctinomops femorosaccus</u>			G4	SA	Yes	1
Mammalia	Muridae	Arizona Cotton Rat	<u>Sigmodon arizonae</u>			G5	S1	Yes	1
Mammalia	Muridae	Fulvous Harvest Mouse	<u>Reithrodontomys fulvescens</u>			G5	S1	Yes	5
Mammalia	Muridae	Northern Pygmy Mouse	<u>Baiomys taylori</u>			G4G5	S2	Yes	16
Mammalia	Muridae	Yellow-nosed Cotton Rat	<u>Sigmodon ochrognathus</u>			G4G5	S2	Yes	10
Mammalia	Phyllostomidae	Lesser Long-nosed Bat	<u>Leptonycteris curasoae verbabuena</u>	LE		G4T3T4	S2	Yes	9
Mammalia	Phyllostomidae	Mexican Long-nosed Bat	<u>Leptonycteris nivalis</u>	LE	E	G3	S1	Yes	1
Mammalia	Phyllostomidae	Mexican Long-tongued Bat	<u>Choeronycteris mexicana</u>			G4	S2	Yes	13
Mammalia	Sciuridae	Harris's Antelope Squirrel	<u>Ammospermophilus harrisi</u>		E	G5	S3	Yes	9
Mammalia	Soricidae	Arizona Shrew	<u>Sorex arizonae</u>		E	G3	S1	Yes	1
Mammalia	Tayassuidae	Collared Peccary	<u>Pecari tajacu</u>			G5	S4	Yes	10
Mammalia	Vespertilionidae	Cave Myotis	<u>Myotis velifer</u>			G5	S4	Yes	1
Mammalia	Vespertilionidae	Western Red Bat	<u>Lasiurus blossevillii</u>			G5	S2	Yes	13
Mammalia	Vespertilionidae	Western Yellow Bat	<u>Lasiurus xanthinus</u>		T	G5	S2	Yes	4

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Reptilia	Colubridae	Yaqui Black-headed Snake	<u>Tantilla vaquita</u>			G4	S1	Yes	1
Reptilia	Elapidae	Arizona Coral Snake	<u>Micruroides euryxanthus</u>			G5	S3	Yes	3
Reptilia	Helodermatidae	Gila Monster	<u>Heloderma suspectum</u>		E	G4	S3	Yes	9
Reptilia	Phrynosomatidae	Slevin's Bunchgrass Lizard	<u>Sceloporus slevini</u>		T	G4	S1	Yes	3
Reptilia	Teiidae	Gray-checked Whiptail	<u>Aspidoscelis dixonii</u>		E	G3G4	S2	Yes	1
Reptilia	Viperidae	Banded Rock Rattlesnake	<u>Crotalus lepidus klauberi</u>			G5T5	S2	Yes	3
Reptilia	Viperidae	Mojave Rattlesnake	<u>Crotalus scutulatus</u>			G5	S3	Yes	1
Reptilia	Viperidae	New Mexico Ridgenose Rattlesnake	<u>Crotalus willardi obscurus</u>	LT	E	G5T1T2	S1	Yes	8