

GEOTHERMAL REGULATIONS-PROGRAMS STAKEHOLDER MEETINGS

2010

Chavez, Carl J, EMNRD

From: Sent: To: Cc: Subject: Chavez, Carl J, EMNRD Thursday, April 24, 2014 8:47 AM 'Peter Gower' Dawson, Scott, EMNRD RE: Geothermal Roadmapping Workshop

Peter:

Good morning. Please click <u>here</u> to view the OCD Geothermal Resource Page (Pages 3 - 4) with other possible geothermal agencies and contacts.

Some New Mexico Geothermal Stakeholder Contacts are:

- 1) New Mexico Energy, Minerals & Natural Resources Department (EMNRD)- Oil Conservation Division (OCD):
 - a. Ms. Jami Bailey (Director) (505) 476-3460 E-mail: Jami.Bailey@state.nm.us
 - b. Mr. Scott Dawson (Deputy Director) (505) 476-3480 E-mail: <u>Scott.Dawson@state.nm.us</u>
 - c. Mr. Carl Chávez (Environmental Engineer) (505) 476-3490 E-mail: CarlJ.Chavez@state.nm.us
- 2) New Mexico EMNRD- Energy Conservation & Management Division (ECMD):
 - a. Mr. Harold Trujillo (505) 476-3372 E-mail: <u>harold.trujillo@state.nm.us</u> (Web: <u>http://www.emnrd.state.nm.us/ECMD/RenewableEnergy/geothermal.html</u>)
- 3) New Mexico Office of the State Engineer (OSE):
 - a. Mr. Mike Johnson (Hydrology Bureau Chief) 505-827-3867 E-mail: <u>mike.johnson@state.nm.us</u>
 - b. Mr. Doug Rappuhn (Hydrology Bureau) 505-383-4000 E-mail: <u>doug.rappuhn@state.nm.us</u>
- 4) New Mexico Regulations & Licensing Department (RLD)- Construction Industries Division (CID):
 - a. Ms. Lisa Martinez (Director) 505-476-4689 E-mail: Lisa.Martinez@state.nm.us
 - b. Mr. Fermin Aragon (Gen. Construction Bureau Chief) 505-476-4672 Email: <u>Fermin.Aragon@state.nm.us</u>
 - c. Mr. Remijio Pacheco (Electrical Bureau Chief) 505-476-4679 Email: rem.pacheco@state.nm.us
 - d. Mr. Jerome T. Baca (Mechanical Breau Chief) 505-476-4661 E-mail: Jerome.Baca@state.nm.us
 - e. Mr. Andy Dalmy (Licensing Manager) 505-670-6078 E-mail: <u>Andy.Dalmy@state.nm.us</u>
- 5) New Mexico Environment Department (NMED):
 - a. Mr. John Hall (Hydrologist) 505-827-1049 E-mail: John.Hall@state.nm.us
- 6) New Mexico State Land Office (SLO):
 - a. Mr. Brian Bingham (505) 827-5760

- 7) New Mexico Office of Taxation & Revenue (505) 827-0825
- 8) Bureau of Land Management (BLM)
 - a. Mr. Edward Seum (Supervisor Lands & Minerals) Las Cruces District Office 575-525-4313 Email: <u>eseum@blm.gov</u>
 - b. Ms. Adrienne Brumley (Petroleum Engineer) 505-954-2140 E-mail: Adrienne Brumley Email: <u>Adrienne.Brumley@blm.gov</u>

Thank you.

Carl J. Chavez, CHMM

New Mexico Energy, Minerals & Natural Resources Department Oil Conservation Division, Environmental Bureau 1220 South St. Francis Drive, Santa Fe, New Mexico 87505 O: (505) 476-3490 E-mail: <u>CarlJ.Chavez@State.NM.US</u> Web: <u>http://www.emnrd.state.nm.us/ocd/</u> **"Why Not Prevent Pollution; Minimize Waste; Reduce the Cost of Operations; & Move Forward With the Rest of the Nation?"** To see how, please go to: "Pollution Prevention & Waste Minimization" at

http://www.emnrd.state.nm.us/ocd/environmental.htm#environmental



From: Peter Gower [mailto:peter.gower@empsi.com] Sent: Wednesday, April 23, 2014 5:09 PM To: Chavez, Carl J, EMNRD Subject: RE: Geothermal Roadmapping Workshop

Hi Carl,

Thank you for sending this information. I spoke with Scott Dawson. He was fine with having you attend, but needed to get approval from your director. I sent him more information about the project so he could pass it on. At this point, we are ready to commit to May 14th; once I hear from you or Scott, I will move forward with booking a venue and sending out invitations.

Speaking of invitations, I have been reviewing the stakeholder group files on the OCD site you provided. Short of going through those sign-in sheets and emails, would you be able to provide a short list of key individuals who you would like to see at the workshop? It would be great to have a diverse and knowledgeable group in attendance.

Thanks again,

Peter

Peter Gower, A EMPSi Environm 4773 Caughlin Pa	AICP CEP ental Management ar	nd Planning Solutions, Inc.	
Reno, NV 89519	in Kway, Suite T		
tel: 775-323-143 www.EMPSi.com	3 Twitter: EMPSInc	Facebook: EMPSi	
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From: Chavez, Carl J, EMNRD [mailto:CarlJ.Chavez@state.nm.us] Sent: Wednesday, April 23, 2014 9:58 AM To: Peter Gower Subject: RE: Geothermal Roadmapping Workshop

Mr. Gower:

The New Mexico Oil Conservation Division is in receipt of your e-mail below and will respond soon.

To view the agencies and information associated with Geothermal in New Mexico, please click here (see "Geothermal Regulations – Program Stakeholder Meetings" thumbnail).

Thank you.

Carl J. Chavez, CHMM

New Mexico Energy, Minerals & Natural Resources Department Oil Conservation Division. Environmental Bureau 1220 South St. Francis Drive, Santa Fe, New Mexico 87505 O: (505) 476-3490 E-mail: CarlJ.Chavez@State.NM.US Web: http://www.emnrd.state.nm.us/ocd/

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From: Peter Gower [mailto:peter.gower@empsi.com] Sent: Monday, April 21, 2014 11:55 AM To: Chavez, Carl J, EMNRD Subject: Geothermal Roadmapping Workshop

Hi Carl.

I would like to coordinate with you regarding an upcoming geothermal regulatory Roadmapping workshop being sponsored by the US DOE. Hopefully you have been in contact with Aaron or Amanda from the National Renewable Energy Laboratory (NREL) regarding your input on the preliminary geothermal roadmaps (flowcharts). The workshop will be an opportunity for you and other New Mexico state agency representatives to work directly with our facilitators to refine the roadmaps and learn more about DOE's RAPID/Roadmapping program.

At this point, we are looking at holding the workshop on **Wednesday, May14**th at a venue **in Santa Fe**. The workshop will run from 9am to 4pm (but likely ending sooner), with a complimentary lunch. You are one of our priority participants, so before I move ahead with booking a venue, I would like to make sure you will be available to attend. If the 14th does not work for you, please let me know and we can explore alternative dates.

More information about the project can be found at: http://en.openei.org/wiki/RAPID/Roadmap/Geo.

Thank you and I look forward to talking with you soon.

Sincerely,

Peter Gower, AICP CEP EMPSi Environmental Management and Planning Solutions, Inc. 4773 Caughlin Parkway, Suite I Reno, NV 89519 tel: 775-323-1433 www.EMPSi.com Twitter: EMPSInc Facebook: EMPSi

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SOURCE: CONSUMER ENERGY CENTER

By Staci Matlock

The New Mexican

eothermal systems are increasing in New Mexico as a renewable energy alternative for heating and cooling buildings.

The Santa Fe Civic Housing project under construction on West Alameda Street just east of St. Francis Drive will use 119 geothermal pumps to heat, cool and provide hot water for the 110 homes and two community centers.

Española's City Hall and the Fort Sumner Municipal Schools both already have geothermal systems in some of their buildings. And the Jicarilla Apache tribe is looking to build an entire energy-efficient agriculture building heated by geothermal, more technically known as a ground-source heat pump system.

A geothermal state tax credit approved in 2009 helped stimulate the number of systems residential customers ordered and ensured that installers are professionally certified. Recently, federal stimulus money helped municipalities and school districts purchase a few of the systems, which use the Earth's steady belowground temperature to heat and cool buildings.

Now the state Legislature is considering House Bill 75, which expands the definition of who qualifies for the tax credit, a move that could double the number of claims and boost geothermal sales further.

Please see EARTH, Page A-5

Proposed expansion of state tax credit could boc use of geothermal heating and cooling systems

Powered by Earth

Bruce Carswell, left, and Mike Brown with Smith & Sons Mechanical of Bosgue Farms, worl

Bruce Carswell, left, and Mike Brown with Smith & Sons Mechanical of Bosque Farms, worl the geothermal system at Villa Alegre, the Santa Fe Civic Housing project under contructio West Alameda Street. The development will use 119 geothermal pumps to heat, cool and pi hot water for the 110 homes and two community centers. JANE PHILLIPS/THE NEW MEXICAN

 Iseemed are created because of the tax credit. The bill's approval would be munity fousing project because it will alwer edit. May cost of the project because it will alwer environ allow the city to recoup some of the cost of the project. Peña said the tax credit has boosted sales and installations. Before 2009, Dahl was installations before 2009, Dahl was installations. Before 2009, Dahl was installation geothermal business increased substantially, 'said peña, who also is a certified geothermal busines increased substantially.' Sate law requires geothermal busines the effort has boosted sales and installer. New installers to be certified. Before 2009, there were three installers, certified installers around the state. Certified installers around the system. The state also passed a law show want to ke system. Duying Gold & Silver for 27 Years. Mure Fri lo 30. 5:30 · Saturday 12.5 * 	of solar and geothermal the best combination wi shortest payback period Romero said the first 50 homes and one comm center should be finishe April and the second ph 60 homes completed in People who live in the h will enjoy low utility bill a minimal amount of ele and no natural gas is nee to power the geotherma pumps. The state Legislature I helped geothermal by pp ing tax incentives. In 200 Mexico began offering v a \$9,000 tax credit for pe who install ground-sour pumps. Now HB 75 expands th nition of who qualifies fi tax credit to include trib nonprofit 50(c)(3) orgations. The bill means the would forgo about \$290, year in revenue and pott double the number of cl the credit. If approved, the credit be effective for 2011 thro 2021. HB 75 also would the 2021. HB 75 also would the the 2021. HB 75 also would the tribule the the 2021. HB 75 also would the tribule the tr	existing building." Still, the geothermal system retrofitted into a 30,000-square- foot gym in August and another in a new building, have proven money savers. Nine other schools in the district are con- ducting energy audits. In Fort Sumner, "ground water was only 13 feet below the surface, and there was substan- tial gravel that would dissipate the heat," Miller said. "These two factors, along with the tem- perature of the water, made our terrain virtually ideal for a geo- thermal installation. Not every school or community is in that circumstance." The city of Santa Fe received a \$5.3 million green grant through federal stimulus funds for the entire Villa Alegre proj- ect. The city had to commit to making the housing project an energy-efficient, "green" devel- opment. Along with the geo- thermal heat pump systems, the project will generate at least hal of its own electricity using solar photovoltaics. Ed Romero, Santa Fe Civic Housing Authority director, said the combination Travel Bug Jeff Hood Spm Sat 3/5 839 Passo de Perata 932.4418	20 percent to 40 percent more efficiently than air conditioners, the association claims. Those efficiencies are entirely dependent on where the system is used, the energy efficiency of the building and the skill of the installer. A geothermal ground-source heat pump system is expensive. Peña said the system costs \$28,000 to \$32,000 for a typical 1,500-square-foot home. Homes, apartment buildings and commercial offices, especially those using forced-air heaters, can be retrofitted with geothermal systems. Fort Summer Municipal Schools Superintendent Patricia Miller found geothermal was a good option for only two of the would be more cost effective to replace the current package (heating and cooling) gas-fired units with a ground-source heat pump system, and discovered that it would not be the best option. I encourage everyone to do a thorough analysis to determine what is best for an system of a set or analysis to determine what is best for an system of the set of the system of the set of the system of the set of analysis to the thermine what is best for analysis to determine what is best for an system of the set of	Continued from Page A-1 Ground-source heat pump systems use water and anti- freeze running through plastic tubes installed vertically or horizontally up to hundreds of feet below ground. In cold weather, the constant tem- perature of the ground neats the water in the pipe, which crosses a heat exchanger in the house and warms up the air. In hot weather, the process is reversed and the ground tem- perature cools the pipes and later the home's air. Excess heat from the geothermal system can also be used to heat a home's water. "Basically the geothermal system takes the heat from the Earth, boosts it and distributes it through a building," said Joanne Peña, geothermal sales special- ist for Dahl Plumbing in Santa Fe. Geothermal systems are 50 percent to 70 percent more efficient than other types of electric- and natural-gas-fired furnaces and heating systems, according to the International Ground Source Heat Pump Association. They also cool Western Ca * Quick fingncial * Outstanding Bill
32K for typical hom	\$28K-\$3	/stem costs	othermal sy	Set Set
Tuesday, March 1, 2011 THE	-			

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other types of umbing in Santa e Heat Pump uatural-gas-firec he International neating systems 70 percent more hey also cool l systems are

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> efficiently than air conditioners 20 percent to 40 percent more the association claims.

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heaters, can be retrofitted with good option for only two of Fort Sumner Municipal

Miller found geothermal was pump system, and discovered it would be more cost effective school building to determine if district. "We did a life-cycle cos Schools Superintendent Patricia geothermal systems. to do a thorough analysis to option. I encourage everyone to replace the current package analysis on our own elementary three buildings analyzed in the that it would not be the best units with a ground-source hea (heating and cooling) gas-fired

ducting energy audits. in a new building, have proven existing building." schools in the district are conmoney savers. Nine other foot gym in August and another retrofitted into a 30,000-square-Still, the geothermal system

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a \$5.3 million green grant of its own electricity using solar opment. Along with the geoenergy-efficient, "green" devel ect. The city had to commit to Fe Civic Housing Authority photovoltaics. Ed Romero, Santa project will generate at least half thermal heat pump systems, the making the housing project an director, said the combination for the entire Villa Alegre proj through federal stimulus funds The city of Santa Fe received

839 Paseo de Peralta Canoeing the Everglades **Travel Bug** Jeff Hood coffee - soup - WiFi - maps 5 pm Sat 3/5 992-0418

determine what is best for an

will enjoy low utility bills since 50 homes and one community shortest payback period. to power the geothermal heat and no natural gas is needed a minimal amount of electricity April and the second phase of the best combination with the People who live in the houses 60 homes completed in May. center should be finished by of solar and geothermal seemed Romero said the first

ing tax incentives. In 2009, Nev who install ground-source heat a \$9,000 tax credit for people Mexico began offering up to helped geothermal by providpumps. The state Legislature has

double the number of claims to year in revenue and potentially would forgo about \$290,000 a tions. The bill means the state nonprofit 501(c)(3) organizatax credit to include tribes and nition of who qualifies for the Now HB 75 expands the defi

be effective for 2011 through 2021. HB 75 also would track the credit. It approved, the credit would

"Where Integrity Matters" MPG2 MMW viatia com 2 MPG www.ziakia.com (KIJ) KIA MOTOR

how many geothermal jobs are created because of the tax

allow the city to recoup some of good for the Villa Alegre civic credit. the cost of the project. nousing project because it will The bill's approval would be

geothermal installer. 2009, "our geothermal business ing about five a year. After Before 2009, Dahl was install-Pena, who also is a certified increased substantially," said poosted sales and installations Peña said the tax credit has

Ground Source Heat Pump by the 33-year-old International state. Certification is handled Peña said. Now, there are 2009, there were three installers installers to be certified. Before Association. 74 certified installers around the State law requires geothermal

The state also passed a law

geothermal classes twice a such a district, which allows a renewable energy special tax allowing counties to establish programs. resistance from federal agencies the effort has been stalled by Known as a PACE program, back through property taxes. chase a system and pay the loan became the first to approve power systems. Santa Fe County install geothermal, solar or wind assessment districts to help interest, long-term loan, purhomeowner to take out a low homeowners who want to hat oversee federal mortgage Dahl Plumbing also offers

who want to know more about the systems. month for potential customers

sfnewmexican.com 986-3055 or smatlock@ Contact Staci Matlock at



Geothermal system costs \$28K-\$32K for typical home Tuesday, March 1, 2011 THE NEW MEXICAN A-5

Chavez, Carl J, EMNRD

From:	Chavez, Carl J, EMNRD
Sent:	Friday, September 24, 2010 8:06 AM
To:	Hall, John, NMENV; Johnson, Mike S., OSE; Heber, David, OSE; Altomare, Mikal, EMNRD;
	Lucero, Stephen A., EMNRD; Olson, Bill, NMENV; Fesmire, Mark, EMNRD;
	'Mike_Smith@blm.gov'; Martinez, Lisa, RLD; 'Adrienne.Brumley@blm.gov'; Brooks, David K.,
	EMNRD; Dalmy, Andy ., RLD; Baca, Jerome T., RLD; Pacheco, Rem, RLD; Aragon, Fermin,
	RLD; VonGonten, Glenn, EMNRD; Chavez, Carl J, EMNRD; Rappuhn, Doug H., OSE;
	Sizemore, Jim L., OSE; 'Black, Herb'; Hill, Larry, EMNRD; Dade, Randy, EMNRD; Perrin,
	Charlie, EMNRD; Martin, Ed, EMNRD
Cc:	Bailey, Jami C.; Sanchez, Daniel J., EMNRD
Subject:	Geothermal Regulations & Programs Stakeholders Meeting Minutes from September 8, 2010
•	Final Meeting
Attachments:	Meeting Minutes 9-8-10.doc

Ladies and Gentlemen:

Please find attached a copy of the final meeting minutes from our last and final meeting on geothermal regulations, etc. held on September 8, 2010. The meeting minutes will be scanned into the Oil Conservation Division's (OCD) Administrative Record at "OCD Online" (see link below).

OCD Online (UIC-999) under "Geothermal Regulations-Programs Stakeholder Meetings": http://ocdimage.emnrd.state.nm.us/imaging/AEOrderFileView.aspx?appNo=pCJC1004741751

Please take a moment to review the final minutes and consider providing any final comments or input to the OCD by COB October 8, 2010. A couple of issues after finalizing the minutes that the OCD would like to resolve are:

- OCD requests Counsel from RLD to contact Counsel from OCD (Ms. Mikal Altomare) at (505) 476-3480 to discuss the OSE's requirement for NM Certified Water Well Drillers at all Geothermal Projects in NM. The OCD is not sure how this requirement would apply to a high-temperature geothermal environment project?
- 2) OCD is working to update Geothermal Forms G-108 (Monthly Production Report) and G-109 (Monthly Purchasers Report), which may be relied upon by other state and federal agencies for financial assessments. OCD will need to allow agencies that will assess taxes, royalty, etc. an opportunity to review the forms before OCD can finalize them for its website. I have copied the State Land Office (SLO) on this message so it knows the OCD will be sending the forms via e-mail very soon. The Department of Interior has already provided feedback on the forms that will be sent to the SLO. Similar to No. 1 above, Ms. Altomare may be contacted for questions about the forms.

Any other issues that the OCD identifies for closure of its Administrative Record may be forthcoming....

Please contact me if you have questions. Thank you.

Carl J. Chavez, CHMM New Mexico Energy, Minerals & Natural Resources Dept. Oil Conservation Division, Environmental Bureau 1220 South St. Francis Dr., Santa Fe, New Mexico 87505 Office: (505) 476-3490 Fax: (505) 476-3462 E-mail: <u>Carl J. Chavez@state.nm.us</u> Website: <u>http://www.emnrd.state.nm.us/ocd/</u>index.htm (Pollution Prevention Guidance is under "Publications")

Geothermal Regulations Stakeholder Work Group (GRSWG) Final Meeting Oil Conservation Division- 1220 South St. Francis Drive, Santa Fe, NM 87505 (Wendell Chino Building)

Meeting Minutes (9/8/2010)

Meeting Attendees: See sign-in sheet below.

FIN	AL MEETIN	IG	· · · · · · · · · · · · · · · · · · ·
OCD-	Sonta Fe	Genthermal Regulations - 3 takeholden Mtg.	- programs 9/8/2010
Name	Agency	phone	E-mil
Curl Chai	ez oco	505-476-3490 C	arli. Chaveze state. nm. US
David Brok	the OCD	-476-3450 da	2vid. 6rooks@stzte.nm.us
JOHN HOL	NMED	827-1029 N	MILES 1915 NM. VS
REPA PACHE	CO CID	<u>4764679</u> ren	1. pachero estate-nm.us
JT-Back	<u>CIP</u>	<u>476-4661</u>	wore bac & Sale nous
Mikal_Altom	ave <u>040</u>	<u>476-3480 M.Kala</u>	altumare Ostate, nm. us
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Andy Do	Kny CID	670.6078 and	dalm- 0, starte, nm, US
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Teleconference Attendees: None.

1) OCD G-107 through G-111 Forms

Review forms in detail together. Mikal Altomare handed out updated hardcopies of G-101 – 106 and G-112 Forms for final comments due October 8, 2010.

G-101	Application for Permit to Drill, Deepen or Plug Back
G-102	Well Location and Acreage Dedication
G-103	Sundry Notice
G-104	Certificate of Compliance and Authorization to Produce
G-105	Well Log
G-106	Well Summary Report
G-107	Well History

G-108	Monthly Production Report
G-109	Monthly Purchaser's Report
G=110	Monthly Injection Report
G-111	Annual Temperature and Pressure Test
G-112	Application to Place Well on Injection

2) OCD Geothermal Resource Website update for discussion, feedback, etc. Review final webpage draft revisions in detail together

Andy Dalmy (*RLD*- see number 3 below) and John Hall (*NMED*- see submittal to OCD below for meeting) sent some more information for the OCD website resource page to consider.

Overview: The role of the Ground Water Quality Bureau (GWQB) is to protect the environmental quality of New Mexico's ground water resources as mandated by the Water Quality Act and the Water Quality Control Commission (WQCC) regulations (20.6 NMAC), and to identify, investigate and clean-up contaminated sites which pose significant risks to human health and the environment.

The GWQB

- Reviews Notice of Intent (NOI) forms for discharges or potential discharges (e.g., lagoons, underground tanks, surface discharges/disposal) to make formal determinations as to whether a ground water pollution prevention permit is necessary.
- Issues ground water discharge pollution prevention permits (DP) for discharges or potential discharges that may move directly or indirectly into groundwater
- Requires abatement of water pollution where contamination has occurred
- Has primacy for the federal Underground Injection Control (UIC) program, except for oil and gas facilities and geothermal facilities that are deemed incidental by the oil conservation division.
- Does not have authority on tribal land
- Does not have authority over local land use, nuisance, and/or zoning issues including flies, odors, dust, weeds or property values administered at the county level

NOI(S)

A. STATUTORY AUTHORITY:

- Water Quality Act: NMSA 1978 §§74-6-1 through 74-6-17
- B. REGULATIONS:

• Water Quality Control Commission (WQCC) regulations (20.6.2 NMAC).

C. SUMMARY OF NOI DETERMINATION PROCESS:

I. Applicability

Discharges that are not covered by a DP, have not been reported on an NOI form, and have the potential to impact ground water quality pursuant to the Water Quality Control Commission (WQCC) regulations (20.6.2 NMAC).

2. <u>Submission Requirements</u> Submit complete NOI <u>form</u>

Note: incidental geothermal energy discharges are regulated by GWQB generally as industrial or agricultural discharges. Therefore, the DP will not address the domestic waste discharges from a facility unless they are greater than 2,000 gallons per day. Domestic waste discharges 2,000 gallons per day or less require Liquid Waste Permits issued by the New Mexico Environment Department's Environmental Health Division.

3. <u>GWQB Responds</u>

Within 60 days GWQB will respond in writing notifying the discharger if a DP is required or not.

- 4. <u>Fees</u> None.
- 5. <u>Appeal Process</u>

Any appeal of the NOI determination that a Discharge Permit is required must be made to the New Mexico Water Quality Control Commission within 30 days of receipt of the determination letter, in accordance with Subsection B of 20.6.2.3112 NMAC.

D. ADDITIONAL INFORMATION:

• Frequently asked questions

E. ADMINISTERING AGENCY:

John S. Hall UIC Coordinator (505)-827-1049 <u>john.hall@state.nm.us</u> Ground Water Quality Bureau New Mexico Environment Department P.O. Box 5469 – 1190 St. Francis Dr. Santa Fe, New Mexico 87502-5469

(505)827-2900 Web site: http://www.nmenv.state.nm.us/gwb/

$2.0 \quad DP(S)$

A. STATUTORY AUTHORITY:

• Water Quality Act: NMSA 1978 §§74-6-1 through 74-6-17

B. REGULATIONS:

• Water Quality Control Commission (WQCC) regulations (20.6.2 NMAC).

C. SUMMARY OF PERMIT PROCESS:

I. Applicability

Any Discharge for which a NOI determination that a Discharge Permit is required has been made must submit an application for a DP pursuant to the Water Quality Control Commission (WQCC) regulations (20.6.2 NMAC).

2. <u>Submission Requirements</u>

Submit three signed copies of complete DP Application <u>forms</u> and \$100 filing fee. Instructions are included with form. Please check the list of <u>guidelines</u> to see if any pertain to your facility.

- 3. Simplified Description of Procedures for Obtaining Permit
- *GWQB* rules application administratively complete or incomplete (takes about 4 weeks). If complete, GWQB prepares and sends the applicant's public notice materials for posting along with the Administratively Complete Letter.
- *GWQB* assigns *DP* application to technical staff member for technical review and drafting of permit
- When draft permit is available it is sent to applicant and GWQB posts its public notice announcing that the draft permit is available for review—this includes sending the announcement to any interested parties that contacted GWQB as a result of the applicant's public notice. The posting of GWQB's public notice starts a 30-day comment period in which anyone, including the applicant, can request a hearing.

- If there is no significant interest in having a hearing, the DP will be issued after the closing of the 30-day comment period.
- The permitting process typically takes six months to one year depending on factors such as the number of applications and renewals GWQB receives, GWQB staffing levels, the technical completeness and adequacy of the application, and whether or not a hearing is held. Hearings and any subsequent legal procedures can significantly delay DP issuance beyond one year.

4. <u>Fees</u>

\$ 100 application filing fee + permit fee. See table in Section 20.6.2.3114 NMAC of <u>WQCC</u> <u>regulations</u>.

5. <u>Appeal Process</u>

Applicant can request a hearing regarding the draft DP during the 30-day comment period described above. After the issuance of the DP the permittee may file a petition for review before the WQCC. Such petition must be in writing to the WQCC within thirty (30) days of receipt of the DP.

D. ADDITIONAL INFORMATION:

• <u>Frequently asked questions</u>

E. ADMINISTERING AGENCY:

John S. Hall UIC Coordinator (505)-827-1049 john.hall@state.nm.us

Ground Water Quality Bureau New Mexico Environment Dept P.O. Box 5469 – 1190 St. Francis Dr. Santa Fe, New Mexico 87502-5469

(505)827-2900 Web site: <u>http://www.nmenv.state.nm.us/gwb/</u>

3) Other Permit Requirements, i.e., construction, electrical, etc.? Commercial geothermal power plant construction, buildings, power grids, electrical, plumbing permits, etc. is CID-RLD responsibility (see Andy Dalmy's RLD submittal details for meeting below). *Contractor licensing requirements were discussed in a little detail and how the OCD and RLD could help*

make contractors aware of this. RLD licensing is about a 6 month process; consequently, any renewable energy projects should be made aware of these RLD requirements up front. RLD will provide a draft footnote message with link to RLD with licensing information to OCD to consider for its resource webpage. RLD is grappling with the lack of "geothermal" language in its codes. RLD can make rule revisions in a 90 day process.

In addition to CID-RLD permit requirements, some City and County Governments may also have permit requirements and they follow CID-RLD regulations. Projects on Federal land paid for by Federal funding (i.e., contractors are paid with Federal funds) are exempt from the CID-RLD/City/County Permitting process. Projects on Indian lands are exempt from the CID-RLD/City/County Permitting process.

CID/RLD (Andy Dalmy)

CID/RLD- Big Picture: Responsible for permitting buildings and associated electrical (power grid), plumbing, etc. infrastructure for all renewable energy power projects in the state. Same as before, closed-loop systems (i.e., heat exchange) that are perceived to be geothermal, but are not and OCD webpage and G-100 Form should inform applicants where to go to get permits for these projects. OCD Form G-100 Form completion will help identify serious geothermal applicants and weed out non-serious inquiries.

- CID licenses contractors in all construction trades.
- CID issues permits only to licensed contractors.
- CID does not deal with the owners of projects other than advising them.
- Pursuant to statute and rule, only contractors who have a CID issued license in the appropriate license classification are authorized to contract or even bid on projects.
- A contractor who submits a bid to or contracts with a project owner without being validly licensed is subject to administrative action against the contractor, including fines/ penalties, and could cause delays.

CID license classifications that may be required for Geothermal Projects:

<u>Electrical</u> Low voltage systems and controls Medium voltage High voltage <u>Plumbing/Mechanical/HVAC /Process Piping</u> <u>Power Plants</u> - Drilling, piping, pressure vessels, heat exchangers, boilers <u>Buildings</u> <u>Specialties</u> - Direction Drilling/Boring

CID website - <u>www.rld.state.nm.us/cid</u>

- 4) Group Discussion: Open dialogue to flesh out any final remaining issues to resolve BLM, CID/RLD, DOI, ECMD, NMED, OCD, OSE & Other
 - RLD Licensing Requirements could slow geothermal construction projects down and need to take action(s) to prevent this.
 - OCD G-108 and 109 Forms may have royalty and fee connotations that may need to be run by SLO? Some Federal DOI feedback on the forms received after the meeting stated the following:

Here are the geothermal product codes we have our geothermal lessees use when reporting their royalties to us. As you can see, we want to know about electricity production, steam or hot water, and if it's a direct use facility, then we use different units (i.e., hundreds of gallons vs. thousands of pounds or millions of gallons for electricity production):

31 Geothermal—electrical generation, kWh

- 32 Geothermal—electrical generation, thousands of pounds
- 33 Geothermal—electrical generation, MMBtu
- 34 Geothermal—electrical generation, other
- 35 Geothermal—direct utilization, MMBtu
- 36 Geothermal—direct utilization, hundreds of gal
- 37 Geothermal—direct utilization, other
- 38 Geothermal—commercially demineralized water
- 41 Geothermal byproduct—sulfur
- 42 Geothermal byproduct—carbon dioxide
- 43 Geothermal byproduct—silica
- 44 Geothermal byproduct—other

Here is the link to this royalty reporting handbook: <u>http://www.mrm.boemre.gov/FM/PDFDocs/RevenueHandbook.pdf</u>

If you want to know more about how geothermal royalties are calculated for electrical generation and direct use facilities on federal leases, here is the link to The Geothermal Payor Handbook: <u>http://www.mrm.boemre.gov/FM/PDFDocs/geopayor.pdf</u>

This handbook is in the process of being revised to reflect the new geothermal regulations.

I read the section on royalties in your geothermal section. It looks like your Form G-109 is sufficient for reporting byproducts and geothermal resources from wells. However, I did not see a section to report on electricity produced if a company has to pay royalties based on the following: A royalty of 8 % of the net revenue for the operation of an energy producing plant on the leased land.

As far as your Form G-108, someone from BLM would be more qualified than I to comment on production reports.

Nobody uses millions of tons in royalty calculations. It is just a production amount that we collect. The amount of electricity produced is, however, used in royalty calculations, of course.

In direct use, on new federal leases, lessees use the amount of water produced and the temperature to read off the fees (i.e., royalty) from a table that we produced.

Hope that helps.

Herb

Herb Black Geologist Royalty Valuation P.O. Box 25165, MS 61112B, Denver, CO 80225 303-231-3769 <u>herb.black@mms.gov</u>

- OCD and NMED should consider placing a link to the NMED's "Green Jobs" website that highlights geothermal permitting requirements. NMED- AQB was tasked with putting this website together as part of the recent Governor's 12/09 Executive Order to NMED. CID/RLD indicated that it was never contacted by AQB, while NMED- GWQB and EMNRD- OCD were contacted and provided a write-up.
- OCD uses a G-100 Form while NMED uses a NOI Form for processing applications. OCD indicated that the G-100 Form does not need to be completed if the applicant already knows he/she needs to deal with a certain agency. OCD likes its G-100 Form because it helps to identify serious applicants. OCD will track G-100s that it receives and work closely and carefully with other agencies before we make a final referral to other agencies. Agency communication and meetings with the applicant may also be held based on the complexity of a geothermal project.
- OCD Geothermal Regulations appear to include a G-108 Monthly Production Form and G-109 Monthly Purchaser Report Form, which may both be used by Federal and State Agencies who assess geothermal royalties, rents, etc. OCD will work to include the agencies that may be directly affected by the updated forms for feedback before finalizing the forms.

- OCD recommended that CID-RLD follow-up with OSE on heat exchanger projects with shallow ground water to verify which agency has oversight. OCD briefly discussed OSE's position on Certified NM Water Well Drillers on Geothermal Projects. OSE believes its regulations require it. RLD had mentioned to OSE in a prior meeting that it licenses directional borehole drillers and OSE indicated maybe they did not have to inspect these projects when RLD could provide environmental oversight. This may affect the OCD "Geothermal Resource Page"?
- 5) **BLM** Big Picture: Involved in Geothermal Projects on Federal Lands along with the OCD. Identified some redundancies between agencies, (i.e., dual permitting, bonding, etc.) that the agencies may be able to address in the future through proper channels. Heat exchange and closed-loop projects on Federal Lands will not be subject to rent, royalties, etc. Agency will elaborate further or clarify the above as necessary.....

There was no BLM Representative in attendance or on teleconference during the meeting.

6) DOI- Big Picture: Involved in Federal rent, royalty, etc. Provided review of G-108 and 109 Forms after the 9/8 meeting. Agency will elaborate further or clarify the above as necessary......

There was no DOI Representative in attendance or on teleconference during the meeting.

7) CID/RLD- Big Picture: Responsible for regulations and permits for buildings and associated electrical (power grid), plumbing, etc. (See No. 3 above). Contractor licenses are required and RLD is putting together website information that will be able to be viewed from the RLD link on its OCD resource page. This should help to streamline geothermal projects. Closed-loop systems (i.e., heat exchange) that are perceived to be geothermal, but are not, are handled by RLD. The OCD resource web page and G-100 Form should help applicants with the permit process and help to identify serious geothermal applicants while weeding out non-serious inquiries. Agency will elaborate further or clarify the above as necessary......

Big Picture: See No. 3 above.

- 8) NMED- Big Picture: Involved where ground water is potable and closed or open-loop systems are deemed "Incidental" use of the heat and not permitted by the OCD (John Hall will provide more text on this subject for the meeting minutes next week). Agency will elaborate further or clarify the above as necessary......
- 9) OSE- Big Picture: Involved with any geothermal project where water is potable or where ground water is appropriated or requires appropriation and requires geothermal drillers to be Certified New Mexico Water Well Drillers. Agency will elaborate further or clarify the above as necessary.....

There was no OSE Representative in attendance or on teleconference during the meeting.

- 10) OCD- Big Picture: Everything basically is the same as before except OCD now handles low-temperature nursery and aquaculture geothermal open-loop system permitting. Previous interpretation of geothermal regulations was that OCD handled all geothermal projects greater than 250° F and NMED handled projects below 250° F, but OCD's recent February 2010 findings that it has jurisdiction over low (non-boiling) in addition to high temperature (boiling) geothermal projects under its geothermal regulations. Currently geothermal regulations do not supersede other applicable state regulations, which results in multiple agency involvement in the current permit process. Consequently, OCD with this stakeholder group has worked to develop a web page that specifies "who does what" in an OCD resource page which includes: multipermitting; co-permitting process; what is not geothermal; updated forms, and which agencies are involved in the process, etc.
- 11) ECMD- Big Picture: Leading another Geothermal Working Group under Governor's Executive Order (12/2009) on Deep Source Geothermal Power Generation- development of database of deep source geothermal locations, resource information, policy and technical recommendations to streamline the geothermal permit process to make NM No. 1 in Renewable Energy. A final report to the Governor is due on December 1, 2010. ECMD is interested in OCD's recent regulatory findings (Feb. 2010) that it also has jurisdiction over low-temperature geothermal in addition to high-temperature geothermal in New Mexico.

There was no ECMD Representative in attendance or on teleconference during the meeting.

- **12) Any other issues?** Federal Environmental Impact Statement on Federal Lands for these projects? Indian Land issues?
 - OCD identified post-meeting Administrative Record concerns it needs to follow-up with 0 other agency counsel(s) from applicable agencies. First, OSE's position in the current Administrative Record is that geothermal well drillers must be NM Certified Water Well Drillers in order to drill through fresh water zones. OCD did not present a position that opposed OSE's position on this matter other than stating that the low-temperature geothermal environment was consistent with water well driller experience while the high temperature geothermal environment was not. On 9/10, OCD decided it may not agree with OSE's position and it needs to discuss the issue with OSE Counsel(s). No OSE Representative was present at the final meeting to discuss this issue. Based on this issue and during the meeting, OCD recommended that RLD double check with OSE about which agency has oversight a heat exchanger installations with shallow ground water? Also, during the meeting OCD explained that the OCD Resource Page will document "who does what" in the application and permit process. It will continue to be updated. OCD Geothermal Regulations do not supersede other applicable state regulations and RLD indicated it had concerns about OCD protection of fresh water its regulations did supersede their regulations. OCD indicated that it knew how RLD felt as it also has concerns about the current lack of project tracking and closure requirements for heat exchanger projects, which was identified in previous meetings. NMED is currently working to develop BMPs for its website on proper system closure with RLD. RLD reiterated that aside from permitting "heat exchanger" projects and completing an inspection of the system once installed, it does not currently track projects. OCD

indicated that it will track all of its projects. Second, Forms G-108 (Mo. Prod. Rpt.) and 109 (Mo. Purchaser Rpt.) along with all of its geothermal forms are currently being updated and may be reviewed by appropriate Federal and State Royalty, Tax Assessors, etc. to ensure the updated forms also meet their agency needs or requirements. OCD Geothermal Regulations cover these forms, but other agencies appear to rely on them for assessments. On 9/9 during an OCD discussion, it was agreed to send the revised forms to the State Land Office (SLO) and Bureau of Land Management (BLM) for comment at completion of OCD revisions (keying on Fed. requirements) for the Administrative Record. OCD needs to make sure the Administrative Record covers the above issues. The OCD has allowed 30 days or until Oct. 8, 2010 to receive final comments from the agencies. OCD will attempt to complete this before 10/8.

13) Miscellaneous

- OCD informed the group about ECMD's recent draft proposal to host a geothermal coproduction with oil and gas symposium in New Mexico. The symposium was moved back to the Spring of 2011 and it is not known if it will occur at all. RLD indicated that it will have involvement in the permitting and inspection of infrastructure for these power projects too. OCD indicated that NW NM was the most likely location for this type of power project based on a combination of geothermal activity and to a smaller extent geothermal gradient (~1.35° F/100 Ft.), which is considered marginal compared to other oil and gas states with higher geothermal gradients, etc., i.e., Montana, Nevada, Texas and Wyoming).
- OCD checked with the other agencies to make sure that their Directors were ok with the Geothermal Regulations-Programs Stakeholder meetings and the conclusion at this final meeting. The representatives who were present indicated that there were no issues at this time and appreciated the communication process and how the seven months of meetings that were held at each other's offices help with the communication process on geothermal projects.
- 14) Path Forward: This was the final meeting. OCD will continue to update its geothermal forms, web resource page, permit process, and work very closely with the stakeholder agencies as we receive and make preliminary determinations on G-100 Forms received from applicants, which will likely result in a meeting or communication with the applicant and applicable agencies based on project specific information or may end up as a referral based on agency discussion(s) before a referral.

The group's assistance and communication has been timely as OCD is working concurrently to address the Governor's recent (December 2009) Executive Order (Order) to streamline the commercial geothermal power permit process and in general make New Mexico No. 1 in renewable energy production. OCD appreciates the group's input and hard work in helping to streamline the geothermal permit process in New Mexico based on the Order. OCD will allow 30-days or until October 8, 2010 for any final feedback from stakeholder agencies.

Please contact Carl Chavez (OCD) at (505) 476-3490 if you have questions. Thank you.

Chavez, Carl J, EMNRD

From: Sent: To: Dalmy, Andy ., RLD Tuesday, September 07, 2010 5:11 PM Chavez, Carl J, EMNRD; Hall, John, NMENV; Johnson, Mike S., OSE; Heber, David, OSE; Altomare, Mikal, EMNRD; Lucero, Stephen A., EMNRD; Olson, Bill, NMENV; Fesmire, Mark, EMNRD; 'Mike_Smith@blm.gov'; Martinez, Lisa, RLD; 'Adrienne.Brumley@blm.gov'; Brooks, David K., EMNRD; Baca, Jerome T., RLD; Pacheco, Rem, RLD; Aragon, Fermin, RLD; VonGonten, Glenn, EMNRD; Rappuhn, Doug H., OSE; Sizemore, Jim L., OSE; 'Black, Herb'; Hill, Larry, EMNRD; Dade, Randy, EMNRD; Perrin, Charlie, EMNRD; Martin, Ed, EMNRD RE: Geothermal Regulations & Programs Stakeholders Final Meeting

Subject:



Geothermal egulations Stakeho.

Carl and All,

For discussion tomorrow I've attached a short synopsis of how CID licensing functions may effect geothermal projects.

Andy Dalmy Licensing Manager New Mexico Construction Industries Division 2550 Cerrillos Road, Santa Fe, NM 87505 Phone(505)476-4673; Fax(505)476-4685; Cell(505)670-6078 E-mail: andv.dalmy@state.nm.us

-----Original Appointment----From: Chavez, Carl J, EMNRD
Sent: Tuesday, September 07, 2010 6:36 AM
To: Hall, John, NMENV; Johnson, Mike S., OSE; Heber, David, OSE; Altomare, Mikal, EMNRD; Lucero, Stephen A., EMNRD; Olson, Bill, NMENV; Fesmire, Mark, EMNRD; Mike_Smith@blm.gov; Martinez, Lisa, RLD; Adrienne.Brumley@blm.gov; Brooks, David K., EMNRD; Dalmy, Andy ., RLD; Baca, Jerome T., RLD; Pacheco, Rem, RLD; Aragon, Fermin , RLD; VonGonten, Glenn, EMNRD; Chavez, Carl J, EMNRD; Rappuhn, Doug H., OSE; Sizemore, Jim L., OSE; Black, Herb; Hill, Larry, EMNRD; Dade, Randy, EMNRD; Perrin, Charlie, EMNRD; Martin, Ed, EMNRD
Subject: Geothermal Regulations & Programs Stakeholders Final Meeting
When: Wednesday, September 08, 2010 10:00 AM-12:00 PM (GMT-07:00) Mountain Time (US & Canada).
Where: Oil Conservation Division 3rd Floor Conference Room (Wendell Chino Bldg.) 1220 South St. Francis Dr., Santa Fe, NM 87505

Teleconference Information to be provided before meeting for phone callers.

Scheduled Conference Date	Wednesday, September 8, 2010	
Scheduled Start Time:	10:00 AM Mountain Daylight Time	
Scheduled End Time:	12:25 PM Mountain Daylight Time	
Scheduled # of Participants:	30	
Type of Conference:	Web-Scheduled Standard	
Dial-in Number:	1-213-289-0500 (Los Angeles)	
Participant Access Code:	4509670	



Conference Room Equipment: Projector, Laptop hooked up to Internet, USB Jumper drives for anyone wanting to show or discuss a topic, telephone to conference in callers who are unable to physically attend......

Call for Agenda Items. Please note that meeting minutes have been posted from the 8/4/2010 Meeting on OCD Online "UIC-999" for the upcoming meeting (see current agenda for next meeting below). Note that this will be the final meeting. OCD requests that the group stay focused on information provided to OCD thus far and consider any final thoughts for OCD consideration of the geothermal program in NM. OCD requests that at least one representative attend the final meeting.

Geothermal Regulations Stakeholder Work Group (GRSWG) Meeting

Oil Conservation Division- 1220 South St. Francis Drive, Santa Fe, NM 87505 (Wendell Chino Building)

Final Meeting Agenda (9/8/2010)

1) OCD G-107 through G-111 Forms

Review forms in brief detail together (mainly form upgrade to Microsoft Word)

G-101	Application for Permit to Drill, Deepen or Plug Back
G-102	Well Location and Acreage Dedication
G-103	Sundry Notice
G-104	Certificate of Compliance and Authorization to Produce
G-105	Well Log
G-106	Well Summary Report
G-107	Well History
G-108	Monthly Production Report
G-109	Monthly Purchaser's Report
G-110	Monthly Injection Report
G-111	Annual Temperature and Pressure Test
G-112	Application to Place Well on Injection

- 2) OCD Geothermal Resource Website update for discussion, feedback, etc. Review final webpage draft revisions in detail together
- 3) Other Permit Requirements, i.e., construction, electrical, etc.? Commercial geothermal power plant construction, buildings, power grids, electrical, plumbing permits, etc. is CID/RLD responsibility. How about on Federal or Indian Lands..... Does CID/RLD state permitting apply? Do local county and/or city governments have this type of permit authority?
- 4) Group Discussion: Open dialogue to flesh out any final remaining issues to resolve BLM, CID/RLD, DOI, ECMD, NMED, OCD, OSE & Other

- 5) BLM- Big Picture: Involved in Geothermal Projects on Federal Lands along with the OCD. Identified some redundancies between agencies, (i.e., dual permitting, bonding, etc.) that the agencies may be able to address in the future through proper channels. Clarified that in heat exchange and closed-loop projects on Federal Lands, there will be no rent, royalties, etc. will be assessed on federal lands. Agency will elaborate further or clarify the above as necessary......
- 6) DOI- Big Picture: Involved in Federal rent, royalty, etc. and may have recommendations for the group as we move toward the final meeting. Agency will elaborate further or clarify the above as necessary......
- 7) CID/RLD- Big Picture: Responsible for permitting buildings and associated electrical (power grid), plumbing, etc. infrastructure for all renewable energy power projects in the state. Same as before, closed-loop systems (i.e., heat exchange) that are perceived to be geothermal, but are not and OCD webpage and G-100 Form should inform applicants where to go to get permits for these projects. OCD Form G-100 Form completion will help identify serious geothermal applicants and weed out non-serious inquiries. Agency will elaborate further or clarify the above as necessary...... This needs to be added to the OCD's web resource page.
- 8) NMED- Big Picture: Involved where water is potable and open-loop systems are not permitted by the OCD. Agency will elaborate further or clarify the above as necessary......
- 9) OSE- Big Picture: Involved with any geothermal project where water is potable or appropriated and requires geothermal drillers to be certified water well drillers in NM on these projects. Agency will elaborate further or clarify the above as necessary......
- 10) OCD- Big Picture: Everything basically the same as before except OCD now handles low-temp. nursery and aquaculture geothermal open-loop system permitting. Previous interpretation of geothermal regulations was that OCD handled all geothermal projects greater than 250F and NMED handled projects below 250F, but OCD's February 2010 recent Findings that it has jurisdiction over low and high temperature geothermal projects. Currently Geothermal Regulations do not supersede other applicable state regulations, which results in multiple agency involvement in the current permit process. Consequently, OCD with this stakeholder group has worked to develop a webpage that specifies "who does what" in the multi- permitting, process, what is not geothermal, etc. Some confusion remaining on projects on what agency (County? CID/RLD, etc.) reviews the construction, electrical, plumbing engineering aspects of geothermal projects to make sure applicants are addressing local, state, and/or federal (i.e., Environmental Impact Statements- EIS on Federal Lands) requirements for these projects). Agency will elaborate further or clarify the above as necessary......
- 11) ECMD- Big Picture: Leading another Geothermal Working Group under Governor's Executive Order on Deep Source Geothermal Power Generation- development of database of deep source geothermal locations in the state, Policy and Technical Recommendations to streamline the geothermal permit process to make NM No. 1 in Renewable Energy. Report due to Governor on December 1, 2010. Interested in OCD's recent finding (Feb. 2010) that it also has jurisdiction over low-temperature geothermal in addition to high-temperature geothermal.
- 12) Any other issues? Federal Environmental Impact Statement on Federal Lands for these projects? Indian Land issues?

13) Miscellaneous

14) Path Forward: This is the final meeting. OCD will update its geothermal forms, web resource page, and work very closely with the stakeholder agencies as it receives and make preliminary determinations on G-100 Forms, which will likely result in a meeting or communication with the applicant and applicable agencies based on project specific information. Thank you all for your cooperation and participation in this geothermal regulation-programs stakeholder meeting group and for your timely assistance. Your participation has assisted the OCD with work on the Governor's recent (December 2009) Executive Order to streamline the commercial geothermal permit process and make New Mexico No. 1 in renewable energy production. OCD appreciates your input and hard work. ©

Please contact Carl Chavez (OCD) at (505) 476-3490 if you have questions. Thank you.

Geothermal Regulations Stakeholder Work Group (GRSWG) Meeting

CID/RLD

CID/RLD- Big Picture: Responsible for permitting buildings and associated electrical (power grid), plumbing, etc. infrastructure for all renewable energy power projects in the state. Same as before, closed-loop systems (i.e., heat exchange) that are perceived to be geothermal, but are not and OCD webpage and G-100 Form should inform applicants where to go to get permits for these projects. OCD Form G-100 Form completion will help identify serious geothermal applicants and weed out non-serious inquiries.

- CID licenses contractors in all construction trades.
- CID issues permits only to licensed contractors.
- CID does not deal with the owners of projects other than advising them.
- Pursuant to statute and rule, only contractors who have a CID issued license in the appropriate license classification are authorized to contract or even bid on projects.
- A contractor who submits a bid to or contracts with a project owner without being validly licensed is subject to administrative action against the contractor, including fines/ penalties, and could cause delays.

CID license classifications that may be required for Geothermal Projects:

Electrical

Low voltage systems and controls

Medium voltage

High voltage

Plumbing/Mechanical/HVAC /Process Piping

<u>Power Plants</u> - Drilling, piping, pressure vessels, heat exchangers, boilers

Buildings

Specialties - Direction Drilling/Boring

CID website - <u>www.rld.state.nm.us/cid</u>.

Chavez, Carl J, EMNRD

From: Sent: To: Attachments: Hall, John, NMENV Tuesday, September 07, 2010 5:08 PM Chavez, Carl J, EMNRD NMEDGeothermal paragraph for OCD_9_7_10.doc

Carl,

I have attached a write up I did for the Green Energy Permitting Guidelines I did earlier this year. I tweaked it a bit for geothermal. I could not find the UIC-999 folder on the OCD Online webpage, so I did not have an example of the format you wanted. Anyhow, if this works, great, otherwise I can cast it into another format....

See you tomorrow,

John S. Hall UIC Coordinator Ground Water Quality Bureau New Mexico Environment Dept. (505)-827-1049 **Overview:** The role of the Ground Water Quality Bureau (GWQB) is to protect the environmental quality of New Mexico's ground water resources as mandated by the Water Quality Act and the Water Quality Control Commission (WQCC) regulations (20.6 NMAC), and to identify, investigate and clean-up contaminated sites which pose significant risks to human health and the environment. The GWQB

- Reviews Notice of Intent (NOI) forms for discharges or potential discharges (e.g., lagoons, underground tanks, surface discharges/disposal) to make formal determinations as to whether a ground water pollution prevention permit is necessary.
- Issues ground water discharge pollution prevention permits (DP) for discharges or potential discharges that may move directly or indirectly into groundwater
- Requires abatement of water pollution where contamination has occurred
- Has primacy for the federal Underground Injection Control (UIC) program, except for oil and gas facilities and geothermal facilities that are deemed incidental by the oil conservation division.
- Does not have authority on tribal land
- Does not have authority over local land use, nuisance, and/or zoning issues including flies, odors, dust, weeds or property values administered at the county level

1.0 NOI (S)

A. STATUTORY AUTHORITY:

• Water Quality Act: NMSA 1978 §§74-6-1 through 74-6-17

B. **REGULATIONS**:

• Water Quality Control Commission (WQCC) regulations (20.6.2 NMAC).

C. SUMMARY OF NOI DETERMINATION PROCESS:

1. Applicability

Discharges that are not covered by a DP, have not been reported on an NOI form, and have the potential to impact ground water quality pursuant to the Water Quality Control Commission (WQCC) regulations (20.6.2 NMAC).

2. <u>Submission Requirements</u> Submit complete NOI form

Note: incidental geothermal energy discharges are regulated by GWQB generally as industrial or agricultural discharges. Therefore, the DP will not address the domestic waste discharges from a facility unless they are greater than 2,000 gallons per day. Domestic waste discharges 2,000 gallons per day or less require Liquid Waste Permits issued by the New Mexico Environment Department's Environmental Health Division.

3. GWQB Responds

Within 60 days GWQB will respond in writing notifying the discharger if a DP is required or not.

- 4. <u>Fees</u> None.
- 5. Appeal Process

Any appeal of the NOI determination that a Discharge Permit is required must be made to the New Mexico Water Quality Control Commission within 30 days of receipt of the determination letter, in accordance with Subsection B of 20.6.2.3112 NMAC.

D. ADDITIONAL INFORMATION:

• Frequently asked questions

E. ADMINISTERING AGENCY:

John S. Hall UIC Coordinator (505)-827-1049 john.hall@state.nm.us

Ground Water Quality Bureau New Mexico Environment Department P.O. Box 5469 – 1190 St. Francis Dr. Santa Fe, New Mexico 87502-5469

(505)827-2900 Web site: <u>http://www.nmenv.state.nm.us/gwb/</u>

2.0 DP (S)

A. STATUTORY AUTHORITY:

• Water Quality Act: NMSA 1978 §§74-6-1 through 74-6-17

B. **REGULATIONS**:

• Water Quality Control Commission (WQCC) regulations (20.6.2 NMAC).

C. SUMMARY OF PERMIT PROCESS:

1. Applicability

Any Discharge for which a NOI determination that a Discharge Permit is required has been made must submit an application for a DP pursuant to the Water Quality Control Commission (WQCC) regulations (20.6.2 NMAC).

2. <u>Submission Requirements</u>

Submit three signed copies of complete DP Application <u>forms</u> and \$100 filing fee. Instructions are included with form. Please check the list of <u>guidelines</u> to see if any pertain to your facility.

- 3. Simplified Description of Procedures for Obtaining Permit
 - GWQB rules application administratively complete or incomplete (takes about 4 weeks). If complete, GWQB prepares and sends the applicant's public notice materials for posting along with the Administratively Complete Letter.
 - GWQB assigns DP application to technical staff member for technical review and drafting of permit
 - When draft permit is available it is sent to applicant and GWQB posts its public notice announcing that the draft permit is available for review—this includes sending the announcement to any interested parties that contacted GWQB as a result of the applicant's public notice. The posting of GWQB's public notice starts a 30-day comment period in which anyone, including the applicant, can request a hearing.
 - If there is no significant interest in having a hearing, the DP will be issued after the closing of the 30-day comment period.
 - The permitting process typically takes six months to one year depending on factors such as the number of applications and renewals GWQB receives, GWQB staffing levels, the technical completeness and adequacy of the application, and whether or not a hearing is held. Hearings and any subsequent legal procedures can significantly delay DP issuance beyond one year.
- 4. <u>Fees</u>

\$ 100 application filing fee + permit fee. See table in Section 20.6.2.3114 NMAC of <u>WQCC regulations</u>.

5. Appeal Process

Applicant can request a hearing regarding the draft DP during the 30-day comment period described above. After the issuance of the DP the permittee may file a petition for review before the WQCC. Such petition must be in writing to the WQCC within thirty (30) days of receipt of the DP.

D. ADDITIONAL INFORMATION:

• Frequently asked questions

E. ADMINISTERING AGENCY:

John S. Hall UIC Coordinator (505)-827-1049 john.hall@state.nm.us Ground Water Quality Bureau New Mexico Environment Dept P.O. Box 5469 – 1190 St. Francis Dr. Santa Fe, New Mexico 87502-5469

(505)827-2900 Web site: <u>http://www.nmenv.state.nm.us/gwb/</u>

FINAL MEETING Geothermal Regulations - Programs 3 takeholden Mtg. OCD-Sonta Fe 9/8/2010 E-mail Name Agency phone Carl Chavez 505-476-3490 Carlj. Chaveze state. nm. US ÓCD David Brinks OCD -476-3450 davidbrooks@state.nm.us JOHN HOL NMED REPA PACHECO CID rem-pachero estate-nm.us 4764679 IT Bace CID 476-4661___ Jerone baca & State nor US Mikal Altomative 000 476-34BU Mika/altomare@state.nm.us Formin Avalow CD 476 Horz Fermin arago state NRI. US Hody Dolmy CID 670.6078 and Judalmy & starte. nm. US

<u>District 1</u> 1625 N. French Dr. Hobbs, NM 88240	STATE OF NEW	Mexico	Revised July 1, 2	010	
District II 301 W. Grand Avenue, Artesia, NM 88210	ENERGY MINERALS A	ND NATURAL	Form G-100		
<u>District III</u> 1000 Rio Brazos Road, Aztec, NM 87410	RESOURC	ES	Submit Origi	nal	
District IV 220 S. St. Francis Dr., Santa Fr. NM 87505	OIL CONSERVATIO	N DIVISION	Plus I Co to Santa	ppy Fe	
1220 S. St. Planets D., Santa Pe, NW 07505	1220 South St. Fi	rancis Dr.	I Copy to Appropri District Off	ate îce	
	Santa Fe, INIVI	87505			
	<u>Geothermal Proje</u>	<u>ct Form</u>			
i [New 🗌 Renewal	Modification			
DATE CHARMENTERIAN:	2.	OGRID (if applicat	ble):		
OPERATOR:					
ADDRESS.					
Contact Person:		PHONE	1 <u>861).</u> 		
LOCATION:/4	/4 <u>Section</u>	<u> </u>	Range		
APPLICANT MUST SUBMIT A LARGE SC	CALE TOPOGRAPHIC MAP SHO	WING EXACT LOCA	TION WITH GPS COORDINATES	·	
 site. If the facility site is comprised identify what portion of facility site <u>Attach</u> documentation specifying the the site location, and for each specif. <u>Attach</u> documentation containing a d pits, dikes and tanks on the facility. <u>Attach</u> documentation identifying all drilling/installation/site construction <u>Specify</u> whether there will be a grout jurisdiction of the Office of the State <u>USE DETERMINATION</u>: a. Is the primary use of any water <u>YES</u> NO PROJEC b. If NO to "a "above, please and tanks" 	of moreithan one parcel, and is owned by each by attaching : name, telephone number and y what their interest(s) is(are) lescription of the facility with materials that are currently of and/or during the regular cou ind water appropriation asso e Engineer (OSE): YES []	not all parcels are of g a diagram. haddress of the mir a diagram clearly if or will be stored or urse of operations a ociated with the pro NO ject, the extraction ER	owned by the same landowner(heral right's interest holders for indicating the location of fence used at the facility during t the facility. oposed project under the of the heat carried by that wate	s), s, er?	
 b. If <u>NO</u> to "a." above, please and i. Is the extraction of heat if YES NO ii. Is the water less than 250° YES NO iii. Is the water potable? YES NO *See WQCC Rule 20.7.10 NMAC regar 	swer <u>all three following</u> quest neidental" to another benefici F?	ial, primary use of t	he water?		
 <u>Attach</u> documentation identifying an average quality and daily volume of 	nd describing all present source waste water must be included	ces of effluent and v l.	waste solids. Specification of		
4. <u>Attach</u> documentation identifying ar	nd describing all current liquid	d and solid waste co	ollection/treatment/disposal		

.

- procedures.
- 15. <u>Attach</u> documentation specifying all proposed modifications to existing collection/treatment/disposal systems.

- 16. <u>Attach</u> documentation identifying and describing a routine inspection and maintenance plan for the facility/project that will ensure permit compliance.
- 17. <u>Attach</u> documentation detailing a contingency plan for the reporting and clean-up of spills or releases at the facility/project.
- 18. <u>Attach</u> documentation reflecting geological/hydrological information for the facility/project. Documentation of depth to and quality of ground water must be included.
- 19. <u>Attach</u> documentation detailing a facility closure plan, and any other information necessary to demonstrate compliance with any other OCD or WQCC rules, regulations and/or orders.
- 20. <u>APPLICANT-DESIGNATED GEOTHERMAL PROJECT TYPE(s)</u>:
- Open loop (single/multiple well for water withdrawal, water returned to assurface source)
- Open loop (single/multiple well for water withdrawal, water returned to a second well)
- Standing Column (single well for water withdrawal and water return)
- Closed-loop
- Other*

* Please note that heat pump systems (open or closed-loop) are <u>not</u> considered "geothermal" and are therefore not permitted through the OCD. These projects are handled directly by the Construction Industries Department/Regulation and Licensing Division (CID/RLD) and, where groundwater is potentially impacted, by NM Environment Dept. (NMED). <u>Inquiries and applications for permits relating to heat pump systems should be directed to CID/RLD and, where appropriate, to the NMED.</u>

ADDITIONAL IMPORTANT INFORMATION:

- OCD may require OSE certified water well drillers for certain projects.
- Applicants are responsible for contacting the appropriate Federal, State, Tribal and/or local government agencies responsible for rent, royalty and/or tax assessment.
- OCD approval of this application does not relieve operator of responsibility should their operations pose a threat to ground water, surface water, human health or the environment. In addition, OCD approval does not relieve the
- operator of responsibility for compliance with any other federal, state, or local laws and/or regulations...
- 21. <u>CERTIFICATION</u>: Thereby certify that the information submitted with this application is true and correct to the best of my knowledge and belief, and that I am authorized to so certify on behalf of the above-identified company/operator.

			₩			
<u>Name:</u>				<u></u>		
Signature	:					
<u>E-mail Ad</u>	ldress:	<u> </u>		<u>Date</u> :	• •	
		AND.				

District I 1625 N. French Dr., Hobbs, NM 88240 District II 1301 W. Grand Avenue, Artesia, NM 88210 District III 1000 Rio Brazos Road, Aztec, NM 87410 District IV 1220 S. St. Francis Dr., Santa Fe, NM 87505

STATE OF NEW MEXICO ENERGY MINERALS AND NATURAL RESOURCES

OIL CONSERVATION DIVISION 1220 South St. Francis Dr. Santa Fe, NM 87505 Form G-101 September 7, 2010

Submit one copy to appropriate District Office AND one copy to Santa Fe (Environmental Bureau)

AMENDED REPORT

**NOTICE – ALL GEOTHERMAL APPLICANTS MUST COMPLETE AND SUBMIT A FORM G-100 BEFORE SUBMITTING A FORM G-101 APPLICATION

APPLICATION FOR PERMIT TO DRILL, DEEPEN OR PLUG-BACK-GEOTHERMAL RESOURCES WELL

			¹ Operator Nam	e and Address						<u>2</u> '	OGRID Num	<u>ber</u>
								3	0 -		API Numbe	<u>r</u>
Prope	rty Code			······,	Property	Name					« W	/ell No.
			Proposed Pool 1		k		^{III} Proposed Pool 2					
				7	Surfac	e Loc	Location			م		
UL or lot no.	or lot no. Section Township Range Lot Idn Feet free		om the	North/South line	Fee	t from the	Ea	st/West line	County			
	⁸ Proposed Bottom Hole Loc				ation If Different From Surface					· · · · · · · · · · · · · · · · · · ·		
UL or lot no.	Section	Township	Range Lot Idn Feet fr		Feet In	om the	North/South line	Fee	t from the	Ea	East/West line <u>County</u>	
				Additio	onal W	ell In	formation		<u>1</u> 20			· · · · ·
¹¹ Work	Гуре Code	□Geo	thermal Produ	tion (<i>select type</i>	<u>Type:</u>)) □Exp	loratory	Observation		¹³ Cablé/R	otary	¹⁵ Gr	ound Level Elevation
16 M	ultiple		Proposed Der	this George Provide Antice Control of the Control o				¹⁴ Lease Type Code ²⁰ Spud Date		²⁰ Spud Date		
		K\$7. K	21	Proposed C	Casing	and C	ement Progr	am				
Hole S	ize	Casi	ng Size	Casing weight	/foot	ot Setting Depth			Sacks of Cement			Estimated TOC
		in the second	<u> </u>									
C	<u>ant</u> S						[
	` t @.,			5 <u>%</u>								
	۳ĺ <u>s</u>			144 144 144 144	ýs.							
Describe the b	²² <u>Describe</u> the proposed program. If this application is to DEEPEN or PEUG B/ <u>Describe</u> the blowout prevention program, if any. <u>Use additional sheets if necessa</u>							sent pi	oductive	zone and	a proposed no	w produciive zone.
⁴ I hereby cert best of my kno of the above-ic	ify that the wledge and lentified on	information g f belief and th crator	given above is tr at I am authoriz	ue and complete to ed to so certify on l	the behalf	OIL CONSERVATION DIVISION						
Signature:						Approved by:						
Printed name:					Title:	Title:						
Title:						Approv	al Date:			Expirat	ion Date:	
E-mail Addres	s:											
Date:			Phone:			Conditions of Approval Attached						

<u>District 1</u> 1625 N. French Dr., Hobbs, NM 88240 <u>District 11</u> 1301 W. Grand Avenue, Artesia, NM 88210 <u>District 111</u> 1000 Rio Brazos Rd., Aztec, NM 87410 <u>District IV</u> 1220 S. St. Francis Dr., Santa Fe, NM 87505 State of New Mexico Energy, Minerals & Natural Resources Department OIL CONSERVATION DIVISION 1220 South St. Francis Dr. Santa Fe, NM 87505

Revised September 7, 2010 Attach a copy to each G-101 submitted (one copy to appropriate District Office AND one copy to Santa Fe Environmental Bureau)

AMENDED REPORT

FORM G-102

GI	eothe	RMAL	RESOUR	CES W	ELL LOCA	fion and <u>ac</u>	REAGE DE	DICATION PI	LAT	
API N	ailable)		² Pool Code	2	³ Pool/Name					
⁴ Property Code			,-L		⁵ Property	Name		6 V	* Well Number	
⁷ OGRID No. (if available)					* <u>Operatoi</u>	NAME			* Elevation	
					¹⁰ Surface	Location				
VL or lot no.	, or lot no. Section Township		Range	Lot Idn	Feet from the	North/South line	Feet from the	Feet from the East/West line		
		•	¹¹ Bot	tom Hol	e Location I	f Different Fror	n Surface	Хў.	్. సి. సి. సాగ్. సి.	
UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	e County	
¹² Dedicated Acres	i ¹³ Joint o	r Infill 🔤	Consolidation C	ode ¹⁵ Or	der No.			<u> </u>		
No allowable v division.	will be as:	signed to t	his complet	ion until a	Il interests have	ebeen consolidated	or a non-standa	rd unit has been a	pproved by the	
					- -		Printed Name E-mail Address ISSURV / hereby certify the	PERATOR CERT tat the information contained her edge and belief, and that this org ed mineral interest in the land in tas a right to drill this well at thi such a mineral or working inter- impulsory pooling order heretoff "EYOR CERT fy that the well location si	'IFICATION cin is true and complete to the anization either owns a working chaling the proposed bonom s location parstant to a contract st, or to a voluntary pooling are entered by the division. Date IFICATION hown on this plat was	
							Date of Survey Signature and S	n, and that the same is tr ield notes of actual survey ief.	is made by me or under w and correct to the	

District 1 1625 N. French Dr., Hobbs, NM 88240 District II 1301 W. Grand Avenue, Artesia, NM 88210 District III 1000 Rio Brazos Rd., Aztec, NM 87410 District IV 1220 S. St. Francis Dr., Santa Fe, NM 87505

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State of New Mexico Energy, Minerals & Natural Resources

> Oil Conservation Division 1220 South St. Francis Dr. Santa Fe, NM 87505

Form G-104 Revised September 7, 2010

Submit one copy to appropriate **District Office** <u>AND</u> one copy to **Santa Fe** (Environmental Burcau)

AMENDED REPORT

_	<u>Certif</u>	ICATE OF	Сомр	LIANCE	AND AUTH	ORIZATION TO I	PRODUCE GE	OTHERMAL R I	ESOURCES		
	NAME										
UPERATOR	NAME.						* Operator Ad	dress			
							³ OGRID NUMBER				
⁴ <u>API Numb</u> 30 - 0	<u>er</u>	⁵ Lea	se Name				⁶ Kind of Lease (Fee, Fed or State)				
7 WELL NAM	E & NUME	IER		* <u>T</u> Y	PE OF WELL	⁹ <u>Reason for Filing</u>					
	□ Geo	thermal Pi	roduction (select type)	New Well						
		<i>.</i>	> Low temp				Change in Ownership Designation of Purchaser				
		□ Exp	loratory/O	bservation			D Other(please	explain)			
□ Geotherm				isposal/Inj	ection						
— Ⅱ. [™] Su	rface Lo	cation							and the second s		
Ul or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South Line	Feet from the	East/West line	<u>County</u>		
н Во	ttom Ha	le Locatio)11	1	(kara)						
UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet-from the	East/West line	<u>County</u>		
L]	<u></u>	ATAL					
ПІ. ¹² Туі	ne of Pro	nduct			E.						
Dry St	cam/Su	oerheated	Steam		E Steam and	l Water	^D Low Ten	p Thermal Wa	iter		
□ Other_			<i></i>								
IV.					949 7 196 • 195 - 1990						
¹³ Des	ignation	of Purch	<u>aser of </u>	<u>Product</u>							
Name of	Purchas	ser:		and the bar	· · · · · · · ·	Address of Pi	rchaser:				
	».	×e.									
Product	will be u	sed for:			È.						
⁴² I hereby cer	tify that th	e rules of th	e Oil Con	servation I	Division have	OIL CONSERVATION DIVISION					
been complied	with and e best of n	that the info	mation gi	ven above ef and that	is true and						
authorized to s	to certify c	m behalf of	the above-	identified	operator.						
Signature:		ંગ્લ્યાં				Approved by:					
Printed name:						Title:					
Title:						Approval Date:					
E-mail Addres	is:										
Date:		Pho	one:								
District 1 1625 N. French Dr., Hobbs, NM 88240 District II 1301 W. Grand Avenue, Artesia, NM 88210 District III 1000 Rio Brazos Rd., Aztec, NM 87410 District IV 1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico Energy, Minerals & Natural Resources

> **Oil Conservation Division** 1220 South St. Francis Dr. Santa Fe, NM 87505

Submit one copy to appropriate District Office AND one copy to Santa Fe (Environmental Bureau)

Geothern	MAL RES	OURCES WELL L	<u>OG</u>	WELL API NO. 5. Andicate Type of	Lease
				6. State Oil & Cas	FEE Lease No.
Geothermal Production (selection (selection)	1. Type	of Well: ☐ Exploratory/Observa	ation	7. 'Lease/ <u>Unit</u> Name	2.
¹³ High temp ¹³ Low temp		Geothermal Disposa	l/Injection	8. Well Number	
2. <u>NAME OF OPERATOR</u>		φ.		9. OGRID NUMI	<u>SER</u>
3. Address of Operator				[₩] 10. Pool or Reservo	ir Name
4. <u>Well Location</u>			· · · ·		
Unit Letter Section	: Township	_ieet from the Range	Ine and NMPM	feet from the	ie line
		TNICTINUC		and the second sec	

This form is to be filed with the appropriate District Office of the Division not later than 20 days after the completion of any newly-drilled or deepened well and not later than 60 days after completion of closure. When submitted as a completion report, this shall be accompanied by one copy of all electrical and radio-activity logs, directional surveys, physical or chemical logs, water analyses, tests and temperature surveys run on the well and a summary of all special tests conducted, including drill stem tests. All depths reported shall be measured depths. In the case of directionally drilled wells, true vertical depths shall also be reported.

LITHOLOGY RECORD (Attach additional sheet if necessary)

From	To	Thickness In Feet	Eithology	From	To	Thickness In Feet	Lithology
From	To	Thickness	Eithology	From	Το	Thickness In Feet	Lithology

INDICATE FORMATION TOPS IN CONFORMANCE WITH GEOGRAPHICAL SECTION OF STATE

Southea	stern New Mexico		Northwester	n New Mexico
T. Anhy	T. Canyon		T. Ojo Alamo	T. Penn A"
T. Salt	T. Strawn		T. Kirtland 🥂 👘 👯	T. Penn. "B"
B. Salt	T. Atoka		T. Fruitland	T. Penn. "C"
T. Yates	T. Miss		T. Pictured Cliffs	TRenn. "D"
T. 7 Rivers	T. Devonian		T. Cliff House	T. Leadville
T. Queen	T. Silurian		T. Menefee	T. Madison
T. Grayburg	T. Montoya		T.,Roint Lookout	T. Elbert
T. San Andres	T. Simpson		T-Mancos	T. McCracken
T. Glorieta	Т. МсКее		T. Gallup	T. Ignacio Otzte
T. Paddock	T. Ellenburger		Base Greenhorn	T.Granite 🖉
T. Blinebry	T. Gr. Wash		T. Dakota	
T.Tubb	T. Delaware Sand	et	T. Morrison	
T. Drinkard	T. Bone Springs	William.	T.Todilto	
T. Abo	T		T. Entrada	
T. Wolfcamp	Τ.	j= t≥r*_%	T:Wingate	
T. Penn	Т.	<u> </u>	T.Chinle	
T. Cisco (Bough C)	<u> T.</u>	1988. 	T. Permian	

OIL OR GAS SANDS OR ZONES

No.	1.	from	 No. 3, from	
N La	ົ	fuere		•
NO.	Ζ.	trom	 No. 4. from	

IMPORTANT WATER SANDS

Inch	ide data	on rate of w	ater inflow:	and elevation	to which wate	er rose in hole	e.	
No.	1. from.		· · · · · · · · · · · · · · · · · · ·	to			feet	
No.	2. from.			to		ine an Ref	feet	
No.	3. from.			to			feet	
	.,	6/*						•••••••••••••••••••••••••••••••••••••••

I hereby certify that the information above is true and complete to the best of my knowledge and belief and that I am authorized to so certify on behalf of the above-identified operator.

SIGNATURE	TITLE	DATE	
Type/ Print Name_	E-mail address:	<u> </u>	
PHONE:		· · ·	

District I 1625 N. French Dr., Hobbs, NM 88240 District II 1301 W. Grand Avenue, Artesia, NM 88210 District III 1000 Rio Brazos Road, Aztec, NM 87410 District IV 1220 S. St. Francis Dr., Santa Fe, NM 87505

I.

State of New Mexico Energy Minerals and Natural Resources

Revised September 7, 2010

Submit Original Plus 1 Copy to Santa Fe 1 Copy to Appropriate District Office

OIL CONSERVATION DIVISION 1220 South St. Francis Dr. Santa Fe, NM 87505

Form G-112

APPLICATION TO PLACE WELL ON INJECTION - GEOTHERMAL RESOURCES AREA

1.	*PURPOSE: UIC Class Application qualifies for ad	V Geothermal	Disposal val? Yes	⊡No		
2.	DISTRICT:			OGRID:		
3.	OPERATOR NAME:					
	ADDRESS:					
	Contact Person:			PHONE:	ň. 11.	
4.	*Well Location:	/4	/4 Section	T ownship	Range	
5.	*WELL NAME:	, s ^{arti} nga Januari Dana atara atara	8. API#			

6. WELL DATA: Provide the requested data and information in Section II, Well Data, below, and complete the attached "Injection Well Data Sheet" for each well proposed for injection. Additional sheets may be attached if necessary.

*If this application is being used for more than one well, attach additional sheets providing the information requested by Nos. 1, 4 and 5, above.

- Is this an expansion of an existing project? Yes
 No
 If yes, identify the Division order number authorizing the existing project: _____
- 8. <u>Attach a map that identifies all wells and leases within two miles of any proposed injection well</u> with a one-half mile radius circle drawn around each proposed injection well. This circle identifies the well's area of review.
- 9. <u>Attach a tabulation of data on all wells of public record within the area of review which penetrate the proposed injection zone</u>. Such data shall include a description of each well's type, construction, date drilled, location, depth, record of completion, and a schematic of any plugged well illustrating all plugging detail.
- 10. Attach data for the proposed operation, including:
 - a) Proposed average and maximum daily volumetric rate of injection;
 - b) Whether the system is open or closed;
 - c) Proposed average and maximum surface injection pressure and depth to top of perforated or injection interval;
 - d) Sources and an appropriate analysis of injection fluid and compatibility with the receiving formation if other than reinjected produced water; and,
 - e) If injection is for disposal purposes into a zone not productive of oil or gas at or within one mile of the proposed well, <u>attach</u> a chemical analysis of the disposal zone formation water (may be measured or inferred from existing literature, studies, nearby wells, etc.).
 - f) If injection zone is within one-mile of oil and gas and/or potash production, attach justification for injection or disposal.
- 11.# <u>Attach appropriate geologic data</u> for the injection zone including appropriate lithologic detail, geologic name, thickness, and depth. <u>Specify</u> the geologic name, and depth to bottom of all underground sources of drinking water (aquifers containing waters with total dissolved solids concentrations of 10,000 mg/l or less) overlying the proposed injection zone, as well as any such sources known to be immediately underlying the injection interval.

- 12. **Provide** a description of the proposed well stimulation or frac program, if any.
- 13.# <u>Attach appropriate logging and test data</u> on the well. (If well logs have been filed with the Division, they need not be resubmitted). *Note that proper geothermal forms should be used to collect, document and submit well information to the OCD.*
- 14.#<u>Attach a chemical analysis of fresh water</u> from two or more fresh water wells (if available and producing) within one mile of any injection or disposal well, with such analysis including documentation of the location and depth of the wells with aquifer(s) type(s) (i.e., water table, confined...) and the dates samples were collected.
- 15. Applicants for injection/disposal wells must <u>make an affirmative statement that they have examined available</u> <u>hydrogeologic, geologicalengineering, and geophysical data and have evaluated the project risks and public safety</u> from human caused seismicity that could be caused by the well to populated areas where open faults, fractured bedrock, <u>and/or any other hydrologic connection</u> between the injection/disposal zone(s) and any underground sources of drinking water.
- 16. Applicants must <u>complete the "Proof of Notice" (Section III)</u> on following page of this form.
- 17. **CERTIFICATION**: I hereby certify that the information submitted with this application is true and correct to the best of my knowledge and belief, and that I am authorized to so certify on behalf of the above-identified operator.

Name:	Title:		
Signature:	Certificati	on/License #:	
E-mail Address:	Date:		"\$P\$"

- If the information required under Nos 11, 13 and 14, above, has been previously submitted, it need not be resubmitted. Please specify the date(s) and circumstances of the earlier submittal:

II. WELL DATA

- 18. The following well data must be submitted for <u>each</u> injection/disposal well covered by this application. The data must be both in tabular and schematic form and shall include:
 - a) Lease name; Well No.; Location by Section, Township and Range; and footage location within the section.
 - b) Each casing string used with its size, setting depth, sacks of cement used, hole size, top of cement, and how such top was determined.
 - c) A description of the expected geothermal environment (high/low temperature w/~°F), mud or air drilling method(s) with Blow-Out Prevention Equipment (BOPE) Setup and any special drilling equipment for low or high temperature conditions expected.
 - d) A description of the tubing to be used including its size, lining material, and setting depth.
 - e) The name, model, and setting depth of the packer or plug used or a description of any other seal (special elastomers) system or assembly used.

Division District Offices have supplies of Well Data Sheets which may be used or which may be used as models for this purpose. Applicants for several identical wells may submit a "typical data sheet" rather than submitting the data for each well.

19. The following must be submitted for <u>each</u> injection well covered by this application. All items must be addressed for the initial well. Responses for additional wells need be shown only when different. Information shown on schematics need not be repeated.

Form G-112 – *Page 2*

- a) The name of the injection formation and, if applicable, the field or pool name.
- b) The injection interval and whether it is perforated or open-hole.
- c) State if the well was drilled for injection or disposal, if not, the original purpose of the well.
- d) Give the depths of any other perforated intervals and detail on the sacks of cement or bridge plugs used to seal off such perforations.
- e) Give the depth to and the name of the next higher and next lower oil or gas zone in the area of the well, if any.

HI. Notice Requirements for Geothermal Wells

- 20. Is the proposed site within the corporate limits of any city, town or village of the state? Yes No
 <u>If Yes</u> Applicant must <u>attach</u> proof that notice of intention to drill such well has been given to the duly constituted governing body of such city, town or village or its duly authorized agent. (See Geothermal Rule 19.14.21.8.B NMAC).
- 21. Applicant is further required to provide a copy of this Form G-112 to all other geothermal lease owners, if any there be, within a one-half mile radius of the proposed geothermal well (See Geothermal Rule 19.14.93.8.B NMAC, providing a 20 day waiting period during which such neighboring lease owners may submit objections for consideration by the Division Director).

<u>Please identify</u> by name and address the geothermal lease owners within a one-half mile radius to whom Applicant is providing a duplicate of this completed G-112 form:

	Spin.			
			×. 8	
		N.		

NOTE: A discharge permit under the Water Quality Act/Water Quality Conservation Commission Rules is also required for a Geothermal well, and carries additional, separate notice requirements. *See WQA Rules 20.6.2.3101-3114 and 20.6.2.5001-5210 NMAC regarding discharge permits and injection wells, generally, and WQA Rule 20.6.2.3108 NMAC regarding notice requirements, specifically.*

Form G-112 - Page 3

Side 1 Form G-112 INJECTION	WELL DATA SHEET			
OPERATOR:			-	
WELL NAME & API:				
WELL LOCATION:				
	FOOTAGE L	OCATION	UNIT LETTER	
SECTION	TOWNSHIP		RANGE	
WELLBORE SCHEMATIC	<u>C</u>		WELL CONSTRUCT	<u>ON DATA</u>
Include drilling BOPE Sett	up diagram with any special	drilling equipment för löw a Surface Casing Hole Size	ndthigh temperature geothern	nal environments.
		Gemented with:	Sx or	ft ³
		Top of Cement:	Method De	termined:
		Hole Size:	Casing Siz	\$ 2:
		Cemented with:	SX. 01'	ft ³
		Top of Cement:	Method De	termined:
A		Production Casing		
		Hole Size:	Casing Size	
		Top of Cement:	sx. <i>or</i> Method De	termined:
		Total Depth:		
		Injection Interval		
		Ya	feet to	·
		(Perforated or Open Hole	; indicate which)	
1				

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Side 2 Form G-112 INJECTION WELL DATA SHEET

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Tubin	g Size:Lini	ing Material:
Туре	of Packer:	
Packe	r Setting Depth:	
Other	Type of Tubing/Casing Seal (if applicable):	
<u>Addr</u>	<u>Ional Data</u>	
1.	Is this a new well drilled for injection?	No
	If <u>no</u> , for what purpose was the well original	Ily drilled?
2.	Name of the Injection Formation:	
3.	Name of Field or Pool (if applicable):	
4.	Has the well ever been perforated in any othe List all such perforated intervals and provide	er zone(s)?YesNo Splugging detail, i.e. sacks of cement or plug(s) used:
5.	Identify the <u>name(s)</u> and <u>depth(s)</u> of any oil	or gas zones underlying or overlying the proposed injection zone in this area:
~		

Chavez, Carl J, EMNRD

From: Sent: To: Dalmy, Andy ., RLD Tuesday, September 07, 2010 5:11 PM Chavez, Carl J, EMNRD; Hall, John, NMENV; Johnson, Mike S., OSE; Heber, David, OSE; Altomare, Mikal, EMNRD; Lucero, Stephen A., EMNRD; Olson, Bill, NMENV; Fesmire, Mark, EMNRD; 'Mike_Smith@blm.gov'; Martinez, Lisa, RLD; 'Adrienne.Brumley@blm.gov'; Brooks, David K., EMNRD; Baca, Jerome T., RLD; Pacheco, Rem, RLD; Aragon, Fermin, RLD; VonGonten, Glenn, EMNRD; Rappuhn, Doug H., OSE; Sizemore, Jim L., OSE; 'Black, Herb'; Hill, Larry, EMNRD; Dade, Randy, EMNRD; Perrin, Charlie, EMNRD; Martin, Ed, EMNRD RE: Geothermal Regulations & Programs Stakeholders Final Meeting

Subject:



Geothermal egulations Stakeho.

Carl and All,

For discussion tomorrow I've attached a short synopsis of how CID licensing functions may effect geothermal projects.

Andy Dalmy Licensing Manager New Mexico Construction Industries Division 2550 Cerrillos Road, Santa Fe, NM 87505 Phone(505)476-4673; Fax(505)476-4685; Cell(505)670-6078 E-mail: andv.dalmy@state.nm.us

----Original Appointment----From: Chavez, Carl J, EMNRD
Sent: Tuesday, September 07, 2010 6:36 AM
To: Hall, John, NMENV; Johnson, Mike S., OSE; Heber, David, OSE; Altomare, Mikal, EMNRD; Lucero, Stephen A., EMNRD; Olson, Bill, NMENV; Fesmire, Mark, EMNRD; Mike_Smith@blm.gov; Martinez, Lisa, RLD; Adrienne.Brumley@blm.gov; Brooks, David K., EMNRD; Dalmy, Andy ., RLD; Baca, Jerome T., RLD; Pacheco, Rem, RLD; Aragon, Fermin , RLD; VonGonten, Glenn, EMNRD; Chavez, Carl J, EMNRD; Rappuhn, Doug H., OSE; Sizemore, Jim L., OSE; Black, Herb; Hill, Larry, EMNRD; Dade, Randy, EMNRD; Perrin, Charlie, EMNRD; Martin, Ed, EMNRD
Subject: Geothermal Regulations & Programs Stakeholders Final Meeting
When: Wednesday, September 08, 2010 10:00 AM-12:00 PM (GMT-07:00) Mountain Time (US & Canada).
Where: Oil Conservation Division 3rd Floor Conference Room (Wendell Chino Bldg.) 1220 South St. Francis Dr., Santa Fe, NM 87505

Teleconference Information to be provided before meeting for phone callers.

Scheduled Conference Date:	Wednesday, September 8, 2010
Scheduled Start Time:	10:00 AM Mountain Daylight Time
Scheduled End Time:	12:25 PM Mountain Daylight Time
Scheduled # of Participants:	30
Type of Conference:	Web-Scheduled Standard
Dial-in Number:	1-213-289-0500 (Los Angeles)
Participant Access Code:	4509670
Server	



Conference Room Equipment: Projector, Laptop hooked up to Internet, USB Jumper drives for anyone wanting to show or discuss a topic, telephone to conference in callers who are unable to physically attend......

Call for Agenda Items. Please note that meeting minutes have been posted from the 8/4/2010 Meeting on OCD Online "UIC-999" for the upcoming meeting (see current agenda for next meeting below). Note that this will be the final meeting. OCD requests that the group stay focused on information provided to OCD thus far and consider any final thoughts for OCD consideration of the geothermal program in NM. OCD requests that at least one representative attend the final meeting.

Geothermal Regulations Stakeholder Work Group (GRSWG) Meeting

Oil Conservation Division- 1220 South St. Francis Drive, Santa Fe, NM 87505 (Wendell Chino Building)

Final Meeting Agenda (9/8/2010)

1) OCD G-107 through G-111 Forms

Review forms in brief detail together (mainly form upgrade to Microsoft Word)

G-101	Application for Permit to Drill, Deepen or Plug Back
G-102	Well Location and Acreage Dedication
G-103	Sundry Notice
G-104	Certificate of Compliance and Authorization to Produce
G-105	Well Log
G-106	Well Summary Report
G-107	Well History
G-108	Monthly Production Report
G-109	Monthly Purchaser's Report
G-110	Monthly Injection Report
G-111	Annual Temperature and Pressure Test
G-112	Application to Place Well on Injection

- 2) OCD Geothermal Resource Website update for discussion, feedback, etc. Review final webpage draft revisions in detail together
- 3) Other Permit Requirements, i.e., construction, electrical, etc.? Commercial geothermal power plant construction, buildings, power grids, electrical, plumbing permits, etc. is CID/RLD responsibility. How about on Federal or Indian Lands.... Does CID/RLD state permitting apply? Do local county and/or city governments have this type of permit authority?
- 4) Group Discussion: Open dialogue to flesh out any final remaining issues to resolve BLM, CID/RLD, DOI, ECMD, NMED, OCD, OSE & Other

Geothermal Regulations Stakeholder Work Group (GRSWG) Meeting

CID/RLD

CID/RLD- Big Picture: Responsible for permitting buildings and associated electrical (power grid), plumbing, etc. infrastructure for all renewable energy power projects in the state. Same as before, closed-loop systems (i.e., heat exchange) that are perceived to be geothermal, but are not and OCD webpage and G-100 Form should inform applicants where to go to get permits for these projects. OCD Form G-100 Form completion will help identify serious geothermal applicants and weed out non-serious inquiries.

- CID licenses contractors in all construction trades.
- CID issues permits only to licensed contractors.
- CID does not deal with the owners of projects other than advising them.
- Pursuant to statute and rule, only contractors who have a CID issued license in the appropriate license classification are authorized to contract or even bid on projects.
- A contractor who submits a bid to or contracts with a project owner without being validly licensed is subject to administrative action against the contractor, including fines/ penalties, and could cause delays.

CID license classifications that may be required for Geothermal Projects:

Electrical

Low voltage systems and controls

Medium voltage

High voltage

Plumbing/Mechanical/HVAC /Process Piping

Power Plants - Drilling, piping, pressure vessels, heat exchangers, boilers

Buildings

<u>Specialties</u> - Direction Drilling/Boring

CID website - <u>www.rld.state.nm.us/cid</u>.

Chavez, Carl J, EMNRD

From: Sent: To: Attachments: Hall, John, NMENV Tuesday, September 07, 2010 5:08 PM Chavez, Carl J, EMNRD NMEDGeothermal paragraph for OCD_9_7_10.doc

Carl,

I have attached a write up I did for the Green Energy Permitting Guidelines I did earlier this year. I tweaked it a bit for geothermal. I could not find the UIC-999 folder on the OCD Online webpage, so I did not have an example of the format you wanted. Anyhow, if this works, great, otherwise I can cast it into another format....

See you tomorrow,

John S. Hall UIC Coordinator Ground Water Quality Bureau New Mexico Environment Dept. (505)-827-1049 **Overview:** The role of the Ground Water Quality Bureau (GWQB) is to protect the environmental quality of New Mexico's ground water resources as mandated by the Water Quality Act and the Water Quality Control Commission (WQCC) regulations (20.6 NMAC), and to identify, investigate and clean-up contaminated sites which pose significant risks to human health and the environment. The GWQB

- Reviews Notice of Intent (NOI) forms for discharges or potential discharges (e.g., lagoons, underground tanks, surface discharges/disposal) to make formal determinations as to whether a ground water pollution prevention permit is necessary.
- Issues ground water discharge pollution prevention permits (DP) for discharges or potential discharges that may move directly or indirectly into groundwater
- Requires abatement of water pollution where contamination has occurred
- Has primacy for the federal Underground Injection Control (UIC) program, except for oil and gas facilities and geothermal facilities that are deemed incidental by the oil conservation division.
- Does not have authority on tribal land
- Does not have authority over local land use, nuisance, and/or zoning issues including flies, odors, dust, weeds or property values – administered at the county level

1.0 NOI (S)

A. STATUTORY AUTHORITY:

• Water Quality Act: NMSA 1978 §§74-6-1 through 74-6-17

B. REGULATIONS:

• Water Quality Control Commission (WQCC) regulations (20.6.2 NMAC).

C. SUMMARY OF NOI DETERMINATION PROCESS:

1. <u>Applicability</u>

Discharges that are not covered by a DP, have not been reported on an NOI form, and have the potential to impact ground water quality pursuant to the Water Quality Control Commission (WQCC) regulations (20.6.2 NMAC).

2. <u>Submission Requirements</u> Submit complete NOI <u>form</u>

Note: incidental geothermal energy discharges are regulated by GWQB generally as industrial or agricultural discharges. Therefore, the DP will not address the domestic waste discharges from a facility unless they are greater than 2,000 gallons per day. Domestic waste discharges 2,000 gallons per day or less require Liquid Waste Permits issued by the New Mexico Environment Department's Environmental Health Division.

3. <u>GWQB Responds</u>

Within 60 days GWQB will respond in writing notifying the discharger if a DP is required or not.

- 4. <u>Fees</u> None.
- 5. Appeal Process

Any appeal of the NOI determination that a Discharge Permit is required must be made to the New Mexico Water Quality Control Commission within 30 days of receipt of the determination letter, in accordance with Subsection B of 20.6.2.3112 NMAC.

D. ADDITIONAL INFORMATION:

Frequently asked questions

E. ADMINISTERING AGENCY:

John S. Hall UIC Coordinator (505)-827-1049 john.hall@state.nm.us

Ground Water Quality Bureau New Mexico Environment Department P.O. Box 5469 – 1190 St. Francis Dr. Santa Fe, New Mexico 87502-5469

(505)827-2900 Web site: <u>http://www.nmenv.state.nm.us/gwb/</u>

2.0 DP (S)

A. STATUTORY AUTHORITY:

• Water Quality Act: NMSA 1978 §§74-6-1 through 74-6-17

B. REGULATIONS:

• Water Quality Control Commission (WQCC) regulations (20.6.2 NMAC).

C. SUMMARY OF PERMIT PROCESS:

1. Applicability

Any Discharge for which a NOI determination that a Discharge Permit is required has been made must submit an application for a DP pursuant to the Water Quality Control Commission (WQCC) regulations (20.6.2 NMAC).

2. Submission Requirements

Submit three signed copies of complete DP Application <u>forms</u> and \$100 filing fee. Instructions are included with form. Please check the list of <u>guidelines</u> to see if any pertain to your facility.

3. Simplified Description of Procedures for Obtaining Permit

- GWQB rules application administratively complete or incomplete (takes about 4 weeks). If complete, GWQB prepares and sends the applicant's public notice materials for posting along with the Administratively Complete Letter.
- GWQB assigns DP application to technical staff member for technical review and drafting of permit
- When draft permit is available it is sent to applicant and GWQB posts its public notice announcing that the draft permit is available for review—this includes sending the announcement to any interested parties that contacted GWQB as a result of the applicant's public notice. The posting of GWQB's public notice starts a 30-day comment period in which anyone, including the applicant, can request a hearing.
- If there is no significant interest in having a hearing, the DP will be issued after the closing of the 30-day comment period.
- The permitting process typically takes six months to one year depending on factors such as the number of applications and renewals GWQB receives, GWQB staffing levels, the technical completeness and adequacy of the application, and whether or not a hearing is held. Hearings and any subsequent legal
 procedures can significantly delay DP issuance beyond one year.
- 4. <u>Fees</u>

\$ 100 application filing fee + permit fee. See table in Section 20.6.2.3114 NMAC of <u>WQCC regulations</u>.

5. Appeal Process

Applicant can request a hearing regarding the draft DP during the 30-day comment period described above. After the issuance of the DP the permittee may file a petition for review before the WQCC. Such petition must be in writing to the WQCC within thirty (30) days of receipt of the DP.

D. ADDITIONAL INFORMATION:

Frequently asked questions

E. ADMINISTERING AGENCY:

John S. Hall UIC Coordinator (505)-827-1049 john.hall@state.nm.us Ground Water Quality Bureau New Mexico Environment Dept P.O. Box 5469 – 1190 St. Francis Dr. Santa Fe, New Mexico 87502-5469

(505)827-2900 Web site: <u>http://www.nmenv.state.nm.us/gwb/</u>

Geothermal Regulations-Programs Stakeholder Group 8/4/2010

Geothermal Regulations Stakeholder Group (GRSWG) Meeting Oil Conservation Division- 1220 South St. Francis Drive, Santa Fe, NM 87505 (Wendell Chino Building)

Meeting Attendees: See sign-in sheet below.

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Name	DCD-Sonta Fre	ьЯ	814/2010
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J Hac	Nmz12-CHQ33	5-5-5-27-1049	Starlin. US Store. Mr. John Molle, US -
D Heber	DSE	505-982.2354	david heborastermin
Mikal Altor	are OCD	505.620-9024 m	. Kal. altomare Ostak. nu
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Teleconference Attendees: None

Meeting Minutes:

1) OCD seeks to update geothermal forms: G-101-106 & 112 Forms (G-112 replaces OCD C-108 Inject Form for geothermal injection and disposal)

The group spent the majority of the meeting reviewing the yellow highlighted forms below in detail together- agencies have until September 8, 2010 last meeting to make comments on these forms, but OCD will likely allow some additional time after the September meeting for final agency comments, etc. OCD will also work to have G-Forms 107 – 111 revised or updated to current day standards for its website and resource page.

G-101	Application for Permit to Drill, Deepen or Plug Back
G-102	Well Location and Acreage Dedication
G-103	Sundry Notice
G-104	Certificate of Compliance and Authorization to Produce
G-105	Well Log
G-106	Well Summary Report
G-107	Well History
G-108	Monthly Production Report

Geothermal Regulations-Programs Stakeholder Group 8/4/2010

G-109	Monthly Purchaser's Report
G-110	Monthly Injection Report
G-111	Annual Temperature and Pressure Test
G-112	Application to Place Well on Injection

Some G-100 Form discussions included: Add "Brief Summary" section above No. 7 for applicants to briefly explain project; No. 12 "Use Determination" questions for determining whether project is "Incidental Use" and outside of OCD Geothermal Regulations pose a challenge as regulation states "less than 250F and potable water" to be incidental; however, what if the water is non-potable water in the case of the Rio Rancho where Saline Ground Water is to be treated for public drinking water and heat will be extracted for direct use heating applications. NMED is overseeing this water treatment and geothermal project. Based on OCD's Geothermal Regs., this project may have been required to be permitted by OCD under its Section 12 questions and its regulations because the water is non-potable- not considered incidental use; however, the end use or product is public drinking water that NMED may be better suited to deal with. NMED expressed concerns about correlative rights issues once OCD deems an application to meet incidental use of the heat. NMED is not responsible for administering correlative rights. When applicants complete the G-100 Form, OCD must look at all ramifications of the project; i.e., public health, end product, etc. in consideration of making a determination. In addition, before making a final determination, the OCD must communicate with appropriate agencies to ensure the agencies are in agreement to assist in making an accurate final determination based on each geothermal project scenario where the G-100 Form is submitted. The issue of correlative rights was discussed where OCD makes an "Incidental Use" determination or exemption, there are no correlative rights for incidental users of the heat and NMED does not need to consider projects OCD related due to the correlative rights issue. However, if an incidental user wishes to claim its extraction of the heat is primary, then OCD could issue a geothermal permit, which would establish correlative rights under geothermal regulations in this case. OSE doesn't deal with correlative rights, but is concerned about sustainable flow for all appropriated users with emphasis on protecting early users rights under NM State Regs. This again reinforces the preferred isolation of geothermal projects away from multiple water appropriated areas, etc. that tend to prevent projects from being completed.

Some **G-101 Form** discussions included: replace "pool" with "pool or reservoir"; and replace well type "Geothermal Producer" with "High-Temp Geothermal."

Some G-102 Form discussions included replacing "pool" with "pool or reservoir."

Some **G-103 Form** discussions included: replace well type "Geothermal Producer" with "High-Temp Geothermal" and also add "Geothermal Production/Development."

Some **G-104 Form** discussions included: replace well type "Geothermal Producer" with "High-Temp Geothermal" and also add "Geothermal Production/Development"; No. 6 "Kind of Lease" add "Indian"; and No. III. Under Type of Product replace "Steam and Water" with "High Temp Thermal Water." Some G-105 Form discussions included: No.1 replace Type of Well "Geothermal Producer" with "Geothermal Production/Development "and add "Low Temp Geothermal"; No. 5 leas type add "Federal" and "Indian"; No. 6 State Oil & Gas Lease No. should be replaced by State Geothermal Lease No."; add more "Lithology Record" section on the second page to make room for information; under "SE NM and NW NM sections add "Other" field to each for alluvium, quaternary or other types of geology that may need to be described; under "Important Water Sands" replace this with "Important Water Bearing Zones" and include in text below it "was water fresh water < 10,000 mg/L Total Dissolved Solids."

Some **G-106 Form** discussions included: No. 2 separate "Fed/Indian" in this section; and No. 3 change to "Geothermal Lease No."

Some **G-112 Form** discussions included: No. 1 replace "UIC Class V Geothermal" with UIC Class V Injection"; also replace "UIC Disposal" with "Geothermal Disposal; and may want to add "Pool or Reservoir Name (if known)" somewhere at the beginning of form to help the agency identify correlative rights in and the pool or reservoir that it applies to; add "Land Type" and include State, Federal, Indian, etc.; and remove reference to "WQA" and replace with "WQCC."

2) OCD Geothermal Resource Website update for discussion, feedback, etc. (will continue to work on throughout meetings until final).

NMED would like to send more revisions to what it already sent to OCD with links for better customer service similar to what it did for AQB who was tasked with green jobs portion of the Executive Order to provide customer service on the geothermal process (only one of many renewables that it is working on to fulfill the Order.

Review webpage in detail together- agencies have until September 8, 2010 last meeting to make final comments, but will allow more time afterward to make sure all agencies are in agreement with the stakeholder process and the OCD documents that hopefully help to reinforce what the stakeholders agreed to during meetings and discussions, etc.

3) Group Discussion: Open dialogue to flesh out any remaining issues thus far.... Commercial geothermal power plants, grids and construction and electrical permits, etc. (Applicable, Relevant, Relevant and Appropriate Regulations- ARARs). Is this CID/RLD and/or local government responsibility?

BLM, DOI, CID/RLD, NMED, OSE, OCD, ECMD, & Other

CID/RLD was unable to attend the meeting. The group briefly discussed thought the County was responsible for construction permits, etc. On Federal Lands are there any Environmental Impact Statements or Department of Interior, etc. requirements that need to be addressed? The group would like to carry this forward to the next meeting where it hopes all members are in attendance.

Geothermal Regulations-Programs Stakeholder Group 8/4/2010

- 4) **BLM- Big Picture**: Involved in Geothermal Projects on Federal Lands along with the OCD. Identified some redundancies between agencies, (i.e., dual permitting, bonding, etc.) that the agencies may be able to address in the future through proper channels. Clarified that in heat exchange and closed-loop projects on Federal Lands, there will be no rent, royalties, etc. will be assessed on federal lands. Agency will elaborate further or clarify the above as necessary.....
- 5) **DOI- Big Picture**: Involved in Federal rent, royalty, etc. and may have recommendations for the group as we move toward the final meeting. Agency will elaborate further or clarify the above as necessary.....
- 6) CID/RLD- Big Picture: Same as before, closed-loop systems (i.e., heat exchange) that are perceived to be geothermal, but are not and OCD webpage and G-100 Form should inform applicants where to go to get permits for these projects. Agency will elaborate further or clarify the above as necessary.....
- 7) **NMED- Big Picture**: Involved where water is potable and open-loop systems are not permitted by the OCD. Agency will elaborate further or clarify the above as necessary......
- 8) **OSE- Big Picture**: Involved with any geothermal project where water is potable or appropriated and requires geothermal drillers to be certified water well drillers in NM on these projects. Agency will elaborate further or clarify the above as necessary.....
- 9) OCD- Big Picture: Everything basically the same except OCD now handles low-temp. Nursery and Aquaculture geothermal permitting. Previous interpretation of geothermal regulations was that OCD handled all geothermal projects greater than 250F and NMED handled projects below 250F, but OCD's February 2010 findings is that it has jurisdiction over low and high temperature geothermal projects. Currently Geothermal Regulations do not supersede other applicable state regulations and OCD with the stakeholder group has worked to develop a webpage that shows "who does what" in the co-permitting process, what is not considered geothermal, etc. Some confusion remaining on projects on what agency (County? CID/RLD, etc.) reviews the construction, electrical, plumbing engineering aspects of geothermal projects to make sure applicants are addressing local, state, and/or federal (i.e., Environmental Impact Statements- EIS on Federal Lands) requirements for these projects). Agency will elaborate further or clarify the above as necessary......
- 10) ECMD- Big Picture: Leading another Geothermal Working Group under Governor's Executive Order on Deep Source Geothermal Power Generation- development of database of deep source geothermal locations in the state, Policy and Technical Recommendations to streamline the geothermal permit process to make NM No. 1 in Renewable Energy. Report due to Governor on December 1, 2010. Interested in OCD's recent finding (Feb. 2010) that it also has jurisdiction over low-temperature geothermal in addition to high-temperature geothermal.
- 11) Miscellaneous: Hopefully all stakeholders will have at least one representative the final September 8, 2010 meeting.

12) Path Forward (next and final meeting September 8, 2010 Oil Conservation Division). OCD would like all agencies to have at least one representative at the last meeting to voice any final concerns, issues, recommendations, etc. to the group and for wrapping up the meetings.

Please contact Carl Chavez (OCD) at (505) 476-3490 if you have questions. Thank you.

Geothermal Regulations-Programs Working Group 8/4/2010

Geothermal Regulations Stakeholder Work Group (GRSWG) Meeting

Oil Conservation Division- 1220 South St. Francis Drive, Santa Fe, NM 87505 (Wendell Chino Building) (8/4/2010)

Meeting Attendees: See sign-in sheet below.

Teleconference Attendees:

Meeting Agenda:

1) OCD seeks to update geothermal forms: G-101-106 & 112 Forms (G-112 replaces OCD C-108 Inject Form for geothermal injection and disposal)

Review forms in detail together- agencies have until September 8, 2010 last meeting to make final comments

G-101	Application for Permit to Drill, Deepen or Plug Back
G-102	Well Location and Acreage Dedication
G-103	Sundry Notice
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G-109	Monthly Purchaser's Report
G-110	Monthly Injection Report
G-111	Annual Temperature and Pressure Test
G-112	Application to Place Well on Injection

2) OCD Geothermal Resource Website update for discussion, feedback, etc. (will continue to work on throughout meetings until final)

Review webpage in detail together- agencies have until September 8, 2010 last meeting to make final comments

3) Group Discussion: Open dialogue to flesh out any remaining issues thus far.... Commercial geothermal power plants, grids and construction and electrical permits, etc. (Applicable, Relevant, Relevant and Appropriate Regulations- ARARs). Is this CID/RLD and/or local government responsibility?

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BLM, DOI, CID/RLD, NMED, OSE, OCD, ECMD, & Other

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11) Miscellaneous

Geothermal Regulations-Programs Working Group 8/4/2010

12) Path Forward (next and final meeting September 8, 2010 with Location TBD)

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Please contact Carl Chavez (OCD) at (505) 476-3490 if you have questions. Thank you.

Geothermal Regulations-Programs Working Group 8/4/2010

Geothermal Regulations Stakeholder Work Group (GRSWG) Meeting

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Teleconference Attendees:

Meeting Minutes:

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BLM, DOI, CID/RLD, NMED, OSE, OCD, ECMD, & Other

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- 7) **NMED- Big Picture**: Involved where water is potable and open-loop systems are not permitted by the OCD. Agency will elaborate further or clarify the above as necessary......
- 8) OSE- Big Picture: Involved with any geothermal project where water is potable or appropriated and requires geothermal drillers to be certified water well drillers in NM on these projects. Agency will elaborate further or clarify the above as necessary.....
- 9) OCD- Big Picture: Everything basically the same except OCD now handles low-temp. Nursery and Aquaculture geothermal permitting. Previous interpretation of geothermal regulations was that OCD handled all geothermal projects greater than 250F and NMED handled projects below 250F, but OCD's February 2010 findings is that it has jurisdiction over low and high temperature geothermal projects. Currently Geothermal Regulations do not supersede other applicable state regulations and OCD with the stakeholder group has worked to develop a webpage that shows "who does what" in the co-permitting process, what is not considered geothermal, etc. Some confusion remaining on projects on what agency (County? CID/RLD, etc.) reviews the construction, electrical, plumbing engineering aspects of geothermal projects to make sure applicants are addressing local, state, and/or federal (i.e., Environmental Impact Statements- EIS on Federal Lands) requirements for these projects). Agency will elaborate further or clarify the above as necessary......
- 10) ECMD- Big Picture: Leading another Geothermal Working Group under Governor's Executive Order on Deep Source Geothermal Power Generation- development of database of deep source geothermal locations in the state, Policy and Technical Recommendations to streamline the geothermal permit process to make NM No. 1 in Renewable Energy. Report due to Governor on December 1, 2010. Interested in OCD's recent finding (Feb. 2010) that it also has jurisdiction over low-temperature geothermal in addition to high-temperature geothermal.

11) Miscellaneous

Geothermal Regulations-Programs Working Group 8/4/2010

12) Path Forward (next and final meeting September 8, 2010 with Location TBD)

Please contact Carl Chavez (OCD) at (505) 476-3490 if you have questions. Thank you.

	<u>District 1</u> 625 N. French Dr., Hobbs, NM 88240 <u>District 11</u> 301 W. Grand Avenue, Artesia, NM 88210 <u>District 111</u> 000 Rio Brazos Road, Aztee, NM 87410 <u>District 1V</u> 220 S. St. Francis Dr., Santa Fe, NM 87505	STATE OF NEW M ENERGY MINERALS AN RESOURCE OIL CONSERVATION 1220 South St. Fra Santa Fe, NM 8	1exico vd Natural s i Division ancis Dr. 37505	Revised July 1, 2010 FORM G-100 Submit Original Plus 1 Copy to Santa Fe I Copy to Appropriate District Office
		GEOTHERMAL PROJEC	<u>et Form</u>	
		New 🗌 Renewal [Modificatior	1
1.	DATE OF APPLICATION:	2. <u>C</u>	<u>)GRID (</u> if applica	ıble):
3.	Operator:		<u> 4884.</u>	
4.	ADDRESS:		<u> </u>	
5.	CONTACT PERSON:		Phone	ал. Зи
6.	LOCATION: /4	/4 Section	Township	Range
**	APPLICANT MUST SUBMIT A LARGE S	CALE TOPOGRAPHIC MAP SHOW	/ING EXACT LOCA	ATION WITH GPS COORDINATES.
7. 8. 9. 10 11.	Attach documentation specifying the site. If the facility site is comprised identify what portion of facility site Attach documentation specifying the the site location, and for each specif Attach documentation containing a con- pits, dikes and tanks on the facility. Attach documentation identifying all drilling/installation/site construction Specify whether there will be a grou- jurisdiction of the Office of the Stat USE DETERMINATION: a. Is the primary use of any water YES NO PROJECT b. If <u>NO</u> to "a." above, please and i. Is the extraction of heat." YES NO	e name, telephone number and a of more than one parcel, and no is owned by each by attaching e name, telephone number and a by what their interest(s) is(are). description of the facility with a l materials that are currently or nand/or during the regular cours ind water appropriation assoc e Engineer (OSE): YES _ N involved in the proposed proje T DOES NOT INVOLVE WATER iswer all three following questic incidental" to another beneficial	address of the lan ot all parcels are a diagram. address of the mini- address of the mini- diagram clearly will be stored or se of operations a ciated with the pro- O ct, the extraction R ons: l, primary use of	nd/surface owner(s) of the facility owned by the same landowner(s), neral right's interest holders for indicating the location of fences, used at the facility during at the facility. oposed project under the of the heat carried by that water? the water?
13.	ii. Is the water less than 250 YES NO iii. Is the water potable? YES NO *See WQCC Rule 20.7.10 NMAC rego Attach documentation identifying a average quality and daily volume of	^{**} F? <i>Inding drinking water standards</i> nd describing all present source: * waste water must be included.	s of effluent and	waste solids. Specification of

- 14. <u>Attach</u> documentation identifying and describing all current liquid and solid waste collection/treatment/disposal procedures.
- 15. <u>Attach</u> documentation specifying all proposed modifications to existing collection/treatment/disposal systems.

- 16. <u>Attach</u> documentation identifying and describing a routine inspection and maintenance plan for the facility/project that will ensure permit compliance.
- 17. <u>Attach</u> documentation detailing a contingency plan for the reporting and clean-up of spills or releases at the facility/project.
- 18. <u>Attach</u> documentation reflecting geological/hydrological information for the facility/project. Documentation of depth to and quality of ground water must be included.
- 19. <u>Attach</u> documentation detailing a facility closure plan, and any other information necessary to demonstrate compliance with any other OCD or WQCC rules, regulations and/or orders.
- 20. <u>APPLICANT-DESIGNATED GEOTHERMAL PROJECT TYPE(s)</u>:
- Open loop (single/multiple well for water withdrawal, water returned to a surface source)
- Open loop (single/multiple well for water withdrawal, water returned to a second well)
- Standing Column (single well for water withdrawal and water return)
- Closed-loop
- Other*

* Please note that heat pump systems (open or closed-loop) are <u>not</u> considered "geothermal" and are therefore not permitted through the OCD. These projects are handled directly by the Construction Industries Department/Regulation and Licensing Division (CID/RLD) and, where groundwater is potentially impacted, by NM Environment Dept. (NMED). <u>Inquiries and applications for permits relating to heat pump systems should be directed to CID/RLD and, where appropriate, to the NMED.</u>

ADDITIONAL IMPORTANT INFORMATION:

- OCD may require OSE certified water well drillers for certain projects.
- Applicants are responsible for contacting the appropriate Federal, State, Tribal and/or local government agencies responsible for rent, royalty and/or tax assessment.
- OCD approval of this application does not relieve operator of responsibility should their operations pose a threat to ground water, surface water, human health or the environment. In addition, OCD approval does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations.
- 21. <u>CERTIFICATION</u>: I hereby certify that the information submitted with this application is true and correct to the best of my knowledge and belief, and that I am authorized to so certify on behalf of the above-identified company/operator.

Name:			Title:	
Signature:	· ·			
E-mail Ado	lress:	<u></u>	 <u>Date</u> :	

STATE OF NEW MEXICO ENERGY MINERALS AND NATURAL RESOURCES

Form G-101 July 1, 2010

Submit one copy to appropriate District Office AND one copy to Santa Fe (Environmental Bureau)

AMENDED REPORT

OIL CONSERVATION DIVISION 1220 South St. Francis Dr. Santa Fe, NM 87505

**NOTICE – ALL GEOTHERMAL APPLICANTS MUST COMPLETE AND SUBMIT A FORM G-100 BEFORE SUBMITTING A FORM G-101 APPLICATION

APPLIC		N FOR PI	ERMIT TO	O DRILL, DE	EEPEN	NOR	PLUG-BAG	C K -	GEOTH	IERM	AL RES	OURCES WELI
			Operator Nam	e and Address			A	×.	N.	4 <u>0</u>	GRID Num	ber
							- P		30	<u></u> ,	API Number	
° Prope	rty Code				Property	Name	<u> </u>	L			• W	ell No.
		م ہ	roposed Pool 1					The second secon	10,	Proposed	Pool 2	
				⁷ S	urfac	e Loc	ation.			- Viller V		
UL or lot no.	Section	Township	Range	Lot Idn	Feet fro	om the	North/Southline		Feet from the	Eas	st/West/line	<u>County</u>
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UL or lot no.	Section	Township	Range		Feet fro	om the	North/South line		eet from the	Eas	st/West line	<u>County</u>
		!		Addition	nal W	ell In	formation				l	<u> </u>
¹¹ Work ²	Гуре Code	□ Geo □ Geo	thermal Producer othermal Disposa	¹² Well Type:	Low-Ter Explorate	np Geothe ory/Obser	ernal	¹³ Ct	ible/Rotàry		15 Gro	und Level Elevation
¹⁶ M	ultiple		Proposed Dep	pth	^{J8} For	mation		¹⁴ Léas	e Type Code			²⁰ Spud Date
		A	21	Proposed Ca	asing	and C	Cement Pro	grar	<u>n</u>			
Hole S	ze	Casir	ig Size	Casing weight/	foot	S	Setting Depth	epth Sacks of Cement Estimated TOC			Estimated TOC	
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1.24	<u>~~~</u>			<u> </u>		······						<u> </u>
22 Describe th	e proposec	llsprogram. If t	his application	is to DEEPEN or PL	UG BAG	CK, <u>give</u>	the data on the p	oresent	productive	zone and	proposed ne	w productive zone.
Describe the t	lowout pro	wention progra	um, if any. <u>Use</u>	additional sheets if i	necessary	<u>Y</u> .						
²³ I hereby certify that the information given above is true and complete to the best of my knowledge and belief and that I amauthorized to so certify on behalf					the chalf	OIL CONSERVATION DIVISION						
Signature					Approved by:							
Printed name:					Title:							
Title:					Approv	al Date:			Expiration	on Date:		
E-mail Addres	s:								l.			
Date:			Phone:			Conditi	ons of Approval A	attache	d 🗌			



District I 1625 N. French Dr., Hobbs, NM 88240 District H 1301 W. Grand Avenue, Artesia, NM 88210 District III 1000 Rio Brazos Rd., Aztec, NM 87410 District IV 1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico Energy, Minerals & Natural Resources Department OIL CONSERVATION DIVISION 1220 South St. Francis Dr. Santa Fe, NM 87505

Form G-102 Revised August 2, 2010 Attach a copy to each G-101 submitted (one copy to appropriate District Office AND one copy to Santa Fe Environmental Bureau)

☐ AMENDED REPORT

GI	EOTHE	ERMA	L RESOU	RCES	WELL LOCA	TION AND AC	REAGE DE	DICATION P	LAT
Í A	, <u>, , , , , , , , , , , , , , , , , , </u>		² Pool C	ode	³ Puôl [®] Namē				
⁴ Property Code				⁸ Property Name				6	Well Number
⁷ OGRID N	⁷ OGRID No. 8				⁸ Operator	Name			⁹ Elevation
	-				¹⁰ Surface	Location		VA.	
UL or lot no.	Section	Townshij) Range	Lot I	dn Feet from the	North/South line	Feet from the	East/West line	County
			¹¹ Bo	ottom H	lole Location 1	f Different Fron	n Surface		
UL or lot no.	Section	Township	Range	Lot 1	dn Feet from the	North/South line	Feet from the	East/West line	County
¹² Dedicated Acres	¹³ Joint or	· Infill	¹⁴ Consolidation	Code 15	Order No.	N.			

No allowable will be assigned to this completion until all interests have been consolidated or a non-standard unit has been approved by the division.

_			18.3M-66.107.	The second s	. (C.75-647)
ſ	16			· / * * * * * *	*** ¹⁷ OPERATOR CERTIFICATION
		<u> </u>			to the best of my knowledge and belief, and that this organization either
			NG V		owns a working interest or unleased mineral interest in the land including
		la de la companya de			the proposed bottom hole location or has a right to drill this well at this
					location pursuant to a contract with an owner of such a mineral or working
			A. Marian		interest, or to a voluntary pooling agreement or a compulsory pooling order
					heretofore entered by the division.
				i de la compañía de la	
				1	Signature Date
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	f and a				Printed Name
ľ					
					E-mail Address
	N 1944		1997 - C.		
┢					18 SURVEYOR CERTIFICATION
					<i>L</i> hereby certify that the well location shown on this plat
	, with the second se				was noted from field notes of actual survive mode his
					was protect from field notes of actual surveys made by
					me or under my supervision, and that the same is true
					and correct to the best of my belief.
		.ê.			



Submit I Copy To Appropriate District Office	State of New	Mexico	Form G-103 Revised August 2, 2010
<u>District 1</u> 1625 N. French Dr., Hobbs, NM 88240 District II	Energy, Minerals and F	Natural Resources	WELL API NO.
1301 W. Grand Ave., Artesia, NM 88210 District III	OIL CONSERVATI 1220 South St. I	ON DIVISION Francis Dr.	5. Indicate Type of Lease
1000 Rio Brazos Rd., Aztec, NM 87410 <u>District IV</u> 1220 S. St. Francis Dr., Santa Fe, NM 27505	Santa Fe, NM	1 87505	6. State Oil & Gas Lease No.
SUNDRY NOTICES & REPORT	S ON GEOTHERMAL RE	SOURCES WELLS	7. Lease Name or Unit Agreement Name
(DO NOT USE THIS FORM FOR PROPOSALS TO D USE "GEOTHERMAL APPLICATION FOR PERMIT 1. <u>Type of Well</u> :Geothermal Pro	RILL OR TO DEEPEN OR PLUG BACK TO " (<i>FORM G-101</i>) FOR SUCH PROPOSAL Dducer Low-Temp G) A DIFFERENT RESERVOIR. _S.) eothermal	8. Well:Number
Geothermal Dispo	osal/Injection LExplorator	y/Observation	
2. Name of Operator	·······		9. OGRID Number
3. Address of Operator			10. Pool or Reservoir name
4. Well Location			
Unit Letter:	feet from the		feet from theline
Section	Township	Range	NMPM County
	11. Elevation (Show whether	DR, RKB, RT, GR, etc.)	
		N.M.	
12. Check Ap	propriate Box to Indicate	Nature of Notice, l	Report or Other Data
		CNR	
		CASING/CEMENT	
	Ve.		
OTHER:		OTHER:	
13. <u>Describe</u> proposed or completed date of starting any proposed	ted operations. (Clearly state work). SEE RULE 19.15.7.14	all pertinent details, and NMAC. For Multiple	l <u>give pertinent dates</u> , including estimated Completions: Attach wellbore diagram of
proposed completion or recon	npletion.		<u>interes</u> consists angland of
Constant of the second s			
		1. All and the second s	
		Q4	
Spud Date:	Rig Release	e Date:	
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I hereby certify that the information above is true and complete to the best of my knowledge and belief and that I am authorized to so certify on behalf of the above-identified operator.

E-mail address:	PHONE:
TITLE	DATE
	E-mail address:

Conditions of Approval (if any):

District 1 1625 N. French Dr., Hobbs, NM 88240 District II 1301 W. Grand Avenue, Artesia, NM 88210 District III 1000 Rio Brazos Rd., Aztec, NM 87410 District IV 1220 S. St. Francis Dr., Santa Fe, NM 87505 State of New Mexico Energy, Minerals & Natural Resources

> Oil Conservation Division 1220 South St. Francis Dr. Santa Fe, NM 87505

Form G-104 Revised August 2, 2010

Submit one copy to appropriate District Office <u>AND</u> one copy to Santa Fe (Environmental Bureau)

AMENDED REPORT

CERTIFICATE OF COMPLIANCE AND AUTHORIZATION TO PRODUCE GEOTHERMAL RESOURCES

I.												
Operator N	lame							² Operator Ad	dress			
								³ OCDID Nup				
								OGKID Null	iner .			
⁴ API Numb	er	5	Leas	se Name				⁶ Kind of Leas	e (Fee, Fed or State)			
30 - 0	_							$= \frac{1}{2} \frac{1}{1 + 1} \frac{1}{1$				
⁷ Well Name & Number ⁸ Type of Well								⁹ Reason for Filing				
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			¹ Gec	othermal I	Disposal/Ir	niection		Change in Ownership Designation of Purchaser				
			Evr		Observatio	n .		Diher(pleas)	sevilain)			
			DAF	nonation yr	56361 4410			_ Other(please				
									<u> </u>			
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¹⁰ <u>Su</u>	rface Lo	ocation							· · · ·			
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[^{7*}] hereby cer [been complied	tify that th Lwith and	e rules o that the	f the infor	Oil Cons mation et	ervation D ven above	ivision have		<u>OIL CONSER</u>	VATION DIVISIO	<u>ON</u>		
complete to th	e best of n	ny know	ledge	e and belie	ef and that	1 am						
authorized to so certify on behalf of the above-identified operator.												

						}	³ OGRID Num	ber			
⁴ API Number ⁵ Lease Name 30 - 0							⁶ Kind of Leasé (Fee, Fed or State)				
⁷ Well Name & Number ⁸ Type of Well							⁹ Reason for Filing				
		Geo	othermal P	roducer	□Low-Te	mp Geothermal	□ New Well	□ _{Recom}	pletion		
		Geo	othermal [Disposal/Ini	iection	·	Perchange in Ownershin Designation of Purchaser				
			oloratory/(Observation)		Dither(please	e expláin)			
II. ¹⁰ Su	rface Loo	ation						:	· · · .		
Ul or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South Line	Feet from the	East/West line	County		
¹¹ Bo	ttom Hol	e <u>Locati</u> c	on								
UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County		
III. ¹² <u>Type of Product</u> ¹² Dry Steam											
Product will be used for:											
⁴² I hereby ce been complie complete to th authorized to Signature:	rtify that the d with and he best of m so certify o	e rules of th hat the info ny knowledy n behalf of	e Qil Cont rmation g ge and beli the above-	Servation D iven above of and that identified	vivision have is true and I am operator.	OIL CONSERVATION DIVISION Approved by:					
Printed name	- <u></u>					Title:					
Title:						Approval Date:					
E-mail Addre	SS:										
Date:		PI	none:		-						

-

District I 1625 N. French Dr., Hobbs, NM 88240 District II 1301 W. Grand Avenue, Artesia, NM 88210 District III 1000 Rio Brazos Rd., Aztec, NM 87410 District IV 1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico Energy, Minerals & Natural Resources

> Oil Conservation Division 1220 South St. Francis Dr. Santa Fe, NM 87505

Form G-105 Revised August 2, 2010

Submit one copy to appropriate District Office AND one copy to Santa Fe (Environmental Bureau)

			PA 4	
	GEOTHERMAL RESOURCES WELL LOC	z	WELL APINO.	
	GEOTHERMAL RESOURCES WELL LOC	<u>-</u>	5. Indicate Type of Lease	
			STATE _ FEE [
		40	6. State Oil & Gas Lease No.	
			. <u> </u>	
<u>1</u> .	Type of Well: Geothermal Producer Uow-Temp G	eothermal	7. Lease/ <u>Unit</u> Name	
	Geothermal Disposal/Injection			
	Exploratory/Observation		8. Well Number	
2.	Name of Operator		9. OGRID Number	
3.	Address of Operator	100 V	10. Pool or Reservoir Name	
	4ther			
4.	Well Location	, 6%		
	Unit Letter:feet from the	line and	feet from theli	ne
	Section Township Range	NMPM	County	
		65.0 v.	-	
			H.	

This form is to be filed with the appropriate District Office of the Division not later than 20 days after the completion of any newly-drilled or deepened well and not later than 60 days after completion of closure. When submitted as a completion report, this shall be accompanied by one copy of all electrical and radio-activity logs, directional surveys, physical or chemical logs, water analyses, tests and temperature surveys run on the well and a summary of all special tests conducted, including drill stem tests. All depths reported shall be measured depths. In the case of directionally drilled wells, true vertical depths shall also be reported.

LITHOLOGY RECORD (Attach additional sheet if necessary)

From	To Thickness	Lit	hology	From	То	Thickness In Feet	Lithology
- ()							
		4 ¹					
Form G-105 Page 2

INDICATE FORMATION TOPS IN CONFORMANCE WITH GEOGRAPHICAL SECTION OF STATE

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T. 7 Rivers	T. Devonian		T. Cliff House	_ T.Leadville
T. Queen	T. Silurian		T. Mcnefée	T. Madison
T. Grayburg	T. Montoya		T. Roint Lookout	T. Elbert
T. San Andres	T. Simpson		T Mancos	T. McCračken
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OIL OR GAS SANDS OR ZONES

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IMPORTANT WATER SANDS

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I hereby certify that the information above is true and complete to the best of my knowledge and belief and that I am authorized to so certify on behalf of the above-identified operator.

SIGNATURE	<u> </u>	TITLE	DATE	
Type/ print name_		E-mail address:		
PHONE:		- · · ·		

District I	Hobby NM	1 99040		Sta	te of Ne	w Mex	lico			Forn	<u>n G-1</u>	06	Revised /	August	3, 2010
District II	110005, 1994	1 88240	En	ergy, Min	erals and	i Natura	al Res	ources		Submit Santa F	1 copy to Fe (Enviro	 Appropria onmental Bi 	areau)	Office	AND I copy to
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GEOT	THERM	AL RESOU	RCES	WELL	SUMM	ARY I	REPO	RT		- Con				and the	ar Secondary - cores ar
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9. Type of Cor	mpletion: WELL	WORKOVER] DEEPE	NING ∏PI	LUGBACK	DIFF	ERENT	RESERA	/OIR	оті	HER				
10. Reservoir:									<u>n.</u> Nationi				<u>.</u>		
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12. Date Spuddec	d 13. Date	e T.D. Reached	14. D	ate Rig Relea	ised		15. Di	ite Comp	leted (F	Ready to	5°Produce		6. Elevátio BR, etc.)	ns (DF	F and RKB, RT,
17. Total Measur	ed Depth of	Well	18. Pl	ug Back Mea	asured Deptl	h	19. W	/as Direct	tional S	urvey N	Aade?	20. Ty	be Electric	and Ot	ther Logs Run
21. Producing Int	terval(s), of	this completion -	Top, Bott	om, Name	N.	ilian.					3				
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27.				PRODI	CTION	TEST	DAT	A	!	<u>.</u>					
DATE	Static Test Well H	t Shut-in Head		<u>Total</u>	Mass Flo	w Data						<u>Separat</u>	or Data		
a constant	emp [*] F	Pres. Psig	bs/Hr 🐄	Temp F	Pres.Psig	©. "Enthal	py 💱	Orifice	Wate	er cuFt/l	Hr Stea	ım Lbs/Hr	Pres Psig		Temp [*] F
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Temperature I	log Depth	s:				Electric	al Log	Depths:							
31. If an on-site on-site burial: I.	burial was .atítude	s used at the wel	l, report <b>Longi</b>	the exact lo tude	cation of t	he 32 	2. If a te temp	emporary orary pit	/ pit w	as usec	l at the v	well, <u>attac</u>	<u>h</u> a plat w	ith the	e location of

I hereby certify that the informati	on shown on both sides of this form is i	true and complete to the best of m	y knowledge and belief and that I					
am authorized to so certify on behalf of the above-identified operator.								
	Printed							
Signature	Name	Title	Date					
E-mail Address								



istrict 1 1625 N. French Dr., Hobbs, NM 88240 District 11 1301 W. Grand Avenue, Artesia, NM 88210 District 111 1000 Rio Brazos Road, Aztec, NM 87410 District 1V 1220 S. St. Francis Dr., Santa Fe, NM 87505

#### STATE OF NEW MEXICO ENERGY MINERALS AND NATURAL RESOURCES

OIL CONSERVATION DIVISION 1220 South St. Francis Dr. Santa Fe, NM 87505 Revised June 30, 2010

Submit Original Plus 1 Copy to Santa Fe 1 Copy to Appropriate District Office

Form G-112

Ŧ	Application to Place Well on Injection - Geothermal Resources Area
<u>1.</u> 1.	*PURPOSE: UIC Class V Geothermal UIC Disposal
2.	Applicant believes application qualifies for administrative approval? Yes No <u>If Yes</u> – Basis?
3.	DISTRICT: 3. OGRID:
4.	OPERATOR NAME:
5.	Address:
6.	CONTACT PERSON:PHONE:
7.	*WELL LOCATION:/4/4 SectionTownship Range
8.	*Well Name:
9.	WELL DATA: Provide the requested data and information in Section II, Well Data, below, and complete the attached "Injection Well Data Sheet" for each well proposed for injection. Additional sheets may be attached if necessary.
	*If this application is being used for more than one well sattach additional sheets providing the information requested by Nos.1, 7an d 8, above.
10.	Is this an expansion of an existing project? Yes In No If yes, identify the Division order number authorizing the existing project:
11.	Is the well injection zone located within a potash or oil and gas production zone? Yes INO
12.	Attach a map that identifies all wells and leases within two miles of any proposed injection well with a one-half mile radius circle drawn around each proposed injection well. This circle identifies the well's area of review.
13.	Attach a tabulation of data on all wells of public record within the area of review which penetrate the proposed injection zone. Such data shall include a description of each well's type, construction, date drilled, location, depth, record of completion, and a schematic of any plugged well illustrating all plugging detail.
14.	Attach data for the proposed operation, including:
	a) Proposed average and maximum daily volumetric rate of injection;
	b) Whether the system is open or closed;
	c) Proposed average and maximum surface injection pressure and depth to top of perforated or injection interval;
	d) Sources and an appropriate analysis of injection fluid and compatibility with the receiving formation if other than reinjected produced water; and,

e) If injection is for disposal purposes into a zone not productive of oil or gas at or within one mile of the proposed well, **<u>attach</u>** a chemical analysis of the disposal zone formation water (may be measured or inferred from existing literature, studies, nearby wells, etc.).

thickness, and depth. <u>Specify</u> the geologic name, and depth to bottom of all underground sources of drinking water (aquifers containing waters with total dissolved solids concentrations of 10,000 mg/l or less) overlying the proposed injection zone, as well as any such sources known to be immediately underlying the injection interval. *Note that proper GEOTHERMAL RESOURCE FORMS should be used to collect, document and submit well information to the OCD.* 

- 16. <u>Provide</u> a description of the proposed stimulation program, if any.
- 17.# <u>Attach appropriate logging and test data</u> on the well. (If well logs have been filed with the Division, they need not be resubmitted). Note that proper GEOTHERMAL RESOURCE FORMS should be used to collect, document and submit well information to the OCD.
- 18.# <u>Attach a chemical analysis of fresh water from USDW(s)</u> from two or more fresh water wells (if available and producing) within one mile of any injection or disposal well, with such analysis including documentation of the location and depth of the wells, specification of the type(s) of aquifer(s) (i.e., water table, confined, etc.) and the dates samples were collected.
- 19. Applicants for injection/disposal wells must <u>make an affirmative statement</u> that they have examined available hydro-geologic, geological engineering, and geophysical data and have evaluated the project risks and public safety from human caused seismicity that could be caused by the well to populated areas where open faults, fractured bedrock, and/or any other hydrologic connection between the injection/disposal zone(s) and any underground sources of drinking water.
- 20. Applicants must complete the "Proof of Notice" (Section III) on following page of this form.
- 21. CERTIFICATION: I hereby certify that the information submitted with this application is true and correct to the best of my knowledge and belief, and that I am authorized to so certify on behalf of the above-identified company/operator.

Title: Name: Signature:_ Date E-mail Address:

# - If the information required under Nos. 15, 17 and 18, above, has been previously submitted, it need not be resubmitted. Please specify the date(s) and circumstances of the earlier submittal:

#### II. WELL DATA

- 21. The following well data must be submitted for <u>each</u> injection well covered by this application. The data must be both in tabular and schematic form and shall include:
  - a) Lease name; Well No; Location by Section, Township and Range; and footage location within the section.
  - b) Each casing string used with its size, setting depth, sacks of cement used, hole size, top of cement, and how such top was determined.
  - c) A description of the tubing to be used including its size, lining material, and setting depth.
  - d) The name, model, and setting depth of the packer used or a description of any other seal system or assembly used.

Division District Offices have supplies of Well Data Sheets which may be used or which may be used as models for this purpose. Applicants for several identical wells may submit a "typical data sheet" rather than submitting the data for each well.

- 22. The following must be submitted for <u>each</u> injection well covered by this application. All items must be addressed for the initial well. Responses for additional wells need be shown only when different. Information shown on schematics need not be repeated.
  - a) The name of the injection formation and, if applicable, the field or pool name.
  - b) The injection interval and whether it is perforated or open-hole.
  - c) State if the well was drilled for injection or, if not, the original purpose of the well.

Form G-112 - Page 2

- d) Give the depths of any other perforated intervals and detail on the sacks of cement or bridge plugs used to seal off such perforations.
- e) Give the depth to and the name of the next higher and next lower oil or gas zone in the area of the well, if any.

#### III. Notice Requirements for Geothermal Wells

- 23. Is the proposed site within the corporate limits of any city, town or village of the state? Yes No
  <u>If Yes</u> Applicant must <u>attach</u> proof that notice of intention to drill such well has been given to the duly constituted governing body of such city, town or village or its duly authorized agent. (See Geothermal Rule 19.14.21.8.B NMAC).
- 24. Applicant is further required to provide a copy of this Form G-112 to **all other geothermal lease owners**, if any there be, **within a one-half mile radius** of the proposed geothermal well (See Geothermal Rule 19.14.93.8.B NMAC, providing a 20 day waiting period during which such neighboring lease owners may submit objections for consideration by the Division Director).

<u>Please identify</u> by name and address the geothermal lease owners within a one-half mile radius to whom Applicant is providing a duplicate of this completed G-112 form:

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**NOTE:** A discharge permit under the Water Quality Act/Water Quality Conservation Commission Rules is also required for a Geothermal well, and carries additional, separate notice requirements. *See WQA Rules 20.6.2.3101-3114 and 20.6.2.5001-5210 NMAC regarding discharge permits and injection wells, generally, and WQA Rule 20.6.2.3108 NMAC regarding notice requirements, specifically.* 

Side 1 Form G-112 INJECTIO	N WELL DATA SHEET				
OPERATOR:				<u></u>	
WELL NAME & API: _					
WELL LOCATION:					
	FOOTAGE LC			. I ER	
SECTION	TOWNSHIP		RANGE		
WELLBORE SCHEMAT	<u>[]C</u>		WELL CONST	<u>RUCTION DATA</u>	
		Surface Casing Hole Size:	Ca:	sing Size:	
		Cemented with:			ft ³
		Top of Cement:	Me	thod Determined:	
		Intermediate Casing			
	633.	Hole Size:	Cas	sing Size:	
		Gémented with:		, <u></u>	
			SA. 0/ _		I(
		Top or cement:	Wie	Inod Determined:	
		Hole Size:	Cas	ing Size:	
		Cemented with:	SX. Or _		ft ³
		Top of Cement:	Mer	thod Determined:	
		Total Depth:			
City .		Injection Interval			
			feet to		
		(Perforated or Open Hole;	; indicate which)		

#### Side 2 Form G-112 INJECTION WELL DATA SHEET

Tubin	g Size:	Lining Material:
Туре	of Packer:	
Packe	r Setting Depth:	
Other	Type of Tubing/Casing Seal (if applicable	e):
ADDE	ΓΙΟΝΑL DATA	
1.	Is this a new well drilled for injection?	<u>Yes</u> <u>No</u>
	If $\underline{no}$ , for what purpose was the well or	riginally drilled?
2.	Name of the Injection Formation:	
3.	Name of Field or Pool (if applicable):	
4.	Has the well ever been perforated in an List all such perforated intervals and p	ny other zone(s)?YesNo provide plugging detail, i.e. sacks of cement or plug(s) used:
5.	Identify the <u>name(s)</u> and <u>depth(s)</u> of a	any oil or gas zones underlying or overlying the proposed injection zone in this area:

New Mexico Energy, Minerals and Natural Resources Department

# Oil Conservation Division (OCD) Geothermal Resource Guide

The New Mexico OCD is the state agency primarily responsible for the regulation of geothermal resources pursuant to the <u>Geothermal Resources Conservation Act (Act)</u> (NMSA  $\S71-5-1$  *et.seq.*), and the associated <u>Geothermal Rules and Regulations</u> ( $\S\$19.14.1 - 19.14.132$  NMAC), and is responsible for administering all geothermal permit.applications submitted in New Mexico.



• Education of applicants regarding which other state agencies they may be required to work with for various types of projects.

(Draft Revised: 6/22/10)

Depending on the nature of the particular project, applicants may be required to work with one or more of the following <u>State</u> Agencies

<u>Geothermal Projects</u>¹:

- <u>OIL CONSERVATION DIVISION (OCD Environmental</u> <u>Bureau</u>),
- <u>Office of the State Engineer</u> (<u>OSE</u>),
- <u>New Mexico Environment Department</u> (<u>NMED</u> -Ground Water Quality Bureau),

• <u>REGULATION & LICENSING DEPT. /CONSTRUCTION</u> <u>INDUSTRIES DIVISION (RLD/CID</u>-<u>Mechanical</u> <u>Bureau</u>).

OCD - ENVIRONMENTAL BUREAU

GEOTHERMAL PERMITS: POWER GENERATION & DIRECT USE DISCHARGE PERMITS/UIC PERMITTING

**GEOTHERMAL PERMITS:** The use or extraction of a geothermal resource (as defined by the Act), whether for power generation or for the intentional direct use of the heat, requires the acquisition of an OCD <u>GEOTHERMAL PERMIT</u>. This potentially includes:

- open-loop (wells that inject or dispose into subsurface formations) and closed-loop (opposite of open-loop) systems associated with geothermal power generation (i.e., co-geothermal production) or production (i.e., sale and inter-intrastate transmission of power via an electrical grid system(s));
- direct-use (open loop) applications such as nurseries and aquaculture; and
- anywhere an applicant seeks to install injection wells into subsurface formations primarily for the purpose of use of geothermal heat.

# **OCD** GEOTHERMAL FORMS TO APPLY TO RECEIVE A PERMIT ARE AVAILABLE ON THE <u>OCD WEBSITE</u>.

¹ Discussed in further detail below, these projects do not meet the definition of "geothermal resource" under the Act; however, information is provided here for applicants of Quasi-Geothermal Projects in an attempt to clarify what the appropriate agency(ies) is(are) for purposes of submission of applications.

The permitting process for geothermal resource projects through the OCD is set out in the <u>Geothermal Resources Conservation Act</u> and the <u>Geothermal Rules and Regulations</u> (Rules), and all applications submitted to the OCD must comply with the requirements outlined in the Rules and Regulations. Geothermal permit fees are currently specified in <u>20.6.2.3114 NMAC Table 1</u>: \$100 filing fee that must accompany the application(s), and if approved, a final \$1,700 permit fee (good for 5-years) will be issued.

A new geothermal project is initiated with the filing of a Form G-100 Geothermal Project Form, which is submitted to the OCD Environmental Bureau (EB) for review.

- Once the EB has received a complete Form G-100 with all necessary information and attachments for review (*Note: all questions must be answered for administrative completeness*), the EB will then review the Form G-100 and will determine bas ' the information submitted whether is appropriate for the applicant to noce with an application for a Geothermal Permit (G-<u>101 Application to prill, 1 epen or Plug Back-Geothermal Resources</u>), and will determine what if any other permits may be required from the OCD for the project (such a ischar or injection permits).
  o Forms 101 a row hall be submitted for any geothermal project well type with a pogrimic map (generally 7.5 Minute Quadrangle) of to dis a yeach well'location for spacing requirements. In addition, a Gaussian contract of the submitted for each project injection or disposal wells
  - Note that geothermal projects involving an existing oil or gas well will require submittal of G-101, 102 and G-103 Forms.
- Once exploration is completed and the permittee desires to proceed with the project, there are forms requesting approval to produce/develop and/or inject that must be submitted for each well. The remainder of the G-Forms are to be completed during exploration to verify that the geothermal resource(s) is adequate, and must be submitted to the OCD for its Administrative Record. The OSE should be contacted early in the permit process where there will likely be water appropriation issues associated with a geothermal project relying on potable drinking water, etc.
- The OCD will also use the information provided in the G-100 to attempt to assist the operator in determining what other permits may be required from *other* state agencies to move the project forward, depending on the nature of the particular project.

Once the EB has determined that it is appropriate for the applicant to proceed with submission of a <u>G-101 Geothermal Application</u>, the applicant submits the G-101to the EB along with a Form <u>G-102</u> (*geothermal resources well location plat*) as provided in the <u>Rules</u>. Upon receipt of a complete set of G-101 and G-102 forms and all required attachments, the EB will review the application and issue an approval, approval with modifications or denial with explanation of denial as set forth in the <u>Rules</u>.

**DISCHARGE & INJECTION PERMITS:** As delegated by the Water Quality Control Commission (WQCC), the OCD has been given responsibility for the administration and enforcement of WQCC regulations that pertain to surface and ground water protection or discharges "at oil and natural gas production sites, oil refineries, natural gas processing plants, <u>geothermal installations</u>, carbon dioxide facilities, natural gas transmission lines, and discharges associated with activities of the oil field service industry"². Similarly, the OCD has been delegated the responsibility by the <u>EPA</u> (with some collaboration with the order of the oil field service industry is state agencies) for the administration of the Underground Injection (antroi IIC) program in New Mexico, and UIC permits for injection wells related to be oil a digas industry and geothermal installations.

Under the Geothermal source Conservation Act, the OCD has been given the specific authority to perform the injection of fluids into geothermal reservoirs and low-temperature and thermal reservoirs and to regulate the disposition of for its esidue, and ensure that any such disposal affords and inst co amination of protectable waters. In short the OCD is associated with geothermal projects, regardless of the esidue in the transmitting water produced from geothermal wells or other geothermal RCRA exempt fluids.

#### Geothermal Applicants should consider the following:

- If a geothermal project involves injection well(s), a <u>DISCHARGE PERMIT</u>, and an <u>APPLICATION TO PLACE WELL ON INJECTION-GEOTHERMAL</u> <u>RESOURCES AREA-</u> (FORM G-112) for each injection well, will be required.³ A CERTIFICATE OF COMPLIANCE AND AUTHORIZATION TO PRODUCE-(FORM G-104) for each production/development well, will also be required.
- If the project involves other actual or potential discharges that may adversely affect surface water or groundwater, a **<u>DISCHARGE PERMIT</u>** may be required even if injection wells are not contemplated.

Note that any well bore into fresh ground water may require an OSE Certified Water Well Driller with the exception of geothermal power facilities where drillers with oil, gas and geothermal

² WOCC Delegation of Authority to OCD for Geothermal Activities in New Mexico

³ If the project is located in Indian Country, as defined in 18 U.S.C. Section 1151, a UIC injection permit from USEPA may also be required.

expertise have experience protecting fresh water (<= 10,000 mg/L TDS) during drilling and well completion.

#### Click HERE⁴ for New Mexico Legal References relating to the OCD's Regulatory Authority regarding geothermal resources.

# RLD/CID-MECHANICAL BUREAU

#### GROUND-SOURCE HEAT-PUMPS/ "GEOTHERMAL" HVAC SYSTEMS: QUASI-GEOTHERMAL PROJECTS

Ground Source "Geothermal" HVAC systems, heat-exchange, heat pumps, and directuse open and closed-loop heating systems are used for the heating and cooling of buildings. These systems most typically utilize a closed-loop pipe system for the transfer of heat to and for double indices and the earth and are characovized by piping that both begins and terminates the same piece of heating or cooling equipment or appurtenance. These systems in a use either an approved chemical transfer media or a water based media, are used for siman comfort and are not used in the processing or manufacturing of a prod

Although sometimes reheat-pump systems are DTc, sified as geothermal," in New Mexico, ground-source DTc, sified as geothermal because they do not meet the definition of a "geothermal tree" as defined in the Act. These projects are therefore referred to for a "geothermal" but do not actually rise to the level of the criteria for "geothermal resource" set out in the Act.

Because ground-source heat-pump systems do not utilize geothermal resources as defined in New Mexico, they **DO NOT** require a geothermal permit through the <u>OCD</u>.

⁴ New Mexico Oil Conservation Division- Environmental Bureau, Chapter 71: Energy & Minerals, Article 5: Geothermal Resources Conservation Act, <u>Chapter 71, Article 5 NMSA 1978</u> /// Title 19: Natural Resources & Wildlife, Chapter 14: Geothermal Power, <u>Title 19, Chapter 14 NMAC (11-15-83 Recompiled 12-31-01)</u> /// Title 20: Environmental Protection, Chapter 6 Water Quality, Part 2 "Ground and Surface Water Protection" (<u>20.6.2</u> <u>NMAC</u>) and Part 4 "Standards for Interstate and Intrastate Surface Waters" (<u>20.6.4 NMAC</u>). /// <u>WQCC</u> <u>Delegation of Authority</u> to OCD for Geothermal Activities in New Mexico

⁵ Information regarding the permitting of these systems is included here as a courtesy in an attempt to better inform applicants regarding the proper permitting processes for such projects, and given that the OCD anticipates that applicants may assume that the OCD is the appropriate agency from whom to seek permits and/or information for such projects since they are commonly referred to as "geothermal."

Other types of permits are, however required for these systems. <u>The principal permits</u> required for these systems are administered by the RLD/CID Mechanical Bureau.

Note that any well bore into fresh ground water may require an OSE Certified Water Well Driller and may require approval from <u>NMED Groundwater Quality Bureau</u>, and any project involving water appropriation may require a permit from the <u>OSE</u>.

# NMED – GROUND WATER QUALITY BUREAU

#### DISCHARGE PERMITS: GROUND-SOURCE HEAT-PUMP SYSTEMS & FACILITIES MEETINC INCIDENTAL USE EXCEPTION

NMED is responsible for regulation of those facilities with discharges or the potential for discharges that fall outside the scope of the authority of the OCD in that they are not facilities involved is  $d^{1}$  extraction or use of a geothermal propurce (and are likewise not within the a more of the OCD as wells regulated under the <u>Oil-and Gas</u> <u>Act</u>).

Of particular relevance o the opic of geothermal/quasi-geothermal, NMED is responsible for the regulation of any GROUND SOURCE HEAT-PUMP/HVAC SYSTEM with the potential to in oundwater, and is responsible for regulation of any facilities that have the pential to impact groundwater and that meet the criteria for the "INCIDENTALAUSE" | Lo the definition of "geothermal resource" under the Act. The division of IMED esponsible for handling these matters is the Ground Water Quality Bureau (C 7QB).

- NMED requires that a <u>Notice of Intent (NOI</u>) be filed with the GWQB for Ground Source heat pump/HVAC systems that are large (provide heating and/or cooling for large buildings or complexes of buildings), use other than standard technologies or construction, or are used for industrial or manufacturing purposes.
- Small systems for individual residences or small businesses, offices, or apartment buildings need *not* submit a NOI, <u>provided that the systems have been approved by RLD/CID.</u>

Note that any well bore into fresh ground water may require an OSE Certified Water Well Driller.

#### <u>Click HERE</u>⁶ for New Mexico Legal References relating to the NMED's <u>Regulatory Authority.</u>

⁶ New Mexico Environment Department- Ground Water Quality Bureau, Title 20: Environmental Protection, Chapter 6 Water Quality, Part 2 "Ground and Surface Water Protection" (20.6.2 NMAC) and Part 4 "Standards for Interstate and Intrastate Surface Waters" (20.6.4 NMAC).

# S OSE

#### WATER RIGHTS: PERMIT REQUIRED FOR WATER APPROPRIATION

**OSE REGULATORY AUTHORITY**: The constitution and statutes of the State of New Mexico set forth procedures for appropriating the public waters of the state for beneficial use. The New Mexico Office of the State Engineer (OSE) administers the rules and regulations governing groundwater withdrawals and use in the State of New Mexico.

**OSE PERMITTING:** The same procedure is followed to obtain a permit to appropriate groundwater for geothermal use as would be followed for any other non-domestic groundwater applications.

- The permitting property started with the filing of an applice on with the OSE, most component only me <u>Application for Permit to Appropriate</u> Underground Wate (form VR-05), which requires the applicant to submit information on the cation, f the well, the amount of water to be withdrawn, the source, the intersed us and other related data.
  - If the ground there is in which a permit is sought is closed to new appropriation ther he first step would instead be to file an application to ansfe valid existing water right. The <u>Application to</u> Change Loc on of well and Place and/or Purpose of Use of

<u>Underground</u> <u>later</u> (<u>f rm WR-08</u>) is used for this purpose.

To transfer surface water rights, the Application to Change Point of Diversion and Place and/or Purpose of Use from Surface to Ground Water (form WR-09) would be used.

These forms are available on-line by clicking the name of the application desired, above, or can be obtained from OSE District offices. The application fee is \$25 for an application to appropriate and \$50 for an application to transfer water rights.

- Upon receipt of an application, OSE issues a legal notice for publication to the applicant, which must be posted in a local newspaper for 3 weeks.
- If there are no protests, the OSE reviews the application for completeness and decides whether to approve, partially approve or deny the application based upon criteria established by New Mexico statutes and regulations.

a politic with conditions. This process takes approximately 6 to 8 weeks, provided there are no protests.

• If the application is challenged, the OSE will conduct hearings to determine whether the application should be approved, partially approved, or denied.

Once approved, a developer can begin to drill a well. The well must be constructed in full compliance with the terms of the permit and the rules and regulations governing well construction in the state, including the use of a licensed well driller. The well driller and applicant are required to submit certain filings with the OSE throughout the well drilling and completion process. Forms can be obtained from a district office, or can be downloaded from the OSE site by clicking **HERE**, and further details regarding well construction, permitting, and form submission can be obtained on the OSE site.

Questions on water rights permitting may be directed to one of the OSE district offices. District office formation and district boundary a pais available HERE.

Reference:

<u>Note</u>: An OSE permit is  $\frac{1}{2}$  field to appropriate water where the water is found <u>below</u> 2,500 feet subsurf  $\frac{1}{2}$  is greater than 1,000 TDS.

Please be advised that NMOCD web resources or guidance does not relieve owner/operator of responsibility should their operations pose a threat to ground water, surface water, human health or the environment. In addition, NMOCD web resources or guidance may not be comprehensive and complete in its current scope and does not relieve the owner/operator of responsibility for compliance with any other federal, state, or local laws and/or regulations. Owner/operators are responsible for ensuring that all proper permits have been obtained and all filings have been made with any and all federal, state or local regulatory agencies, and that any tax, rent and rovalty issues have been addressed with the appropriate agencies.

⁷ Modified from Source: <u>A Regulatory Guide to Geothermal Direct Use Development</u> Prepared by Kim Lyons of the Washington State University Extension Energy Program. 2003.

#### Geothermal Regulations Stakeholder Work Group (GRSWG) Meeting Oil Conservation Division- 1220 South St. Francis Drive, Santa Fe, NM 87505 (Wendell Chino Building) (7/7/2010)

Meeting Attendees: See sign-in sheet below.



Teleconference Attendees: Herb Black- DOI- MMS & Doug Rappuhn- OSE

#### **Meeting Minutes**

- 1) OCD Generic "G-100" Geothermal Application Form Update
  - Pre-requisite for all new OCD discharge permits and some questions will assist OCD to route applicants to proper agencies for dual permitting, etc. For example, heat exchange projects are not considered "Geothermal" under its regulations and applicants must be routed to CLD/RLD for assistance with these types of projects.
  - Incidentally, the G-101 and G-122 (modified to be like C-108 without oil and gas connotation) Forms are currently being revised and will be shared with the group at the next meeting. Eventually all of the G-Forms will be updated.
- 2) OCD Geothermal Resource Website Updates with agency paragraphs incorporated into webpage (will continue to work on throughout meetings until final)
  - Provides links to other resources. Most text will be replaced by links, but sharing info. for agencies to read and provide final feedback.
  - Near bottom of page where > 2500 ft. and >1000 ppm TDS, OSE does not have jurisdiction? NOI required by OSE for OSE to confirm with determination. There is a nuance to it as the top of the entire confining unit above the potable aquifer must be greater than 2500 ft. David Brooks questioned whether it was mainly potability of the water that determined who had jurisdiction in an OSE

response to OCD inquiries made 2 years ago. David will send OSE's response to OCD questions to OSE for review and consideration.

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- 3) Discussion: OCD presentation handouts from 6/16/2010 Geothermal Regulations Work Group Meeting on Ownership of Geothermal Resources (David Brooks), Geothermal Regulations in NM (Mikal Altomare), and OCD Permit Process (Carl Chavez) with group free to interact in discussion(s) to flesh out any remaining or unidentified issues thus far.... Presentations printouts are available at OCD Online "UIC-999" under either thumbnail for group members to review before meeting.
  - David Brooks highlights his presentation for the group with the Co-Geothermal Production Well permitting processed similar to a Class II SWD well with C108 Application through oil and gas and not through WQCC, etc. ECMD is working on a Co-Geothermal Symposium in September in Albuquerque. Geothermal rules need to be revamped probably will occur in the next 2 years. Mikal Altomare highlights her presentation for the group. Carl Chavez highlights the geothermal permit process under WQCC with fees being an issue. For example, geothermal permits cost \$1700 for 5-yrs., but some geothermal projects may not be permitted under WQCC and may have no charge. OCD Attorneys are looking into the fees associated with all geothermal projects. Carl thinks any WQCC discharge permit involving open-loop injection wells would pay the \$1700 permit fee? In instances where OCD issues a WQCC discharge permit for reasons other than well type, this needs to be determined....

4) BLM

- Not present.
- 5) CID/RLD
  - Not present.
- 6) OSE
  - New Mexico Certified Water Wells Drillers are required for all drilling projects that penetrate fresh water aquifer systems under OSE Regulation § 1927(4), which would apply to low-temperature and high-temperature power generation projects.
  - OSE is looking into revisions of its regulations and will consider discussions with OCD on revisions to its rules.

#### 7) NMED

- Not present.
- 8) OCD thinks it can wrap-up the Geothermal Regulations Stakeholder Working Group meetings in the next couple of months and it will be important for all agencies to attend the final meetings and to be reviewing OCD's draft documents so that OCD can finalize its webpage, application, forms, etc.
  - OCD questioned the NM Water Well Driller Certification requirement by OSE for high-temperature geothermal drilling on power projects, which seemed to be counter-productive to the recent Governor Executive Order to streamline the commercial geothermal power permit process. OCD Geothermal Regulations cannot supersede other state and local laws.
  - OCD indicated that the drilling and construction of low-temperature geothermal wells have similarities to water wells, but high-temperature geothermal wells do not and are more in line with oil and gas wells, but will unique equipment, BOPE setup, special elastomer seals that can handle high heat, etc. Water well drillers are not even familiar with high-temperature geothermal well drilling and completion methods.
  - While OCD requested that OSE consider this in their upcoming rule making there is no guarantee that OSE would make any change to its regulations.
  - Water well driller certification requires a test given by the OSE Roswell Office. A bond is required and it takes several weeks to obtain.
  - OSE's artesian well permit would also apply to geothermal (high temperature) wells. For example, OSE could never approve wells with spacers and mud as cement in drilled wells....

#### 9) Miscellaneous

- OCD is committed to tracking any of its permitted geothermal projects and recommends the same for the stakeholder group. At some time we need to be accountable for all of our geothermal projects.
- OCD mentioned at the last meeting that closed-loop projects handled by CID/RLD and tracking concerns associated with closure where chemicals could remain in non-working systems and eventually leak to contaminate fresh ground water if they are not properly evacuated and /or closed.
- 10) Path Forward: Wednesday, August 4, 2010 Meeting from 10:00 a.m. Noon at New Mexico Environment Department- Ground Water Quality Bureau or Oil Conservation Division? Stay tuned......

Please contact Carl Chavez (OCD) at (505) 476-3490 if you have questions. Thank you.

#### Geothermal Regulations Stakeholder Work Group (GRSWG) Meeting

Oil Conservation Division- 1220 South St. Francis Drive, Santa Fe, NM 87505 (Wendell Chino Building) (7/7/2010)

Meeting Attendees: See sign-in sheet below.



Teleconference Attendees: Herb Black- DOI- MMS & Doug Rappuhn- OSE

#### **Meeting Minutes**

- 1) OCD Generic "G-100" Geothermal Application Form Update
  - Pre-requisite for all new OCD discharge permits and some questions will assist OCD to route applicants to proper agencies for dual permitting, etc. For example, heat exchange projects are not considered "Geothermal" under its regulations and applicants must be routed to CLD/RLD for assistance with these types of projects.
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#### Geothermal Regulations Stakeholder Work Group (GRSWG) Meeting

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Oil Conservation Division- 1220 South St. Francis Drive, Santa Fe, NM 87505 (Wendell Chino Building)

#### Meeting Agenda (7/7/2010)

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- 2) OCD Geothermal Resource Website Updates with agency paragraphs incorporated into webpage (will continue to work on throughout meetings until final)
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- 4) BLM
- 5) CID/RLD
- 6) OSE
- 7) NMED
- 8) OCD (other forms under revision, i.e., update G-101, and incorporate C-108 into G-112, etc...)
- 9) Miscellaneous
- 10) Path Forward: Wednesday, August 4, 2010 Meeting from 10:00 a.m. Noon at New Mexico Environment Department- Ground Water Quality Bureau?

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<u>Di</u> 12	strict IV 20 S. St. Francis Dr., Santa Fe, NM 87505	OIL CONSERVATIO 1220 South St. F Santa Fe, NM	n DIVISION rancis Dr. 87505	Plus I Copy to Santa Fe 1 Copy to Appropriate District Office
-		<b>Geothermal Proj</b>	ECT FORM	
		] New 🗌 Renewal	Modification	
1.	DATE OF APPLICATION:	2.	. <mark>OGRID</mark> (if applica	ble):
3.	OPERATOR:			
4.	Address:			
5.	CONTACT PERSON:		<u>Phone</u>	
6.	LOCATION:/4	/4 <u>Section</u>	<u>Township</u>	Range
** <u>4</u> 7.	<u>APPLICANT MUST SUBMIT A LARG</u> <u>Attach</u> documentation specifying site. If the facility site is compris identify what portion of facility s	E SCALE TOPOGRAPHIC MAP SHO the name, telephone number an sed of more than one parcel, and site is owned by each by attachin	DWING EXACT LOCA Id address of the lan 1 not all parcels are 1g a diagram.	d/surface owner(s) of the facility owned by the same landowner(s),
8.	<u>Attach</u> documentation specifying the site location, and for each specified and the site location.	the name, telephone number an ecify what their interest(s) is(are	d address of the mi	neral right's interest holders for
9.	Attach documentation containing pits, dikes and tanks on the facili	a description of the facility wit	h a diagram clearly	indicating the location of fences,
10.	. <u>Attach</u> documentation identifying drilling/installation/site construct	g all materials that are currently tion and/or during the regular co	or will be stored or purse of operations a	used at the facility during at the facility.
11.	. <u>Specify</u> whether there will be a <b>g</b> jurisdiction of the Office of the S	round water appropriation as State Engineer (OSE): YES	sociated with the pr NO	oposed project under the
12.	. <u>USE DETERMINATION</u> : a. Is the primary use of any way <b>YES NO PRO</b>	ater involved in the proposed pr JECT DOES NOT INVOLVE WA	oject, the extraction	of the heat carried by that water?
	b. If <u>NO</u> to "a." above, please i. Is the extraction of hea YES NO	e answer <u>all three following</u> ques at "incidental" to another benefic	stions: cial, primary use of	the water?
	ii. Is the water less than 2 YES NO	250°F?		
	iii. Is the water potable? YES D NO * *See WQCC Rule 20.7.10 NMAC	regarding drinking water standards		
13.	Attach documentation identifyin average quality and daily volume	g and describing all present sou e of waste water must be include	rces of effluent and ed.	waste solids. Specification of
14	Attach documentation identifyin	a and describing all surrent liqu	id and calid wasta	collection/treatment/disposal

- 14. <u>Attach</u> documentation identifying and describing all current liquid and solid waste collection/treatment/disposal procedures.
- 15. <u>Attach</u> documentation specifying all proposed modifications to existing collection/treatment/disposal systems.

- 16. <u>Attach</u> documentation identifying and describing a routine inspection and maintenance plan for the facility/project that will ensure permit compliance.
- 17. <u>Attach</u> documentation detailing a contingency plan for the reporting and clean-up of spills or releases at the facility/project.
- 18. <u>Attach</u> documentation reflecting geological/hydrological information for the facility/project. Documentation of depth to and quality of ground water must be included.
- 19. <u>Attach</u> documentation detailing a facility closure plan, and any other information necessary to demonstrate compliance with any other OCD or WQCC rules, regulations and/or orders.
- 20. <u>APPLICANT-DESIGNATED GEOTHERMAL PROJECT TYPE(s)</u>:
- Open loop (single/multiple well for water withdrawal, water returned to a surface source)
- Open loop (single/multiple well for water withdrawal, water returned to a second well)
- Standing Column (single well for water withdrawal and water return)
- Closed-loop
- Other*

* Please note that heat pump systems (open or closed-loop) are <u>not</u> considered "geothermal" and are therefore not permitted through the OCD. These projects are handled directly by the Construction Industries Department/Regulation and Licensing Division (CID/RLD) and, where groundwater is potentially impacted, by NM Environment Dept. (NMED). <u>Inquiries and applications for permits relating to heat pump systems should be directed to CID/RLD and, where appropriate, to the NMED.</u>

ADDITIONAL IMPORTANT INFORMATION:

- OCD may require OSE certified water well drillers for certain projects.
- Applicants are responsible for contacting the appropriate Federal, State, Tribal and/or local government agencies responsible for rent, royalty and/or tax assessment.
- OCD approval of this application does not relieve operator of responsibility should their operations pose a threat to ground water, surface water, human health or the environment. In addition, OCD approval does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations.
- 21. <u>CERTIFICATION</u>: I hereby certify that the information submitted with this application is true and correct to the best of my knowledge and belief.

Name:		Title:	
Signature:		Certification/License #:	
E-mail Address:		Date:	
`	New Action of the Second Se		

Name:	Title:
Signature:	Certification/License #:
E-mail Address:	Date:

Name:	<u>Title</u> :
Signature:	Certification/License #:
E-mail Address:	Date:
Name:	Title
Signature:	Certification/License #:
E-mail Address:	Date:

New Mexico Energy, Minerals and Natural Resources Department

# Oil Conservation Division (OCD) Geothermal Resource Guide

The New Mexico OCD is the state agency primarily responsible for the regulation of geothermal resources pursuant to the <u>Geothermal Resources Conservation Act (Act)</u> (<u>NMSA §71-5-1 et.seq.</u>), and the associated <u>Geothermal Rules and Regulations</u> (§§19.14.1 – 19.14.132 NMAC), and is responsible for administering all geothermal permit applications submitted in New Mexico.

- Assistance to ap cants and understanding appicable regulations that apply and in initial ing the geothermal application process,
- Education of applicants regarding what types of projects fall within the scope of the regulations (as <u>"geothermal resources</u>" as defined in the Act), and therefore require an OCD geothermal permit, and
- Education of applicants regarding which other state agencies they may be required to work with for various types of projects.

(Draft Revised: 6/22/10)

Depending on the nature of the particular project, applicants may be required to work with one or more of the following <u>State</u> Agencies

when applying for or working on <u>Geothermal Projects</u> or <u>Quasi-</u> <u>Geothermal Projects</u>¹:

- <u>OIL CONSERVATION DIVISION (OCD -Environmental</u> <u>Bureau</u>),
- <u>OFFICE OF THE STATE ENGINEER</u> (<u>OSE</u>),
- <u>New Mexico Environment Department</u> (<u>NMED</u> -Ground Water Quality Bureau),

• <u>REGULATION & LICENSING DEPT. /CONSTRUCTION</u> <u>INDUSTRIES DIVISION</u> (<u>RLD/CID</u>- <u>Mechanical</u> <u>Bureau</u>).

OCD – ENVIRONMENTAL BUREAU

<u>GEOTHERMAL PERMITS: POWER GENERATION & DIRECT USE</u>
 <u>DISCHARGE PERMITS/UIC PERMITTING</u>

**GEOTHERMAL PERMITS:** The use or extraction of a geothermal resource (as defined by the Act), whether for power generation or for the intentional direct use of the heat, requires the acquisition of an OCD <u>GEOTHERMAL PERMIT</u>. This potentially includes:

- open-loop (wells that inject or dispose into subsurface formations) and closed-loop (opposite of open-loop) systems associated with geothermal power generation (i.e., co-geothermal production) or production (i.e., sale and inter-intrastate transmission of power via an electrical grid system(s));
- direct-use (open loop) applications such as nurseries and aquaculture; and
- anywhere an applicant seeks to install injection wells into subsurface formations primarily for the purpose of use of geothermal heat.

# **OCD** GEOTHERMAL FORMS TO APPLY TO RECEIVE A PERMIT ARE AVAILABLE ON THE <u>OCD WEBSITE</u>.

¹ Discussed in further detail below, these projects do not meet the definition of "geothermal resource" under the Act; however, information is provided here for applicants of Quasi-Geothermal Projects in an attempt to clarify what the appropriate agency(ies) is(are) for purposes of submission of applications.

The permitting process for geothermal resource projects through the OCD is set out in the <u>Geothermal Resources Conservation Act</u> and the <u>Geothermal Rules and Regulations</u> (Rules), and all applications submitted to the OCD must comply with the requirements outlined in the Rules and Regulations. Geothermal permit fees are currently specified in <u>20.6.2.3114 NMAC Table 1</u>: \$100 filing fee that must accompany the application(s), and if approved, a final \$1,700 permit fee (good for 5-years) will be issued.

A new geothermal project is initiated with the filing of a Form G-100 Geothermal Project Form, which is submitted to the OCD Environmental Bureau (EB) for review.

- Once the EB has received a complete Form G-100 with all necessary information and attachments for review (*Note: all questions must be answered for administrative completeness*), the EB will then review the Form G-100 and will determine bas the information submitted whether is appropriate for the applicant to the information for a Geothermal Permit (G-101 Application to Drill, 1 epen or Plug Back-Geothermal Resources), and will determine what if any other permits may be required from the OCD for the project (such as ischar or injection permits).
  - Forms 101 a type with a type with a sufficient sca addition, a G disposal well
     Forms 101 a type with a type with a pogr. 'hic map (generally 7.5 Minute Quadrangle) of to dis, and the submitted for spacing requirements. In 12 Form shall be submitted for each project injection or disposal well
  - Note that geothermal projects involving an existing oil or gas well will require submittal of G-101, 102 and G-103 Forms.
- Once exploration is completed and the permittee desires to proceed with the project, there are forms requesting approval to produce/develop and/or inject that must be submitted for each well. The remainder of the G-Forms are to be completed during exploration to verify that the geothermal resource(s) is adequate, and must be submitted to the OCD for its Administrative Record. The OSE should be contacted early in the permit process where there will likely be water appropriation issues associated with a geothermal project relying on potable drinking water, etc.
- The OCD will also use the information provided in the G-100 to attempt to assist the operator in determining what other permits may be required from *other* state agencies to move the project forward, depending on the nature of the particular project.

Once the EB has determined that it is appropriate for the applicant to proceed with submission of a <u>G-101 Geothermal Application</u>, the applicant submits the G-101to the EB along with a Form <u>G-102</u> (*geothermal resources well location plat*) as provided in the <u>Rules</u>. Upon receipt of a complete set of G-101 and G-102 forms and all required attachments, the EB will review the application and issue an approval, approval with modifications or denial with explanation of denial as set forth in the <u>Rules</u>.

**DISCHARGE & INJECTION PERMITS:** As delegated by the Water Quality Control Commission (WQCC), the OCD has been given responsibility for the administration and enforcement of WQCC regulations that pertain to surface and ground water protection or discharges "at oil and natural gas production sites, oil refineries, natural gas processing plants, geothermal installations, carbon dioxide facilities, natural gas transmission lines, and discharges associated with activities of the oil field service industry"². Similarly, the OCD has been delegated the responsibility by the <u>EPA</u> (with some collaboration with the transmission of the underground Injection ( ntron IC) program in New Mexico, and UIC permits for injection wells related to be oil a d gas industry and geothermal installations.

Under the Geothermal source Conservation Act, the OCD has been given the specific authority to perform a regulate the injection of fluids into geothermal reservoirs and low-temp and thermal reservoirs and to regulate the disposition of or it residue, and ensure that any such disposal affords not compare the sassociated with geothermal projects, regardless of the transmitting water produced from geothermal wells or other geothermal RCRA exempt fluids.

#### Geothermal Applicants should consider the following:

- If a geothermal project involves injection well(s), a <u>DISCHARGE PERMIT</u>, and an <u>APPLICATION TO PLACE WELL ON INJECTION-GEOTHERMAL</u> <u>RESOURCES AREA-</u> (FORM G-112) for each injection well, will be required.³ A CERTIFICATE OF COMPLIANCE AND AUTHORIZATION TO PRODUCE-(FORM G-104) for each production/development well, will also be required.
- If the project involves other actual or potential discharges that may adversely affect surface water or groundwater, a **<u>DISCHARGE PERMIT</u>** may be required even if injection wells are not contemplated.

Note that any well bore into fresh ground water may require an OSE Certified Water Well Driller with the exception of geothermal power facilities where drillers with oil, gas and geothermal

² <u>WQCC Delegation of Authority</u> to OCD for Geothermal Activities in New Mexico

³ If the project is located in Indian Country, as defined in 18 U.S.C. Section 1151, a UIC injection permit from USEPA may also be required.

expertise have experience protecting fresh water (<= 10,000 mg/L TDS) during drilling and well completion.

<u>Click HERE</u>⁴ for New Mexico Legal References relating to the OCD's <u>Regulatory Authority regarding geothermal resources.</u>

# **RLD/CID-***MECHANICAL BUREAU*

#### ➢ GROUND-SOURCE HEAT-PUMPS/ "GEOTHERMAL" HVAC SYSTEMS: QUASI-GEOTHERMAL PROJECTS

Ground Source "Geothermal" HVAC systems, heat-exchange, heat pumps, and directuse open and closed-loop heating systems are used for the heating and cooling of buildings. These systems most typically utilize a closed-loop pipe system for the transfer of heat to and f dividings and the earth and are charace ized by piping that both begins and terminates the same piece of heating or cooling equipment or appurtenance. These systems in since use either an approved chemical transfer media or a water based media, are i or d for liman comfort and are not used in the processing or manufacturing of a prod

Although sometimes reheat-pump systems are definition of a "geothe definition definition of a "geothe definition of a "geothe definition of a "geothe definition definition of a "geothe definition definiti

Because ground-source heat-pump systems do not utilize geothermal resources as defined in New Mexico, they **DO NOT** require a geothermal permit through the <u>OCD</u>.

⁴ New Mexico Oil Conservation Division- Environmental Bureau, Chapter 71: Energy & Minerals, Article 5: Geothermal Resources Conservation Act, <u>Chapter 71, Article 5 NMSA 1978</u> /// Title 19: Natural Resources & Wildlife, Chapter 14: Geothermal Power, <u>Title 19, Chapter 14 NMAC (11-15-83 Recompiled 12-31-01)</u> /// Title 20: Environmental Protection, Chapter 6 Water Quality, Part 2 "Ground and Surface Water Protection" (<u>20.6.2</u> <u>NMAC</u>) and Part 4 "Standards for Interstate and Intrastate Surface Waters" (<u>20.6.4 NMAC</u>). /// <u>WQCC</u> <u>Delegation of Authority</u> to OCD for Geothermal Activities in New Mexico

⁵ Information regarding the permitting of these systems is included here as a courtesy in an attempt to better inform applicants regarding the proper permitting processes for such projects, and given that the OCD anticipates that applicants may assume that the OCD is the appropriate agency from whom to seek permits and/or information for such projects since they are commonly referred to as "geothermal."

Other types of permits are, however required for these systems. <u>The principal permits</u> required for these systems are administered by the RLD/CID Mechanical Bureau.

Note that any well bore into fresh ground water may require an OSE Certified Water Well Driller and may require approval from <u>NMED Groundwater Quality Bureau</u>, and any project involving water appropriation may require a permit from the <u>OSE</u>.

# NMED – GROUND WATER QUALITY BUREAU

#### DISCHARGE PERMITS: GROUND-SOURCE HEAT-PUMP SYSTEMS & FACILITIES MEETINC INCIDENTAL USE EXCEPTION

NMED is responsible for regulation of those facilities with discharges or the potential for discharges that fall outside the scope of the authority of the OCD in that they are *not* facilities involved is the extraction or use of a geothermal response (and are likewise not within the a more f the OCD as wells regulated under the <u>Oil and Gas</u> <u>Act</u>).

Of particular relevance o the opic of geothermal/quasi-geothermal, NMED is responsible for the regu with the potential to in facilities that have the p entia o impact groundwater and is responsible for regulation of any entia o impact groundwater and that meet the criteria for the <u>"INCIDENTAL USE" I</u> <u>CEPTI I</u> to the definition of "geothermal resource" under the Act. The division of <u>IMED</u> is ponsible for handling these matters is the <u>Ground</u> <u>Water Quality Bureau (C</u> <u>VQB</u>).

- NMED requires that a <u>Notice of Intent (NOI</u>) be filed with the GWQB for Ground Source heat pump/HVAC systems that are large (provide heating and/or cooling for large buildings or complexes of buildings), use other than standard technologies or construction, or are used for industrial or manufacturing purposes.
- Small systems for individual residences or small businesses, offices, or apartment buildings need *not* submit a NOI, <u>provided that the systems have been approved by RLD/CID.</u>

Note that any well bore into fresh ground water may require an OSE Certified Water Well Driller.

#### <u>Click HERE ⁶ for New Mexico Legal References relating to the NMED's</u> <u>Regulatory Authority.</u>

⁶ New Mexico Environment Department- Ground Water Quality Bureau, Title 20: Environmental Protection, Chapter 6 Water Quality, Part 2 "Ground and Surface Water Protection" (<u>20.6.2 NMAC</u>) and Part 4 "Standards for Interstate and Intrastate Surface Waters" (<u>20.6.4 NMAC</u>).



#### WATER RIGHTS: PERMIT REQUIRED FOR WATER APPROPRIATION

**OSE REGULATORY AUTHORITY**: The constitution and <u>statutes</u> of the State of New Mexico set forth procedures for appropriating the public waters of the state for beneficial use. The New Mexico Office of the State Engineer (OSE) administers the <u>rules and regulations</u> governing groundwater withdrawals and use in the State of New Mexico.

**OSE PERMITTING**: The same procedure is followed to obtain a permit to appropriate groundwater for geothermal use as would be followed for any other non-domestic groundwater applications.

The permitting proposed started with the filing of an applice on with the OSE, most component only he <u>Application for Permit to Appropriate</u> <u>Underground Wat</u> (form <u>VR-05</u>), which requires the applicant to submit cation for the well, the amount of water to be withdrawn, the source, the integret of w and other related data.

If the ground<br/>appropriationue1sin in which a permit is sought is closed to new<br/>theiappropriation<br/>application to<br/>Change Loc<br/>Undergroundsin in which a permit is sought is closed to new<br/>theithei<br/>he<br/>firsthe<br/>firstfirst<br/>on<br/>(ater (fthei<br/>rm<br/>wR-08)is used for this purpose.

To transfer surface water rights, the <u>Application to Change Point of</u> <u>Diversion and Place and/or Purpose of Use from Surface to Ground</u> <u>Water (form WR-09)</u> would be used.

These forms are available on-line by clicking the name of the application desired, above, or can be obtained from <u>OSE District offices</u>. The application fee is \$25 for an application to appropriate and \$50 for an application to transfer water rights.

- Upon receipt of an application, OSE issues a legal notice for publication to the applicant, which must be posted in a local newspaper for 3 weeks.
- If there are no protests, the OSE reviews the application for completeness and decides whether to approve, partially approve or deny the application based upon criteria established by New Mexico statutes and regulations.

- If the application is approved, OSE will issue a permit with conditions. This process takes approximately 6 to 8 weeks, provided there are no protests.
- <u>If the application is challenged</u>, the OSE will conduct hearings to determine whether the application should be approved, partially approved, or denied.

Once approved, a developer can begin to drill a well. The well must be constructed in full compliance with the terms of the permit and the <u>rules and regulations governing</u> <u>well construction</u> in the state, including the use of a <u>licensed well driller</u>. The well driller and applicant are required to submit certain filings with the OSE throughout the well drilling and completion process. Forms can be obtained from a district office, or can be downloaded from the OSE site by clicking <u>HERE</u>, and further details regarding well construction, permitting, and form submission can be obtained on the <u>OSE site</u>.

Questions on water rights permitting may be directed to one of the OSE district offices. District office formation and district boundary p is available **HERE.** 7

Reference;⁷

<u>Note</u>: An OSE permit is red to appropriate water where the water is found <u>below</u> 2,500 feet subsurf e <u>a.</u> is greater than 1,000 TDS.

Please be advised that NMOCD web resources or guidance does not relieve owner/operator of responsibility should their operations pose a threat to ground water, surface water, human health or the environment. In addition, NMOCD web resources or guidance may not be comprehensive and complete in its current scope and does not relieve the owner/operator of responsibility for compliance with any other federal, state, or local laws and/or regulations. Owner/operators are responsible for ensuring that all proper permits have been obtained and all filings have been made with any and all federal, state or local regulatory agencies, and that any tax, rent and royalty issues have been addressed with the appropriate agencies.

# Ownership of Geotherma

# Resources



David Brooks

OCD Engineering Bureau- SF (505) 476-3450


### Ownership of Geotherma Resources

Federal Lands: Where US Gov't owns Minerals, it owns Geothermal (GT) resources.

Other Split-Estate Lands: Mineral owner probably owns GT resources.

Surface Owner Protection Act does not apply.

### **Geothermal Resources**

### **Conservation Act**

- Oil Conservation Division (OCD) has genera regulatory jurisdiction over all aspects of geothermal development, including:
- Well drilling: location and construction of wells
- geothermal development, approves "discharge plans" and permits Waste disposal: OCD administers Water Quality Act as applied to Class V geothermal injection wells. ł
- Correlative rights: OCD must adjust competing claims of owners and users of the same geothermal reservoir. Ŧ

# Exceptions to OCD Jurisdiction

- Heat Exchange Systems: Not Geothermal 1
- "Incidental Use": A limited category of uses of geothermal heat incidental to water use is excluded by statute from OCD jurisdiction.
- Indian Lands:

Permit from federal EPA or Tribe required for injection wells.

Other OCD jurisdiction may be preempted by federal law or Tribal sovereignty.

# **OCD Jurisdiction NOT Exclusive**

- particular aspects of Geothermal Operations: Other State Agencies have authority over
- Office of the State Engineer (OSE) issues permits for water use, except as discussed below.
- Regulations and Licensing Department (RLD) regulates construction. I
- Public Regulation Commission (PRC) regulates power generation. I
- Other agencies may also be involved.
- Local Government land-use and other regulatory requirements may apply.

## Use of WATER in Geothermal

### Operations

- An OSE permit (or water right is) required except for:
- Co-production with Oil or Gas where the water would be produced from the oil or gas well even if its geothermal heat were not used.
- Production of water from an aquifer >2,500 feet below the surface, where the water contains >1,000 ppm Total Dissolved Solids. 1

(Certain notice requirements apply. See NMSA 1978 Sections 72-12-26 and 72-12-27.)

## GT/O&G Co-Production

(a simpler regulatory environment)

Geothermal/Oil & Gas Co-Production, using common wells, will be simpler because:

- OSE permits will (generally) not be required.

- Water Quality Act discharge permits will (generally) not be required. Water produced from an oil and gas well can be Class II injection permit issued through OCD's Engineering re-injected into the same or a different well pursuant to a Bureau.

# GT vs. O&G: Possible Conflicts

- development adversely affecting existing or potential future Oil and Gas operators may have concerns about geothermal oil and gas production from the same or proximate formations.
- affected by removal or injection of water in the course of oil Geothermal potential of a formation may be adversely and gas operations.
- OCD has jurisdiction of these issues, but has developed no applicable rules.

Conflicts	
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- Conflicts between O&G developers and potash developers have been extensive.
- concern than O&G, also presents potential problems. GT interference with potash mining, though less of a
- OCD's R-11-P (relating to O&G vs. Potash) does not apply. OCD has jurisdiction over GT/Potash conflicts. However
- developers indicates potash areas (in Eddy and western Lea Extensive and on-going litigation between O&G and Potash counties) are unlikely candidates for geothermal development in the near future.

## A Need for Rulemaking

- current geothermal issues, particularly with 1980s) need substantial revision to address OCD's Geothermal Rules (developed in the respect to correlative rights.
- stakeholders, including GT developers and other agencies, to develop up-to-date and OCD looks forward to working with effective GT rules.

GT vs. Other Mining: Possible Conflicts
<ul> <li>Neither OCD, nor any other state agency, has</li> </ul>
jurisdiction over conflicts that could arise
between geothermal development and mining
activities, other than potash mining.
<ul> <li>USBLM may have jurisdiction over such</li> </ul>

conflicts on federal land.

### GEOTHERMAL REGULATION IN NEW MEXICO PURSUANT TO THE GEOTHERMAL RESOURCES CONSERVATION ACT:

Ongoing, multi-agency effort to clarify permitting framework pursuant to the Act in light of increased interest in geothermal energy.

June 16, 2010

Mikal M. Altomare, Assistant General Counsel Energy, Minerals and Natural Resources Dept, Oil Conservation Division GEOTHERMAL REGULATION IN NEW MEXICO PURSUANT TO THE GEOTHERMAL RESOURCES CONSERVATION ACT:

•Threshold determination is required regarding whether the project constitutes a "geothermal resource" under NM Law.

•Requires cooperative (& sometimes simultaneous) management by multiple state agencies.

### **OCD's ROLE IN GEOTHERMAL REGULATION**

### - 71-5-6-COMMISSION'S AND DIVISION'S POWERS AND DUTIES.

A. In addition to its other powers and duties, the division shall have, and is hereby given, jurisdiction over all matters relating to the conservation of geothermal resources and the prevention of waste of potash as a result of geothermal operations in this state. It shall have jurisdiction, authority and control of and over all persons, matters or things necessary or proper to enforce effectively the provisions of the Geothermal Resources Conservation Act [71-5-1 NMSA 1978] or any other law of this state relating to the conservation of geothermal resources and the prevention of waste of potash as a result of geothermal resources and the prevention of waste of potash as a result of geothermal resources and the prevention of waste of potash as a result of geothermal operations. Provided, however, nothing in this section shall be construed to supersede the authority which any state department or agency has with respect to the management, protection and utilization of the state lands or resources and its jurisdiction.

B. The commission shall have concurrent jurisdiction and authority with the division to the extent necessary for the commission to perform its duties as required by the Geothermal Resources Conservation Act. In addition, any hearing on any matter may be held before the commission if the division director, in his discretion, determines that the commission shall hear the matter.

### OCD'S ROLE IN GEOTHERMAL REGULATION

### **<u>* 71-5-7-Power of Commission & Division to Prevent</u>** <u>Waste & Protect Correlative Rights</u>

The commission and division are hereby <u>empowered</u>, and it <u>is their duty</u>, to prevent the waste prohibited by the <u>Geothermal Resources Conservation Act</u> [71-5-1 NMSA 1978] and to protect correlative rights, as in that act provided. To that end, the commission and division may make and enforce rules, regulations and orders relating to geothermal resources, and to do whatever may be reasonably necessary to carry out the purposes of that act whether or not indicated or specified in any section thereof.

### OCD'S ROLE IN GEOTHERMAL REGULATION

### § 71-5-3. DEFINITIONS.

As used in the Geothermal Resources Conservation Act [71-5-1 NMSA 1978]:

A. "geothermal resources" means the natural heat of the earth or the energy, in whatever form, below the surface of the earth present in, resulting from, created by or which may be extracted from this natural heat and all minerals in solution or other products obtained from naturally heated fluids, brines, associated gases and steam, in whatever form, found below the surface of the earth, but excluding oil, hydrocarbon gas and other hydrocarbon substances;

E. "geothermal reservoir" means an underground reservoir containing geothermal resources, whether the fluids in the reservoir are native to the reservoir or flow into or are injected into the reservoir;

F. "geothermal field" means the general area which is underlaid or reasonably appears to be underlaid by at least one geothermal reservoir;

G. "**low-temperature thermal reservoir**" means a geothermal reservoir containing low-temperature thermal water, which is defined as *naturally heated water, the temperature of which is less than boiling at the altitude of occurrence,* which has additional value by virtue of the heat contained therein and is found below the surface of the earth or in warm springs at the surface;

### **INCIDENTAL USE EXCLUSION; INCIDENTAL LOSS OR**

### **EXTRACTION OF HEAT**

### <u>71-5-2.1 NMSA</u>

When the application of potable water to a beneficial use involves the incidental loss or extraction of heat, *and* the water is 250 degrees Fahrenheit or less, *then that heat is not a geothermal resource* for which a royalty is due. In such a case, the use is not governed by laws related to geothermal resources but is simply governed by Chapter 72 NMSA 1978.

### IN OTHER WORDS:

In order to fall within the exclusion to "geothermal resource," <u>all</u> <u>four</u> of the following three requirements must be met:

1. The water is "potable,"

2. The water is being applied to a <u>beneficial use</u>,

 The heat is being lost or extracted from the water "<u>incidentally</u>," AND

4. The water is <u>250° or less</u>.

### WHEN ALL FOUR REQUIREMENTS ARE MET FOR THE EXCLUSION:

- The application/use/project does not require a geothermal permit through the OCD, AND
- No state royalty payments are required pursuant to the Act.

### HEAT EXCHANGE/HEAT TRANSFER SYSTEMS – COMMONLY REFERRED TO AS "GEOTHERMAL"

### HEAT PUMP SYSTEMS

•The engineering and scientific communities prefer the terms "geoexchange" or "ground source heat pumps" because geothermal power traditionally refers to heat originating from deep in the Earth's mantle. *Wikipedia "Geothermal Heat Pump"* 

•Unlike a project tapping into a geothermal reservoir, these systems use the natural heat storage capacity of the earth or ground water to provide energy efficient heating and cooling. The heat pump equipment works like a reversible refrigerator by removing heat from one location and depositing it in another location. *Geothermal Heat Pumps, Toolbase Services, www.toolbase.org.* 

### <u>REVIEW:</u>

<u>Geothermal Resource</u>  $\rightarrow$  The natural heat of the earth or the energy... present in, resulting from, created by or which may be extracted from this natural heat.

"GEOTHERMAL" HEAT PUMPS DO NOT USE THE <u>NATURAL</u> <u>HEAT OF THE EARTH</u>. THEY ARE THUS NOT <u>GEOTHERMAL</u> <u>RESOURCES</u>, AND THEREFORE DO NOT FALL UNDER THE PURVIEW OF EITHER THE GEOTHERMAL RESOURCE CONSERVATION ACT OR THE REGULATORY AUTHORITY OF THE OCD.



* <u>OSE:</u> With the exception of 3.b, above (*closed loop heat transfer projects*), all other projects potentially involve water appropriation. Operators are responsible for ensuring that all water appropriation issues are addressed, proper documentation is submitted and permits are obtained through the OSE where required.



* <u>OSE</u>: With the exception of 3.b, above (*closed loop heat transfer projects*), all other projects potentially involve water appropriation. Operators are responsible for ensuring that all water appropriation issues are addressed, proper documentation is submitted and permits are obtained through the OSE where required.

District I 1625 N. Franch Dr., Hobbs, 1 District II 1301 W. Grand Avazne, Are <u>District III</u> 1000 Rio Branos: Road, Arta District IV 1220 S. St. Francis Dr., Sant	NM 88240 orin, NM 88210 c; NM 87410 a Fa, NM 87505	State of New Mi Energy Minerals and Natu Oil Conservation I 1220 South St. Fra Santa Fe, NM 8	exico rral Resources Division ncis Dr. 7505	1	Revised June 9, 2010 Submit Original Pins 1 Copy to Santa Fe Copy to Appropriate District Office
DISCHARGE PLAN APPLICATION FOR GEOTHERMAL FACILITIES/PROJECTS (Permit Expires 5-years from date of discharge permit issuance and/or OCD project approval, whichever is later)					
	🗌 Ne	w 🗌 Renewal [	] Modification		
1. DISTRICT:		2. <b>(</b>	<u>VGRID</u> (if applica	(ble):	
3. OPERATOR:			<u> </u>		,
4. ADDRESS:					
5. CONTACT PERSO	<u>N</u> :		PHONE		
6. LOCATION:	/4	/4 Section	Township	Ran	P.6
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<ul> <li>pits, dikes and tar</li> <li>10. <u>Attach</u> documenta drilling/installation</li> <li>11. <u>Specify</u> whether the jurisdiction of the</li> <li>12. <u>USE DETERMIN</u> <ul> <li>a. Is the primary YES</li> <li>b. If <u>NO</u> to "a.</li> <li>i. Is the exercised of the target of the primary YES</li> </ul> </li> <li>b. If <u>NO</u> to "a.</li> <li>i. Is the exercised of the target of the primary YES</li> </ul>	iks on the facility. Ation identifying all r on/site construction a here will be a groun Office of the State J ATION: y use of any water in NO PROJECT " above, please answ straction of heat "in NO vater less than 250°F NO vater notable*?	naterials that are currently or nd/or during the regular cour d water appropriation asso- Engineer (OSE): YES [] N nvolved in the proposed proje DOES NOT INVOLVE WATE wer all three following questi- ridental" to another beneficia ?	will be stored or se of operations a ciated with the pr TO ect, the extraction IR ons: 1, primary use of	used at the facility. oposed project u of the heat carr the water?	ity during mder the ied by that water?
III. Is the v YES	rater potable*? NO Bule 20.7.10 NMAC ree	ardine årinkine water standards			
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<ol> <li><u>Attach</u> document procedures.</li> <li><u>Attach</u> document</li> </ol>	ation identifying and ad daily volume of v ation identifying and ation specifying all j	l describing all present source raste water must be included. I describing all current liquid proposed modifications to exi	es of effluent and and solid waste o isting collection/t	waste solids. Sj collection/treatm reatment/disposa	pecification of ent/disposal al systems.

OCD- Geothermal - Page 1

that will ensure permit compliance.	
<ol> <li><u>Attach</u> documentation detailing a contingency project.</li> </ol>	plan for the reporting and clean-up of spills or releases at the
<ol> <li><u>Attach</u> documentation reflecting geological/hydrogenetic to and quality of ground water must be included</li> </ol>	drological information for the facility/project. Documentation of dept 1
<ol> <li><u>Attach</u> documentation detailing a facility closur compliance with any other OCD or WQCC rule</li> </ol>	re plan, and any other information necessary to demonstrate es, regulations and/or orders.
). Applicant-designated Geothermal Project	<u>TT TYPE(</u> s):
] Open loop (single/multiple well for water withd	lrawal, water returned to a surface source)
] Open loop (single/miltiple well for water withd	lrawal, water returned to a second well)
] Standing Column (single well for water withdra	uwal and water return)
] Closed-loop	
Other*	
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# **OCD Geothermal Permit Process**



Carl Chavez

OCD Environmental Bureau- SF (505) 476-3490



### Oil Conservation Division (OCD) Geothermal Power Regulations, Application, Bonding, Forms& Resource Information (Revised: 08/18/2009)

**Geothermal Regulations:** 

Chapter 71: Energy & Minerals Article 5: Geothermal Resources Conservation Act Chapter 71, Article 5 NMSA 1978 Title 19: Natural Resources & Wildlife Chapter 14: Geothermal Power Title 19. Chapter 14 NMAC (11-15-83 Recompiled 12-31-01)

Water Quality Control Commission 20.6.2 NMAC (Class V Injection Well Designation)

Application Forms: <u>Geothermal</u> <u>Permit to Inject (C-108)</u> **Drilling (G-101 & 102) & Bond Forms** (please note that bonds for Class V Injection Wells are handled separately under the WQCC Regulations (UIC Program) while geothermal production or development wells are bonded separately under the "G" Forms and associated geothermal regulations): Geothermal Exploration & Production Forms (see "Geothermal Well Forms")

Bonding (see "Bond Forms" GT-B-1 and GT-B-2)

	GEOTHERMAL WELL FORMS		
G-101	Application for Permit to Drill, Deepen or Plug Back	50E	
G-102	Well Location and Acreage Dedication	u S C a	
G-103	Sundry Notice	الد ت م.	
G-104	Certificate of Compliance and Authorization to Produce	L O G	
G-105		PDF	
G-106	Well Summary Report	PDF	
G-107	Well History	402	- un dereise
G-108	Monthly Production Report	PDF	
G-109	Monthly Purchaser's Report	PDF	
G-110	Monthly Injection Report	PDF	
6-111	Annual Temperature and Pressure Test	POF	
G-112	Application to Place Well on Injection	- D L L	
	UNNUMBERED FORMS		· · · · · · · · · · · · · · · · · · ·
	Discharge Plan Application for Service Companies, Gas Plants, Refineries, Compressor, Geothermal Facilities and Crude Oil Pump Stations	PD(F	0.02
	BOND FORMS		
	\$50,000 Blanket Plugging Bond (4/2009 - 7/2009)	ЦЦ	200
CBA	Assignment of Cash Collateral Deposit (4/2009 - 7/2009)	POF	000
CBB	Blanket Cash Plugging Bond (4/2009 - 7/2009)	5 D E	200
L C	Letter of Credit - To be used to satisfy the financial assurance requirement for wells (4/2009 - 7/2009)	Ц О а	
GT 8-1	Geothermal One Production-Well Plugging Bond Surety Bond	ъDF	000
GT B-2	Geothermal Multi-Production Well Plugging Bond Surety Bond	PDF	200
	Geothermal Injection-Well Plugging Bond Cash Plugging Bond	щОd	
	Geothermal Injection-Well Plugging Bond Assignment of Cash Collateral Deposit	ц. Да.	

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1609 Rto Herzos Road, Azfec, NM 87410 District IV 1226 S. St. Francis Dr., Santa Fe, NA 85505	Energy Minerals and Natural Resources Oil Conservation Division 1220 South St. Francis Dr. Santa Fe. NM 87505	Submit Original Plus I Capy to Same Fe I Copy to Appropriate District Office
DISCHARGE PLAN APPLI REFINERIES, CC AND (Refer to the OCD)	ICATION FOR SERVICE COMPANE OMPRESSOR, GEOTHERMAL FACIL CRUDE OIL PUMP STATIONS O Guidelines for assistance in completing the applicatio	S,GAS PLANTS, LITES ^{DI)}
1. Type:	sw 🔲 Renewal 🔲 Modification	<b>a</b> an is <b>a</b> and <b>b</b>
2. Operator:		
Address: Contact Person:	Phone:	
3. Location:/4 Submit I:	A Section Township args scale topographic map showing exact location.	Range
<ol> <li>Attach the name, telephone number at</li> </ol>	nd address of the landowner of the facility site.	
5. Attach the description of the facility v	with a diagram indicating location of fences, pits, dikes	s and tanks on the facility.
6. Attach a description of all materials st	tored or used at the facility.	
<ol> <li>Attach a description of present source must be included.</li> </ol>	es of effluent and waste solids. Average quality and da	aily volume of waste water
8. Attach a description of current liquid	and solid waste collection/treatment/disposal procedur	res.
9. Attach a description of proposed mod	lifications to existing collection treatment/disposal syst	tems.
<ol> <li>Attach a routine inspection and main 11. Attach a confingency plan for reporti</li> </ol>	uenance plan to ensure permu computance. ing and clean-up of spills or releases.	
<ol> <li>Attach geological/hy/drological inform</li> </ol>	mation for the facility. Depth to and quality of ground	l water must be included.
<ol> <li>Attach a facility closure plan, and of rules, regulations and/or orders.</li> </ol>	her information as is necessary to demonstrate complia	ance with any other OCD
14. CERTIFICATIONI hereby certify the best of my knowledge and belief.	that the information submitted with this application is t	true and correct to the
Name:	Tide:	
Signature:	Date:	
E-mail Address:		

R 93	TATE OF NEW MEXICO         Oil Conservation Division           GERGY, MINERALS AND NATURAL         1220 South St. Francis Dr.           ESOURCES DEPARTMENT         Sunth Fe, New Mexico 87505	FORM C.108 Revised June 10, 2003
	APPLICATION FOR AUTHORIZATION T	<b>ENECT</b>
mó	PURPOSE: Secondary Recovery Pressure Mainter Application qualifies for administrative approval? Yes	ince Disposal Storage
=	OPERATOR:	
	ADDRESS:	
	CONTACT PARTY:	PHONE:
Ē	WELL DATA: Complete the data required on the reverse side of this form for e- Additional sheets may be attached if necessary.	h well proposed for injection.
N	Is this an expansion of an existing project? Yes If yes, give the Division order number authorizing the project.	тур фил түре и жи түнөрөөнөө бөрөө түрөрт бүл ойламдагадаар түрөө илтогдаар алаас алаас алаасаар алаасаар алаас
Ň	Attach a map that identifies all wells and leases within two miles of any propose drawn around each proposed injection well. This circle identifies the well's area	injection well with a one half wile radius circle f review.
N.	Attach a tabulation of data on all wells of public record within the area of review Such data shall include a description of each well's type, construction, date drille schematic of any plugged well illustrating all plugging detail.	which pertertuate the proposed injection zone. location, depth, record of completion, and a
VII.	. Attach data on the proposed operation, including:	
	<ol> <li>Proposed average and maximum daily rate and volume of fluids to be injecte 2. Whether the system is open or closed.</li> <li>Proposed arenge and maximum injection pressure.</li> <li>Sources and an appropriate analysis of injection fluid and compatibility with preduced water, and.</li> <li>If injections is for disposal purposes into a zone not preductive of oil or gas a chemical analysis of the disposal zone formation water (may be mesured or wells, sec).</li> </ol>	e receiving formation if other than reinjected r within one mile of the proposed well, attach a rferred frem existing literature, studies, nearby
W.	II Attach appropriate geologic duts on the injection zone including appropriate lith depth. Give the geologic name, and depth to bottom of all undergrenned sources total dissolved solids concentrations of 10,000 mg/l or less) overlying the propoknown to be immediately underlying the injection interval.	logic detail, geologic name, thickness, and dimking water (aquifers containing waters with d injection zame as well as any such sources
R	Describe the proposed stimulation program, if any.	
X	Attach appropriate logging and test data on the well. (If well logs have been file	with the Division, they need not be resubmitted).
Ϋ́Υ.	<ul> <li>Attach a chemical analysis of fresh water from two or more fresh water wells (if, injection or disposal well showing location of wells and dates samples were taker</li> </ul>	ailable and producing) within one mile of any
XII.	Applicants for disposal wells must make an affirmative statement that they have data and find no evidence of open faults or any other hydrologic connection bett sources of drinking water.	xomined available geologic and engineering ten the dispesal zone and any underground
XIII.	. Applicants must complete the "Proof of Notice" section on the reverse stde of thi	form.
XIV.	<ul> <li>Certification: I hereby certify that the information submitted with this application and belief.</li> </ul>	is true and correct to the best of my knowledge
	NAME:	nte:
	SIGNATURE	DATE:
*	E-MAIL ADDRESS: If the information required under Sections VI, VIII, X, and XI above has been pre Praces dynamic date and ritrumstances of the catilor submitted.	iously submitted, if need not be resubmitted.

DISTRIBUTION: Original and one copy to Santa Fe with one copy to the appropriate District Office

HI. WELL DATA

A. The following well data must be submitted for each injection well covered by this application. The data must be both in tabular and schematic form and shall include:

(1) Lease name: Well No.; Location by Section. Township and Range: and footage location within the section

(2) Each casing string used with its size. setting depth. sucks of cement used, hole size. top of cement, and how such top was determined.

(3) A description of the tubing to be used including its size, lining material, and setting depth.

(4) The name, model, and setting depth of the packer used or a description of any other seal system or assembly used.

Division District Offices have supplies of Well Data Sheets which may be used or which may be used as models for this purpose. Applicants for several identical wells may submit a "typical data sheet" rather than submitting the data for each well. B. The following must be submitted for each injection well covered by this application. All items must be addressed for the initial well. Responses for additional wells need be shown only when different. Information shown on schematics need not be repeated.

(1) The name of the injection formation and, if applicable, the field or pool name.

(2) The injection interval and whether it is perforated or open-hole.

(3) State if the well was drilled for injection or, if not, the original purpose of the well.

(4) Give the depths of any other performed intervals and detail on the sacks of comont or bridge plugs used to seal off such performance.

(5) Give the depth to and the name of the next higher and next lower oil or gas zero in the area of the well, if any,

NIV. PROOF OF NOTICE

All applicants must furnish preof that a copy of the upplication has been furnished, by certified or registered muit, to the owner of the surface of the tand on which the well is to be located and to each leasehold operator within one-half mile of the well location.

Where an application is subject to administrative approval, a proof of publication must be submitted. Such proof shall consist of a copy of the legal advertisement which was published in the county in which the well is lecated. The contents of such advertisement must include:

(1) The name, address, phone number, and costact party for the applicant.

(2) The intended purpose of the injection well: with the exact location of single wells or the Section, Township, and Range location of multiple wells.

(3) The formation name and depth with expected maximum injection rates and pressures; and

(4) A notation that interested parties must file objections or requests for hearing with the Oil Conservation Division, 1220 South St. Francis Dr., Santa Fe, New Mexico 87505, within 15 days.

NO ACTION WILL BE TAKEN ON THE APPLICATION UNTIL PROPER PROOF OF NOTICE HAS BEEN SUBMITTED. NOTICE: Surface owners or offset operators must file any objections or requests for hearing of administrative applications within 15 days from the date this application was mailed to them.





Geothermal Regulations Stakeholder Work Group (GRSWG) Meeting (6/9/2010) Office of State Engineer- 130 South Capitol Street (Concha Ortiz y Pino Building) Santa Fe, NM 87504-5102. (Call David Heber or Mike Johnson at 505-827-6102 or 505-827-3867)

Attendees: (see sign-in sheet below).

Teleconference Attendees: J.T. Baca, Andy Dalmy, Herb Black DOI-MMS, Doug Rappuhn-OSE & Mike Smith-BLM

	Geothermal Reg. Mue	ting Office of State Engineer (Pino Bldg.)
Name	Agency Office	phone E-mill
Carl Chave	2 NMOCD	505-476-3490 Carlj. Chavez@ 47
David Broo	ps. NMOCO	-476-3450 david brookse "
Mika Alton	WICE NMOCD	476 - 3480 mikel altomarela "
MIKE JOHN	SON NM.OSE	827-3867 mike, johnson@ 11
Jehl nuet	L ME	827-1049 pho. hall Q'
DAV.O HES	R OSE	827-6102 david heber@"
		•

### **Meeting Minutes:**

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  - Discussion of whether CID/RLD has closure provision in permit to construct closed-loop systems. They do not, but they perform inspection(s) within 180 days of permit issuance. OCD brought up concern about systems that are temporarily abandoned or not used and possible consideration by CID and/or OSE and NMED to include closure provision in permit or requirement to evacuate chemicals from systems when taken out of service to eliminate threat of leakage to fresh ground water. J.T. Baca indicated that an Admin. Code would need to be changed. CID. sent OCD a brochure on installation of HVAC and heat exchange systems. OCD agreed to send this out to the group to better understand what CID/RLD permits. NMED indicated it could develop Best Mgt. Practice for closed-loop systems that would include evacuation of fluids from the system when taken out of service. Could develop link that OCD could link to on it geothermal

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		Geothermal Regu Muet	lations stakeholder Work Group ring Office of State Engineer (Pino Bldg) 6/9/2010
Name		AgencyOffic	phone E-mil
Carl Chave	2	NMOCD	505-476-3490 Carlj. Chavez@ 47
David Broo	ps.	NMOCO	-476-3450 dzuid brookse"
Mikal Alton	are	NMOCD	476 - 3480 mikel altomare a
Mike JOHN	ison	NMOSE	827-3867 mike, johnson@ 11
Jehl HHA	<u></u>	NM ED	527-1029 pho. hall Q'
DAVID HES	PR	OSE	827-6102 david heber @ "

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### Chavez, Carl J, EMNRD

From:	Chavez, Carl J, EMNRD
Sent:	Friday, June 25, 2010 2:22 PM
То:	Johnson, Mike S., OSE; Heber, David, OSE; Altomare, Mikal, EMNRD; Lucero, Stephen A., EMNRD; Olson, Bill, NMENV; Fesmire, Mark, EMNRD; 'Mike_Smith@blm.gov'; Martinez, Lisa, RLD; 'Adrienne.Brumley@blm.gov'; Brooks, David K., EMNRD; Dalmy, Andy ., RLD; Baca, Jerome T., RLD; Pacheco, Rem, RLD; Aragon, Fermin , RLD; VonGonten, Glenn, EMNRD: Chavez, Carl J. EMNRD: Rappuhn, Doug H., OSE: Sizemore, Jim L., OSE:
	Sanchez, Daniel J., EMNRD; 'Black, Herb'
Subject:	Geothermal Regulations Stakeholder Working Group Meeting Minutes from 6/9/2010 Meeting at OSE
Attachments:	Meeting Minutes 6-9-10.pdf

FYI. Our records expert is on vacation for a couple of weeks; therefore, please find attached the above subject meeting minutes for your review before our next meeting on July 7, 2010 at OCD from 10 to Noon.

The meeting minutes will be posted under OCD Online "UIC-999" in a couple of weeks.

Please contact me if you have questions. Thank you.

Carl J. Chavez, CHMM New Mexico Energy, Minerals & Natural Resources Dept. Oil Conservation Division, Environmental Bureau 1220 South St. Francis Dr., Santa Fe, New Mexico 87505 Office: (505) 476-3490 Fax: (505) 476-3462 E-mail: <u>Carl J. Chavez@state.nm.us</u> Website: <u>http://www.emnrd.state.nm.us/ocd/</u>index.htm (Pollution Prevention Guidance is under "Publications") Geothermal Regulations Stakeholder Work Group (GRSWG) Meeting (6/9/2010) Office of State Engineer- 130 South Capitol Street (Concha Ortiz y Pino Building) Santa Fe, NM 87504-5102. (Call David Heber or Mike Johnson at 505-827-6102 or 505-827-3867)

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Name	AgencyOffi	E phone E-méril
Carl Chave	2 NMOCD	505-476-3490 Carlj. Chaveze g
David Bros	pr. NMOCO	-476-3450 dzuid. brookse"
Mikal Alton	tare NMOCD	476 - 3480 mikel altomare a
MIKE JOHN	SON NMOSE	- 827-3867 mike, johnson@ 11
John Hal	r men	827-1049 pho. hall Q "
DAVID HES	DSE OSE	827-6102 david heber@ "

### **Meeting Minutes:**

- 1) OCD Generic Geothermal Application Form (also look at OCD C-108 Application to Inject Form) Try to look at other state agency forms.
  - Question of "Potable Water" came up and Mike Johnson of OSE referenced 72.12.25 NMAC for citation. J.T. Baca of CID indicated that "potable water" referenced in plumbing code is limited to that code and cited definition from "Webster's Dictionary".
  - Item 20 of form could include J.T. as contact for CID and John Hall NMED for closedloop systems where potable water is involved. John Hall indicated that NMED would like to be involved in large projects only.
  - Discussion of whether CID/RLD has closure provision in permit to construct closed-loop systems. They do not, but they perform inspection(s) within 180 days of permit issuance. OCD brought up concern about systems that are temporarily abandoned or not used and possible consideration by CID and/or OSE and NMED to include closure provision in permit or requirement to evacuate chemicals from systems when taken out of service to eliminate threat of leakage to fresh ground water. J.T. Baca indicated that an Admin. Code would need to be changed. CID. sent OCD a brochure on installation of HVAC and heat exchange systems. OCD agreed to send this out to the group to better understand what CID/RLD permits. NMED indicated it could develop Best Mgt. Practice for closed-loop systems that would include evacuation of fluids from the system when taken out of service. Could develop link that OCD could link to on it geothermal

resource page to pass the practice along? OCD also brought up the topic of regulatory agencies discouraging acceptance of geothermal systems that are bad for the environment to eliminate threats to NM's scarce fresh water resources similar to OCD and how it discourages or dislikes "flash steam" geothermal.

- OCD indicated that the final generic form could be assigned a "G-100" designation and filed with the rest of the G-Forms on its webpage? This draft form replaces the old generic form. New sections were added to identify "Incidental Use" and route applicants to CID/RLD to closed loop HVAC systems, since even though the name implies "geothermal", these systems are not considered "geothermal" under the OCD Regulations. This way, OCD can eliminate applications submitted to OCD, but should actually have been directed to CID/RLD, etc.
- 2) OCD "Who Does What" Geothermal Resource Website with revisions, inclusion of state agency links to permits, program, and permit flow-chart(s) process for discussion, feedback, etc. (will continue to work on throughout meetings until final)
  - OCD presented "spaghetti diagram" of what OCD currently thinks each state regulatory agency involved with the geothermal program is responsible for. The diagram may be placed on the OCD's updated geothermal resource webpage with links. OCD is working to eliminate text and develop hyperlinks or cursory review of brief topics on webpage that steer applicants and the general public to state agency application forms, regulations, etc.
  - The term "geothermal" in "geothermal heat pumps" although implied by the nomenclature is actually not considered "geothermal" under OCD regulations. However, the nomenclature does not help convey OCD's determination. Education of the public will likely be needed.
  - Group voted to upgrade each agency's program with links to forms, applications and regulations for OCD's geothermal resource page. OCD will be working with agencies on this for next meeting.
- **3)** Discussion: OCD will provide a brief overview of where the geothermal program is going, issues, and who does what with group free to interact in discussion(s) to flesh out issues thus far....
  - Updated group on regulatory issues, aftermath of OCD's Feb. 2010 findings that it is responsible for both low and high temperature geothermal regulations with forward thinking, what OCD is doing to satisfy Governor's Recent Executive Order to make NM No. 1 in renewable energy; and permit process.
  - OCD's plenary environmental authority over development of geothermal broader than even oil and gas development.
  - OCD currently has no rules in place to address environmental issues.
  - OCD geothermal Regs. are not exclusive and must not supersede on other state or local regulations? Local government may have regulations to abide by...
  - If WQCC Regulations don't apply, then OCD has Statutory Authority.
  - Correlative rights issues in geothermal will not likely be determined or understood until more geothermal exploration and production of geothermal reservoirs are completed

similar to oil and gas to determine the correlative rights of a reservoir. Will likely need stakeholder input and new regulations to address.

- Who owns geothermal resource? Owner of mineral rights on State land. Split-estate not addressed in NM. Legal precedent in court case, geothermal resource considered a mineral on Fed. land. Probably the same on state land?
- If not potash or mineral (oil, gas or geothermal), not OCD. Cooperation between potash and geothermal is OCD jurisdiction. No current regulations to address this or these issues.
- Thoughts about OSE certified well driller requirements and where OSE can be amenable to allowing other state agencies overseeing their jurisdictional aspects of their programs to oversee applications and protect fresh water. OCD includes a provision that it may require Certified Water Well Drillers on certain projects, but stated that oil, gas and geothermal drillers may have more expertise in protecting fresh water (< 10,000 ppm TDS) than a certified water driller who is experienced at drilling at shallower depths. CID/RLD has a directional boring license requirement on its HVAC projects that OSE may feel more comfortable allowing CID/RLD oversight of projects that penetrate shallow ground water. As long as ground water is not moved around or displaced, OSE may not have to be involved with closed-loop HVAC Projects.
- 4) Agency Lists of Permitted Projects for OCD consideration in adding to its OCD Online low and high temperature permit tracking system and to assess the magnitude of the existing programs to understand work load, etc.
  - CID/RLD is currently not tracking their projects on a database. OSE tracks projects, i.e., spa wells, through well permit process. NMED had no permitted projects. OCD only has 1 permitted power plant project that it tracks via OCD Online and its Risk Based Data Management System. OCD will need to develop an API# process for bonding, well tracking, etc. as more projects develop under its geothermal program.
- 5) Continued Discussion regarding heat-transfer systems and classification as either geothermal or non-geothermal resources in NM for purposes of regulation by OCD or other state agencies.
  - These "direct use" heat pump or heat exchange project applications are in fact NOT geothermal resources in NM because they are not using the earth's geothermal heat directly, but rather are capturing, storing and then using heat later from inside the buildings, heat from the sun, etc.
  - In that regard, OCD thinks any discussion of issuance of permits and assessment of associated fees for these projects is premature and may not fall into OCD's jurisdiction and would not be an item for discussion unless and until OCD determines if it is even something to be regulated/permitted- Mikal Altomare (OCD).
  - Could OCD issue discharge permit for these types of low-temperature closed-loop systems and assess any fees? Probably not.... Could track projects using the generic form (see #1 above.) and enter into OCD Online? But OCD would be responsible for tracking every project even if it falls outside of OCD's jurisdiction.... Don't think OCD has resources to track every geothermal application. Updated OCD generic geothermal

application will alert and direct applicants if their project is closed-loop heat exchange or heat pump installation to the CID/RLD.

- 6) Issues (OSE Certified Well Driller Clarification on Geothermal Projects- Heber/Johnson?).
  - OCD may require certified water well drillers on certain projects, but not geothermal power generation projects where drillers have expertise protecting fresh water aquifers at geothermal drilling projects.
  - OSE Certified Water Well Drillers are required on CID/RLD heat pump and geothermal exchange projects. However, CID/RLD indicated it has a directional borehole license requirement; therefore, CID may be able to oversee these projects without OSE involvement in the future?
- 7) Miscellaneous (BLM/OCD MOU for bonding and any other redundant geothermal issues-Smith/Chavez- BLM) BLM will check to see if royalty, rent and/or taxation requirements would apply to residential and commercial geothermal heating applications and get back to group with answer......
  - Ground Heat Pumps (GHP) not subject o Fed. laws or regulations on exchange or direct use of heat and not subject to Fed. royalty. GHP is not subject to Fed. lease regulations on exchange or direct use.
  - BLM will follow-up with e-mail indicating how OCD could keep the ball rolling on the State Fed MOU..... Bonding is only MOU issue identified by the agencies at this point, but may be more? Under 43 CFR 261, operation plan, drill plan, redundancy between programs. Concept of "Incidental Use" there is no regulatory definition from state or feds. On military land, i.e., WSMR in appropriate act 2004 military is authorized to use minerals for military purposes, i.e., aggregate for roads, etc. on Fed. estate. Would state required permit on federal land? No, would be excluded.
  - OCD should contact Tony Harold (State BLM Director- SF) on MOU to start at the top vs. the bottom. This means from OCD Director to BLM Director to get this done most efficiently.
  - After checking on royalty issues for residential and commercial direct heat for buildings at the Federal level, Mike Smith (BLM) indicated that Federal Rent, Royalty, etc. would not apply.
- 8) Path Forward: Next meeting at OCD Wendell Chino Building on Wednesday, July 7, 2010 from 10:00 a.m. to Noon.

Please contact Carl Chavez (OCD) at (505) 476-3490 if you have questions. Thank you.

### Some OCD Initiatives with Stakeholder Agencies Governor's Executive Order Making NM the No.1 Leader in Renewable Energy Carl Chavez- OCD (6/16/2010)

- 1) OCD has identified with OSE (water appropriation issues) the scarce fresh water resource issues in New Mexico and OCD is working with ECMD to help ensure commercial geothermal power companies are proposing alternative innovative heat exchange or transfer systems with fluids other than just fresh water for heat exchange in their engineering design and constructed systems.
- OCD/BLM/? Memorandum of Understanding(s) (MOU) between state and/or federal agencies to minimize duplication of efforts and streamlining the commercial geothermal power permit process.
- 3) OCD determined in February of 2010 that it had full jurisdiction over Geothermal Regulations for low & high temperature geothermal heat extraction, which further streamlines the permit process in No. 2 above.
- 4) OCD Geothermal Well Bond General Amounts (~\$10K Multi-Well & \$5K Single-Well) are low and an incentive to commercial power generation company by reducing the cost of geothermal exploration and production in the state.
- 5) OCD is actively engaging state and federal agencies in evaluating and seeking a more efficient application review

and permit process with updated website resource page, and updated generic geothermal application form to assist applicants, general public, etc. OCD is concurrently working with the geothermal regulations working group (GRWG) (see No. 3 above), which is also helping to compliment the Governor's Executive Order for Renewable Energy Production- "Deep Source Geothermal."

From:	<b>Carl Chavez- OCD Environmental Bureau</b>
To:	Steve Lucero- ECMD
Date:	6/16/2010

### Subject: OCD Technical & Policy Recommendation Examples with Comments

Some preliminary examples provided by ECMD where OCD has commented include the following:

1) Development of geothermal resources in areas with prolific water resources (siting criteria?) that will provide make-up water for cooling towers, etc.

Geothermal and associated evaporation loss of water resource(s) will always be a fundamental concern until commercial power companies design heat transfer systems independent or non-reliant on hydrologic and hydrogeologic water resources for heat exchange and generation of power. Until new engineered systems (i.e., air and ethylene glycol working fluids instead of fresh water) with innovative heat transfer systems are developed, locations with prolific water supplies like the Animas River Valley, Rio Grande Valley or Pecos River Valley may be preferred locations for power plants? In addition, fault and shattered bedrock locations that may be subject to seismic events near populated areas may need to be considered.

2) Geothermal engineering applications must be efficient to minimize loss of the water resource and depletion of hydrologic resources;

For example, a flash steam system is less efficient than a binary cycle system because the flash steam heat is uncontrolled and evaporates the water resource at a much higher rate; thus, a low efficient system that wastes the geothermal heat or resource).

Designs with heat exchangers that utilize air and/or other working fluids for the exchange of heat in the power generation process would reduce reliance on New Mexico's scarce fresh water resources and also reduce the water appropriation issues of the OSE, which seems to be an obstacle to geothermal power generation permitting. Pollution prevention and waste minimization, i.e., recycling or reuse of the water resource when used, may also help to minimize depletion of fresh water supplies and commercial power companies working in NM need to come up with viable solutions.

3) Pollution prevention and waste minimization (i.e., environmentally friendly chemicals, biocides or technologies that will control scale, fouling and corrosion problems without the application of toxic chemicals;

MagTek Inc. (see representative contact info. provided below) has a chemical free water treatment system.

Mr. Jerry C. Davis CEO / President 122 E. Wisconsin Rd. Edinburg, Texas 78539 Office: 956.289.1406 Cell: 956-369-6772 Fax: 956.289.1412 E-mail: jerry@magtekinc.com

The OCD is aware of other electrical methods that control fouling, scale, rust, etc. without chemical application, which has been forgotten largely due to influence of chemical treatment companies that sell various anti-fouling/corrosion chemical products. There may be certain circumstances when an environmentally friendly biocide is added to a certain treatment system unit, i.e., boiler unit, using the MagTek, Inc. technology. More case-studies and research are needed on magnetic and electric corrosion inhibitor technologies to document the success and understanding of the theory behind these types of technologies.

4) Aesthetic concerns (i.e., noise from well testing; large pits, etc.) need to be developed; Focus on low-quality *or non-fresh* deeper geothermal gradient formation water resources (> 2,500 ft.) in the oil and gas fields of NM accessible to nearby transmission grids;

Annual well testing may be noisy over a protracted period and may be more appropriate in the oil and gas fields of NM than nearby communities. OCD regulations for "noise" under 19.14.31.8 NMAC are as follows: "NOISE ABATEMENT: Adequate noise abatement equipment shall 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. [Recompiled 12/31/01]." Colorado has more definitive regulatory limits on maximum decibel levels allowed and the field monitoring required to determine whether a "noise" violation is occurring from oil and gas field activity.

Co-geothermal power production combined with oil and gas production with existing power grid infrastructure, and at depths greater than 2,500 ft, is not subject to water appropriation by the OSE with exception of any shallow fresh makeup water needed for heat exchange. Spent brine after oil, gas and geothermal heat extraction may be routed to a lined pit and then re-injected into an OCD permitted Class II SWD Well. There may be existing deep oil and gas wells with water temperature thermal gradients high enough to produce power in these fields, but well construction is critical to determining the feasibility of reworking any plugged and abandoned well. This project may be permitted under the NM UIC Program as Class II SWD Wells, which entails an administrative process.

5) Focus on transmission grid assessment and construction into identified deepsource geothermal resource areas to convey power inter-intra state; Power transmission grids already exist in the oil and gas fields of NM; therefore, it makes sense to produce geothermal power in these types of fields provided a viable geothermal reservoir(s) or resource(s) exists. One goal is power generation to support ongoing operator oil and gas field activities, and the other goal may be to produce commercial power to send down the existing grid system.

6) OCD shall facilitate a permit and bonding process for re-entry into existing oil and gas wells that will consist of submittal of G-101, G-102, G-103 along w/ Unnumbered form and C-108 to expedite geothermal applications (including exploratory single well approach without discharge permit issuance and public notice process?) in the oil fields of NM;

Geothermal Co-Production permit applications will likely be considered an oil and gas UIC Class II Well type application, which may not include the WQCC Regulatory discharge permit framework? The C-108 specifies the main regulatory requirements for injection or disposal wells, which includes public notice and a hearing process based on any public comments received from a notice and the applications are handle by OCD Administratively. The unnumbered or generic form is being revised to address the OCD's recent findings that it is responsible for both low and high temperature (boiling at STP) geothermal extraction of the heat.

7) OCD already has a WQCC process in place for permitting larger geothermal exploration and production projects;

OCD has a Geothermal Resource Page under its "Publications" link of its website. Any project that includes a UIC Class V injection well(s) with the exception of UIC Class II SWD Wells, may likely require a WQCC 20.6.2 NMAC discharge permit from the OCD. A generic geothermal form and C-108 "Application for Authorization to Inject" form submittal. In all cases, the OCD Geothermal G-Forms (G-101-102 and G-103 for existing well workovers) are required to be completed to satisfy OCD Geothermal Regulations. OCD will combine the geothermal component of the application with a WQCC discharge permit to prevent contamination to surface and ground water.

8) OCD geothermal exploration w/o WQCC discharge permit process for geothermal exploration in existing oil and gas wells in the oil fields of NM?;

OCD believes that it may be possible to permit Co-Geothermal Production Wells as UIC Class II Wells under its existing injection well and oil and gas regulations where the activity is considered oil and gas due to primary wastes involved. This would be an administrative process (generic geothermal and C-108 forms) with associated public notice requirements and possible hearing based on public comments received, if any.

9) Develop policy for number 8 above

It may already be formalized in the present OCD UIC Class II application process (generic and C-108) process? Once we receive an application(s), the OCD will follow the appropriate administrative process.

## Ownership of Geotherma

### Resources



### OCD Engineering Bureau- SF (505) 476-3450

David Brooks







Geothermal Power Scenarios

### **Ownership of Geothermal** Resources

Federal Lands: Where Us Geothermal (GT) resources. Where US Gov't owns Minerals, it owns

GT resources. Other Split-Estate Lands: Mineral owner probably owns

Surface Owner Protection Act does not apply.

## **Geothermal Resources**

### Conservation Act

- Oil Conservation Division (OCD) has general geothermal development, including: regulatory jurisdiction over all aspects of
- Well drilling: location and construction of wells
- geothermal development, approves "discharge plans" and permits Waste disposal: OCD administers Water Quality Act as applied to Class V geothermal injection wells
- Correlative rights: OCD must adjust competing claims of owners and users of the same geothermal reservoir.

. .

# Exceptions to OCD Jurisdiction

- Heat Exchange Systems: Not Geothermal
- "Incidental Use": A limited category of uses of geothermal OCD jurisdiction. heat incidental to water use is excluded by statute from
- Indian Lands:

Permit from federal EPA or Tribe required for injection wells.

Other OCD jurisdiction <u>may be</u> preempted by federal law or Tribal sovereignty.

# OCD Jurisdiction NOT Exclusive

- Other State Agencies have authority over particular aspects of Geothermal Operations:
- Office of the State Engineer (OSE) issues permits for water use, except as discussed below
- Regulations and Licensing Department (RLD) regulates construction
- Public Regulation Commission (PRC) regulates power generation.
- Other agencies may also be involved.
- Local Government land-use and other regulatory requirements may apply.

## Use of WATER in Geothermal

### Operations

- An OSE permit (or water right is) required except tor:
- Co-production with Oil or Gas where the water would be produced from the oil or gas well even if its geothermal heat were not used.
- Production of water from an aquifer <u>>2,500 feet below the</u> surface, where the water contains >1,000 ppm Total **Dissolved Solids**.

(Certain notice requirements apply. See NMSA 1978 Sections 72-12-26 and 72-12-27.)

## GT/O&G Co-Production

(a simpler regulatory environment)

common wells, will be simpler because: Geothermal/Oil & Gas Co-Production, using

OSE permits will (generally) not be required.

Bureau Class II injection permit issued through OCD's Engineering re-injected into the same or a different well pursuant to a be required. Water produced from an oil and gas well can be Water Quality Act discharge permits will (generally) not

# GT vs. O&G: Possible Conflicts

- tormations oil and gas production from the same or proximate development adversely affecting existing or potential future Oil and Gas operators may have concerns about geothermal
- attected by removal or injection of water in the course of oil and gas operations Geothermal potential of a formation may be adversely
- OCD has jurisdiction of these issues, but has developed no applicable rules.

# GT vs. Potash: Possible Conflicts

- Conflicts between O&G developers and potash developers have been extensive
- concern that O&G, also presents potential problems. GT interference with potash mining, though less of a
- OCD has jurisdiction over GT/Potash conflicts. However OCD's R-11-P (relating to O&G vs. Potash) does not apply.
- development in the near future counties) are unlikely candidates for geothermal Extensive and on-going litigation between O&G and Potash developers indicates potash areas (in Eddy and western Lea

# GT vs. Other Mining: Possible Conflicts

- activities, other than potash mining. jurisdiction over conflicts that could arise Neither OCD, nor any other state agency, has between geothermal development and mining
- USBLM may have jurisdiction over such conflicts on federal land.

## A Need for Rulemaking

- OCD's Geothermal Rules (developed in the current geothermal issues, particularly with respect to correlative rights. 1980s) need substantial revision to address
- effective GT rules. stakeholders, including GT developers and OCD looks forward to working with other agencies, to develop up-to-date and

### GEOTHERMAL REGULATION IN NEW MEXICO PURSUANT TO THE GEOTHERMAL RESOURCES CONSERVATION ACT:

Ongoing, multi-agency effort to clarify permitting framework pursuant to the Act in light of increased interest in geothermal energy.

June 16, 2010

Mikal M. Altomare, Assistant General Counsel Energy, Minerals and Natural Resources Dept, Oil Conservation Division

### GEOTHERMAL REGULATION IN NEW MEXICO PURSUANT TO THE GEOTHERMAL RESOURCES CONSERVATION ACT:

Threshold determination is required regarding whether the project constitutes a "geothermal resource" under NM Law.

 Requires cooperative (& sometimes simultaneous) management by multiple state agencies.

### **OCD'S ROLE IN GEOTHERMAL REGULATION**

### 71-5-6-COMMISSION'S AND DIVISION'S POWERS AND DUTIES.

A. In addition to its other powers and duties, the division shall have, and is hereby given, jurisdiction over all matters relating to the conservation of geothermal resources and the prevention of waste of potash as a result of geothermal operations in this state. It shall have jurisdiction, authority and control of and over all persons, matters or things necessary or proper to enforce effectively the provisions of the Geothermal Resources Conservation Act [71-5-1 NMSA 1978] or any other law of this state relating to the conservation of geothermal resources and the prevention of waste of potash as a result of geothermal resources and the prevention of waste of potash as a result of geothermal resources and the prevention of waste of potash as a result of geothermal operations. Provided, however, nothing in this section shall be construed to supersede the authority which any state department or agency has with respect to the management, protection and utilization of the state lands or resources and its jurisdiction.

B. The commission shall have concurrent jurisdiction and authority with the division to the extent necessary for the commission to perform its duties as required by the Geothermal Resources Conservation Act. In addition, any hearing on any matter may be held before the commission if the division director, in his discretion, determines that the commission shall hear the matter.

### OCD'S ROLE IN GEOTHERMAL REGULATION

### 71-5-7-POWER OF COMMISSION & DIVISION TO PREVENT WASTE & PROTECT CORRELATIVE RIGHTS

The commission and division are hereby <u>empowered</u>, and it is their duty, to prevent the waste prohibited by the <u>Geothermal Resources Conservation Act</u> [71-5-1 NMSA 1978] and to protect correlative rights, as in that act provided. To that end, the commission and division may make and enforce rules, regulations and orders relating to geothermal resources, and to do whatever may be reasonably necessary to carry out the purposes of that act whether or not indicated or specified in any section thereof.

### **OCD'S ROLE IN GEOTHERMAL REGULATION**

### 71-5-3. DEFINITIONS.

As used in the Geothermal Resources Conservation Act [71-5-1 NMSA 1978]:

A. "geothermal resources" means the natural heat of the earth or the energy, in whatever form, below the surface of the earth present in, resulting from, created by or which may be extracted from this natural heat and all minerals in solution or other products obtained from naturally heated fluids, brines, associated gases and steam, in whatever form, found below the surface of the earth, but excluding oil, hydrocarbon gas and other hydrocarbon substances;

E. "geothermal reservoir" means an underground reservoir containing geothermal resources, whether the fluids in the reservoir are native to the reservoir or flow into or are injected into the reservoir;

F. "geothermal field" means the general area which is underlaid or reasonably appears to be underlaid by at least one geothermal reservoir;

G. "<u>low-temperature thermal reservoir</u>" means a geothermal reservoir containing low-temperature thermal water, which is defined as *naturally heated water*, *the temperature of which is less than boiling at the altitude of occurrence*, which has additional value by virtue of the heat contained therein and is found below the surface of the earth or in warm springs at the surface;

### Incidental Use Exclusion; Incidental Loss or

### **EXTRACTION OF HEAT**

### 71-5-2.1 NMSA

When the application of potable water to a beneficial use involves the incidental loss or extraction of heat, *and* the water is 250 degrees Fahrenheit or less, *then that heat is not a geothermal resource* for which a royalty is due. In such a case, the use is not governed by laws related to geothermal resources but is simply governed by Chapter 72 NMSA 1978.

### **IN OTHER WORDS:**

In order to fall within the exclusion to "geothermal resource," <u>all</u> <u>four</u> of the following three requirements must be met:

1. The water is "potable,"

2. The water is being applied to a <u>beneficial use</u>,

3. The heat is being lost or extracted from the water "<u>incidentally</u>," AND

4. The water is <u>250° or less</u>.

### WHEN ALL FOUR REQUIREMENTS ARE MET FOR THE EXCLUSION:

- The application/use/project does not require a geothermal permit through the OCD, AND
- No state royalty payments are required pursuant to the Act.

### HEAT EXCHANGE/HEAT TRANSFER SYSTEMS – COMMONLY REFERRED TO AS "GEOTHERMAL"

### HEAT PUMP SYSTEMS

•The engineering and scientific communities prefer the terms "geoexchange" or "ground source heat pumps" because geothermal power traditionally refers to heat originating from deep in the Earth's mantle. *Wikipedia "Geothermal Heat Pump"* 

•Unlike a project tapping into a geothermal reservoir, these systems use the natural heat storage capacity of the earth or ground water to provide energy efficient heating and cooling. The heat pump equipment works like a reversible refrigerator by removing heat from one location and depositing it in another location. *Geothermal Heat Pumps, Toolbase Services, www.toolbase.org.* 

### <u>Review:</u>

<u>Geothermal Resource</u>  $\rightarrow$  The natural heat of the earth or the energy... present in, resulting from, created by or which may be extracted from this natural heat.

"GEOTHERMAL" HEAT PUMPS DO NOT USE THE <u>NATURAL</u> <u>HEAT OF THE EARTH</u>. THEY ARE THUS NOT <u>GEOTHERMAL</u> <u>RESOURCES</u>, AND THEREFORE DO NOT FALL UNDER THE PURVIEW OF EITHER THE GEOTHERMAL RESOURCE CONSERVATION ACT OR THE REGULATORY AUTHORITY OF THE OCD.



* <u>OSE:</u> With the exception of 3.b, above (<u>closed</u> loop heat transfer projects), all other projects ootentially involve water appropriation. Operators are responsible for ensuring that all water appropriation issues are addressed, proper documentation is submitted and permits are obtained through the OSE where required.



* OSE: With the exception of 3.b, above (<u>closed loop heat transfer projects</u>), all other projects ootentially involve water appropriation. Operators are responsible for ensuring that all water appropriation issues are addressed, proper documentation is submitted and permits are obtained through the OSE where required.

District I       State of New Mexico       Ravised June 9, 2010         District II       Energy Minerals and Natural Resources       Submit Original         1301 W. Grand Arezone, Anteria, NM 88210       Oil Conservation Division       Submit Original         District II       Oil Conservation Division       Phus 10 opy to Santa Fe         1000 Resources       Submit Original       Phus 10 opy to Santa Fe         District IV       1220 South St. Francis Dr.       1 Copy to Appropriate         District IV       Santa Fe, NM 87505       District Office         District Sciences Read, Artec, NM 87505       Santa Fe, NM 87505       District Office
🗌 New 🔲 Renewal 🔲 Modification
1. DISTRICT: 2. OGRID (if applicable):
3 OPERATOR
3. CONTACT PERSON: PHONE:
6. LOCATION:/4/4 Section Township Range
** <u>APPLICANT MUST SUBMIT A LARGE SCALE TOPOGRAPHIC MAP SHOWING EXACT LOCATION WITH GPS COORDINATES.</u>
<ul> <li>Attach documentation specifying the name, telephone number and address of the land/surface ownet(s) of the facility site. If the facility site is comprised of more than one parcel, and not all parcels are owned by the same landowner(s), identify what portion of facility site is owned by each by attaching a diagram.</li> <li>Attach documentation specifying the name, telephone number and address of the mineral right's interest holders for the site location, and for each specify what their interest(s) is(are).</li> <li>Attach documentation containing a description of the facility with a diagram clearly indicating the location of fences, pits, dikes and tanks on the facility.</li> <li>Attach documentation identifying all materials that are currently or will be stored or used at the facility during drilling/installation/site construction and/or during the regular course of operations at the facility.</li> <li>Specify whether there will be a ground water appropriation associated with the proposed project under the jurisdiction of the Office of the State Engineer (OSE): YES    NO   </li> <li>USE DETERMINATION: <ul> <li>Is the primary use of any water involved in the proposed project, the extraction of the heat carried by that water? YES    NO   </li> <li>If NO to "a." above, please answer all three following questions: <ul> <li>i. Is the extraction of heat "incidental" to another beneficial, primary use of the water?</li> <li>YES    NO   </li> <li>ii. Is the author above.</li> </ul> </li> </ul></li></ul>
YES NO See WOCC Rule 20.7.10 NMAC resarding drinking water standards.
<ol> <li>Attach documentation identifying and describing all present sources of effluent and waste solids. Specification of average quality and daily volume of waste water must be included.</li> </ol>
<ol> <li><u>Attach</u> documentation identifying and describing all current liquid and solid waste collection/treatment/disposal procedures.</li> </ol>
15. <u>Attach documentation specifying all proposed modifications to existing collection/treatment/disposal systems</u> .

<ol> <li><u>Attach</u> documentation identifying and describing a routine insp that will ensure permit compliance.</li> </ol>	pection and maintenance plan for the facility/project			
17. <u>Attach</u> documentation detailing a contingency plan for the reportacility/project.	orting and clean-up of spills or releases at the			
<ol> <li>Attach documentation reflecting geological/hydrological inform to and quality of ground water must be included.</li> </ol>	mation for the facility/project. Documentation of depth			
19. <u>Attach</u> documentation detailing a facility closure plan, and any compliance with any other OCD or WQCC rules, regulations a	other information necessary to demonstrate nd/or orders.			
20. APPLICANT-DESIGNATED GEOTHERMAL PROJECT TYPE(s):				
Open loop (single/multiple well for water withdrawal, water returned to a surface source)				
Open loop (single/multiple well for water withdrawal, water re	turned to a second well)			
Standing Column (single well for water withdrawal and water	return)			
Closed-loop				
Other*				
<ul> <li>* Please note that heat pump systems (open or closed-loop) are not considered "geothermal" and are therefore not permitted through the OCD. These projects are handled directly by the Regulation and Licensing Department/Construction Industries Division (RLD/CID) and where groundwater is potentially impacted, by NM Environment Dept. (MED). Inquiries and applications for permits relating to heat pump systems should not be made via this form, and schould instead be directed to CID/RLD and to the NMED.</li> <li>Applicants are responsible for contacting the appropriate Federal, State, Tribal and/or local government agencies responsible for rent, royalty and/or tax assessment.</li> <li>OCD approval of this application does not relieve operator of responsibility should their operations pose a threat to ground water, surface water, human health or the environment, In addition, OCD approval does not relieve the operator of responsibility should deal correct to the best of my knowledge and belief.</li> <li><u>CERTIFICATION</u>: I hereby certify that the information submitted with this application is true and correct to the best of my knowledge and belief.</li> <li><u>Namesi</u> <u>Iride</u> <u>Lennail Address</u> <u>Date</u> <u>Date</u></li> </ul>				
<u>Name:</u>	<u>Title:</u>			
Signature:	Certification/License #:			

Date: _____

E-mail Address:

OCD- Geothermal - Page 2

# OCD Geothermal Permit Process



### OCD Environmental Bureau- SF (505) 476-3490 Carl Chavez








.Volcanics

# Oil Conservation Division (OCD) Geothermal Power Regulations, Application, Bonding, Forms& Resource Information (Revised: 08/18/2009)

**Geothermal Regulations:** 

Chapter 71: Energy & Minerals Article 5: Geothermal Resources Conservation Act Chapter 71, Article 5 NMSA 1978

Title 19: Natural Resources & Wildlife Chapter 14: Geothermal Power Title 19, Chapter 14 NMAC (11-15-83 Recompiled 12-31-01)

<u>Water Quality Control Commission 20.6.2 NMAC</u> (Class V Injection Well Designation)

Application Forms: Geothermal Permit to Inject (C-108)

Drilling (G-101 & 102) & Bond Forms (please note that bonds for Class V Injection Wells are handled separately under the WQCC Regulations (UIC Program) while geothermal production or development wells are bonded separately under the "G" Forms and associated geothermal regulations): <u>Geothermal Exploration & Production Forms</u> (see "Geothermal Well Forms")

Bonding (see "Bond Forms" GT-B-1 and GT-B-2)

G-101	Application for Permit to Drill, Deepen or Plug Back	ðr.	
G-102	Well Location and Acreage Dedication	POP	
G-103	Sundry Notice	Por	
G-104	Certificate of Compliance and Authorization to Produce	906	and the second s
G-105	Well Log	ade	
G-106	Well Summary Report	POF	
G-107	Well History	ð,	
G-108	Monthly Production Report	DE	
G-109	Monthly Purchaser's Report	POF	
G-110	Monthly Injection Report	Š	
G-111	Annual Temperature and Pressure Test	POF	
G-112	Application to Place Well on Injection	JOC	
	UNNUMBERED FORMS		
	Discharge Plan Application for Service Companies, Gas Plants, Refineries, Compressor, Geothermal Facilities and Crude Oil Pump Stations	ğ	DOC
	BOND FORMS		
8-8	\$50,000 Blanket Plugging Bond (4/2009 - 7/2009)	ČF	DOC
СВА	Assignment of Cash Collateral Deposit (4/2009 - 7/2009)	ją	000
CBB	Blanket Cash Plugging Bond (4/2009 - 7/2009)	°,	DOC
۲ộ	Letter of Credit - To be used to satisfy the financial assurance requirement for wells (4/2009 - 7/2009)	ç	Doc
GT B-1	Geothermal One Production-Well Plugging Bond Surety Bond	4 Cr	DOC
GT 8-2	Geothermal Multi-Production Well Plugging Bond Surety Bond	ЧČ	Doc
	Geothermal Injection-Well Plugging Bond Cash Plugging	Ý	
	Geothermal Injection-Well Plugging Bond Assignment of Cash Collateral Deposit	ğ	

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Applicants must complete the "Proof of Notice" section on the reverse side of this form.	Applicants for disposal wells must make an affirmative statement that they have examined available geologic and engineering data and find ne evidence of open faults or any other hydrologic connection between the disposal zone and any underground sources of drinking water.	Attach a chemical analysis of fresh water from two or more fresh water wells (if available and producing) within one mile of any injection or disposal well showing location of wells and dates samples were taken.	Attach appropriate logging and test data on the well. (If well logs have been filed with the Division, they need not be resubmitted).	Describe the proposed stimulation program, if any,	Attach appropriate geologic data on the injection zone including appropriate lithologic detail, geologic name, thickness, and depth. Give the geologic name, and depth to bottom of all underground sources of drinking water (aquifers containing waters with total dissolved solids concentrations of 10,000 mg/l or less) overlying the proposed injection zone as well as any such sources known to be immediately underlying the injection interval	<ol> <li>Proposed average and maximum daily rate and volume of fluids to be injected;</li> <li>Whether the system is open or closed;</li> <li>Proposed average and maximum injection pressure;</li> <li>Sources and an appropriate analysis of injection fluid and compatibility with the receiving formation if other than reinjected produced water, and,</li> <li>If injection is for disposal purposes into a zone not productive of oil or gas at or within one mile of the proposed wells, etc.),</li> </ol>	Attach data on the proposed operation, including;	Attach a tabulation of data on all wells of public record within the area of review which penetrate the proposed injection zone. Such data shall include a description of each well's type, construction, date drilled, location, depth, record of completion, and a schematic of any plugged well illustrating all plugging detail	Attach a map that identifies all wells and leases within two miles of any proposed injection well with a one-half mile radius circle drawn around each proposed injection well. This circle identifies the well's area of review.	Is this an expansion of an existing project? Yes No If yes, give the Division order number authorizing the project	WELL DATA: Complete the data required on the reverse side of this form for each well proposed for injection. Additional sheets may be attached if necessary.	CONTACT PARTY:PHONE:	ADDRESS:	OPERATOR:	PURPOSI:         Secondary Recovery         Pressure Maintenance         Disposal         Storage           Application qualities for administrative approval?         Yes         No         No         No	APPLICATION FOR AUTHORIZATION TO INJECT	Of NEW MEXICO     Off Conservation Division     FORM C-108       RGY, MINERALS AND NATURAL     1220 South St. Francis Dr.     Revised June 10, 2003       OURCES DEPARTMENT     Santa Fe, New Mexico 87505     Revised June 10, 2003	

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E-MAIL ADDRESS: If the information required under Sections VI, VIII, N, and NI above has been previously submitted, it need not be resubmitted. Please show the date and circumstances of the earlier submittal: XIV. Certification: I hereby certify that the information submitted with this application is true and correct to the best of my knowledge and belief.

TITLE

DATE:

*

NAME:

DISTRIBUTION: Original and one copy to Santa Fe with one copy to the appropriate District Office

## III. WELL DATA

- A. The following well data must be submitted for each injection well covered by this application. The data must be both in tabular and schematic form and shall include:
- (1) Lease name; Well No.; Location by Section, Township and Range, and fovtage location within the section
- (2) Each casing string used with its size, setting depth, sacks of cement used, hole size, top of cement, and how such top was determined.
- (3) A description of the tubing to be used meluding its size, lining material, and setting depth.
- (4) The name, model, and setting depth of the packer used or a description of any other seal system or assembly used

Division District Offices have supplies of Well Data Sheets which may be used or which may be used as models for this purpose. Applicants for several identical wells may submit a "typical data sheet" rather than submitting the data for each well.

B. The following must be submitted for each injection well covered by this application. All tients must be addressed for the initial well. Responses for additional wells need be shown only when different. Information shown on schematics need not be repeated.

(1) The name of the injection formation and, if applicable, the field or pool name.

(2) The injection interval and whether it is perforated or open-hole.

(3) State if the well was drilled for injection or, if not, the original purpose of the well.

.

(4) Give the depths of any other perforated intervals and detail on the sacks of cement or bridge plugs used to seal off such perforations.

(5) Give the depth to and the name of the next higher and next lower oil or gas zone in the area of the well, if any

NIV. PROOF OF NOTICE

All applicants must furnish proof that a copy of the application has been furnished, by certified or registered mail, to the owner of the surface of the land on which the well is to be located and to each leasehold operator within one-half mile of the well location.

Where an application is subject to administrative approval, a proof of publication must be submitted. Such proof shall consist of a copy of the legal advertisement which was published in the county in which the well is located. The contents of such advertisement must include:

- (1) The name, address, phone number, and contact party for the applicant
- (2) The intended purpose of the injection well; with the exact location of single wells or the Section. Township, and Kange location of multiple wells;
- (3) The formation name and depth with expected maximum injection rates and pressures; and,
- (4) A notation that interested parties must file objections or requests for hearing with the Oil Conservation Division, 1220 South St. Francis Dr., Santa Fe, New Mexico 87505, within 15 days.
- NO ACTION WILL BE TAKEN ON THE APPLICATION UNTIL PROPER PROOF OF NOTICE HAS BEEN SUBMITTED.

Side 2

NOTICE: Surface owners or offset operators must file any objections or requests for hearing of administrative applications within 15 days from the date this application was mailed to them.





#### Chavez, Carl J, EMNRD

From: Sent: To: Subject: Attachments: Baca, Jerome T., RLD Wednesday, June 09, 2010 10:07 AM Chavez, Carl J, EMNRD FW: Message from 45C-2 S45C-210060910000.pdf

From: calendars.rld@state.nm.us [mailto:calendars.rld@state.nm.us] Sent: Wed 6/9/2010 11:00 AM To: Baca, Jerome T., RLD Subject: Message from 45C-2



HOW GEOTHERMAL TECHNOLOGY CAN HEAT AND COOL YOUR HOME WHILE LIMITING CARBON EMISSIONS

#### Story by Matt Chapuran

he second decade of the 21st century hasn't yet furnished us all with jet packs, but each year technology nudges us closer to green energy solutions that lay fossil fuels aside for a reusable alternative. One such potential solution is geothermal heating and cooling, an energy source that uses the energy storage capacity of the Earth itself to reduce the need for traditional heating and cooling.

"The heat from the Earth represents a significant energy resource that can be tapped to reduce emissions contributing to climate change," says Department of Energy Secretary Steven Chu. "Expanded use of geothermal heating pumps (GHPs) in the United States will create new jobs for engineers, manufacturers and technicians while at the same broadening our nation's clean and renewable energy portfolio."

#### How It Works

While the temperatures in your community may be fickle, the base temperature of the Earth is not; it remains fixed at a constant between  $45^{\circ}$ F and  $55^{\circ}$ F. According to the Geothermal Heat Pump Consortium (Geoexchange), a Washington-based non-profit trade association for the geothermal heat pump industry, as much as 47 percent of the sun's energy — in excess of 500 times more energy than mankind needs every year — is absorbed by the Earth, rendering the planet an enormous source of untapped energy. A geothermal system utilizes copper or plastic pipes placed beneath the home, often in a closed-loop system. In the winter, the pipes borrow the accumulated heat from the earth, warming the water or refrigerant in the system in depths of up to 200 feet below the home and then return the heat to the home through a conventional system of baseboard radiation or radiant tubing.

In the summer time, the opposite process takes effect, with the pipes carrying excess heat from the home and releasing it into the relatively cooler temperatures of the earth. Some of the efficiency of geothermal systems stems from the Earth's more stable temperatures providing a more reliable temperature differential than the differential between interior and exterior air.

#### Installation

For HVAC professionals, two questions should dominate initial conversations and planning with prospective homeowners considering geothermal systems. The first is whether the system will be water or refrigerant based. The ideal market for geothermal systems is a green-inclined consumer who has already prioritized renewable technologies. This same market segment may at first be reluctant to invest in burying refrigerant beneath their homes, possibly exposing themselves to environmental risks.

Jeff Parsons, owner of Geo Source One, Inc., in Plain City, Ohio, says that some initial iterations of the geothermal systems incorporated methanol as the antifreeze solution that conducted the heat.



Opposite Page: This building constructed in 2009 is a 3,700 sq. ft. chapel located at Pilgrim Center, a year round camp and retreat in Green Lake, Wisconsin.

PHOTO BY JEFF PUHLMANN-BECKER



#### 8 INNOVATION GEOTHERMAL TECHNOLOGY

MARCH/APRIL 2010 OFFICIAL

Right: Slinky Loop method of Geothermal technology. Far Right: Vertical lines being installed.

PHOTOS COURTESY OF OKLAHOMA STATE UNIVERSITY

Middle Right: Geothermal probe ready for the descent in the borehole PHOTO BY KUCE BEODOM

Bottom Right: Lines being prepared for installation of loops to the bottom of a pond.

> PHOTO COURTESY OF SCHOONOVER PLUMBING AND HEATING

Bellow: An example of the Horizontal Loop method.

ARCHITECT & PHOTOGRAPHER MARK STEPHENS, RIBA MRIA WWW.MARKSTEPHENS ARCHITECTS COM



OFFICIAL MARCH/APRIL 2010

Vertical

Loop

#### GEOTHERMAL TECHNOLOGY INNOVATION



#### Slinky Loop



#### "It's not something I'd want to see in my drinking water," Parsons says, advising installers and consumers to be wary of refrigerants labeled with a skull and crossbones.

Safer alternatives exist, such as environmentally friendly synthetic oil. Some state regulations mandate the use of pure glycerin solution, food grade propylene glycol or dipotassium phosphate. Installers should also be aware that some systems use refrigerants that "are great solvents," Parsons says. "In which case, you'll want a corrosion inhibitor so you don't see deterioration to the system."

Concerns of using a chemical refrigerant rather than water may be offset, however, since according to Geoexchange, water loops need to penetrate some 200 feet beneath the topsoil and require that the loops be placed some 20 feet apart, but refrigerant-based systems can go as shallow as 100 feet deep and require spacing of seven feet. Not only does this mean that a smaller surface area is needed for allocation to the system, but the cost of installation can be reduced by drilling shallower wells.

## The Economic Advantage

In 2009, Secretary Chu announced nearly

\$50 million from the American Reinvestment and Recovery Act to "advance commercial deployment of the renewable heating and cooling systems, which use energy from below the Earth's surface to move heat either into or away from the home or building."

Initiatives such as these, as well as a growing demand for green technology has been a shot in the arm for the geothermal industry. A hydrogeologist by background, Parsons credits the new-found interest in geothermal energy with revitalizing his business.

#### Open Loop

The diagrams above show five methods of piping configuration used for geothermal climate control. All methods use the natural heat contained in the soil or water.

GRAPHICS BY

(2)

#### INNOVATION | GEOTHERMAL TECHNOLOGY ഹ

How Geothermal Energy Works: Your own backyard has the potential to be an. energy source for heating and cooling comfort. Outdoor air temperatures fluctuate throughout the year with the changing seasons. In contrast, ground temperatures about four to six feet below the Earth's surface remain relatively moderate and constant all year. That's because the Earth absorbs nearly half of all the heat energy that reaches it's surface from the sun.

GRAPHIC BY JEFF ORTIZ

Far Right Top: Geothermal. entry and return lines flow into home through a manifold.

PHOTO BY KUCE BEODOM

Far Right Top Bottom: A different type of entry system allows flow lines to pass through valves.

PHOTO COURTESY OF ASHDEN AWARDS WWW.ASHDENAWARDS.ORG

Right: Geothermal unit installations. PHOTO BY. HUBERT KIRCHGAESSNER

Far Right: Installer straps the exit flow lines to the Geothermal unit.

PHOTO COURTESY OF OKLAHOMA STATE UNIVERSITY



MARCH/APRIL 2010 OFFICIAL

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OFFICIAL MARCH/APRIL 2010



"The increased demand is the one thing that's kept our business going the last two years," he says. Around the country, well-water excavators are finding a new life as geothermal installers.

The emergent nature of this industry means that states are still working to define their own regulations for the installation of geothermal heat pumps and national standards have yet to be adopted. However, organizations such as the International Ground Source Heat Pump Association (IGSHPA) now offer accreditation to contractors.

Geoexchange underscores the potential economic impact of this stimulus funding. "Every 18 heat pump installations can create one new job," it says. "That means 133 new green collar jobs can be created. ... Every geothermal heat pump requires 24 hours of manufacturing labor and 32 hours of installation labor. Small businesses involved in the installation include heating and air conditioning contractors, electricians, plumbers, excavators and drilling machine operators."

Contractors will frequently encourage the use of refrigerant to a consumer, not only because its lesser demands in space make it a less complicated system to apply in a retrofit installation, but also because the current tax incentive offered by the Obama Administration -a 30 percent federal tax credit of the entire cost of the system with no cap - is effective only on refrigerant-based systems.

RELATED INFO

## New Category of Geothermal Heat Pumps Can Now Earn the Energy Star



The U.S. Environmental Protection Agency has announced new requirements for residential geothermal heat pumps (GHPs); enabling waterto-water geothermal heat pumps to earn the Energy Star label for the first time. EPA's stringent specifications for this new category of geothermal heat pumps will help protect the environment and reduce energy costs, because GHPs that meet the new standards will be up to 45 percent more efficient than conventional pumps.

Geothermal heat pumps use ground temperature air instead of outside air to provide heating, cooling and often water heating. GHPs can be installed in new and existing homes. Because they use the constant temperature of the earth, GHPs are among the most efficient heating and cooling technologies currently available in the marketplace.

EPA worked with industry stakeholders to revise the requirements in response to growing consumer demand for water-to-water geothermal heat pumps. Water-to-water geothermal heat pumps provide heating and cooling and/or water heating to a building using liquid rather than forced air. The new requirements for water-to-water equipment complements existing efficiency and performance requirements for water-to-air and direct geoexchange GHP models.

Homeowners who install geothermal heat pumps with the Energy Star are eligible for a 30 percent federal tax credit.

More information on the heat pumps: http://www.energystar.gov/ghp More information on the tax credit: http://www.energystar.gov/taxcredits

#### 11

INNOVATION GEOTHERMAL TECHNOLOGY



Geothermal System Demystified: The heat pump is able to extract heat from well water and dump it into the hydronic tank at left. When needed, the hot water in the hydronic tank is pumped through the radiant floor.

PHOTO COURTESY OF CHEWONKI SUSTAINABILITY "The equipment must have an Air Conditioning, Heating & Refrigeration Institute rating," writes Carol Fey of Carol Fey and Association in Littleton, Colo. "If only ground water is used for cooling, by definition it does not have an AHRI rating."

On its Website, Energy Star -a joint venture of the Department of Energy and the Environmental Protection Agency intended to protect the environment through energy efficient products and practices - says that new standards on geothermal heat pumps went into effect on Dec. 1, 2009.

"The new specifications allow water-to-water GHPs to immediately be eligible to qualify for the label," it says. More stringent requirements will be phased in first on Jan. 1, 2011, and then again on Jan. 1, 2012.

#### **Other Savings**

Because the cost of drilling the holes — Fey estimates between and \$2,000 and \$3,000 for each hole, estimating the necessary heat and cooling load is of paramount importance for the prospective consumer. Fey recommends augmenting the system with a'smaller conventional heat pump "so that a conventional system provides the last 20 percent of the anticipated maximum load. That way, money is not spent on drilling holes for capacity that is used occasionally."

The system is also much more environmentally friendly than many conventional systems, such as a gas-fired boiler.

"Since a geoexchange system merely transfers heat from the ground into your home in winter, you don't need to burn any fossil fuels to create a warm interior environment," says Geoexchange. "Electric bills for a 2,000 sq. ft. home can be reduced to as low as \$1 a day, using a geoexchange system."

"For the average unit life of 24.4 years, 97.6 metric tons of emissions could be eliminated over the lifetime of each unit, and 234,240 tons over the lifetime of every 2,400 units sold through a state rebate program," Geoexchange claims, further pointing to an Oak Ridge National Laboratory paper that estimated, "aggressive deployment of GHPs could achieve 35 to 40 percent of a recommended carbon reduction path for the U.S. building sector."

#### Geothermal Regulations Stakeholder Work Group (GRSWG) Meeting

Office of State Engineer- 130 South Capitol Street (Concha Ortiz y Pino Building) Santa Fe, NM 87504-5102. (Call David Heber or Mike Johnson at 505-827-6102 or 505-827-3867)

#### Meeting Agenda (6/9/2010):

- 1) OCD Generic Geothermal Application Form (also look at OCD C-108 Application to Inject Form) Try to look at other state agency forms.
- 2) OCD "Who Does What" Geothermal Resource Website with revisions, inclusion of state agency links to permits, program, and permit flow-chart(s) process for discussion, feedback, etc. (will continue to work on throughout meetings until final)
- 3) Discussion: OCD will provide a brief overview of where the geothermal program is going, issues, and who does what with group free to interact in discussion(s) to flesh out issues thus far....
- 4) Agency Lists of Permitted Projects for OCD consideration in adding to its OCD Online low and high temperature permit tracking system and to assess the magnitude of the existing programs to understand work load, etc.
- 5) Continued Discussion regarding heat-transfer systems and classification as either geothermal or non-geothermal resources in NM for purposes of regulation by OCD or other state agencies. These "direct use" applications are in fact NOT geothermal resources in NM because they are not using the earth's heat, but rather are capturing, storing and then using later heat from inside the buildings, heat from the sun, appliances, etc. in that regard, I think any discussion of issuance of permits and assessment of fees is premature and would not be an item for discussion unless and until we determined it is even something to be regulated/permitted- Mikal Altomare (OCD). Does CID/RLD have a closure provision in its permit when systems fail or are no longer used? Could OCD issue discharge permit for these types of low-temperature closed-loop systems and assess any fees? Probably not.... Could track projects using the generic form (see #1 above.) and enter into OCD Online?
- 6) Issues (OSE Certified Well Driller Clarification on Geothermal Projects- Heber/Johnson?) Because the heat exchange systems are likely not geothermal resources to be regulated/permitted by OCD, this may not be an issue- Mikal Altomare.
- 7) Miscellaneous (BLM/OCD MOU for bonding and any other redundant geothermal issues-Smith/Chavez- BLM) BLM will check to see if royalty, rent and/or taxation requirements would apply to residential and commercial geothermal heating applications and get back to group with answer......
- 8) Path Forward: Next meeting at OCD Wendell Chino Building on Wednesday, July 7, 2010 from 10:00 a.m. to Noon.

District II E 1301 W. Grand Avenue, Artesia, NM 88210	Inergy Minerals and Natural Resources	Submit Original
District III 1000 Rio Brazos Road, Aztec, NM 87410 <u>District IV</u> 1220 S. St. Francis Dr., Santa Fe, NM 87505	Oil Conservation Division 1220 South St. Francis Dr. Santa Fe, NM 87505	Plus 1 Čopy to Santa Fe 1 Copy to Appropriate District Office

#### DISCHARGE PLAN APPLICATION FOR SERVICE COMPANIES, GAS PLANTS, REFINERIES, COMPRESSOR, GEOTHERMAL FACILITES AND CRUDE OIL PUMP STATIONS

(Refer to the OCD Guidelines for assistance in completing the application)

	New Renewal Modification
1.	Туре:
2.	Operator:
	Address:
	Contact Person:Phone:
3.	Location:       /4       /4       Section       Township       Range         Submit large scale topographic map showing exact location.
4.	Attach the name, telephone number and address of the landowner of the facility site.
5.	Attach the description of the facility with a diagram indicating location of fences, pits, dikes and tanks on the facility.
6.	Attach a description of all materials stored or used at the facility.
7.	Attach a description of present sources of effluent and waste solids. Average quality and daily volume of waste water must be included.
8.	Attach a description of current liquid and solid waste collection/treatment/disposal procedures.
9.	Attach a description of proposed modifications to existing collection/treatment/disposal systems.
10.	Attach a routine inspection and maintenance plan to ensure permit compliance.
11.	Attach a contingency plan for reporting and clean-up of spills or releases.
12.	Attach geological/hydrological information for the facility. Depth to and quality of ground water must be included.
13.	Attach a facility closure plan, and other information as is necessary to demonstrate compliance with any other OCD rules, regulations and/or orders.
1 t	4. CERTIFICATIONI hereby certify that the information submitted with this application is true and correct to the best of my knowledge and belief.
ľ	Name: Title:
S	Signature: Date:

E-mail Address:_____

	District 1 625 N. French Dr., Hobbs, NM 88240 District II 301 W. Grand Avenue, Artesia, NM 88210 District III 000 Rio Brazos Road, Aztec, NM 87410 District IV 220 S. St. Francis Dr., Santa Fe, NM 87505	State of New Mex Energy Minerals and Natura Oil Conservation Div 1220 South St. Franc Santa Fe, NM 875	ico Il Resources vision bis Dr. 505 FDMAL FACULT	Revised June 9, 2010 Submit Original Plus 1 Copy to Santa Fe 1 Copy to Appropriate District Office
ł	(Permit Expires 5-years from date	of discharge permit issuance and/o	or OCD project approval,	whichever is later)
		New Renewal	Modification	
1.	DISTRICT:	2. <u>OG</u>	<u> <b>SRID</b> (if applicable</u> ):	
3.	OPERATOR:			
1				
4.	ADDRESS.			
5.	CONTACT PERSON:		<u>PHONE</u>	
6.	PROJECT LOCATION:	_/4/4 <u>Section</u>	<u>Township</u>	<u>Range</u>
**	APPLICANT MUST SUBMIT A 7.5 MINU	TE USGS QUADRANGLE TOPO	GRAPHIC MAP SHOWING F	XACT LOCATION WITH
<u>GI</u>	<u>PS COORDINATES.</u>			
7.	<u>Attach</u> documentation specifying the site. If the facility site is comprised identify what portion of facility site	name, telephone number and add of more than one parcel, and not a is owned by each by attaching a d	lress of the land/surface o all parcels are owned by t liagram.	wner(s) of the facility the same landowner(s),
8.	<u>Attach</u> documentation specifying the the site location, and for each specifying the site location and specifying the specifying the site location and specifying the speci	name, telephone number and add y what their interest(s) is(are).	lress of the mineral right'.	s interest holders for
9.	Attach documentation containing a c pits, dikes and tanks on the facility.	lescription of the facility with a di	agram clearly indicating t	the location of fences,
10	. <u>Attach</u> documentation identifying al drilling/installation/site construction	materials that are currently or wi and/or during the regular course of	ll be stored or used at the of operations at the facilit	facility during y.
11	. <u>Specify</u> whether there will be a <b>grou</b> jurisdiction of the Office of the State	nd water appropriation associat Engineer (OSE): YES 🗌 NO	ted with the proposed pro	ject under the
12	. <u>USE DETERMINATION</u> : a. Is the primary use of any water <b>YES NO PROJEC</b>	involved in the proposed project, T DOES NOT INVOLVE WATER [	the extraction of the heat	carried by that water?
	b.If <u>NO</u> to "a." above, please ans	wer all three following questions:		
	i. Is the extraction of heat "i YES I NO	ncidental" to another beneficial or	r primary use of the water	?
	ii. Is the water less than 250° YES I NO I	F?		
	iii. Is the water potable*? <b>YES NO</b> <del>*</del> <i>*See WOCC Rule 20.7.10 NMAC re</i>	egarding drinking water standards.		
13.	<u>Attach</u> documentation identifying an average quality and daily volume of	nd describing all present sources of waste water must be included.	f effluent and waste solid	s. Specification of

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14. <u>Attach</u> documentation identifying and describing all current liquid and solid waste collection/treatment/disposal procedures.

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- 15. Attach documentation specifying all proposed modifications to existing collection/treatment/disposal systems.
- 16. <u>Attach</u> documentation identifying and describing a routine inspection and maintenance plan for the facility/project that will ensure permit compliance.
- 17. <u>Attach</u> documentation detailing a contingency plan for the reporting and clean-up of spills or releases at the facility/project.
- 18. <u>Attach</u> documentation reflecting geological/hydrological information for the facility/project. Documentation of depth to and quality of ground water must be included.
- 19. <u>Attach</u> documentation detailing a facility closure plan, and any other information necessary to demonstrate compliance with any other OCD or WQCC rules, regulations and/or orders.
- 20. <u>APPLICANT-DESIGNATED GEOTHERMAL PROJECT TYPE(s)</u> (OCD generally permits open-loop geothermal systems):
- Open-loop (single well for water withdrawal, water returned to a surface source)
- Open-loop (single well for water withdrawal, water returned to a second well)
- Standing Column (single well for water withdrawal and water return)
- Closed¹loop (vertical boreholes)
- Closed-loop (subsurface trenched or other configuration, but not vertical boreholes)
- Closed-loop (surface water body emplacement)
- Direct exchange (DX) (vertical boreholes)
- Concentric System (heat exchange fluid flows to the bottom of the hole through a small diameter inner pipe and then up the annular space between the inner and outer pipes)
- Other*

* Please note that heat pump systems (open or closed-loop) are <u>not</u> considered "geothermal" and are therefore not permitted through the OCD. These projects are handled directly by the Construction Industries Division/Regulation and Licensing Department (CID/RLD) and, where groundwater is potentially impacted, by NM Environment Dept. (NMED). Inquiries and applications for permits relating to heat pump systems should not be made via this form, and should instead be directed to CID/RLD and, where appropriate, to the NMED.

ADDITIONAL IMPORTANT INFORMATION:

- OCD may require OSE certified water well drillers for certain projects.
- Applicants are responsible for contacting the appropriate Federal, State, Tribal and/or local government agencies responsible for rent, royalty and/or tax assessment.
- OCD approval of this application does not relieve operator of responsibility should their operations pose a threat to ground water, surface water, human health or the environment. In addition, OCD approval does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations.
- 21. <u>CERTIFICATION</u>: I hereby certify that the information submitted with this application is true and correct to the best of my knowledge and belief.

Name:	<u>Title</u> :	_
Signature:	Certification/License #:	
E-mail Address:	Date:	_

<u>Name:</u>		<u>Title</u> :	
Signature:		Certification/License #:	
E-mail Address:		<u>Date</u> :	
Name:		Title:	
Signature:		Certification/License #:	
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	<u>Assidented and a second and as second and a second and a</u>		
Name:		Title	
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#### STATE OF NEW MEXICO ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

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Oil Conservation Division 1220 South St. Francis Dr. Santa Fe, New Mexico 87505

#### APPLICATION FOR AUTHORIZATION TO INJECT

I.	PURPOSE:	Secondary Recovery or administrative approval?	Pressure Maintenance Yes	DisposalNo	Storage
II.	OPERATOR:		······································		
	ADDRESS:				
	CONTACT PARTY:		· · · · · · · · · · · · · · · · · · ·	PHONE:	
III.	WELL DATA: Compl Addition	ete the data required on the reverse si onal sheets may be attached if necessa	de of this form for each we	ll proposed for injection.	
IV.	Is this an expansion of If yes, give the Divisio	an existing project? Y n order number authorizing the proje	esNo ct:		
V.	Attach a map that iden drawn around each pro	tifies all wells and leases within two i posed injection well. This circle ider	niles of any proposed injec tifies the well's area of rev	tion well with a one-half mile r iew.	adius circle
VI.	Attach a tabulation of a Such data shall include schematic of any plugg	data on all wells of public record with a description of each well's type, con ed well illustrating all plugging detai	in the area of review which astruction, date drilled, loca l.	penetrate the proposed injection, depth, record of completion	on zone. on, and a
VII.	Attach data on the prop	oosed operation, including:			
	<ol> <li>Proposed average a</li> <li>Whether the system</li> <li>Proposed average a</li> <li>Sources and an app produced water; ar</li> <li>If injection is for d chemical analysis of wells, etc.).</li> </ol>	nd maximum daily rate and volume of is open or closed; nd maximum injection pressure; ropriate analysis of injection fluid an d, sposal purposes into a zone not produ of the disposal zone formation water (	of fluids to be injected; d compatibility with the rec active of oil or gas at or wit may be measured or inferre	eiving formation if other than t hin one mile of the proposed w ed from existing literature, stud	reinjected rell, attach a ies, nearby
*VIII.	. Attach appropriate geo depth. Give the geolog total dissolved solids o known to be immediat	ologic data on the injection zone inclu- cic name, and depth to bottom of all u concentrations of 10,000 mg/l or less) ely underlying the injection interval.	ding appropriate lithologic nderground sources of drin overlying the proposed injo	detail, geologic name, thicknes king water (aquifers containing ection zone as well as any such	ss, and , waters with sources
IX.	Describe the proposed	stimulation program, if any.			
*X.	Attach appropriate logg	ging and test data on the well. (If wel	l logs have been filed with	the Division, they need not be	resubmitted).
*XI.	Attach a chemical analy injection or disposal we	vsis of fresh water from two or more f Il showing location of wells and date	resh water wells (if availab s samples were taken.	le and producing) within one n	nile of any
XII.	Applicants for disposa data and find no evide sources of drinking wa	l wells must make an affirmative stat nee of open faults or any other hydrol ter.	ement that they have exami ogic connection between th	ned available geologic and eng ae disposal zone and any underg	ineering ground
XIII.	Applicants must compl	ete the "Proof of Notice" section on t	ne reverse side of this form		
XIV.	Certification: I hereby and belief.	certify that the information submitted	with this application is true	e and correct to the best of my l	knowledge
	NAME:		TITLE		
	SIGNATURE:			DATE:	
*	E-MAIL ADDRESS: If the information requi Please show the date an	red under Sections VI, VIII, X, and X d circumstances of the earlier submitt	I above has been previousl	y submitted, it need not be resu	bmitted.

Side 2

#### HI. WELL DATA

- A. The following well data must be submitted for each injection well covered by this application. The data must be both in tabular and schematic form and shall include:
  - (1) Lease name; Well No.; Location by Section, Township and Range; and footage location within the section.
  - (2) Each casing string used with its size, setting depth, sacks of cement used, hole size, top of cement, and how such top was determined.
  - (3) A description of the tubing to be used including its size, lining material, and setting depth.

(4) The name, model, and setting depth of the packer used or a description of any other seal system or assembly used.

Division District Offices have supplies of Well Data Sheets which may be used or which may be used as models for this purpose. Applicants for several identical wells may submit a "typical data sheet" rather than submitting the data for each well.

B. The following must be submitted for each injection well covered by this application. All items must be addressed for the initial well. Responses for additional wells need be shown only when different. Information shown on schematics need not be repeated.

(1) The name of the injection formation and, if applicable, the field or pool name.

- (2) The injection interval and whether it is perforated or open-hole.
- (3) State if the well was drilled for injection or, if not, the original purpose of the well.
- (4) Give the depths of any other perforated intervals and detail on the sacks of cement or bridge plugs used to seal off such perforations.
- (5) Give the depth to and the name of the next higher and next lower oil or gas zone in the area of the well, if any.

#### XIV. PROOF OF NOTICE

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All applicants must furnish proof that a copy of the application has been furnished, by certified or registered mail, to the owner of the surface of the land on which the well is to be located and to each leasehold operator within one-half mile of the well location.

Where an application is subject to administrative approval, a proof of publication must be submitted. Such proof shall consist of a copy of the legal advertisement which was published in the county in which the well is located. The contents of such advertisement must include:

- (1) The name, address, phone number, and contact party for the applicant;
- (2) The intended purpose of the injection well; with the exact location of single wells or the Section, Township, and Range location of multiple wells;
- (3) The formation name and depth with expected maximum injection rates and pressures; and,

(4) Anotation that interested parties must file objections or requests for hearing with the Oil Conservation Division, 1220 South St. Francis Dr., Santa Fe, New Mexico 87505, within 15 days.

NO ACTION WILL BE TAKEN ON THE APPLICATION UNTIL PROPER PROOF OF NOTICE HAS BEEN SUBMITTED.

NOTICE: Surface owners or offset operators must file any objections or requests for hearing of administrative applications within 15 days from the date this application was mailed to them.

WELL NAME & NUMBER:		
WELL LOCATION: FOOTAGE LOCATION	UNIT LETTER	SECTION TOWNSHIP RANGE
WELLBORE SCHEMATIC		<u>IVELL CONSTRUCTION DATA</u> Surface Casing
	Hole Size:	Casing Size:
	Cemented with:	sx. orfi
	Top of Cement:	Method Determined:
		Intermediate Casing
	Hole Size:	Casing Size:
	Cemented with:	sx. <i>or</i> fi ³
	Top of Cement:	Method Determined:
		Production Casing
	Hole Size:	Casing Size:
	Cemented with:	sx. <i>or</i> fi ³
	Top of Cement:	Method Determined:
	Total Depth:	
		Injection Interval
		feet to
	)	(Perforated or Open Hole; indicate which)

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**INJECTION WELL DATA SHEET** 

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Side I

:	<b>INJECTION WELL DATA SHEET</b>
Tut	ing Size: Lining Material:
$Ty_{l}$	De of Packer:
Рас	ker Setting Depth:
Otł	ter Type of Tubing/Casing Seal (if applicable):
	Additional Data
	Is this a new well drilled for injection? YesYesNo
	If no, for what purpose was the well originally drilled?
2.	Name of the Injection Formation:
Э	Name of Field or Pool (if applicable):
4.	Has the well ever been perforated in any other zone(s)? List all such perforated intervals and give plugging detail, i.e. sacks of cement or plug(s) used.
5.	Give the name and depths of any oil or gas zones underlying or overlying the proposed injection zone in this area:

Side 2

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OCD Draft Flow-Charts by Carl Chavez- OCD (6/9/2010)

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*Note: Tribal Lands revert to EPA and BLM

Legend:

<u>BLM</u>- Federal Bureau of Land Management <u>CID/RLD</u>- Construction Industries Division/Regulation and Licensing Division <u>DOI-MMD</u>- Federal Department of Interior- Minerals & Mining Division <u>NMED</u>- New Mexico Environment Department- Ground Water Quality Bureau <u>OCD</u>- Oil Conservation Division <u>OSE</u>- Office of State Engineer <u>SLO</u>- State Land Office TRD- State Taxation & Revenue Department

Note: OSE should be contacted early in the application process to determine whether a permit will be required and any ground water issues that could arise based on the scope of the project. "Incidental Use" (i.e., where use of the heat is not the primary use) of the heat is not considered to be "Geothermal" or regulated under OCD Geothermal Regulations. Federal geothermal royalty, rent, and taxation are handled by DOI-MMD and BLM on Federal Lands. State geothermal royalty, rent, and taxation are handled by SLO and TRD on State Trust Lands.



* <u>OSE</u>: With the exception of 3.b, above (<u>closed loop heat transfer projects</u>), all other projects potentially involve water appropriation. Operators are responsible for ensuring that all water appropriation issues are addressed, proper documentation is submitted and permits are obtained through the OSE where required.



## Oil Conservation Division (OCD) Geothermal Application Forms, Bonding & Resource Information

(Draft Revised: 6/9/2010)

The New Mexico OCD is responsible for the Geothermal Resources Conservation Act and associated Geothermal Power Regulations for low and high temperature (boiling water under ambient conditions) geothermal resources where heat extraction is the primary use of water or working fluids, and the use is not "incidental" to the primary use. The OCD is responsible for administering all geothermal applications submitted in New Mexico and provides this website to assist applicants with the applications process, to illustrate which state and federal agencies will be involved with the permit process, and will coordinate with the applicable agencies after making preliminary determinations based on each application.

The State and Federal Agencies involved with Geothermal Projects in New Mexico on state lands are: Construction Industries Division/ Regulation and Licensing Division (CID/RLD), Oil Conservation Division (OCD), Office of the State Engineer (OSE) whenever there is a ground water appropriation requirement, and New Mexico Environment Department (NMED) becomes the permitting agency when the geothermal application is deemed an "Incidental Use" of the heat.

#### CID/RLD:

Regulation and Licensing Department- Construction Industries Division NMAC Title 14 Housing and Construction The CID regulates its licensee's through permitting and inspection of Ground Source Geothermal HVAC systems, heat exchange, heat pumps, and direct use open and closed-loop heating systems. These systems are used for the incidental heating and or cooling of a building generally using a closed loop pipe system for the exchange of hot or cold energy with the ambient ground. The systems piping will begin and terminate at a piece of heating or cooling equipment or appurtenance. These systems may use an approved chemical transfer media or water based media. These systems are used for human comfort and not used in processing or manufacturing of a product. Note that any well bore into fresh ground water may require an OSE Certified Water Well Driller.

#### NMED:

New Mexico Environment Department- Ground Water Quality Bureau Title 20: Environmental Protection, Chapter 6 Water Quality, Part 2 "Ground and Surface Water Protection" (<u>20.6.2 NMAC</u>) and Part 4 "Standards for Interstate and Intrastate Surface Waters" (<u>20.6.4 NMAC</u>).

NMED is responsible for regulation of facilities with discharges or potential discharges that OCD has deemed to be "Incidental Use" (does not require consideration of correlative rights) of geothermal resources.

The New Mexico Environment Department (NMED) Ground Water Quality Bureau (GWQB) regulates facilities with discharges or potential discharges that may affect groundwater that have "Incidental Use" (does not require consideration of correlative rights) of geothermal resources. This potentially includes Ground Source Geothermal HVAC systems using a closed loop pipe system for the exchange of hot or cold energy with the ambient ground. NMED requires that a Notice of Intent (NOI, available at the NMED- GWQB website) be filed with the GWQB for Ground Source Geothermal HVAC systems that are large (provide heating and/or cooling for large buildings or complexes of buildings), use other than standard technologies or construction, or are used for industrial or manufacturing purposes. Small systems for individual residences or small businesses, offices, or apartment buildings need not submit a NOI provided the systems are approved by the state's Construction Industries Division. *Note that any well bore into fresh ground water may require an OSE Certified Water Well Driller.* 

### OCD:

New Mexico Oil Conservation Division- Environmental Bureau Chapter 71: Energy & Minerals Article 5: Geothermal Resources Conservation Act <u>Chapter 71, Article 5 NMSA 1978</u>

Title 19: Natural Resources & Wildlife Chapter 14: Geothermal Power <u>Title 19, Chapter 14 NMAC (11-15-83 Recompiled 12-31-01)</u>

Title 20: Environmental Protection, Chapter 6 Water Quality, Part 2 "Ground and Surface Water Protection" (<u>20.6.2 NMAC</u>) and Part 4 "Standards for Interstate and Intrastate Surface Waters" (<u>20.6.4 NMAC</u>).

WQCC Delegation of Authority to OCD for Geothermal Activities in New Mexico

OCD has jurisdiction for regulation of all geothermal facilities with associated geothermal wells and Underground Injection Control (UIC) Class V "geothermal energy injection wells" where an underground source(s) of drinking water (USDW) is present and any associated potential for discharges that may adversely affect surface water and groundwater. Where USDWs are not present, OCD still regulates geothermal wells under its Geothermal Resources Conservation Act with associated geothermal forms. *Note that any well bore into fresh ground water may require an OSE Certified Water Well Driller with the*  exception of geothermal power facilities where drillers with oil, gas and geothermal expertise have experience protecting fresh water (<= 10,000 mg/L TDS).

The New Mexico Oil Conservation Division (OCD) Environmental Bureau (EB) regulates facilities with discharges or potential discharges that may affect surface water and groundwater that have "Geothermal Use" (may require consideration of correlative rights) of geothermal resources. This potentially includes open-loop injection systems associated geothermal power production, nursery, aquaculture, and anywhere injection wells into subsurface formations are installed for the primary use of geothermal heat. OCD requires that the Generic Geothermal and C-108 Application Forms be submitted (OCD website) and filed with the EB for open-loop systems that

#### **OSE:**

New Mexico Office of the State Engineer- Water Rights Division NMAC Title 19 Natural Resources and Wildlife Chapter 27 Underground Water

The State Engineer's statutory responsibility to supervise the state's water resources includes administration of rights to divert and consume groundwater. Permits to appropriate groundwater or transfer valid existing water rights may be applied for through the OSE district offices. Permits are required for all purposes of groundwater use, including geothermal use. The OSE also licenses water well drillers and regulates water well drilling.

#### **DOI-MMD** (Rent, Royalty, etc.):

Link list pdf files from two MMS handbooks concerning geothermal: Minerals Revenue Reporter Handbook (Geothermal is in Chapter 7) and Geothermal Payor Handbook:

http://www.mrm.mms.gov/ReportingServices/Handbooks/Handbks.htm In addition, here is a link to the new MMS geothermal valuation regulations from May, 2007:

http://www.mrm.mms.gov/Laws_R_D/FRNotices/PDFDocs/24448.pdf; and Financial Management website with contact names http://www.mrm.mms.gov/ReportingServices/WhoWeAre.htm

The primary permitting agency for all low ( $<250^{\circ}$ F) and high ( $>250^{\circ}$ F) temperature geothermal projects is the OCD. OCD charges a \$100 filing fee that is good for a 5-yr. permit. There will be an additional permit fee for discharge permits that qualify under the Water Quality Control Commission Regulation (WQCC) § 20.6.2.3114 NMAC. These projects require C-108 submittals in addition to the Generic Geothermal Project Application submittal. The primary oversight agencies for geothermal projects are CID/RLD and OCD. CID/RLD handles all low and high-temperature closed-loop and heat exchanger type installation projects in the unsaturated and saturated zones. CID/RLD has strict licensing and certification requirements on all of its projects, i.e., electrical, plumbing, heat exchanger installation, directional borehole drilling, etc. OCD handles all low and high-temperature open-loop and power generation projects in the unsaturated and saturated zones. OSE permitting is required for any geothermal project where water is appropriated. For shallow (< 300 feet bgl) lowtemperature projects in the saturated zone and where ground water is not appropriated, OCD requires any well and boring installation work in the saturated zone to be completed by an OSE Certified Water Well Driller (CWWD) and an OSE Water Appropriation Permit may be required from OSE. On all other OCD geothermal projects, OCD encourages the use of a CWWD, and any drilling must be protective of fresh water (< 10,000 mg/L TDS). There are bonding requirements where geothermal production/development and WQCC Underground Injection Control Wells are installed and must be in place with the applicable "G" Forms before drilling can begin. In most instances, an approved OCD discharge permit will be required. These types of projects required the permit fee specified under WQCC Regulations cited above. Please find below a flow-chart on the OCD geothermal permit process.

#### High Temperature Permit Process

#### Who Does What?

In New Mexico, on federal land, geothermal heat is considered to be a mineral and the BLM is involved with all direct use and power generation applications. On state or private land, and on federal land where state involvement is also required, designation of geothermal heat as a "mineral" or "geothermal resource" depends on the use and whether such use is "incidental." For example, it is considered a "mineral" and therefore within the regulatory authority of the Oil Conservation Division (OCD) whenever heat is extracted for direct use applications or power production. The Office of the State Engineer (OSE) has authority over issues of ground water appropriation.

Where the geothermal extraction is only "incidental" to a beneficial use of water that is being extracted or appropriated, the heat carried by that water is not considered a "mineral" and the extraction or appropriation falls solely within the jurisdiction of the OSE for purposes of regulation of ground water appropriation. In such circumstances, the water extraction would *not* be regulated by the OCD.

Projects involving geothermal extraction *without* the appropriation of ground water fall outside of the jurisdiction of the OSE but still fall within the purview of the OCD's regulatory duties, which encompass all uses of the "mineral" of geothermal heat as defined by statute.

#### **Geothermal Regulations:**

WQCC Delegation of Authority to OCD for Geothermal Activities in New Mexico

Chapter 71: Energy & Minerals Article 5: Geothermal Resources Conservation Act Chapter 71, Article 5 NMSA 1978

Title 19: Natural Resources & Wildlife Chapter 14: Geothermal Power <u>Title 19, Chapter 14 NMAC (11-15-83 Recompiled 12-31-01)</u>

**Legislative Reference:** New Mexico Annotated Code Title 19 Chapter 14-1; Title 19 Chapter 2-7; Title 19 Chapter 13-7 to 13-12

Water Quality Control Commission (WQCC) <u>20.6.2 NMAC</u> (See Class V Injection Well Designation) and <u>20.6.4 NMAC</u> (Standards for Interstate and Intrastate Surface Waters)

#### **Application Forms:**

<u>Geothermal</u> (Required with all applications and/or sole application for direct heat projects w/o borings or wells with \$100 Filing Fee & 5-Yr. General Permit Fee \$600)

Permit to Inject (C-108) (Required where production and/or injection wells are installed with \$100 Filing Fee & 5-Yr. Discharge Permit Fee \$1,700)

Drilling & Work Over (G-101, 102 & 103), Well Test & Bond Forms: <u>Geothermal Exploration & Production Forms</u> (see "Geothermal Well Forms") <u>Bonding</u> (see "Bond Forms" GT-B-1 and GT-B-2)

#### State Land Lease Agency: <u>New Mexico State Land Office</u>

**Leasing:** Leases are available on a non-competitive basis. However, the Commissioner of Public Lands may at his/her discretion reject any application and offer the tract or tracts at public auction. Lands classified as "known geothermal fields" are leased through public auction through either sealed or oral bidding procedure.

#### Lease Terms:

#### Primary: 5 years

**Renewal:** Primary term can be renewed for additional 5 years and thereafter so long as geothermal resources are being produced or utilized or are capable of being produced or utilized in commercial quantities.

**Rentals:** \$1.00 per acre or fraction thereof per year (escalates to \$5.00 per acre per year after primary lease term).

Royalties: 10 % of the gross revenue from the sale or use of steam, brines or hot water, associated gases or other forms of heat or energy derived from production with a minimum of \$2.00 per acre or fraction thereof per year. A royalty of not less than 2 % nor more than 5 % of the gross revenue received for the sale of mineral products or chemical compounds recovered from geothermal fluids. A royalty of 8 % of the net revenue for the operation of an energy producing plant on the leased land. A royalty of not less than 2 % nor more than 10 % of the gross revenue received from the operation of the geothermal resource for recreational, space heating, or health purposes.

#### **Geothermal Resources:**

Geo-Heat Center

Geothermal Education Office

Geothermal Resources Council Annual Meeting

New Mexico Bureau of Geology & Mineral Resources

New Mexico Collocated Resources

New Mexico Energy Conservation & Management Division Geothermal Website New Mexico Geothermal Working Group

New Mexico Oil Conservation Division Geothermal Search Engine (enter order type as "GTLT" or "GTHT")

New Mexico State University- A Strategic Plan For New Mexico Geothermal Resources Development

US Bureau of Land Management

Geothermal Leasing in the Western United States

Geothermal Leasing PEIS A User's Guide

Geothermal Resource Maps

Geothermal Resource Needs in New Mexico

Geothermal Technologies Program

<u>USGS Assessment of Moderate and High Temperature Geothermal Resources of the US</u>

USGS National Geothermal Resource Assessment

#### **Contacts:**

<u>New Mexico Bureau of Geology & Mineral Resources</u> –BGMR (Marshall Reiter 575-835-5306)

<u>New Mexico Bureau of Land Management</u> –BLM (Michael Smith 575-525-4421) <u>New Mexico Construction Industries Division</u> –CID (Jerome T. Baca 505-476-4661)

New Mexico Economic Development Department -EDD

(Brendan.miller@state.nm.us)

<u>New Mexico Energy Conservation & Management Division</u> –ECMD (Stephen Lucero 505-476-3324)

New Mexico Environment Department- Ground Water Quality Bureau (Incidental Use Contact John Hall 505-827-1049)

<u>New Mexico Office of the State Engineer</u> –OSE (Contact District Supervisor or David Heber 505-827-6102)
<u>New Mexico Oil Conservation Division</u> –OCD (Carl Chavez 505-476-3490) <u>New Mexico Regulation and Licensing Department</u> –RLD (Andy Dalmy 505-670-6078)

New Mexico State Land Office –SLO (Brian Bingham 505-827-5760)

<u>New Mexico Taxation and Revenue Department</u> –TRD (Valdean Severson 505-827-0953)

U.S. Geological Survey –USGS (Marshall J. Reed 650-329-5620)

U.S. Department of Energy –USDOE (Curtis Framel 303-275-4872)

U.S. Department of Interior - USDOI (Robert Prael and Herb Black 303-231-

3769) <u>herb.black@mms.gov</u> Links to MMS geothermal regulations and geothermal handbooks having to do with valuation and royalty.

MMS handbooks concerning geothermal: Minerals Revenue Reporter Handbook (Geothermal is in Chapter 7) and Geothermal Payor Handbook:

http://www.mrm.mms.gov/ReportingServices/Handbooks/Handbks.htm

MMS geothermal valuation regulations from May, 2007:

http://www.mrm.mms.gov/Laws_R_D/FRNotices/PDFDocs/24448.pdf Financial Management website with contact names.

http://www.mrm.mms.gov/ReportingServices/WhoWeAre.htm

# **OCD Current Regulatory Issues** David Brooks- OCD (6/9/2010)

- 1) Who owns resources?
- 2) Co-Geothermal Oil & Gas Production may be regulated under Oil and Gas Regulations and not WQCC nor OCD Geothermal Regulations? Avoid potash areas and/or geothermal must not interfere with oil and gas production.
- 3) Extent of OCD Authority over Geothermal Resources? May not be exclusive.
- 4) What is threshold of geothermal resource? What would OCD consider "Incidental Use" and who would make the final determination?
- 5) Regulations appear to require updating to reflect present day applications based on the renewable energy program initiative(s)?
- 6) Understanding Geothermal Reservoirs and Correlative Rights?

7) Other?

# Some OCD Initiatives with Stakeholder Agencies Governor's Executive Order Making NM the No.1 Leader in Renewable Energy Carl Chavez- OCD (6/9/2010)

- 1) OCD has identified with OSE (water appropriation issues) the scarce fresh water resource issues in New Mexico and OCD is working with ECMD to help ensure commercial geothermal power companies are proposing alternative heat exchange or transfer systems with fluids other than just fresh water in their engineering design and constructed systems.
- OCD/BLM/? Memorandum of Understanding(s) (MOU) between state and/or federal agencies to minimize duplication of efforts and streamlining the commercial geothermal power permit process.
- 3) OCD determined in February of 2010 that it had full jurisdiction over Geothermal Regulations for low & high temperature geothermal heat extraction, which further streamlines the permit process in No. 2 above.
- 4) OCD Geothermal Well Bond General Amounts (~\$10K Multi-Well & \$5K Single-Well) are low and an incentive to commercial power generation company by reducing the cost of geothermal exploration and production in the state.
- 5) OCD is actively engaging state and federal agencies in evaluating and seeking a more efficient application review and permit process with website resource page to assist

applicants, general public, etc. (i.e., OCD is working with the deep source geothermal working group (ECMD) and this geothermal regulations stakeholder working group (see No. 3 above), which is complimenting the Governor's Executive Order for Renewable Energy Production- "Deep Source Geothermal."

# Geothermal Regulations & Programs Stakeholders Teleconference Meeting CID/RLD Conference Room (Tony Anaya Building: 2550 Cerrillos Road) Santa Fe, NM Wednesday, May 5, 2010 <u>OCD Website</u> <u>OCD Online "UIC-999"</u>

### **MEETING AGENDA MINUTES**

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Attendees: See Sign-in Sheet below

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**Teleconference:** Mike Smith- BLM, Doug Rappuhn- OSE; Bob Prael- DOI; & Herb Black-DOI

	Geothermal Re	gulations - programs
	Stakeholder CID/	RLD (Tony Anava, Bldg, Santate)
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4) Each stakeholder will pass out their geothermal application forms and or permit associated w/ their geothermal permitting program if applicable for OCD to be aware of and possibly to reproduce for its program? OCD will also hand out its forms. Application process? Agency Website visitation of geothermal resources, i.e., permitting, process, etc. OSE has forms described in WSU article. Could be unappropriated waters, transfer of wells, well records, etc. CID/RLD forms? License forms handed out. Permitting application and files w/ CID/RLD?

OCD is interested in the number and magnitude of the permits to understand work involved with taking over programs, etc. Also, OCD would like to add links to the forms from the OCD "Who does What?" webpage. OCD handed out its proposed draft "Generic Geothermal Application" Form. OSE handed out its "Well Record & Log; Application for Permit to Appropriate Underground Water; and Application for Permit to Change Location of Well and Place and/or Purpose of Use of Underground Water" forms. Also, a handout of the NGWA, Groundwater Protection Council, GeoExchange, and International Ground Source Heat Pump Association "State Regulatory Oversight Survey" Form was passed out (also viewed on overhead projector). OCD's draft application form handout uses the comprehensive geothermal categories from the survey forms for its "Project Description" section of its draft geothermal permit.

CID/RLD handed out its "Application/Permit and Mechanical Permit Request" Forms. The OCD later requested a list of permitted facilities from CID/RLD and OSE for consideration of the

magnitude of their past geothermal permitted facilities and to determine whether it should enter these projects into its OCD Online filing system under "GTHT (high temperature) or GTLT (low temperature)" designations? It is apparent that CID/RLD Permit forms will also need to be completed by applicants when geothermal projects fall under the CID/RLD permit process. For example, dual permitting process with OCD's generic geothermal form completed with every geothermal application.

# 5) "Direct Use or Not Direct Use- Closed Loop Heat Storage" Richard Erdlac (Erdlac Energy Consulting)

Slide show: Slide 3: geothermal uses function of temperature. Is commercial product generated from extraction of geothermal heat, i.e., power generation, fish food (aquaculture), etc? These are examples where the extraction of heat produced a commercial product in the end. Other nonproduct uses include: hot bath houses, ice melting, air heating for home, Geothermal Heat Pumps (GHP), Geothermal HVAC, GeoExchange or moving heat. Slide 4. Geoexchange takes heat out of bldg, and puts it 300 ft. into the ground, solar energy and human breathing or refrigerator. Pull heat out, cool home; pull heat out and use internally. Where heat derived from. Not from geothermal, a little, but most heat from summer time. NM greatest use air conditioning... Slide 5. Closed-Loop systems closed to environ. w/ heat transfer working fluid, Open loop pulls water out of aquifer, runs thru heat exchanger back into aquifer; Power vs. Geo exchange. High salinity fluids in open systems. Less than 4000 ppm NaCl to treat and use direct heat purposes. Slide 6. Size of furnace, handles 3 rooms, open loop system, and water brought in plate to plate system. Middle photo, vault w/ shallow wells closed loop, pipes together one point and inside bldg. Usually outside buried underground. Heat stored underground. If have enough during Winter, can bring up during Winter. No way to determine whether heat came from solar, wind, etc. Heat like electron. Majority of heat underground for air conditioning. Upper 100 ft. acting like heat battery for storage. Slide 8. Loops could have depth 5000 ft down, but here, shallow water well drilling 400 ft. max. In Texas all certified contractors are involved. Loop installers are certified. Heat pump installer equivalent to air conditioner installer, furnace installer, etc. that require certification. Four areas proficiency with different backgrounds involved. Slide 9. Ground source. Heat pump, energy mgt. Like air heat pump. Not talking specifically geothermal, because sun and other energy source warming too. Heat moves in and out. Slide 10. Royalties geothermal heat pumps. In presenter's opinion, ground source heat pump should be excluded from royalty, rent and taxes because there is no commercial product. Schools in NM have put these systems in better stewards of environment. Alamogordo geo exchange systems. Ownership of ground or surface rights could have impact? How much soil does surface owner own? If shallow, not much question. The deeper, more certain what mineral rights may be (see www.Dsire.com) recommended website. Incentives in NM include GHP tax credits. Only GHP has no product, use of heat, ex., 77 hot springs, fee to sit in hot water and leave. How do you assess them for use of heat.... No product just using heat.... Forget it! Extract royalty on heat.... Consistent with personal use, no product involved. OCD take, no distinction between geothermal.... If not geothermal resource, mineral, then does not fall within purview of OCD, just CID/RLD regulation of installation of system. If there are GW protection issues associated with project, OCD could be involved. OCD needs to think about it. Impossible to discern, doesn't make sense to assess royalties. Hot water reheating heaters in house and use the heat in other ways. Don't want to create disincentive. Slide 11. High temp, more electricity. Heat not tangible resource. In bottle, no energy. Royalty issue... Not all heat out of well used for generating electricity. exchange 5 to 10%. By time cool, may drop 280°F to 240°F waste water, can't drink, reinject, only 40 deg. heat used w/ loss of heat along way. How do you take royalty?

Can always assess royalty on net electricity produced by geothermal. Geothermal doesn't work

like electricity. Assess energy going into grid. Slide 12. Other applications. If product made, look at royalty on product, but be careful.

6) Update on Royalty and Conservation Tax Assessment- OCD follow-up efforts w/ State Land Office (SLO) and Taxation and Revenue Department (TRD). They were unaware of the Governor's Executive Order to Make NM No.1 in Nation for Renewable Energy. The SLO and TRD provided their regulations to the OCD in advance of the meeting, which were shared with the group. In short, SLO assesses royalty during leasing process. TRD does assess a "Conservation Tax" and more details may be forthcoming? OCD could simply add a disclaimer to its application forms to contact federal, state and local government royalty and taxation agencies to determine project royalty and/or taxation requirements? Could add links to OCD "Who Does What" resource page to cover these topics.

Mr. Robert Prael (Dept. of Interior- Minerals & Mining Division), et al., Federal Lands Rent, Royalty, lease sale discussion......would this apply to direct heat applications for BTUs used in heating commercial office buildings, etc.? May need to add Federal link on OCD resource page for Federal royalty, tax, etc.?

Onshore, offshore lease, pay rent for producing status, collect royalty, collected by treasury, states, lease obligations on geothermal properties.

BLM Adjudicated. Changed Energy Policy Act 2005, and simpler for electricity and heat, BLM and MMD. Pre-energy leases and post leases.

50 geothermal leases producing on fed. land under old regulations. royalties, and handbooks. CID was not aware of royalties for direct heat above 100 ft. depth. Proposed under new regulations. Fish farm next to Raser (state lease) and straddles federal lease using wells on state. Direct use at university. No royalties being collected on fish farm only on federal. Fish farm paying royalties to the state.... CID licensing, permits, scopes for construction, plan submittal.

Permit needed for direct use and power generation on federal lands. Must know rights under property. Closed-loop? Yes, but greenhouse using federal mineral heat, didn't recognize federal resource that required permitting.

If go through heat exchanger and economic benefit, BTUs would qualify for royalty, etc. For residences, don't know now. Kirby Weatherby-BLM Washington lead geothermal will be contacted by BLM to learn more. Individual houses w/ heat pump, BLM not concerning itself with residences. Who controls mineral estate of land in question? Fed. only oil and gas, not necessarily geothermal. Mike Smith-BLM will get answer.

OCD Royalty Regulation discussion: OCD wants to make sure all agencies are keyed into definition of geothermal resource. Careful, concerned about definition of geothermal resource in permits issued and the context.

Is taxable value equivalent, severance tax on mineral, or just taxable? Value at point of sale, less cost to bring it there....

BLM will check to see if royalty, rent and/or taxation requirements would apply to residential and commercial geothermal heating applications and get back to group with answer.

- 7) OCD "Who does what?" Draft Webpage review and amend OCD's Geothermal Resource Page together (OCD Publications Webpage) Handout passed out by OCD at 3/30 meeting.
  - OCD Draft "Who Does What" (call for each agencies brief summary of application process, etc.?) Develop flow chart and hot links or description of words as you place mouse on word to reduce text while conveying geothermal programs to web browsers. OCD sent CID/RLD and OSE for NMED's (Jay Stemmell) resource website page update to respond similarly to ECMD to make their programs known in the geothermal arena. This will also aid in the development of this task. OCD sent draft to agencies requesting their input and will bring another draft to June 9, 2010 meeting.
  - CID/RLD Direct Use Form Development? Could this be redundant? For example, OCD will require submittal of the generic geothermal form at a minimum, while CID/RLD also has similar permit forms. Should the agencies meld forms into one OCD form or should there be separate forms? Nice to have one form that address multi-agencies, but may have to live with multiple permits and we need to hot link them into our summary of who does what, etc.
- 8) Possible Geothermal Working Group (not to be confused with our "Geothermal Regulations Stakeholder Group) "Geothermal Oil & Gas Coproduction" in the oil patch symposium ~ September 2010. Steve Lucero ECMD organizing. BLM, OSE (water scarcity and appropriation issues) and OCD (permitting, down hole new and reworking well issues, potash and mineral rights issues?), and geothermal company presentations.

Use air, recapture water and make closed-loop system to minimize water loss at OCD geothermal power generation projects. LANL and Penn State thermal cool system use sound for cooling. Can this be used in OCD's environment? Other scenarios to think about? Air in combination with fluids to make it work. Binary system has allowed lower temp w/ air cooling to get away from water. Still infancy stage when ask commercial power generation companies to implement more efficient heat transfer systems that rely less on fresh water and more on closed-system working fluids for heat exchange. New Mexico wants geothermal companies to be aware of our natural resource issues when they come to NM to use our resources to export their power.

- 9) Other issues and concerns?
  - OCD has the lead for all geothermal applications in New Mexico to assess projects for joint permitting or refer to other applicable regulating state agencies for processing. OCD will track the type of projects through its OCD Online electronic record keeping system. There are issues of whether permit issuance and fees may be charged based on OCD's application process?
  - OCD already has an application process, application forms, well tracking, bonding and plug and abandonment mechanisms in place to handle the entire geothermal program with the assistance of the CID/RLD, NMED and OSE. Any project with injection and production wells will require bonding?
  - OCD is currently assessing how it will track geothermal injection/production wells and bonding under its Risk Based Database Management System (RBDMS).
  - Any low-temperature direct heat applications where there is no environmental threat to surface and/or ground water (closed-loop) would likely <u>not</u> require a WQCC discharge permit and applicable fees would likely <u>not</u> apply.
  - When the use of geothermal heat is deemed "Incidental Use" by the OCD, the heat is no longer considered a mineral or to be regulated under OCD Geothermal Regulations. OCD will forward the application to NMED and/or other applicable state agencies (i.e.,

CID/RLD, OSE, etc.) for permitting. OCD may permit any geothermal project where the use is deemed "geothermal use"; injection, and production/development wells are installed in areas with a USDW(s).

- Agencies other than OCD may have concerns about the OCD and how it will ensure applications are processed in a timely manner with joint permitting?
- CID/RLD will likely continue to permit geothermal and "Incidental Use" closed-loop geothermal projects in New Mexico operating under its housing and construction regulatory requirements. CID regulates its licensee's through permitting and inspection of Ground Source Geothermal HVAC systems. These systems are used for the incidental heating and or cooling of a building generally using a closed loop pipe system for the exchange of hot or cold energy with the ambient ground. The systems piping will begin and terminate at a piece of heating or cooling equipment or appurtenance. These systems are used for human comfort and not used in processing or manufacturing of a product. Is there a closure plan for decommissioning these systems?
- NMED's role would be WQCC Discharge Permit writing, but since OCD has the delegated authority, also has WQCC permit authority, it can issue discharge permits for geothermal projects and NMED would not need to be involved with the geothermal programs in New Mexico, unless an application is deemed to be an "Incidental Use" by OCD and where the water is potable. In this case, NMED could be responsible for issuing a WQCC discharge permit under its program(s)?
- Dr. Richard Erdlac presented opinion about why any geothermal project that does not result in a product for sale should not have to pay royalty and/or taxes and CID/RLD preliminarily agreed based on its historical oversight of direct heat projects in the state. To do so would prevent projects from moving forward, i.e., direct heat application at residences, and OCD and/or BLM could make the State TRD and SLO become utility type agencies with collection departments, etc. similar to the former "Public Service Company of New Mexico." It doesn't make sense to collect royalties and taxes from geothermal projects where there is no commercial products derived from use of heat. Another example were spas and bathhouses, but in these cases use of the heat results in revenue, which could be considered a product for taxation? OCD Attorneys are pondering these scenarios, but basically agreed with Dr. Erdlac. BLM needed to check with DOI-MMD to see if this was the federal position?

## 10) Miscellaneous

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- BLM will determine royalty, rent and/or taxation requirements for geothermal heat applications to residences and commercial office buildings on federal lands.
- BLM/OCD may complete MOU for bonding and any other unnecessary duplication of duties, responsibilities, etc. to streamline the geothermal permit process.
- State Land Office assesses royalty during time of sale of lease.
- The DOI-MMD should be contacted to assess royalty, rent and taxation payments from the extraction of geothermal heat on Federal Lands.

# 11) Path Forward?

• Next meeting Wednesday, June 9, 2010 10 a.m. to Noon at Office of State Engineer: 130 South Capitol Street (Concha Ortiz y Pino Building) Santa Fe, NM 87504-5102. (Call David Heber or Mike Johnson at 505-827-6102 or 505-827-3867 respectively, if you have questions)

- Initiate MOU process with BLM and other agencies to comply with Governor's Executive Order to make NM No. 1 in Renewable Energy
- Request review assistance and program permit information from CID/RLD, NMED, and OSE for OCD draft "Generic Geothermal Application" and webpage, "Who Does What" assistance from CID/RLD, NMED and OSE to track and process all geothermal applications in the state? The Webpage forms the basis for the state agencies process for accepting, reviewing and processing geothermal projects in NM. OCD is also working on a flow-chart(s) to share with the group that may simplify the understanding of the geothermal process for geothermal operators, web browsers, etc. at the next meeting.
- OCD was approached later by Jay Stimmell (NMED- AQB) who is working on a webpage customer service webpage for renewable energy as part of their task assigned under the Governor's December 2009 Executive Order. The respective agencies: NMED, OSE and CID/RLI were contacted to assist OCD with compiling basic information for Jay, which should also help for the "Who Does What" webpage.

#### Agency discussion for next meeting:

Currently, based on further discussions and review of the geothermal regulations, OCD believes that the respective key agencies responsible for geothermal projects under geothermal regulations in New Mexico will be CID/RLD and OCD operating under their respective licensing and/or regulations. OSE will be involved whenever there is a ground water appropriation (any temperature) issue to address at which time their role becomes very significant. NMED may become involved if an application is deemed "Incidental Use" by OCD (not under Geothermal Regulations) and therefore not a geothermal direct use of the heat, and if the ground water is potable, NMED may be responsible for any WQCC discharge permitting of geothermal "Incidental Use" determination projects by the OCD? Geothermal and "Incidental Use" Projects that are closed-loop may likely be the sole responsibility of the CID/RLD. On state lands, if the heat is declared "Incidental Use" by OCD after review of the geothermal application, there may be no state royalty, rent or taxation requirements. On federal lands, there may be royalty, rent, and etc. obligations; therefore, the Department of Interior (DOI)- Mining and Minerals Division (MMD) may need to be contacted to find out more.

Note: The draft agenda items above are presented to assist the group with forward thinking in anticipation of the meeting and nothing is final nor should any items above or discussed during work group meetings be misconstrued to mean we are seeking ways to by bypass Geothermal Regulations, etc.

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	Stakeholder 1 CID/1	RLD (Tony Anaya Bldg. Santate)
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REM PACHECO	CID-E	505476 9679 Your pachecoestate non us
Andy Dalmy	CID-Lic.	SOS 670.6078 anly daling & state now U
David Brooks	O.C.D-Olty	505-47-3450 david brooks@ "
Mikal Altomare	OCD-atty	505-476-3480 Mikal.altomare@state.nm.us
MIKE JOHNSON	OSE-HYDROLOGY	505-827-3867 mike.johnson@state.nm.us
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In reviewing OCD's Generic Geothermal Form, a disclaimer could be added to address contacting federal, state and local agencies responsible for royalty, rent and tax assessment. OCD could add links to the SLO, TRD, etc. and regulations to assist customers. CID/RLD recommended that more signature blocks with license or certification numbers be added to the application form. Also, a disclaimer could be added that would address any other applicable local, state and federal requirements (royalty, taxation, etc.). The changes were made and sent via e-mail on 5/13/10 for their consideration. CID/RLD responded and provided a paragraph description of what it permits, inspects, etc. that will also assist with the OCD "Who Does What" draft webpage.

4) Each stakeholder will pass out their geothermal application forms and or permit associated w/ their geothermal permitting program if applicable for OCD to be aware of and possibly to reproduce for its program? OCD will also hand out its forms. Application process? Agency Website visitation of geothermal resources, i.e., permitting, process, etc. OSE has forms described in WSU article. Could be unappropriated waters, transfer of wells, well records, etc. CID/RLD forms? License forms handed out. Permitting application and files w/ CID/RLD?

OCD is interested in the number and magnitude of the permits to understand work involved with taking over programs, etc. Also, OCD would like to add links to the forms from the OCD "Who does What?" webpage. OCD handed out its proposed draft "Generic Geothermal Application" Form. OSE handed out its "Well Record & Log; Application for Permit to Appropriate Underground Water; and Application for Permit to Change Location of Well and Place and/or Purpose of Use of Underground Water" forms. Also, a handout of the NGWA, Groundwater Protection Council, GeoExchange, and International Ground Source Heat Pump Association "State Regulatory Oversight Survey" Form was passed out (also viewed on overhead projector). OCD's draft application form handout uses the comprehensive geothermal categories from the survey forms for its "Project Description" section of its draft geothermal permit.

CID/RLD handed out its "Application/Permit and Mechanical Permit Request" Forms. The OCD later requested a list of permitted facilities from CID/RLD and OSE for consideration of the

magnitude of their past geothermal permitted facilities and to determine whether it should enter these projects into its OCD Online filing system under "GTHT (high temperature) or GTLT (low temperature)" designations? It is apparent that CID/RLD Permit forms will also need to be completed by applicants when geothermal projects fall under the CID/RLD permit process. For example, dual permitting process with OCD's generic geothermal form completed with every geothermal application.

# 5) "Direct Use or Not Direct Use- Closed Loop Heat Storage" Richard Erdlac (Erdlac Energy Consulting)

Slide show: Slide 3: geothermal uses function of temperature. Is commercial product generated from extraction of geothermal heat, i.e., power generation, fish food (aquaculture), etc? These are examples where the extraction of heat produced a commercial product in the end. Other nonproduct uses include: hot bath houses, ice melting, air heating for home, Geothermal Heat Pumps (GHP), Geothermal HVAC, GeoExchange or moving heat. Slide 4. Geoexchange takes heat out of bldg, and puts it 300 ft. into the ground, solar energy and human breathing or refrigerator. Pull heat out, cool home; pull heat out and use internally. Where heat derived from. Not from geothermal, a little, but most heat from summer time. NM greatest use air conditioning... Slide 5. Closed-Loop systems closed to environ. w/ heat transfer working fluid, Open loop pulls water out of aquifer, runs thru heat exchanger back into aquifer; Power vs. Geo exchange. High salinity fluids in open systems. Less than 4000 ppm NaCl to treat and use direct heat purposes. Slide 6. Size of furnace, handles 3 rooms, open loop system, and water brought in plate to plate system. Middle photo, vault w/ shallow wells closed loop, pipes together one point and inside bldg. Usually outside buried underground. Heat stored underground. If have enough during Winter, can bring up during Winter. No way to determine whether heat came from solar, wind, etc. Heat like electron. Majority of heat underground for air conditioning. Upper 100 ft. acting like heat battery for storage. Slide 8. Loops could have depth 5000 ft down, but here, shallow water well drilling 400 ft. max. In Texas all certified contractors are involved. Loop installers are certified. Heat pump installer equivalent to air conditioner installer, furnace installer, etc. that require certification. Four areas proficiency with different backgrounds involved. Slide 9. Ground source. Heat pump, energy mgt. Like air heat pump. Not talking specifically geothermal, because sun and other energy source warming too. Heat moves in and out. Slide 10. Royalties' geothermal heat pumps. In presenter's opinion, ground source heat pump should be excluded from royalty, rent and taxes because there is no commercial product. Schools in NM have put these systems in better stewards of environment. Alamogordo geo exchange systems. Ownership of ground or surface rights could have impact? How much soil does surface owner own? If shallow, not much question. The deeper, more certain what mineral rights may be (see www.Dsire.com) recommended website. Incentives in NM include GHP tax credits. Only GHP has no product, use of heat, ex., 77 hot springs, fee to sit in hot water and leave. How do you assess them for use of heat.... No product just using heat.... Forget it! Extract royalty on heat.... Consistent with personal use, no product involved. OCD take, no distinction between geothermal.... If not geothermal resource, mineral, then does not fall within purview of OCD, just CID/RLD regulation of installation of system. If there are GW protection issues associated with project, OCD could be involved. OCD needs to think about it. Impossible to discern, doesn't make sense to assess royalties. Hot water reheating heaters in house and use the heat in other ways. Don't want to create disincentive. Slide 11. High temp, more electricity. Heat not tangible resource. In bottle, no energy. Royalty issue... Not all heat out of well used for generating electricity. exchange 5 to 10%. By time cool, may drop 280°F to 240°F waste water, can't drink, reinject, only 40 deg. heat used w/ loss of heat along way. How do you take royalty? Can always assess royalty on net electricity produced by geothermal. Geothermal doesn't work

like electricity. Assess energy going into grid. Slide 12. Other applications. If product made, look at royalty on product, but be careful.

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6) Update on Royalty and Conservation Tax Assessment- OCD follow-up efforts w/ State Land Office (SLO) and Taxation and Revenue Department (TRD). They were unaware of the Governor's Executive Order to Make NM No.1 in Nation for Renewable Energy. The SLO and TRD provided their regulations to the OCD in advance of the meeting, which were shared with the group. In short, SLO assesses royalty during leasing process. TRD does assess a "Conservation Tax" and more details may be forthcoming? OCD could simply add a disclaimer to its application forms to contact federal, state and local government royalty and taxation agencies to determine project royalty and/or taxation requirements? Could add links to OCD "Who Does What" resource page to cover these topics.

Mr. Robert Prael (Dept. of Interior- Minerals & Mining Division), et al., Federal Lands Rent, Royalty, lease sale discussion......would this apply to direct heat applications for BTUs used in heating commercial office buildings, etc.? May need to add Federal link on OCD resource page for Federal royalty, tax, etc.?

Onshore, offshore lease, pay rent for producing status, collect royalty, collected by treasury, states, lease obligations on geothermal properties.

*BLM Adjudicated. Changed Energy Policy Act 2005, and simpler for electricity and heat, BLM and MMD. Pre-energy leases and post leases.* 

50 geothermal leases producing on fed. land under old regulations. royalties, and handbooks. CID was not aware of royalties for direct heat above 100 ft. depth. Proposed under new regulations. Fish farm next to Raser (state lease) and straddles federal lease using wells on state. Direct use at university. No royalties being collected on fish farm only on federal. Fish farm paying royalties to the state.... CID licensing, permits, scopes for construction, plan submittal.

Permit needed for direct use and power generation on federal lands. Must know rights under property. Closed-loop? Yes, but greenhouse using federal mineral heat, didn't recognize federal resource that required permitting.

If go through heat exchanger and economic benefit, BTUs would qualify for royalty, etc. For residences, don't know now. Kirby Weatherby-BLM Washington lead geothermal will be contacted by BLM to learn more. Individual houses w/ heat pump, BLM not concerning itself with residences. Who controls mineral estate of land in question? Fed. only oil and gas, not necessarily geothermal. Mike Smith-BLM will get answer.

OCD Royalty Regulation discussion: OCD wants to make sure all agencies are keyed into definition of geothermal resource. Careful, concerned about definition of geothermal resource in permits issued and the context.

Is taxable value equivalent, severance tax on mineral, or just taxable? Value at point of sale, less cost to bring it there....

BLM will check to see if royalty, rent and/or taxation requirements would apply to residential and commercial geothermal heating applications and get back to group with answer.

- 7) OCD "Who does what?" Draft Webpage review and amend OCD's Geothermal Resource Pagel together (OCD Publications Webpage) Handout passed out by OCD at 3/30 meeting.
  - OCD Draft "Who Does What" (call for each agencies brief summary of application process, etc.?) Develop flow chart and hot links or description of words as you place mouse on word to reduce text while conveying geothermal programs to web browsers. OCD sent CID/RLD and OSE for NMED's (Jay Stemmell) resource website page update to respond similarly to ECMD to make their programs known in the geothermal arena. This will also aid in the development of this task. OCD sent draft to agencies requesting their input and will bring another draft to June 9, 2010 meeting.
  - CID/RLD Direct Use Form Development? Could this be redundant? For example, OCD will require submittal of the generic geothermal form at a minimum, while CID/RLD also has similar permit forms. Should the agencies meld forms into one OCD form or should there be separate forms? Nice to have one form that address multi-agencies, but may have to live with multiple permits and we need to hot link them into our summary of who does what, etc.
- 8) Possible Geothermal Working Group (not to be confused with our "Geothermal Regulations Stakeholder Group) "Geothermal Oil & Gas Coproduction" in the oil patch symposium ~ September 2010. Steve Lucero ECMD organizing. BLM, OSE (water scarcity and appropriation issues) and OCD (permitting, down hole new and reworking well issues, potash and mineral rights issues?), and geothermal company presentations.

Use air, recapture water and make closed-loop system to minimize water loss at OCD geothermal power generation projects. LANL and Penn State thermal cool system use sound for cooling. Can this be used in OCD's environment? Other scenarios to think about? Air in combination with fluids to make it work. Binary system has allowed lower temp w/ air cooling to get away from water. Still infancy stage when ask commercial power generation companies to implement more efficient heat transfer systems that rely less on fresh water and more on closed-system working fluids for heat exchange. New Mexico wants geothermal companies to be aware of our natural resource issues when they come to NM to use our resources to export their power.

- 9) Other issues and concerns?
  - OCD has the lead for all geothermal applications in New Mexico to assess projects for joint permitting or refer to other applicable regulating state agencies for processing. OCD will track the type of projects through its OCD Online electronic record keeping system. There are issues of whether permit issuance and fees may be charged based on OCD's application process?
  - OCD already has an application process, application forms, well tracking, bonding and plug and abandonment mechanisms in place to handle the entire geothermal program with the assistance of the CID/RLD, NMED and OSE. Any project with injection and production wells will require bonding?
  - OCD is currently assessing how it will track geothermal injection/production wells and bonding under its Risk Based Database Management System (RBDMS).
  - Any low-temperature direct heat applications where there is no environmental threat to surface and/or ground water (closed-loop) would likely <u>not</u> require a WQCC discharge permit and applicable fees would likely <u>not</u> apply.
  - When the use of geothermal heat is deemed "Incidental Use" by the OCD, the heat is no longer considered a mineral or to be regulated under OCD Geothermal Regulations. OCD will forward the application to NMED and/or other applicable state agencies (i.e.,

CID/RLD, OSE, etc.) for permitting. OCD may permit any geothermal project where the use is deemed "geothermal use"; injection, and production/development wells are installed in areas with a USDW(s).

- Agencies other than OCD may have concerns about the OCD and how it will ensure applications are processed in a timely manner with joint permitting?
- CID/RLD will likely continue to permit geothermal and "Incidental Use" closed-loop geothermal projects in New Mexico operating under its housing and construction regulatory requirements. CID regulates its licensee's through permitting and inspection of Ground Source Geothermal HVAC systems. These systems are used for the incidental heating and or cooling of a building generally using a closed loop pipe system for the exchange of hot or cold energy with the ambient ground. The systems piping will begin and terminate at a piece of heating or cooling equipment or appurtenance. These systems are used for human comfort and not used in processing or manufacturing of a product. Is there a closure plan for decommissioning these systems?
- NMED's role would be WQCC Discharge Permit writing, but since OCD has the delegated authority, also has WQCC permit authority, it can issue discharge permits for geothermal projects and NMED would not need to be involved with the geothermal programs in New Mexico, unless an application is deemed to be an "Incidental Use" by OCD and where the water is potable. In this case, NMED could be responsible for issuing a WQCC discharge permit under its program(s)?
- Dr. Richard Erdlac presented opinion about why any geothermal project that does not result in a product for sale should not have to pay royalty and/or taxes and CID/RLD preliminarily agreed based on its historical oversight of direct heat projects in the state. To do so would prevent projects from moving forward, i.e., direct heat application at residences, and OCD and/or BLM could make the State TRD and SLO become utility type agencies with collection departments, etc. similar to the former "Public Service Company of New Mexico." It doesn't make sense to collect royalties and taxes from geothermal projects where there is no commercial products derived from use of heat. Another example were spas and bathhouses, but in these cases use of the heat results in revenue, which could be considered a product for taxation? OCD Attorneys are pondering these scenarios, but basically agreed with Dr. Erdlac. BLM needed to check with DOI-MMD to see if this was the federal position?

### 10) Miscellaneous

- BLM will determine royalty, rent and/or taxation requirements for geothermal heat applications to residences and commercial office buildings on federal lands.
- BLM/OCD may complete MOU for bonding and any other unnecessary duplication of duties, responsibilities, etc. to streamline the geothermal permit process.
- State Land Office assesses royalty during time of sale of lease.
- The DOI-MMD should be contacted to assess royalty, rent and taxation payments from the extraction of geothermal heat on Federal Lands.

## 11) Path Forward?

• Next meeting Wednesday, June 9, 2010 10 a.m. to Noon at Office of State Engineer: 130 South Capitol Street (Concha Ortiz y Pino Building) Santa Fe, NM 87504-5102. (Call David Heber or Mike Johnson at 505-827-6102 or 505-827-3867 respectively, if you have questions)

.

- Initiate MOU process with BLM and other agencies to comply with Governor's Executive Order to make NM No. 1 in Renewable Energy
- Request review assistance and program permit information from CID/RLD, NMED, and OSE for OCD draft "Generic Geothermal Application" and webpage, "Who Does What" assistance from CID/RLD, NMED and OSE to track and process all geothermal applications in the state? The Webpage forms the basis for the state agencies process for accepting, reviewing and processing geothermal projects in NM. OCD is also working on a flow-chart(s) to share with the group that may simplify the understanding of the geothermal process for geothermal operators, web browsers, etc. at the next meeting.
- OCD was approached later by Jay Stimmell (NMED- AQB) who is working on a webpage customer service webpage for renewable energy as part of their task assigned under the Governor's December 2009 Executive Order. The respective agencies: NMED, OSE and CID/RLI were contacted to assist OCD with compiling basic information for Jay, which should also help for the "Who Does What" webpage.

#### Agency discussion for next meeting:

Currently, based on further discussions and review of the geothermal regulations, OCD believes that the respective key agencies responsible for geothermal projects under geothermal regulations in New Mexico will be CID/RLD and OCD operating under their respective licensing and/or regulations. OSE will be involved whenever there is a ground water appropriation (any temperature) issue to address at which time their role becomes very significant. NMED may become involved if an application is deemed "Incidental Use" by OCD (not under Geothermal Regulations) and therefore not a geothermal direct use of the heat, and if the ground water is potable, NMED may be responsible for any WQCC discharge permitting of geothermal "Incidental Use" determination projects by the OCD? Geothermal and "Incidental Use" Projects that are closed-loop may likely be the sole responsibility of the CID/RLD. On state lands, if the heat is declared "Incidental Use" by OCD after review of the geothermal application, there may be no state royalty, rent or taxation requirements. On federal lands, there may be royalty, rent, and etc. obligations; therefore, the Department of Interior (DOI)- Mining and Minerals Division (MMD) may need to be contacted to find out more.

Note: The draft agenda items above are presented to assist the group with forward thinking in anticipation of the meeting and nothing is final nor should any items above or discussed during work group meetings be misconstrued to mean we are seeking ways to by bypass Geothermal Regulations, etc.



# WELL RECORD & LOG

12

# OFFICE OF THE STATE ENGINEER

www.ose.state.nm.us

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#### NEW MEXICO OFFICE OF THE STATE ENGINEER **APPLICATION FOR PERMIT** TO APPROPRIATE UNDERGROUND WATER

1. APPLICANT	
Name:	Work Phone:
Address:	Home Phone:
City:	State: Zip:
2. LOCATION OF WELL (A, B, C, or D required,	E or F if known)
A1/41/41/4 Sect.	ion:Township:Range:N.M.P.M.
B. X =feet, Y = Zone in the U.S.G.S. Quad Map	feet, N.M. Coordinate System Grant.
C. Latitude:dm	s Longitude:dms
D. East (m), North	(m), UTM Zone 13, NAD (27 or 83)
E. Tract No, Map No	of the Hydrographic Survey
F. Lot No, Block No Subdivisio	of Unit/Tract of the County.
G. Other:	
H. Give State Engineer File Number	r if existing well:
I. On land owned by (required):	
3. WELL INFORMATION	
Approximate depth feet; Outs: Name of well driller and driller ?	ide diameter of casing inches. license number
4. QUANTITY	
Consumptive Use: acre- Diversion Amount: acre-	-feet per annum -feet per annum
5. PURPOSE OF USE	
Domestic:Livestock:Irric Commercial:Other (specify): Specific use:	gation: Municipal: Industrial:
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File Number: ____ (For OSE Use Only)

#### NEW MEXICO OFFICE OF THE STATE ENGINEER **APPLICATION FOR PERMIT** TO APPROPRIATE UNDERGROUND WATER

#### 6. PLACE OF USE

_____ acres of land described as follows: Subdivision of Section Section Township Range Acres (Map No.) (Tract No.) (District or Hydrographic Survey)

Who	is	the	owner	of	the	land?	

#### 7. ADDITIONAL STATEMENTS OR EXPLANATIONS:

1	
-	

### ACKNOWLEDGEMENT

_____ affirm that the foregoing statements are true to I,_____(Please Print) the best of my knowledge and belief, By: _ ·

Aplicant Signature

Applicant Signature

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File Number: Form: wr-05 Trn Number:

page 2 of 3

File Number: (For OSE Use Only)

#### NEW MEXICO OFFICE OF THE STATE ENGINEER APPLICATION FOR PERMIT TO APPROPRIATE UNDERGROUND WATER

#### **ACTION OF STATE ENGINEER**

This application is approved/denied partially approved provided it is not exercised to the detriment of any other having existing rights, and is not contrary to the coservation of water in New Mexico nor detrimental to the public welfare; and further subject to the following conditions:

al this	day of	, 20
, State	Engineer	
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Form:	wr-05	page 3 of 3			

File Number:

(For OSE Use Only)

#### NEW MEXICO OFFICE OF THE STATE ENGINEER APPLICATION FOR PERMIT TO CHANGE LOCATION OF WELL AND PLACE AND/OR PURPOSE OF USE OF UNDERGROUND WATER

1. APPLICANT Name :	Work Phone:
Contact:	Home Phone:
Address:	
City:	State: Zip:
2. CHANGE FROM	
A. LOCATION OF WELL (A and/or B or E Requir	ced)
a1/41/41/4 Section:	Township: Range:N.M.P.M.
b. X = feet, Y = Zone in the U.S.G.S. Quad Map	feet, N.M. Coordinate System Grant.
c. Latitude:dms Lo	ongitude:dms
d. East (m), North (m	n), UTM Zone 13, NAD (27 or 83)
e. Tract No, Map No of the	Hydrographic Survey
f. Lot No, Block No of Unit	c/Tract of the cded in County.
g. Other:	
h. Give State Engineer File Number of exi	sting well:
i. On land owned by (required):	
<pre>j. Is well to be plugged or capped? retained:</pre>	If not, state for what use

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Trn Number: _____ page 1 of 5

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(For OSE Use Only)

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#### NEW MEXICO OFFICE OF THE STATE ENGINEER APPLICATION FOR PERMIT TO CHANGE LOCATION OF WELL AND PLACE AND/OR PURPOSE OF USE OF UNDERGROUND WATER

#### 2. CHANGE FROM - continued

B. PLACE OF USE

_____ acres of land described as follows:

Subdivision of Section (District or Hydrographic Survey)	Sectio (Map No	on o.)	Townsł (Tract	No.)	ange		Acres
		_					
		-				-	
		-				-	
		_				-	
		_				-	
Who is the owner of the land?							
If there are other sources of wat	er for t	these	lands,	describe	by	file	number:

C. PURPOSE OF USE

Domestic:	Livestock:	Irrigation:	_ Municipal:	Industrial:
Commercial:	Other (spe	cify):		
Specific use:				

D. QUANTITY

Diversion Amount: ______ acre-feet per annum Consumptive Use: ______ acre-feet per annum

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	Form:	wr-08	page 2 of 5			

File Number:

(For OSE Use Only)

#### NEW MEXICO OFFICE OF THE STATE ENGINEER APPLICATION FOR PERMIT TO CHANGE LOCATION OF WELL AND PLACE AND/OR PURPOSE OF USE OF UNDERGROUND WATER

#### **3. CHANGE TO**

·•• .

a.	1/4	1/4	1/4 Sect	ion: 7	Township:	Range:	N.M.P.M.
b.	. X = U.S.G.S. (	fee Zone in t Quad Map	et, Y =		feet, N	.M. Coordir	nate System Grant.
C	. Latitude:	d	m	s Long	gitude:	dr	ns
d.	. East	(m),	North	(m),	UTM Zone	13, NAD	(27 or 83)
e	. Tract No.	, Map	No	_ of the		_ Hydrograg	phic Survey
f.	. Lot No	, Block	No. Subdivis:	_ of Unit/1 ion recorde	Pract ed in		of the County.
g	. Other:						
h.	. Give State	e Engineer	File Numbe	er of exist	ing well:		
i	. On land or	wned by (re	equired):				
j.	. If new we diameter o (if known	ll, give ap of casing _ )	proximate inches	depth (if . Name of	known) driller and	feet; Ou d license r	utside number
3. PI	LACE OF USE						
	ac	res of land	describe	d as follow	vs:		
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page 3 of 5

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#### NEW MEXICO OFFICE OF THE STATE ENGINEER APPLICATION FOR PERMIT TO CHANGE LOCATION OF WELL AND PLACE AND/OR PURPOSE OF USE OF UNDERGROUND WATER

#### 3. CHANGE TO - continued

C. PURPOSE OF USE

Domestic: ____ Livestock: ___ Irrigation: ___ Municipal: ___ Industrial: ____ Commercial: ____ Other (specify): _____ Specific use: _____

#### D. QUANTITY

Diversion Amount: ______ acre-feet per annum consumptive Use: ______ acre-feet per annum

#### 4. REASON FOR CHANGE

Application is made to change location of well and/or place and/or purpose of use for the following reasons:

#### 5. ADDITIONAL STATEMENTS OR EXPLANATIONS:

#### ACKNOWLEDGEMENT

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page 4 of 5

File Number: (For OSE Use Only)

#### NEW MEXICO OFFICE OF THE STATE ENGINEER APPLICATION FOR PERMIT TO CHANGE LOCATION OF WELL AND PLACE AND/OR PURPOSE OF USE OF UNDERGROUND WATER

#### **ACTION OF STATE ENGINEER**

This application is approved/denied/partially approved provided it is not exercised to the detriment of any others having existing rights, and is not contrary to the conservation of water in New Mexico nor detrimental to the public welfare; and further subject to the following conditions:

······		
Witness my hand and seal this	day of	. 20
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, State En	gineer	
Ву:		

Do Not Write Below This Line

File Number: Form: wr-08 Trn Number:

page 5 of 5

State of New Mexico Albuquerque Office 5200 Oakland Ave., NE 1-2 Las Cruces Office 505 S. Main St., Ste 150 P.C Santa Fe Office 2550 Cerrillos Road	Regulation and Licensing Department 5 @Alameda Albuquerque, New Mexico 87113 D. Box 939 Las Cruces, New Mexico 88004-09 Santa Fe, New Mexico 87504	Construction Industries Division Phone: (505) 222-9800 Fax: (505) 765-56 39 Phone: (505) 524-6320 Fax: (505) 524-63 Phone: (505) 476-4700 Fax: (505) 476-47
Date Issued: Processed	By: TRACKING/Per	mit Number:
Received By: Mail (A / R) Paid F	3y: Cash Receipt #	eck#Total Fees\$
Walk – In (A / R)	Cash Receipt #	eck #Balance Due \$
Please check the appropriate type for which you ar	e applying:	
Building Permit Residential	Commercial Electrical Review	Only Mechanical/Plumbing Review C
Type of Construction: 1 11 111 IV V	АВ т	otal Sg Ft.
Occupancy Group A B E F H	I M R S U V	'aluation / Sign Contract
Division 1 2 3 4 5		
Description of Work:		
New Construction Addition Alteration	s/Repairs Re-Roof Foundation Only	Demolition Renew Permit #
Wood Masonry Adobe	Rammed Earth Alternative N	Aaterial
Metal / Steel (required Engineer STAMPED	Baled Straw (required Architectural	Other: (required Architectural
foundation & structure drawings	STAMPED)	STAMPED)
PLEASE PROVIDE THE FOLLOWING INFORMATION	ON (Refer to the BUILDING PERMIT GUIDE or	call for addition information):
Parcel No. and/or Project Address: (must provide physic	al address) Nearest City/Town/Village to pr	oject Zip Code County
Subdivision Name	Lot Number Town	ship Range Section
Frome written Directions to the project site.		
	· · · · · · · · · · · · · · · · · · ·	
Contractor Information:	· · · · · · · · · · · · · · · · · · ·	
Company Name:		NM State License Number
Address-No. & Street/PO Box/Rural Route	<u> </u>	Zip Code Phone
Property Owner of Homeowner Information:		
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Professional Name or Firm:		NM State License Number
Address-No & Street/PO Box/Rural Route	City State	Zip Code Phone
I hereby acknowledge by my signature below requirements of the New Mexico Building Code to inspect the building covered by this permit. I Construction Industries Division and this inspec structure on the premises complies with the I Construction Industries Division from requiring X	that I have read this application and state t . I waive my right to require any inspector to However, I waive this right only on the follow ction must be made at reasonable times for p New Mexico Building Code. I understand , compliance with the provisions of the New I	hat the above is correct. I agree to comply wi possess a search warrant before they enter the pr ving conditions: The inspector must be approved urpose of determining whether the work of build that the issuance of this permit shall not preve Mexico Building Code. Date:
	OFFICIAL USE ONLY	
PLANING/ZONNING APPROVED BY:		
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# CONSTRUCTION INDUSTRIES DIVISION



2550 Cerrillos Rd. Santa Fe, NM 87505 Phone: (505) 476-4700 Fax: (505) 476-4685 5200 Oakland Ave. NE Albuquerque, NM 87113 Phone: (505) 222-9800 Fax: (505) 765-5670 505 S. Main St. Ste. 150 Las Cruces, NM 88001 Phone: (505) 524-6320 Fax: (505) 524-6319

)

# Mechanical Permit Request

x:
Payment Type
Cash
Money Order
Check #
Pre-Paid Acct.
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### (Please check one) 🗆 Residential

□ Commercial (CID GENC Tracking #_

Qty.	Item	Price	Sub- total
	Chillers	\$10.00	
	Chilled Water Distribution System	\$10.00	
	Cooling Towers	\$10.00	
	Commercial Duct Systems	\$10.00	
	Residential Duct Systems	\$10.00	
	Plumb. Fixture Waste Discharge Device	\$4.00	
	Water Distribution System	\$4.00	
	Evaporative Cooler	\$6.00	
	Fan Coil Units	\$4.00	
	Gas Appliance Capped Opening	\$4.00	
	Gas Furnace	\$4.00	
	OTHER Gas Appliance	\$4.00	
	Gas Piping Outlets	\$4.00	
	Gas Piping System - LP/Natural	\$6,00	
	Gas Range	\$4.00	
	Gas Wall Heater Appliance	\$4.00	
	Gas Water Heater Appliance	\$4.00	
	Grease Traps/Interceptors	\$4.00	
	Gas Yard Line	\$4.00	
	Combination HVAC Units	\$4.00	

Qty:	Item	Price	Sub-
			total
	Commercial Kitchen Hoods	\$10.00	
	Medical Gas System	\$10.00	
	Hot Water Radiant Heating Syst.	\$10.00	
	Roof Drainage System	\$10.00	
	Refrigeration System	\$6.00	
	Building Sewer	\$4.00	
	Solar Space Heating System	\$20.00	
	Domestic Solar Hot Water Heaters	\$10.00	
	Steam and Condensate Piping System	\$10.00	
	Sewage Ejectors/Grinders	\$4.00	
	.Swimming Pools	\$50.00	
	Vacuum Breakers/Backflow Devices	\$4.00	
	Ventilation Systems	\$6.00	
	Water Conditioners	\$6.00	
	Water Heaters	\$4.00	
	Water Service Line	\$4.00	
1	Administrative Fee	\$37.50	\$37.50
1	Final Inspection Fee	\$ 7.50	\$ 7.50
	TOTAL		
	Re-Inspection Fee Permit #	\$45.00	

# NOTE

Please complete <u>ALL</u> spaces on this form. Failure to do so will result in delaying issuance of your permit.



The term "contracting" includes <u>constructing</u>, <u>altering</u>, <u>repairing</u>, <u>installing</u>, or <u>demolishing</u> any:

- road, highway, bridge, parking area or related project;
- building, stadium or other structure;
- airport, subway or similar facility;
- park, trail, bridle path, athletic field, golf course or similar facility;
- dam, reservoir, canal, ditch or similar facility;
- sewage or water treatment facility, power generating plant, pump station, natural gas compressing station or similar facility;
- sewerage, water, gas or other pipeline;
- transmission line;
- radio, television or other tower;
- water, oil or other storage tank;
- shaft, tunnel or mining appurtenance;
- leveling or clearing land;
- excavating earth;
- air conditioning, conduit, heating or other similar mechanical works;
- electrical wiring, plumbing or plumbing fixture, consumers' gas piping, gas appliances or water conditioners; or
- similar work, structures or installations covered by applicable codes adopted under the provisions of the Construction Industries Licensing Act.

# <u>The Importance of</u> <u>Being Properly Licensed</u>

- You are entitled to a lien against a customer's property if you are not paid.
- You can initiate a civil suit to enforce payment for labor and materials.
- You can obtain permits and have your work inspected to be sure it conforms to code.

Getting Licensed

Psychological Services, Inc.

1-877-663-9267or Http://public.psiexams.com



# Chavez, Carl J, EMNRD

From:Chavez, Carl J, EMNRDSent:Monday, May 24, 2010 9:04 AMTo:Baca, Jerome T., RLDCc:Heber, David, OSE; Johnson, Mike S., OSE; Hall, John, NMENV; Lucero, Stephen A.,<br/>EMNRD; Brooks, David K., EMNRD; Altomare, Mikal, EMNRD; Sanchez, Daniel J., EMNRDSubject:FW: OCD Geothermal Applications, Bonds & Prelminary Observations

J.T, et al.:

FYI, just wanted to share a note below highlighted in yellow that reflects what OCD is preliminarily thinking on these geothermal direct heat projects for the next meeting and there is some background information on how OCD will handle geothermal projects and bond issues moving forward.

I think the OCD Generic Geothermal Form should have a question of whether the project includes a "Water Appropriation" so that we can get OSE involved early on in the application process. Other than that hopefully everyone will agree the form can be finalized to replace the old generic geothermal form on the OCD Website. it appears to me that the primary agencies handling geothermal projects in NM will be CID/RLD, OCD and OSE when there is a water appropriation based on the project?

This means a joint permit process for geothermal applications, but operators must always complete the OCD Generic Geothermal Form for all projects. Larger scale projects will be assessed a \$100 filing fee, while smaller scale projects (direct heat) will likely be assessed a one-time filing fee \$100. Power projects (w/water appropriations and open well systems) will be issued a WQCC Discharge Permit with a 5-year renewal under 20.6.2 NMAC.

One question that comes up on the direct heat projects is are there any notifications, decommissioning requirements, closure, etc. when the system is taken off line? If not, a general permit could specify notification of system closure, etc... We can discuss more at next meeting.

Let me know if CID/RLD, OSE and NMED disagree or have any concerns or recommendations based on the above? This should promote more detailed discussion(s) to assist us with the "Big Picture" going forward. OCD would like to receive any lists from CID/RLD, OSE and NMED of any permitted geothermal facilities before or at the next meeting to assess the magnitude of your geothermal projects and to consider data entry into OCD's Online system.

We'll discuss the final OCD Generic Geothermal permit at the next meeting... I'm working on the meeting minutes and will let you know when I post.

Thank you.

Carl J. Chavez, CHMM New Mexico Energy, Minerals & Natural Resources Dept. Oil Conservation Division, Environmental Bureau 1220 South St. Francis Dr., Santa Fe, New Mexico 87505 Office: (505) 476-3490 Fax: (505) 476-3462 E-mail: <u>CarlJ.Chavez@state.nm.us</u> Website: <u>http://www.emnrd.state.nm.us/ocd/</u>index.htm (Pollution Prevention Guidance is under "Publications")

From: Chavez, Carl J, EMNRD
Sent: Thursday, May 20, 2010 3:47 PM
To: Prouty, Jane, EMNRD
Cc: Phillips, Dorothy, EMNRD; VonGonten, Glenn, EMNRD; Fesmire, Mark, EMNRD; Brooks, David K., EMNRD
Subject: RE: Geothermal Bonds

Jane:

Ok, yes we have a spreadsheet tracking system in place the OCD-EB UIC Program. Thanks.

Carl J. Chavez, CHMM New Mexico Energy, Minerals & Natural Resources Dept. Oil Conservation Division, Environmental Bureau 1220 South St. Francis Dr., Santa Fe, New Mexico 87505 Office: (505) 476-3490 Fax: (505) 476-3462 E-mail: <u>CarlJ.Chavez@state.nm.us</u> Website: <u>http://www.emnrd.state.nm.us/ocd/</u>index.htm (Pollution Prevention Guidance is under "Publications")

From: Prouty, Jane, EMNRD
Sent: Thursday, May 20, 2010 2:59 PM
To: Chavez, Carl J, EMNRD
Cc: Phillips, Dorothy, EMNRD; VonGonten, Glenn, EMNRD; Fesmire, Mark, EMNRD; Brooks, David K., EMNRD
Subject: RE: Geothermal Bonds

The geothermal bond rules are entirely different from the oil and gas well bond rules, so numbering conventions or use of codes will not address the issue. Our oil and gas rules apply one bond to one company or one well; the geothermal bonds are clustered differently to groups of wells, and we have no way to track the status of the bond once certain APDs are cancelled, certain wells are plugged, certain wells become inactive, certain wells are added, etc. because the remaining wells would still be under the bond.

Dorothy could get the bond into the system under her recommendation, but her choices are BLANKET or SINGLE WELL which one would she pick? The geothermal rule allows for the clustering of several wells, but not necessarily all, under one bond. If she were to select blanket and if the operator had more than one "blanket" bond, there would be no way to tell which wells were affiliated with which bond—how would she know when to release the bond?

Excel is not limited to the oil and gas business rules, so it will allow you to record exactly what you want, and if we ever do get hundreds of geothermal wells the spreadsheet will give you a good idea of what you need to track and the relationships among data elements. We have no requirement to capture all data in one system, nor to put all documents into the imaging system—we just need to make the information available if someone requests it. You mentioned filing fees in your note. We have filing fees for Discharge Permits but no system to record them in because those are a small part of our data—we track this in Excel and everyone who needs the information can easily get to it.

Bonds are a minor issue in the large number of discrepancies we will encounter between the geothermal rules and forms and the oil and gas rules and forms. Again, I recommend using Excel to track anything you want to track about geothermal wells. This includes the bonds, permits, production, disposition, injection, completions, compliance and all other items we track for oil and gas wells. If you don't use Excel, we will find ourselves in this conversation as the wells progress through each lifetime event. If someone wants to study both sets of rules and forms and revise the geothermal rules to match the oil and gas ones where possible, or at a minimum update the forms, that would minimize the need for special computer programs which will never be written given the low dollar benefit to OCD to writing or tailoring systems to track very few wells.

David and I just met and he withdrew his request for a meeting.

From: Chavez, Carl J, EMNRD
Sent: Thursday, May 20, 2010 1:56 PM
To: Prouty, Jane, EMNRD; Brooks, David K., EMNRD
Cc: Phillips, Dorothy, EMNRD; VonGonten, Glenn, EMNRD; Fesmire, Mark, EMNRD
Subject: RE: Geothermal Bonds

Jane:

I recommend the first solution below if it can be done quickly. If not, the second solution allows us to begin tracking on geothermal bonds immediately. I will simply link all API# to the OCD geothermal permit number. Plans are to scan all G-Forms similar to oil and gas under the API# and the well permit number on OCD Online.

I have a few comments related to OCD taking over high and low temperature geothermal applications (February 2010 OCD Findings); the lions share of the geothermal projects are currently handled by Construction Industries Division/Regulatory License Division (CID/RLD). OCD is working to take over all of the geothermal programs and some will inevitably be handled by OCD and agencies like CID/RLD together under a joint application/permit process? Depending on the type of project and if there are any injection wells or production wells, there may be no bonding required for these projects. OCD would simply assess a \$100 Filing Fee on these types of projects and issue a basic OCD approval or permit and issue a permit number, i.e., "GTLT" designation. Any geothermal production and/or injection well projects however will be bonded and records hopefully will be maintained by API# in RBDMS and on OCD Online for the linked permit number.

I have requested a list of permitted geothermal projects from CID/RLD and OSE in order to assess the magnitude of the projects over time and possible to enter into OCD Online "GTLT" designation to track all geothermal projects in NM. Regarding geothermal power projects, there haven't been very many, but EMNRD-ECMD, OCD, and other agencies acting under the Governor's Executive Order in 12/2009 are working to make NM No. 1 in renewable energy (including geothermal) will likely increase geothermal activity in NM.

### POSSIBLE QUICK SOLUTIONS:

A couple of solutions, one discussed with Dorothy, would be to simply add a geothermal code to RBDMS in order to keep track of bonds under the geothermal code for corresponding API#s issued on geothermal wells.

A second solution is simply entering a "G" designation in front of any bond numbers to reflect "Geothermal" under the "Bond Holder" designation. This would allow OCD to keep all geothermal bonds (WQCC and Geothermal Production/Development Wells) to be tracked immediately under the RBDMS system and OGRID number established for the Raser Project (GTHT-1).

Thanks.

Carl J. Chavez, CHMM New Mexico Energy, Minerals & Natural Resources Dept. Oil Conservation Division, Environmental Bureau 1220 South St. Francis Dr., Santa Fe, New Mexico 87505 Office: (505) 476-3490 Fax: (505) 476-3462 E-mail: <u>CarlJ.Chavez@state.nm.us</u> Website: <u>http://www.emnrd.state.nm.us/ocd/</u>index.htm (Pollution Prevention Guidance is under "Publications")

From: Prouty, Jane, EMNRD
Sent: Thursday, May 20, 2010 1:24 PM
To: Brooks, David K., EMNRD
Cc: Phillips, Dorothy, EMNRD; Chavez, Carl J, EMNRD; VonGonten, Glenn, EMNRD; Fesmire, Mark, EMNRD
Subject: RE: Geothermal Bonds

For the time being, I believe that keeping track of all entities that relate to the geothermal rules and do not fit within our current computer systems should be handled manually, such as in Excel, as we do with all items that don't fit into our existing systems. This will give us a chance to develop a pattern for what we are required to manage for these wells. Even if we met, IT has about two years of requirements for the rest of our wells, bonds, permits, etc. and we can't change that priority given the great needs to track the wells and peripherals covered under our "normal" rules.

So I'm proposing that we not meet now since we're not in a position to make IT changes to accomodate a category that is such a small percentage of our wells. Let me know if you see things differently from my assessment.

Has anyone looked into the feasibility of changing the geothermal statute/rules to match our other rules at a minimum in areas where they logically could, such as in the financial assurance area? I assume that we will have these issues in
many areas related to geothermal wells and we should assess the value of the differences in the rules vs. the value of writing a whole new system to accomodate them. When I reviewed the geothermal rules years ago It seemed to me that some differences between the two sets of rules and forms were due to 1) the rules never changing over time as our "normal" rules did, and 2) because different people who write different rules come up with different ideas—all good but none consistent!

From: Brooks, David K., EMNRD
Sent: Wednesday, May 19, 2010 2:14 PM
To: Prouty, Jane, EMNRD
Cc: Phillips, Dorothy, EMNRD; Chavez, Carl J, EMNRD; VonGonten, Glenn, EMNRD
Subject: FW: Geothermal Bonds

Jane

We need to set up a meeting between you, me, Carl and Dorothy regarding establishing a way to track geothermal bonds.

I do not regard this as a high priority, however, since at this point we have a very small number and tracking is not a problem now.

Let me know when you have some time.

Thanks

David

From: Chavez, Carl J, EMNRD
Sent: Wednesday, May 19, 2010 12:01 PM
To: Phillips, Dorothy, EMNRD
Cc: Brooks, David K., EMNRD; VonGonten, Glenn, EMNRD
Subject: FW: Geothermal Bonds

Dorothy:

Spoke to David about the geothermal bonds based on your note below. Please file the geothermal and WQCC bonds for the Los Lobos Geothermal Project together in the OCD-EB file system, until we determine a better tracking system.

David will set up a meeting with Jane, et al. to discuss at a later date.

I think the only remaining approval is on the "blanket bond" for the 3 UIC Class V Geothermal Injection Wells. Letter went out yesterday on the geothermal production/development wells. Today an approval letter should go out on the UIC wells. I need to make copies of the blanket bond and approval letter for the OCD Online "GTHT-1" bond file. Also, I usually mail out the letters. Thank you.

Carl J. Chavez, CHMM New Mexico Energy, Minerals & Natural Resources Dept. Oil Conservation Division, Environmental Bureau 1220 South St. Francis Dr., Santa Fe, New Mexico 87505 Office: (505) 476-3490 Fax: (505) 476-3462 E-mail: <u>Carl J. Chavez@state.nm.us</u> Website: <u>http://www.emnrd.state.nm.us/ocd/</u>index.htm (Pollution Prevention Guidance is under "Publications")

From: Brooks, David K., EMNRD Sent: Wednesday, May 19, 2010 11:29 AM

## Chavez, Carl J, EMNRD

From: Sent: To: Cc: Subject: Attachments:	Chavez, Carl J, EMNRD Friday, May 07, 2010 9:13 AM Sanchez, Daniel J., EMNRD VonGonten, Glenn, EMNRD; Hill, Larry, EMNRD; Dade, Randy, EMNRD; Perrin, Charlie, EMNRD; Martin, Ed, EMNRD; Lucero, Stephen A., EMNRD FW: Draft MOU on Geothermal Bonding & Other Redundancy Streamlining Issues Between Geothermal Agencies in NM pic13973.gif
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Daniel:

FYI ONLY****Still DRAFT in progress****Still DRAFT in progress****Still DRAFT in progress.

Please note that this msg. serves to inform you (OCD Underground Injection Control (UIC) Director) about recent Geothermal Working Group Developments and about streamlining the OCD Geothermal Permit Process in NM when Geothermal applicants apply for permits. They may have to deal with fewer state and federal agencies in the process, i.e., OCD, etc.? OCD Attorneys David Brooks and Mikal Altomare were copied on the BLM message below.

For example, CID/RLD may handle ground water issues associated with low-temp. direct heat applications in shallow GW and review process under their "Directional Boring" for closed-loop license requirements and where OSE would allow CID/RLD oversight. Similarly, the OSE would allow OCD or CID/RLD open-loop oversight whenever there is low-temp. installations occur in shallow GW conditions. OCD's generic application for closed and open loop low-temp. system installations could require OSE Well Driller Certification (Geothermal Regs. cannot pre-empt other agency regs. and OCD must include them where required) for any low-temperature direct heat applications while CID/RLD and/or OCD oversees the permit process without OSE oversight, construction, etc. However, OSE is still responsible for certifying drillers, answering questions on certification, etc. and not OCD. On Geothermal Power Projects, OCD could encourage water well driller certification under OSE, but it could not require it. Rationale: Similar to O&G Drillers who protect fresh water, geothermal drillers also know how to protect fresh water and more experienced with expertise in this type of drilling than a certified water well driller w/o expertise in O&G or geothermal drilling..... OSE would ALWAYS be involved (OSE has permit process) whenever water is appropriated (being removed or added to GW).

In the instance below, where OCD may be entering into an MOU with the BLM to prevent redundancy in certain aspects of our geothermal bonding, etc. These MOUs or Internal Policies, etc. are helping to streamline the OCD Geothermal Permit Process inline with the Governor's Executive Order to make NM the No.1 Renewable Energy State in the Nation.

Please contact me know if you have any questions or concerns. It would appear based OCD's geothermal meetings that agencies that were responsible for geothermal in the past will have to give and take based on the OCD's February findings that it is responsible for all geothermal extraction in the state.

Thank you.

Carl J. Chavez, CHMM New Mexico Energy, Minerals & Natural Resources Dept. Oil Conservation Division, Environmental Bureau 1220 South St. Francis Dr., Santa Fe, New Mexico 87505 Office: (505) 476-3490 Fax: (505) 476-3462 E-mail: CarlJ.Chavez@state.nm.us Website: http://www.emnrd.state.nm.us/ocd/index.htm (Pollution Prevention Guidance is under "Publications")

-----Original Message-----From: Mike_Smith@blm.gov [mailto:Mike_Smith@blm.gov] Sent: Thursday, May 06, 2010 9:42 AM To: Chavez, Carl J, EMNRD Cc: Jay_Spielman@blm.gov Subject: Re: Draft MOU on Geothermal Bonding & Other Redundancy Streamlining Issues

#### Carl:

You're welcome. I'll be starting conversations with the BLM State Office regarding a geothermal MOU. I'll look at the UIO-999's, but some of the issues I see right would be eliminating any redundancy in bonding and water quality monitoring. Our State Office will have to be involved if we want this to be a State-wide MOU. This is probably going to take some time. We also have another geologist coming on board at Las Cruces BLM at the end of May, and we have not decided how to divide responsibilities just yet - he may be taking over some of the geothermal program. We'll have to see how things progress, but frankly, I may not be able to report much progress by the next meeting.

Regarding the question of whether a closed-loop heat pump system on Federal mineral estate would require a lease and royalties. I have spoken with Kermit Witherbee, who is the National Geothermal Program Manager for BLM. and he has informed me that such systems are not subject to Federal lease and royalties, because such systems essentially operate using ambient heat.

Michael Smith Geologist - BLM Las Cruces District Office 1800 Marquess Street Las Cruces, NM 88005 575-525-4421 Mike_Smith@blm.gov

> "Chavez, Carl J. EMNRD" <CarlJ.Chavez@sta То <Mike_Smith@blm.gov> te.nm.us> сс 05/06/2010 06:05 "Altomare, Mikal, EMNRD" AM <Mikal.Altomare@state.nm.us>, "Brooks, David K., EMNRD" <david.brooks@state.nm.us> Subject Draft MOU on Geothermal Bonding & Other Redundancy Streamlining. Issues

(Embedded image moved to file: pic13973.gif) Mike:

Thank you for your participation in yesterday's meeting. Based on the miscellaneous discussion of our meeting yesterday, could you please develop a draft MOU for OCD and BLM to consider going forward on geothermal projects? This will help the OCD to focus on this issues and this recommendation was identified in OCD's preliminary recommendations on technical, policy, etc. for the EMNRD Geothermal Working Group based on BLM's suggestion. To view OCD preliminary recommendations on geothermal, please go to OCD Online and search for: "UIC-999" and open the Geothermal Working Group Folder and this is the big picture for OCD right now. BLM is welcome to provide recommendations to the OCD going forward as our next meeting is in June 2010 with a report to the Governor due at the end of December 2010.

I have never developed an MOU, although I've reviewed them and am pre-occupied with two working groups on set geothermal. This would place us ahead of the curve I think. Thank you.

Carl J. Chavez, CHMM New Mexico Energy, Minerals & Natural Resources Dept. Oil Conservation Division, Environmental Bureau 1220 South St. Francis Dr., Santa Fe, New Mexico 87505 Office: (505) 476-3490 Fax: (505) 476-3462 E-mail: CarlJ.Chavez@state.nm.us Website: http://www.emnrd.state.nm.us/ocd/index.htm (Pollution Prevention Guidance is under "Publications")

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## Chavez, Carl J, EMNRD

From:Mike_Smith@blm.govSent:Thursday, May 06, 2010 9:42 AMTo:Chavez, Carl J, EMNRDCc:Jay_Spielman@blm.govSubject:Re: Draft MOU on Geothermal Bonding & Other Redundancy Streamlining IssuesAttachments:pic13973.gif

### Carl:

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Michael Smith Geologist - BLM Las Cruces District Office 1800 Marquess Street Las Cruces, NM 88005 575-525-4421 Mike_Smith@blm.gov

> "Chavez, Carl J, EMNRD" <CarlJ.Chavez@sta Τо te.nm.us> <Mike_Smith@blm.gov> CC 05/06/2010 06:05 "Altomare, Mikal, EMNRD" AM <Mikal.Altomare@state.nm.us>, "Brooks, David K., EMNRD" <<u>david.brooks@state.nm.us</u>> Subject Draft MOU on Geothermal Bonding & Other Redundancy Streamlining Issues

#### Mike:

Thank you for your participation in yesterday's meeting. Based on the miscellaneous discussion of our meeting yesterday, could you please develop a draft MOU for OCD and BLM to consider going forward on geothermal projects? This will help the OCD to focus on this issues and this recommendation was identified in OCD's preliminary recommendations on technical, policy, etc. for the EMNRD Geothermal Working Group based on BLM's suggestion. To view OCD preliminary recommendations on geothermal, please go to OCD Online and search for: "UIC-999" and open the Geothermal Working Group Folder and this is the big picture for OCD right now. BLM is welcome to provide recommendations to the OCD going forward as our next meeting is in June 2010 with a report to the Governor due at the end of December 2010.

I have never developed an MOU, although I've reviewed them and am pre-occupied with two working groups on geothermal. This would place us ahead of the curve I think. Thank you.

Carl J. Chavez, CHMM
 New Mexico Energy, Minerals & Natural Resources Dept.
 Oil Conservation Division, Environmental Bureau 1220 South St. Francis Dr., Santa Fe, New Mexico 87505
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 (Pollution Prevention Guidance is under "Publications")

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#### 19-13-7. Leases; terms; rentals and royalties.

A. Each lease issued pursuant to the Geothermal Resources Act [ <u>19-13-1</u> to <u>19-13-11</u>, <u>19-13-12</u> to <u>19-13-2</u> provide for the following rentals and royalties with respect to geothermal resources produced, saved and sold from within the lease:

(1) a royalty of ten percent, except as provided in Paragraph (4) of this subsection, of the gross revenue, ( approved by the commissioner made or incurred with respect to transmission or other services or processes, rece use of steam, brines or hot water from which no minerals have been extracted, and associated gases or any c energy derived from production under the lease at the point of delivery to the purchaser thereof; provided, howev issued and old leases stipulated pursuant to <u>Section 19-13-11.1</u> NMSA 1978 after the effective date of this act wh land then classified as being in a "known geothermal resource field," the royalty shall be at a rate of not less than t than fifteen percent, the exact amount thereof to be set by the commissioner either by rule or regulation or in the j required for the sale of leases at public auction;

(2) a royalty of not less than two percent nor more than five percent of the gross revenue received from the sale or chemical compounds recovered from geothermal fluids in the first marketable form as to each such mineral compound for the primary term of the lease, except that as to any by-product or minerals covered by other min administered by the commissioner or rules or regulations of the commissioner, the rate of royalty for such mineral c the same as the then existing rate of royalty under leases currently being issued by the commissioner;

(3) a royalty of eight percent of the net revenue received from the operation of an energy producing plant on the l-

(4) a royalty of not less than two percent nor more than ten percent of the gross revenue received from geothermal resources for recreational, space heating or health purposes;

(5) an annual rental, payable in advance, of one dollar (\$1.00) an acre or fraction thereof for each year of the leas

(6) if, after the discovery of geothermal resources in commercial quantities, the total royalties paid during any equal or exceed a sum equal to two dollars (\$2.00) an acre for each acre or fraction thereof then included in the holding the lease shall, within sixty days after the end of the year, pay such sum as is necessary to equal the min dollars (\$2.00) an acre;

(7) the royalties specified pursuant to this section shall be subject to renegotiation after twenty years from the effe and at ten-year intervals thereafter; however, the new royalty rate shall not vary more than fifty percent from the and in no event shall the total royalty be less than five percent nor more than twenty-two and one-half percent. At cause shown, the commissioner may reduce the royalty on any lease; and (8) except for royalties on minerals, royalties and rentals may be negotiated at other rates than that provided in the surface has heretofore been sold with minerals reserved; provided, however, a public hearing shall be held there rates are approved by the commissioner.

B. Royalty payments shall be made pursuant to Paragraphs (1) and (2) of Subsection A of this section for all g used and not sold by a person holding a lease, with the gross revenue therefrom to be determined as though the g had been sold to a third person at the then prevailing market price in the same market area and under the same r provided, however, that no royalties shall be payable for steam used by a person holding a lease in the productic resources subject to the payment of royalties pursuant to Paragraphs (1) and (2) of Subsection A of this section.

C. The commissioner shall have the authority in leasing lands pursuant to the Geothermal Resources Act to pres program. In prescribing the program, the commissioner shall consider all applicable economic factors, including m the cost of drilling for, producing, processing and utilizing of geothermal resources.

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Section 7-30-2 — Definitions.				
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### 7-30-2. Definitions.

As used in the Oil and Gas Conservation Tax Act [7-30-1 NMSA 1978]:

A. "department" means the taxation and revenue department, the secretary of taxation and revenue or a department exercising authority lawfully delegated to that employee by the secretary;

B. "production unit" means a unit of property designated by the department from which products of common owner

C. "severance" means the taking from the soil of any product in any manner whatsoever;

D. "value" means the actual price received for products at the production unit, except as otherwise providec Conservation Tax Act;

E. "product" or "products" means oil, natural gas or liquid hydrocarbon, individually or any combination the geothermal energy, carbon dioxide, helium or a non-hydrocarbon gas;

F. "operator" means any person:

(1) engaged in the severance of products from a production unit; or

(2) owning an interest in any product at the time of severance who receives a portion or all of such product for his

G. "purchaser" means a person who is the first purchaser of a product after severance from a production unit, provided in the Oil and Gas Conservation Tax Act;

H. "person" means any individual, estate, trust, receiver, business trust, corporation, firm, copartnership, coope association or other group or combination acting as a unit, and the plural as well as the singular number;

I. "interest owner" means a person owning an entire or fractional interest of whatsoever kind or nature in the pr severance from a production unit or who has a right to a monetary payment that is determined by the value of such

J. "tax" means the oil and gas conservation tax.

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Section 7-30-5 — Taxable value; method of determining. - New Mexico Section 7-30-5 ... Page 1 of 1

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#### 7-30-5. Taxable value; method of determining.

Α. To determine the taxable value of oil, natural gas or liquid hydrocarbon, individually or any combination the helium or non-hydrocarbon gases, there shall be deducted from the value of products:

(1)royalties paid or due the United States or the state of New Mexico;

royalties paid or due any Indian tribe, Indian pueblo or Indian that is a ward of the United States; and (2)

the reasonable expense of trucking any product from the production unit to the first place of market. (3)

Β. The taxable value of coal shall be the taxable value determined under Section 7-25-3 NMSA 1978, less roya Indian tribe, Indian pueblo or Indian that is a ward of the United States.

The taxable value of uranium shall be twenty-five percent of an amount equal to the difference between: C.

the taxable value determined under Section 7-25-3 NMSA 1978; and (1)

royalties paid or due any Indian tribe, Indian pueblo or Indian that is a ward of the United States. (2)

D. The taxable value of geothermal energy shall be the value at the point of first sale, less the cost of transportir severance to the point of the first sale, less the royalties paid or due the United States or the state of New Mexico Indian pueblo or Indian that is a ward of the United States.

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## OCD Geothermal Regulations Royalty & Taxes (5-5-2010)

Chapter 71: Energy & Minerals Article 5: Geothermal Resources Conservation Act <u>Chapter 71, Article 5 NMSA 1978</u>

## 71-5-2.1. Exclusion; incidental loss or extraction of heat.

When the application of potable water to a beneficial use involves the incidental loss or extraction of heat, and the water is 250 degrees Fahrenheit or less, then that heat is not a geothermal resource for which a royalty is due. In such a case, the use is not governed by laws related to geothermal resources but is simply governed by <u>Chapter 72</u> NMSA 1978.

### 71-5-11. Equitable Allocation of production spacing; pooling.

B. The division may establish a spacing unit for each geothermal reservoir, such being the area that can be efficiently and economically drained and developed by one well, and in so doing the division shall consider the economic loss caused by the drilling of unnecessary wells, the protection of correlative rights, including those of royalty owners, the prevention of waste, the avoidance of the augmentation of risks arising from the drilling of an excessive number of wells and the prevention of reduced recovery which

C. When two or more separately owned tracts of land are embraced within a spacing unit, or where there are owners of royalty interests or undivided interests in geothermal resources which are separately owned, or any combination thereof, embraced within such spacing unit, the owner or owners thereof may validly pool their interests and develop their lands as a unit. Where, however, such owner or owners have not agreed to pool their interests, and where one such separate owner, or owners, who has the right to drill has drilled or proposes to drill a well on said unit to a geothermal reservoir, the division, to avoid the drilling of unnecessary wells or to protect correlative rights, or prevent waste, shall pool all or any part of such lands or interest or both in the spacing unit as a unit.

In the event of any dispute relative to such costs, the division shall determine the proper costs after due notice to interested parties and a hearing thereon. The division is specifically authorized to provide that the owner or owners drilling or paying for the drilling, or for the operation of a well for the benefit of all shall be entitled to all production from such well which would be received by the owner, or owners, for whose benefit the well was drilled or operated, after payment of royalty as provided in the lease, if any, applicable to each tract or interest, and obligations payable out of production, until the owner or owners drilling or operating the well or both have been paid the amount due under the terms of the pooling order or order settling such dispute. No part of the production or proceeds accruing to any owner or owners of a separate interest in such unit shall be applied toward the payment of any cost properly chargeable to any other interest in said unit.

If the interest of any owner or owners of any unleased mineral interest is pooled by virtue of the Geothermal Resources Conservation Act [Chapter 71, Article 5 NMSA 978], seven-eighths of such interest shall be considered as a working interest and one-eighth shall be considered a royalty interest, and he shall in all events be paid one-eighth of all production from the unit and creditable to his interest.

D. Whenever it appears that the owners in any geothermal reservoir have agreed upon a plan for the spacing of wells, or upon a plan or method of distribution of production from the reservoir, or upon any other plan for the development or operation of such reservoir, which plan, in the judgment of the division, has the effect of preventing

waste as prohibited by the Geothermal Resources Conservation Act [71-5-1]NMSA 1978] and is fair to the royalty owners in such reservoir, then such plan shall be adopted by the division with respect to the reservoir; however, the division, upon hearing and after notice, may subsequently modify any such plan to the extent necessary to prevent waste as prohibited by the Geothermal Resources Conservation Act.

## 71-5-13. Spacing unit with divided mineral ownership.

A. Whenever the operator of any geothermal resources well shall dedicate lands comprising a standard spacing unit to a geothermal resources well, it shall be the obligation of the operator, if two or more separately owned tracts of land are embraced within the spacing unit, or where there are owners or royalty interests or undivided interests in the geothermal resources which are separately owned or any combination thereof, embraced within such spacing unit, to obtain voluntary agreements pooling of aid lands or interests or an order of the division pooling said lands, which agreement or order shall be effective from the first production. Any division order that increases the size of a standard spacing unit for a geothermal reservoir, or extends the boundaries of such a reservoir, shall require dedication of acreage to existing wells in the reservoir in accordance with the acreage dedication requirements for said reservoir, and all interests in the spacing units that are dedicated to the affected wells shall share in production from the effective date of the said order.

B. Any operator failing to obtain voluntary pooling agreements, or failing to apply for an order of the division pooling the lands dedicated to the spacing unit as required by this section, shall nevertheless be liable to account to and pay each owner of geothermal interests, including owners of overriding royally interests and other payments out of production, either the amount to which each interest would be entitled if pooling had occurred or the amount to which each interest is entitled in the absence of pooling,

### 71-5-24. Seizure and sale of illegal geothermal resources or illegal geothermal resources product; procedure.

D. Nothing in this section shall deny or abridge any cause of action a royalty owner, or any lien holder, or any other claimant, may have, because of the forfeiture of the illegal geothermal resources or illegal geothermal resources product, against the person whose act resulted in such forfeiture.

# Title 19: Natural Resources & Wildlife Chapter 14: Geothermal Power

## Title 19, Chapter 14 NMAC (11-15-83 Recompiled 12-31-01)

No "Royalty or Tax" language exists in regulations.

New Mexico Energy, Minerals and Natural Resources Department

Oil Conservation Division (OCD) Geothermal Power Application, Direct Use Application, Bonding, Forms & Resource Information

(Draft Revised: 5/5/2010)

# Who Does What?

In New Mexico, on federal land, geothermal heat is considered to be a mineral and the BLM is involved with all direct use and power generation applications. On state or private land, and on federal land where state involvement is also required, designation of geothermal heat as a "mineral" or "geothermal resource" depends on the use and whether such use is "incidental." For example, it is considered a "mineral" and therefore within the regulatory authority of the Oil Conservation Division (OCD) whenever heat is extracted for direct use applications or power production. The Office of the State Engineer (OSE) has authority over issues of ground water appropriation.

Where the geothermal extraction is only "incidental" to a beneficial use of water that is being extracted or appropriated, the heat carried by that water is not considered a "mineral" and the extraction or appropriation falls solely within the jurisdiction of the OSE for purposes of regulation of ground water appropriation. In such circumstances, the water extraction would *not* be regulated by the OCD.

Projects involving geothermal extraction *without* the appropriation of ground water fall outside of the jurisdiction of the OSE but still fall within the purview of the OCD's regulatory duties, which encompass all uses of the "mineral" of geothermal heat as defined by statute.

# **Geothermal Regulations:**

WQCC Delegation of Authority to OCD for Geothermal Activities in New Mexico

Chapter 71: Energy & Minerals Article 5: Geothermal Resources Conservation Act

# Chapter 71, Article 5 NMSA 1978

Title 19: Natural Resources & Wildlife Chapter 14: Geothermal Power Title 19, Chapter 14 NMAC (11-15-83 Recompiled 12-31-01)

Legislative Reference: New Mexico Annotated Code Title 19 Chapter 14-1; Title 19 Chapter 2-7; Title 19 Chapter 13-7 to 13-12

Water Quality Control Commission (WQCC) 20.6.2 NMAC (Class V Injection Well Designation) and 20.6.4 NMAC

# **Application Forms:**

Geothermal (Required with all applications and/or sole application for direct heat projects w/o borings or wells with \$100 Filing Fee & 5-Yr. General Permit Fee \$600) Permit to Inject (C 108) (Required where production and/or injection wells are

installed with \$100 Filing Fee & 5-Yr. Discharge Permit Fee \$1,700)

Drilling & Work/Over (G-101, 102 & 103), Well Test & Bond Forms: Geothermal Exploration & Production Forms (see "Geothermal Well Forms") Bonding (see "Bond Forms" GT-B-1 and GT-B-2)

State Land Lease Agency: New Mexico State Land Office Leasing: Leases are available on a non-competitive basis. However, the Commissioner of Public Lands may at his/her discretion reject any application and offer the tract or tracts at public auction. Lands classified as "known geothermal fields" are leased through public auction through either sealed or oral bidding

procedure.

# Lease Terms:

**Primary:** 5 years

MONE **Renewal:** Primary term can be renewed for additional 5 years and thereafter so long as geothermal resources are being produced or utilized or are capable of being produced or utilized in commercial quantities.

Rentals: \$1.00 per acre or fraction thereof per year (escalates to \$5.00 per acre per year after primary lease term).

Royalties: 10 % of the gross revenue from the sale or use of steam, brines or hot water, associated gases or other forms of heat or energy derived from production with a minimum of \$2.00 per acre or fraction thereof per year. A royalty of not less than 2 % nor more than 5 % of the gross revenue received for the sale of mineral products or chemical compounds recovered from geothermal fluids. A royalty of 8 % of the net revenue for the operation of an energy producing plant on the leased land. A royalty of not less than 2 % nor more than 10 % of the gross revenue received from the operation of the geothermal resource for recreational, space heating, or health purposes.

## **Geothermal Resources:**

<u>Geo-Heat Center</u> Geothermal Education Office

Geothermal Resources Council Annual-Meeting

New Mexico Bureau of Geology & Mineral Resources

New Mexico Collocated Resources

New Mexico Energy Conservation & Management Division Geothermal Website New Mexico Geothermal Working Group

<u>New Mexico Oil Conservation Division Geothermal Search Engine</u> (enter order type as "GTLT" or "GTHT")

New Mexico State University- A Strategic Plan For New Mexico Geothermal Resources Development

US Bureau of Land Management

Geothermal Leasing in the Western United States

Geothermal Leasing PEIS A User's Guide

Geothermal Resource Maps

Geothermal Resource Needs in New Mexico

Geothermal Technologies Program

<u>USGS Assessment of Moderate and High Temperature Geothermal Resources of the US</u>

USGS National Geothermal Resource Assessment

# **Contacts:**

New Mexico Bureau of Geology & Mineral Resources (Marshall Reiter 575-835-5306)

<u>New Mexico Bureau of Land Management</u> (Michael Smith 575-525-4421) <u>New Mexico Economic Development Department</u> (Brendan.miller@state.nm.us) <u>New Mexico Energy Conservation & Management Division</u> (Stephen Lucero 505-476-3324)

New Mexico Environment Department- Ground Water Quality Bureau (Direct Heat Contact John Hall 505-827-1049)

New Mexico Office of the State Engineer (Contact District Supervisor)

New Mexico Office of Taxation & Revenue (505-827-0825)

New Mexico Oil Conservation Division (Carl Chavez 505-476-3490)

New Mexico State Land Office (Brian Bingham 505-827-5760)

U.S. Geological Survey (Marshall J. Reed 650-329-5620)

U.S. Department of Energy (Curtis Framel 303-275-4872)



## Chavez, Carl J, EMNRD

Subject: Location:	Geothermal Regulations Stakeholder Meeting- Continuation of 3/30 Meeting at OCD CID/RLD [Capitol West Campus: Tony Anaya Building; 2550 Cerrilos Rd.; Santa Fe, NM (call J. T. Baca 505-476-4661 if you have questions)]
Start: End:	Wed 5/5/2010 10:00 AM Wed 5/5/2010 12:00 PM
Recurrence:	(none)
Meeting Status:	Meeting organizer
Organizer: Required Attendees:	Chavez, Carl J, EMNRD Hall, John, NMENV; Johnson, Mike S., OSE; Heber, David, OSE; Altomare, Mikal, EMNRD; Lucero, Stephen A., EMNRD; Olson, Bill, NMENV; Fesmire, Mark, EMNRD; Mike_Smith@blm.gov; Martinez, Lisa, RLD; 'Adrienne.Brumley@blm.gov'; Brooks, David K., EMNRD; Dalmy, Andy ., RLD; Baca, Jerome T., RLD; Pacheco, Rem, RLD; Aragon, Fermin , RLD; VonGonten, Glenn, EMNRD; Chavez, Carl J, EMNRD; Rappuhn, Doug H., OSE; rcerdlac@cleansed.net; robert.prael@mms.gov

## Stakeholders:

Need telephone phone line for teleconference capability. Website access w/ projector may be appropriate if agencies wish to show their resources pages, plug in jumper drive w/ Microsoft compatible programs, with application forms, process, etc.?

Conference Details	
Date:	Wednesday, May 05, 2010
Start Time:	10:00 AM Mountain Daylight Time
End Time:	11:55 AM Mountain Daylight Time
Participants:	30
Type of Conference	Web-Scheduled Standard
Dial-in Number:	1-213-289-0500 (Los Angeles)
Organizer Access Code:	$\star$ 693464 (you must include the leading star key)
Participant Access Code	4509670

Note: All associated correspondence will be placed under the OCD Online "UIC-999" location at <u>http://ocdimage.emnrd.state.nm.us/imaging/AEOrderFileView.aspx?appNo=pCJC1004741751</u> under the "Geothermal Regulations Stakeholder....." thumbnail. Will post meeting minutes from 3/30 meeting today......

## Geothermal Regulations & Programs Stakeholders Teleconference Meeting CID/RLD Conference Room (Tony Anaya Building: 2550 Cerrillos Road) Santa Fe, NM Wednesday, May 5, 2010

## Agenda

## Attendees: See Sign-in Sheet below

Request for your agenda items:

- Issues from last meeting, i.e., what are agencies willing to let go and/or what do agencies want to keep on doing or not doing? OCD may want this to continue for some period or indefinitely, i.e., OSE continuing to be part of the CID/RLD direct heat process, but OCD will likely need to develop a direct heat form application to track projects; Water well driller certification/requirements on geothermal projects (OSE), etc.?
- 2) Did group get to read the Washington State University "A Regulatory Guide to Geothermal Direct Use Development" document that OCD sent out. Seems like some good information to be aware of with some outdated information, i.e., "Administrative Complete" deadline for OCD determination under WQCC Regs. is 15 days instead of 30 days; 250 F cutoff may be irrelevant now and it is either boiling (high temp) or non-boiling (low temp). Should each agency attempt to briefly summarize their application process for the OCD "Who Does What" geothermal resource page?
- 3) Did stakeholders get a chance to review OSE's Geothermal Heating & Cooling Systems Survey Form that identified key components of direct heat projects with environmental considerations? Should OCD/CID/RLD develop a form for direct use applications based on the survey form?
- 4) Each stakeholder will pass out their geothermal application forms and or permit associated w/ their geothermal permitting program if applicable for OCD to be aware of and possibly to reproduce for its program? OCD will also hand out its forms. Application process? Agency Website visitation of geothermal resources, i.e., permitting, process, etc.
- 5) "Direct Use or Not Direct Use- Closed Loop Heat Storage" Richard Erdlac (Erdlac Energy Consulting)*

*Note: Speaker may go first depending on his/her schedule.

6) Update on Royalty and Conservation Tax Assessment- OCD follow-up efforts w/ SLO and TRD. They were unaware of the Governor's Exec. Order to Make NM No.1 in Nation for Renewable Energy- may or may not have representatives to discuss their process and regulations for this..... In short, SLO assesses royalty during leasing process. TRD does assess a "Conservation Tax", but more details may be forthcoming? OCD could simply add a disclaimer to its forms to contact federal, state and local government to determine royalty and/or taxation requirements? Could add links to OCD resource page. Just a thought.....?

Mr. Robert Prael (Dept. of Interior- Minerals & Mining Division), et al., Federal Lands Rent, Royalty, lease sale discussion......would this apply to direct heat applications for BTUs used in heating commercial office buildings, etc.? May need to add Federal link on OCD resource page for Federal royalty, tax, etc.?*

*Note: Speaker may go first depending on his/her schedule.

- 7) Who does what- review and amend OCD's Geothermal Resource Page together (OCD Publications Webpage) Handout passed out by OCD at 3/30 meeting.
- 8) FYI, possible Geothermal Working Group (not to be confused with our "Geothermal Regulations Stakeholder Group) "Geothermal Oil & Gas Coproduction" in the oil patch symposium ~ September 2010. Steve Lucero ECMD organizing. BLM, OSE (water scarcity and appropriation issues) and OCD (permitting, down hole new and reworking well issues, potash and mineral rights issues?), and geothermal company presentations.
- 9) Other issues and concerns?
- 10) Miscellaneous

- Next meeting Wednesday, June 9, 2010 10 a.m. to Noon at OSE in Santa Fe? [Santa Fe, NM (Call ? at 505- _____ if you have questions)]
- Discuss NMED NOI and OCD Geothermal Form

Note: The draft agenda items above are presented to assist the group with forward thinking in anticipation of the meeting and nothing is final nor should any items above or discussed during work group meetings be misconstrued to mean we are seeking ways to by bypass Geothermal Regulations, etc.

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# Geothermal Regulations & Programs Stakeholders Teleconference Meeting OCD 3rd. Floor Conference Room (Wendell Chino Building) Santa Fe, NM Tuesday, March 30, 2010

## **Draft Agenda with Meeting Minutes**

Attendees: Teleconference:	See Sign-in Sheet belo Doug Rappuhn OSE Mike Smith, BLM	)W		
	Geothermal M	Rags - program Leting (3/30/	S Stakehole 2010	ler
Name	Co	Title	_ph	E-mail
Carl Chavez	NMOCD	Env. Engr.	505-476-3490	Carlj. ChaveZ@ Statzanmaus
JOHN 4942	NMED	Hypeszusist	527-1049	NM- 45
Fermin Arity	or CID	Gen Const Bureau	Chiel-476-46720	ernsing Grages Char
Remijio Pache	CO CID-E	ELEC BUREAU CALE	= 505 476 4679 v	em.pochecoestate.n.r.y
Jerom T. B	aca CID m/p.	mech. Bureau Ch.	eb =05-476-4461	- brome boatstate.
Andy Dawn	7 CID	Licensing Ngr.	505 · 670 · 60	178 ander glaling
Stere Lucen	NMEMNKD	Specialist HUDDOLOGU	476-3324	stephen lucero
MIKE JOHNSC	NMOSE .	BUREAU CHIEF	827-3867	mike.johuson
DAVID HEB	Er NMOSE	WATER RESOURCE SPI	× 827.6102	@ state. nm, us david heber astan
David Brook	NMOCD	Jegal Epaminer	476-3450	dorooke state, nm. VS
Adrienne Bru	nley BLM-NM30	Petroleum Ensin	eur 954-2140	@ blm.gev
Mikel Altomare	NAOCD	attorney	476-3480 m	ikel.altomarep stuke.nm.us
LIDA MARTINEZ	CID	DIRECTOR	476.4689 4191	SHTE. HM.US
ruthe Spa	the BLM.	$\overline{}$		
Burgh	Reption 052	Telephone	_	
Leisa Martinez Director CID				
Doug	Rapalida - 0	se)	• .	

- 1) Do BLM, CID/RLD, NMED, and OSE agree with OCD's Geothermal Regulatory Interpretation?
  - There was no disagreement with OCD interpretation of OCD Geothermal Regulations that also apply on Federal and Mineral Estate Lands. OCD grappling with taking over entire program.
- 2) Consumer Industry Division (CID)/Regulatory Licensing Division (RLD) geothermal heat exchangers in closed-loop systems, licensee requirements and the inspection process?
  - There may be multiple licensed heating contractor doing work, i.e., down hole heat exchanger & coil installers. Other licensed individuals by extension for electrical, plumbing, and construction of buildings may be needed on its projects. By Order.....Statute prohibits bidders w/o license from bidding on this type of work.
  - No royalties have or are being paid by users of direct heat for homes, offices, etc. that it is aware about. OCD mentioned that this doesn't mean they shouldn't be paying royalties, etc. under the regulations.
  - There is no injection of working fluids into subsurface formations, but thermal energy is recirculated in a closed loop system in subsurface pipe or casing. Issue of whether banked storage or closed loop systems constitute use of the heat under geothermal regulations?
  - OSE also requires that a licensed water well driller under its programs drill any wells for direct heat applications with the CID/RLD. Question of whether all geothermal drillers should be OSE licensed for water well drilling?
- 3) If so in No. 2 above, the stakeholder will brainstorm under the various geothermal applications to determine "Who Does What?"

**NMED:** Incidental use role identification. No correlative rights between users. Not constituent agency in Regulations, only WQCC Regulations. High and low temperature geothermal use may involve both NMED GW Permit and OCD to track correlative rights under geothermal regulations? If not correlative rights, then NMED would issue the DP under WQCC? May be useful to study WQCC "Delegation of Authorities" document back from 1989? Incidental use or not..... NMED has no hydrothermal responsibilities. Perhaps the WQCC "Delegation of Authority" document could be revised to specify the above? NMED issues DP under WQCC. How do we determine incidental use? How do we determine correlative rights issues? New Rules or Regulations would be helpful. Example of incidental use of heat is the "PRR Sandoval Co. Desalinization Project." Start with a 5M gpd deep confined aquifer desalinization treatment. For potable water use w/ expansion from Rio Ranch to West projected at 20 years to 30M gpd. Water in formation is 3000 ft. below ground level and is about 140 F. They want to use some of heat in the process for waste water treatment. Dump heat exchange and possible geothermal waste. Look at in terms of above example. OCD determines correlative rights under Geothermal Act. Does OCD do UIC GW Permitting? Yes. Injection into

deep formations under UIC Program and OCD addresses correlative rights, but if OCD decides it does not need to track correlative rights for geothermal, then NMED could permit.

**OSE:** Who handles royalties or permits NMED or OCD? SLO handles royalties. Is there an "appropriation of water?" If so, this would be OSE's jurisdiction. If direct heat for office buildings, RLD and OSE can work together on this? Yes. OCD Attorneys thinks royalty is due to state for use of office heat or direct heat too, not just power production.... Is closed-loop or banked storage heat transfer systems used for home and office heating considered incidental use? NMED has deferred to OSE and CID to do direct heat where no injection into underground formation where USDWs exist. NMED involved where USDW involved and injection is into underlying formation(s). If no toxic fluids are being injected, NMED didn't require Notice of Intent or WOCC Discharge Permit. If it is a very large office building complex, NMED may permit it? Should there be exclusion for private residences.....closed loop systems? OSE does not want to be involved anymore with closed loop systems and OSE permit appropriations of water, since there is no appropriation where the working fluid is recirculated in a closedloop and no ground water is being used, but OSE wants drillers to be licensed water well drillers under the OSE Programs. OCD thinks if water used or consumed, is changed or not useable for any purposes, operator should still include OCD as water is still consumed.... Closed loop systems do not involve OSE. Whoever is responsible for closed-loop heat system, make sure installers are Certified OSE water well drillers. Licensed drillers w/o concepts of installing heating systems. OSE should be out of it. License from CID/RLD needed and OSE would not be involved. CID cited this example for the question of who would permit? The Space Port Project near T or C. This project involved the creation of a geothermal mound, ground source preheated air in mound. This project came to CID's attention recently, the working fluid is air that is preheat or cooled. Who would be involved in permitting air as the geothermal working fluid for heat exchange? Nobody knows? OSE permits water well drillers. Issue of installer hired OSE certified drillers. OCD could develop quick permits to track projects? Thinks it already has a generic non-number geothermal application form that could work for direct heat applications without injection wells. Common to drop shaft.... could hit USDW, but still closed-loop. Contractors may need to have two licenses on these projects, i.e., one for drilling and one for heat exchanger installation? CID if contractor is licensed, can do portion of work to install. If not removing water for consumption, OSE not involved. Appropriating water for beneficial use? Don't think projects even drill through water bearing zone. OSE licensing could be expansion of current OSE water well driller certification program licensing requirement? OSE deals w/ geothermal systems where water appropriations are applicable to geothermal power generation plants.

**BLM:** If incidental use, that's fine and out of our perview. BTU value to heat is something of interest on Federal Lands only. Federal Courts incidental use regulated by State and State Geothermal Regulations apply on Federal Lands similar to State Lands. BLM or Federal Agencies need to be involved in geothermal applications when they are on Federal Lands. If Federal mineral estate, direct use or power generation, expect compensation or royalty to be paid for it. Direct use, any heating or application outside

of electricity generation. As long as State Regulations don't conflict with Federal Regulations. Dual bonding is an issue between State and Federal Governments that could be worked out in an MOU to require only State Bonding. For example, a system could be worked out deferring to the State to hold the bond on behalf of both Agencies. MOU to see who does what? State's geothermal bonding amounts are thought to be minimal and OCD should consider raising the bond amounts in its geothermal regulations. BLM thinks its bond amounts on Raser's power project near Animas is higher than state. Redundancy in Federal and State Bonding could be eliminated via MOU on dual bonding? Incidental use situations may not require a permit, and in this situation, if working on Federal mineral estate, if no State Discharge Permit, state should refer operators to BLM to meet Federal requirements. Must also meet any State permitting requirements. Direct heat definition, if direct use on Federal Estate, refer to Federal Government. Complications can occur. Example, on military lands.... can get complicated.

**OCD:** Under current OCD Attorney findings, OCD is responsible for all geothermal applications in the state and we welcome participation by the involved agencies to date to possibly continue as we have in the past; however, OSE makes clear case on closed-loop systems where would not be the agency partnering with CID/RLD on these projects, it would be OCD. OSE wants licensed water well drillers only to be involved with these projects, but OCD would not require licensed water well drillers under its geothermal regulations, but would observe CID/RLD licensing requirements. OCD could encourage contractors to be OSE water well driller certified, but because its regulations do not stipulate the requirement, OCD could not require it. OCD thinks that similar to water well drillers not having geothermal or oil and gas drilling experience, there are geothermal, oil and gas drillers that do not have drinking water well drilling experience; however, they are still required to protect fresh water (<= 10,000 ppm TDS) and 20.6.2.3103 NMAC water quality standards. Therefore, OCD feels with its WQCC delegation of authority to protect surface and ground water in the state coupled with its complete Primacy over the Federal UIC Program in New Mexico that it will, similar to OSE, ensure the protection of fresh water in the state.

4) Innovative ways for OCD to handle the magnitude of the permitting process. Seems like OCD needs to evaluate scenarios where the heat is incidental to main use of the water resource, type applicants needing to use the resource, etc. OCD may need to adopt an efficient strategy where the situation may be deemed incidental heat that is unpermitted, which cases must be permitted, etc. Aquifers with greater than 10,000 ppm that may be exempt from WQCC Discharge Permit, but still regulated under Geothermal Regulations (including injection, development, disposal, exploratory wells, etc), i.e., Enhanced Geothermal Systems where there is no USDW or aquifer in the bedrock, fractures are artificially created through controlled fracting, and a generally fixed volume of water is injected into the artificially created fracture(s), and a generally fixed volume is injected and recirculated to create a closed-loop ground recirculating system (again, WQCC Permitting may not apply, or may apply only for Class V Geothermal Injection wells, and any production/development wells, etc.)?

**NMED:** Exclusion in Geothermal Act, GW WQCC permitting falls to NMED if exclusion is met. OCD may permit Class V under Federal UIC Program. OCD handles where does not meet the exclusion. Talk more with NMED Management and review delegation of authorities adopted before geothermal use. Anything except incidental use... Restriction of potable water restricts what would be excluded. Take fluid w/ heat of non-potable nature? What is potable water defined as less than 1000 ppm TDS? Not defined anywhere and certainly not in geothermal. If water won't kill you, and is used incidentally, meets exception. No permitting or goes to NMED.

**OSE:** If permit to appropriate water, OSE has jurisdiction and water rights permitting authority and well driller licensing for construction of well requirements. Closed-loop systems don't fall into water appropriations, so OSE not involved with these projects. Artesian wells inspected by OSE.

**CID/RLD:** Construction of installed direct heat (low temp) systems must be performed by licensed heating contractor for closed-loop systems. Licensed individuals required and by extension electrical and construction of buildings too. Statute prohibits bidders w/o proper license(s) from bidding on these projects.

**OCD:** Wherever injection wells are permitted as Class V under UIC Program or geothermal wells under Geothermal Regulations are installed. OCD is now grappling with other geothermal aspects of the regulations besides the high temperature permitting it has been doing.

**BLM:** If on federal lands and mineral lands w/ split estates, BLM involved. MOU for bonding could follow up on....

- 5) Evaluate the scenarios where the heat may be deemed "incidental" and where it should be deemed a use requiring permitting..... (i.e, a school using the water potable and agricultural use, but wants to use the heat for direct applications for the school?).
  - Does the state want to require a school, church, prison, etc. to obtain a geothermal permit with royalty payments?
  - Will there be exclusions? OCD Attorney doesn't think so.
  - What won't be excluded? OCD Attorney- no exclusions.
  - Is primary use direct heat or use of water? OCD and OSE have to work together-OSE Chapter 32. If meets exclusion (incidental use of heat), back to OSE. Rules needed other than OCD's. Chpt 72 beneficial use in Chpt. 71 Geothermal both agencies have power to adopt similar rules.
- 6) Agency Issues:
  - What can be declared "incidental use of heat" that may require permitting, but no royalty is due to the state?
  - Royalties should be paid to the state regardless of whether electricity is produced, i.e., BTUs extracted from ground water through a production/development well,

and the applicant is a Church, School, Prison, Private, Federal or State Govt. Building, etc. No Exclusions!

- Licensing and Certification Issues?
- All geothermal projects must be considered by OCD under its Geothermal Regulations. Incidental vs. direct use poses a significant issue for the OCD as any/all geothermal projects will need to be tracked and a discharge permit determination made based on each application, and it expects a major application load on direct heat projects w/ closed loop and/or bank heat storage systems.
- Does OCD take the place of OSE or does OSE wish to keep its interaction with CID/RLD? OSE understands that OCD may not require well drillers on former OSE/RLD projects to be licensed water well drillers. 7205 Application of potable water to beneficial use, residential use water well, install coil, combination use withdrawing water, CID and OSE could work out as domestic use of water where OSE is involved with CID. One boring for 2 purposes. 100 boreholes, closed loop, how to interact with mechanical Contractor, submit detailed plan w/ construction submittals, code compliance, permit work construction permit for mechanical work and some permit overlap to electrical permitting.... Approved products with qualifications... safe fluids eco friendly... terminate heating system per code and system works.
- Are direct heat and/or banked heat storage closed-loop geothermal systems considered incidental use? The closed-loop nature of system is not drawing water from formations to remove heat and injecting back into a formation with concerns about USDWs. Richard Erdlac will speak on this subject at next meeting. If it is not an "incidental use", OCD will have to develop a vast residential, commercial and industrial permitting process to track the lion's share of ongoing geothermal projects in New Mexico in addition to power projects with production and injection wells, etc.... According to NMED, GWQB will not develop a specific application, but NMED has a Notice of Intent (NOI) Form that should be filled out by any large ground source/direct heat projects for GWQB to evaluate and make a Discharge Permit requirement determination. OCD has a generic geothermal form that is similar and may work for closed-loop geothermal direct heat applications. OCD also has a Form C-108 for any injection or production/development wells geothermal applications.
- OSE wants Certified Water Well Drillers only to be allowed to install wells at geothermal project areas. OCD believes that this would hamper its duties, responsibilities, and slow down the administration of the program, especially for geothermal power projects where OCD feels water well drillers lack expertise in geothermal drilling methods and geothermal may lack expertise in water well drilling; however, geothermal drillers know how to seal off fresh water zones (<= 10,000 mg/L TDS). OCD is also a delegated agency for the WQCC in oil, gas and geothermal activities in New Mexico. OCD has full Primacy for the Federal UIC Program in New Mexico. Under the current Governor Executive Order, New Mexico is looking to streamline the permitting process and multiple agency involvement would only slow down the process. OCD can recommend that geothermal drillers obtain OSE Certification to drill drinking water wells, but cannot require it under its current geothermal regulations.</li>

- Discuss RLD geothermal heat exchangers in closed loop systems, licensee requirements and the inspection process. No other comments.... Systems and who does what is new to all of us? Struggling on licensing requirements, permitting requirements, CID side to have things in order.... Across the board on renewable power projects not just geothermal. Flesh out nuances to work collaboratively. Licensed well drillers also use licensed well drillers. Require licensed well drillers permit to appropriate water. Closed-loop not the case..... Not involved...
- Innovative ways for OCD to handle the magnitude of the permitting process. Seems like OCD needs to evaluate scenarios where the heat is incidental to main use of the water resource, type applicants needing to use the resource, etc. OCD may need to adopt an efficient strategy where the situation may be deemed incidental heat that is unpermitted, which cases must be permitted, etc. Aquifers with greater than 10,000 ppm that may be exempt from a WQCC Discharge Permit, but still regulated under Geothermal Regulations (including injection, development, disposal, exploratory wells, etc.; EGSs where there is no aquifer in the bedrock, fractures are artificially created, and a generally fixed volume is injected to create a closed-loop ground recirculating system (again, WQCC Permitting may not apply, or may apply for Class V Geothermal injection wells, and any production/development wells; etc.).
- Exclusions carve out chunk not paying royalties. OCD cares about what we don't regulate. OCD interprets court of appeals under 250 is regulated by OCD. SLO get w/ program to collect revenues. OCD not tied up into this issue. BLM Mike Smith Mikal pulled info from web to get finding, one thing is heating of public buildings. Klamath Falls Oregon example of direct use.
- Most traditional geothermal projects focus on the facet of the extraction of heat for whatever purpose. Closed loop systems ("direct use" was the terminology used today) are essentially a two-season HVAC system, responsible for providing relative warmth from the ground source to a facility's HVAC system during coldair seasons, and providing relative coolness from the ground source to a facility's HVAC system during hot-air seasons. The ground source would not be used to any substantial extent during the mild-air seasons, much the way we individuals do not run our heat/air-conditioning systems during the milder spring and fall seasons (yes to fan use and no to use of the heat or cool source).
- Royalties may be going uncollected as use of closed loop systems increases. I would question the right to collect royalties on a two-season system not tapping a defined geothermal resource that extracts ground heat during winter HVAC use, but **recharges** ground heat during summer HVAC use. If the local power company was billing a facility that both consumed and returned power (such as for facilities with solar cells or wind turbines), their billing process would bill for a netted-out effect.
- The CID/RLD may be best able to offer comment about actual extent of summer use of the closed-loop systems, and their records would likely reflect that the closed-loop systems are being built where funds are available or green-thinking individuals make the choice... not where the systems tap a designated geothermal resource. Perhaps the deplete/recharge cycle that occurs with the use of ground

source heat pumps / closed loop systems requires further definition before being swept into certain geothermal categories premised solely on heat extraction.

- The project discussed during the meeting with air as transfer media or working fluid in ground water mound is confusing to the CID/RLT. Who would install such a system? Civil work and not construction work... Isolated case.... Treat as utility 5 ft. from structures. Heads up? Looking at licensing of individuals doing construction work close to well head, electrical component as we consider private source of water. Electrical has jurisdiction. Connections to pumps.....? What does CID/RLD do with drillers, even borings, do we require licenses/Certifications? Exclusion for oil and gas drillers? Does it mention geothermal? Don't think OSE exclusion includes geothermal.... Classification in place to fit driller and directional drillers come to mind....
- 7) Miscellaneous:
  - This working group is a good opportunity for the agencies to promote dialogue, inventory its programs, communication about its programs, interaction and setup a process the agencies all agree upon for interested applicants seeking green renewable geothermal energy in New Mexico. The OCD hopes that the agencies will continue to participate in this working group until we feel we have reached the point in our meetings where no more meetings are necessary and we have developed a network for future communication with each other.
- 8) Path Forward:
  - Next meeting May 5, 2010 10 a.m. to Noon at CID/RLD in Santa Fe [Capitol West Campus: Tony Anaya Building; 2550 Cerrillos Road; Santa Fe, NM (call J. T. Baca 505-476-4661 if you have questions)]
  - Discuss NMED NOI and OCD Geothermal Form
  - Review OCD Draft "Who Does What" for it geothermal resource page on its website.

Note: The draft agenda items above are presented to assist the group with forward thinking in anticipation of the meeting and nothing is final nor should any items above or discussed during work group meetings be misconstrued to mean we are seeking ways to by bypass Geothermal Regulations, etc.

## Chavez, Carl J, EMNRD

From:	Chavez, Carl J, EMNRD
Sent:	Wednesday, April 14, 2010 4:23 PM
То:	Hall, John, NMENV; Johnson, Mike S., OSE; Heber, David, OSE; Altomare, Mikal, EMNRD; Lucero, Stephen A., EMNRD; Olson, Bill, NMENV; Fesmire, Mark, EMNRD;
	'Mike_Smith@blm.gov'; Martinez, Lisa, RLD; 'Adrienne.Brumley@blm.gov'; Brooks, David K.,
	EMNRD; Dalmy, Andy ., RLD; Baca, Jerome T., RLD; Pacheco, Rem, RLD; Aragon, Fermin ,
	RLD; VonGonten, Glenn, EMNRD; Chavez, Carl J, EMNRD; Rappuhn, Doug H., OSE;
	'rcerdlac@cleansed.net'; 'rcerdlac@cleansed.net'
Cc:	Dade, Randy, EMNRD; Sanchez, Daniel J., EMNRD; Hill, Larry, EMNRD; Perrin, Charlie,
	EMNRD; Martin, Ed, EMNRD
Subject:	Geothermal Regulations Stakeholder Working Group (GRSWG) Direct Heat Information in
- •	New Mexico
Attachments:	NewMexico.pdf

Ladies and Gentlemen:

FYI, pdf file on direct heat in New Mexico and website link below provided by OCD Artesia District Office to consider going forward.....

## http://www.energy.wsu.edu/documents/renewables/NewMexico.pdf

Please consider as resources for next meeting. Thanks.

Carl J. Chavez, CHMM New Mexico Energy, Minerals & Natural Resources Dept. Oil Conservation Division, Environmental Bureau 1220 South St. Francis Dr., Santa Fe, New Mexico 87505 Office: (505) 476-3490 Fax: (505) 476-3462 E-mail: <u>CarlJ.Chavez@state.nm.us</u> Website: <u>http://www.emnrd.state.nm.us/ocd/</u>index.htm (Pollution Prevention Guidance is under "Publications")

## A Regulatory Guide to Geothermal Direct Use Development

Prepared by Kim Lyons of the Washington State University Extension Energy Program.

# **NEW MEXICO**

### Introduction

Geothermal resource temperatures range from low temperatures of 50 to 80 degrees F (10 to 27 °C), to temperatures exceeding 650 degrees F (343°C). Although power can be generated economically from resources as low as 218 degrees F (103° C), power generation projects typically favor resource temperatures above 300 degrees F (149° C). High temperature resources (>300 degrees F, 149° C) can also be used for direct-use applications. However, lower temperature resources (< 212° F, 100° C) are often better suited for these projects

Low temperature, direct-use projects cover a variety of applications. Projects may include traditional space heating applications, as well as greenhouse heating, spas and swimming pools, aquaculture, crop drying, industrial processing and other activities requiring lower temperatures. Because these projects are primarily water use applications, they often fall under a different regulatory process than high temperature, power generation projects. Typically this process is shaped by water and wastewater laws and regulations, and administered by their respective state, and in some cases, federal water and wastewater resource agencies.

The intent of this document is to help guide developers of direct use geothermal projects through the regulatory process of drilling, using and disposing of low temperature geothermal fluids in New Mexico. This guide will provide background on the state regulatory process and identify contact information necessary for completing the various applications and permits. This guide; however, cannot substitute for direct communication with the regulatory agencies. These agencies need to be contacted early in the process so that any regulatory hurdles are identified upfront and in time. Projects that are located on federal lands are regulated according to the national Geothermal Steam Act and related federal regulations.

## **Regulatory Process for Direct Use Applications**

In New Mexico, there are 359 discrete thermal wells and springs which have been identified. Of these, 12 communities, in eight counties, have been identified as potential sites to use geothermal energy for district heating and other applications. The eight counties are Doña Ana, Grant, Hidalgo, McKinley, Rio Arriba, San Miguel, Sandoval and Valencia. The Energy Conservation and Management Division of the New Mexico Energy, Mines and Natural Resources maintains a website that has information on New Mexico's geothermal resources including a geothermal map of the state. This site can be accessed by clicking <u>here</u>. A developer interested in low temperature geothermal

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resources may also want to contact the Geo-Heat Center, located in Klamath Falls, Oregon. The Center maintains an extensive database covering wells and springs greater than 50 °C (122 °F) for 16 western states, including New Mexico. Information on the database can be found at <u>http://geoheat.oit.edu/database.htm</u>.

Specific statutes pertaining to geothermal resources are codified in the New Mexico Geothermal Resources Conservation Act under NMSA 71-5. These statutes can be viewed by clicking <u>here</u>. The Act defines geothermal resources "as *the natural heat of the earth or the energy, in whatever form, below the surface of the earth present in, resulting from, created by or which may be extracted from this natural heat and all minerals in solution or other products obtained from naturally heated fluids, brines, associated gases and steam, in whatever form, found below the surface of the earth, but excluding oil, hydrocarbon gas and other hydrocarbon substances.*" The Act further defines low temperature geothermal resources as "*a geothermal reservoir containing low-temperature thermal water, which is defined as naturally heated water, the temperature of which is less than boiling at the altitude of occurrence, which has additional value by virtue of the heat contained therein and is found below the surface of the earth or in warm springs at the surface.*"

The Act identifies the New Mexico Oil Conservation Commission as having jurisdiction over geothermal resources with respect to the conservation of geothermal resources and the prevention of waste of potash as a result of geothermal operations. These powers are enumerated in NMSA 71-5-8.

The Geothermal Resources Act also has a clause allowing concurrent jurisdiction with other state agencies having regulatory jurisdiction. Storage and disposal for geothermal fluids are typically regulated under the New Mexico Water Quality Control Commission (WQCC) regulations, while drilling and production operations fall under the jurisdiction of OCC regulations and orders. The Oil Conservation Division (OCD) of the New Mexico Energy, Minerals and Natural Resources Department provides direct staffing for the Oil Conservation Commission. In cooperation with the State Engineer's Office, the OCD oversees the permitting of geothermal wells, including but not limited to greenhouse heating, warm water aquaculture, space heating, irrigation swimming pools and spas. These wells are regulated in accordance with the rules and statutes governing groundwater appropriation and well drilling regulations.

As a result, a developer must acquire the geothermal resource by means of an application, permit and license similar to that required for a commercial water well. The regulations governing low temperature, direct use geothermal projects differ from conventional water development projects however, in that direct use projects also need to dispose of the water once it has been used for its design application. Disposal is typically accomplished through direct injection of the geothermal water via an injection well, or through surface disposal. The OCD in cooperation with the New Mexico Environment Department (NMED), has regulatory authority over geothermal discharge plans in the state. The OCD will also coordinate with the U.S. EPA Region 6, which has authority over wastewater discharge to surface waters in New Mexico. In addition to working with

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state resource agencies, local and county agencies should be contacted early on in the development process to determine any local zoning issues and for construction permits.

The regulatory process for developing a low temperature, direct use geothermal project consists of the following steps:

- Gain access to lands either through lease or direct ownership.
- Contact local and/or county agencies to ensure compliance with local land use laws including building permits and zoning restrictions.
- Secure water right. (OCD/SEO)
- Obtain well construction permit/develop production well. (SEO/OCD)
- Determine fluid disposal plan and obtain permits for either underground injection or surface disposal. (NMED/OCD)
- Contact state fish and wildlife agency if developing an aquaculture project.

Two additional state resources may be of interest to a developer of direct use geothermal projects. The Energy Management and Conservation Division of the New Mexico Energy, Minerals and Natural Resources Department has resource staff available to discuss geothermal projects. Their website can be accessed by clicking <u>here</u>. The Southwest Technology Development Institute (SWTDI) has been involved with geothermal developments in New Mexico for a number of years. SWDTI is affiliated with the New Mexico State University in Las Cruces and maintains a helpful website on geothermal resources in New Mexico. The SWDTI website can be accessed by clicking here. Contact information for both of these organizations is presented in Appendix A.

## Water Rights

## **Background**

The constitution and statutes of the State of New Mexico guarantee the right to appropriate the public waters of the state for beneficial uses including the utilization of geothermal fluids for direct use applications. The New Mexico State Engineers Office (SEO) administers the rules and regulations governing groundwater withdrawals and use in the State of New Mexico. The state statutes governing groundwater appropriations are codified in Chapter 72, Article 12 NMSA 1978, which can be accessed by clicking here.

## Permit process

Under the Geothermal Resources Act, the Oil Conservation Division (OCD) has statutory control over geothermal resources. However, the Act does not pre-empt the State Engineer's Office (SEO) control over ground water use. Accordingly, the SEO has prior right of approval for geothermal production wells drilled on state, private and federal lands for water under 250 degrees F (121 °F). The OCD has primacy for projects exceeding this temperature.

The process for obtaining a right to appropriate groundwater for geothermal use mirrors that of a conventional water well application. The first step is to file an application with the State Engineer's Office. The permit is entitled *Application for Permit to Appropriate Underground Water* or form WR-05. The form requires the applicant to submit information on the location of the well, the amount of water to be withdrawn, the source, the intended use, and other related data. The form is available on-line by clicking here, or can be obtained from SEO District offices. The application fee is \$25. Appendix 1 includes SEO regional contacts for water right forms and other related issues.

Upon filing, SEO mails the applicant a legal notice of appropriation, which the applicant must post in a local newspaper for 3 weeks. If there are no protests, the SEO reviews the application for completeness and decides whether to approve, modify or deny the application. If the application is approved, the SEO sends a letter approving the permit application including permit conditions. This process takes approximately 6 to 8 weeks, provided there are no protests. If the application is challenged, the SEO will conduct hearings to determine whether the application should be approved, modified or denied.

Once approved, a developer can begin to drill a well. The well must be constructed in full compliance with the terms of the permit and the rules and regulations governing well construction in the state, including the use of a licensed well driller. To assist developers, the State Engineer's Office has published a guidebook entitled *Rules and Regulations Governing Drilling of Wells and the Appropriation of Groundwater in New Mexico.* The guidebook can be downloaded from the SEO website by clicking here.

As soon as practicable after completing the well an applicant should submit a Proof of Completion form, and if required by the permit, a Final Inspection and Report form. Both of these forms can be obtained from a district office, or can be downloaded by clicking <u>here</u>. The SEO does no collect a fee for the Proof of Completion form, however, a \$25 filing fee is charged for the Final Inspection report. If required by permit, the final inspection form is generally prepared by a registered Professional Engineer or by a registered land surveyor.

Upon receipt of the Final Inspection and Report from or the Proof of Completion form, and any other provisions required by the permit, the SEO will issue a "Certificate and License to Appropriate".

## **Disposal of Geothermal Fluids**

The regulations governing the disposal of low temperature geothermal fluids will depend on the type of application. Non contact geothermal projects, where the geothermal fluids are kept in a closed system and do not come in contact with outside contaminants, will typically have an easier compliance path then projects where contact with potential contaminants is made. When contact is made and water quality is potentially degraded, regulatory requirements may become more stringent to ensure that water quality is maintained. There are basically three disposal options available to a developer of a direct use geothermal project: underground injection; disposal to surface waters; and/or, disposal to the ground or land application. In some cases, the regulatory agency(s) will specify the preferred disposal method. For example, in critical groundwater areas, reinjection may be required to ensure that the aquifer is maintained. However, in most cases, it will be up to the project developer to determine the best disposal method based on regulatory requirements and the cost of compliance.

The New Mexico Oil Conservation Division (OCD) administers, through delegation, all New Mexico Water Quality Control Commission (WQCC) regulations pertaining to surface and ground water at geothermal installations. However, the New Mexico Environment Department Ground Water Quality Bureau (GWQB) may take the lead for projects involving heat pump return flow wells. Storage and disposal for geothermal fluids are regulated under <u>WQCC Regulations</u> Part 3 and Part 5 and under the Geothermal Resource Conservation Act.

## Underground Injection Control

The Underground Injection Control (UIC) Program was established in 1982 when Congress passed the Safe Drinking Water Act. This program regulates, to one degree or the other, every "injection" of "fluid" into the subsurface. An "injection" is the emplacement of "fluids" regardless of whether the injection requires the application of pressure or not, and a fluid is defined as any liquid, gas or semisolid which can be made to flow. The intent of the program is to preserve and protect underground water from becoming polluted.

From a resource perspective, the preferred method of disposing of geothermal fluids is to return them to the ground by way of injection wells. Underground injection wells are wells that are used as an entry point for some type of fluid (such as geothermal fluid), which is injected underground for temporary or permanent disposal or storage. To protect groundwater from contamination by injection wells, the federal government established the Underground Injection Control (UIC) Program as part of the Safe Drinking Water Act.

New Mexico has primacy for administration of the UIC Program, which is jointly implemented by the New Mexico Environment Department Ground Water Quality Bureau (GWQB) and the New Mexico Energy, Minerals & Natural Resources Department - Oil Conservation Division (OCD). These agencies administer the UIC Program under authority granted by the New Mexico Water Quality Act and Water Quality Control Commission (WQCC) Regulations, the New Mexico Oil and Gas Act, and the New Mexico Geothermal Resources Act. The OCD is the lead agency in regulating geothermal injection wells. Both of these agencies maintain useful websites explaining the UIC Program and their respective roles. Click <u>here</u> to view the OCD website. The NMED website can be accessed by clicking <u>here</u>. Geothermal facilities that discharge fluids into UIC wells are required to have ground water discharge permits approved by the Oil Conservation Division (OCD). Discharge permits contain operational, monitoring, contingency, and closure plans with specific requirements to prevent and remediate any negative impacts that UIC wells may have on ground water quality. These requirements are presented under Part 5 of WQCC regulations. A public hearing may be held on each application. At this point, the operator of the proposed project may be required to present evidence demonstrating that the injected fluids will not migrate out of the injection zone. The application process will also require a description of how the well(s) will be constructed to ensure it is properly sealed. A copy of the application form can be downloaded by clicking <u>here</u>. It is the same form as that used for permitting groundwater discharges.

If the Division approves the project, the operator submits an application to drill new injection wells, and/or convert producing wells, to the appropriate <u>OCD District Office</u>. District Field Inspectors inspect various phases of well construction. After a completed injection well has been successfully tested for mechanical integrity, the District office issues a permit to inject. An injection pressure limitation is specified for each well to prevent fracturing of the rock above the injection zone which could lead to fluid migrating into the fresh water aquifers above.

Periodically thereafter, the wells are inspected and tested under the supervision of District Field Inspectors to ensure that they have not developed leaks. Operators must report the volume and pressure of injected fluids monthly. When the well is no longer being used for injection, it must be safely plugged in a manner approved by the OCD District Supervisor.

## Surface Disposal of Geothermal Fluids

The New Mexico Water Quality Control Commission Regulations (NMAC 20.6.2) sets forth the administrative rules governing water quality in the state of New Mexico. Discharges to water of the State (surface and groundwater) and discharges to municipal wastewater treatment plants are covered under these regulations. The Oil Conservation Division of the New Mexico Energy, Minerals and Natural Resources Department administers the treatment and disposal of geothermal fluids in the state.

In general, surface disposal to ground is preferable to discharging into surface waters. Discharging to ground minimizes the chance of degrading existing water quality. Land or ground application also keeps the water within the same geographic resource area. Regardless of whether a project proposes to discharge to the surface or groundwater, a developer will need to submit a discharge plan application to OCD. The application is one page in length and can be downloaded by clicking <u>here.</u> Based on the information provided in the notice, OCD will determine whether a groundwater discharge permit is needed.

## Groundwater Discharge Permit

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The state of New Mexico has initiated various groundwater protection efforts and pollution abatement strategies to protect New Mexico's groundwater resources and to prevent water pollution to the maximum degree possible. As part of this effort, geothermal projects that are discharging fluids either to the ground surface or to underground injection wells may need to obtain a Groundwater Discharge Permit if OCD determines that the project may jeopardize ground water resources. The discharge permit application requires information on the location, operation, monitoring, contingency and closure plans appropriate for the proposed treatment and disposal system as per WOCC regulations. The application must be submitted in triplicate to OCD, and must be accompanied by a \$100 filing fee. A copy of the form can be downloaded by clicking here.

The OCD must review the application for technical and administrative completeness within 30 days of submittal and notify the applicant of their findings. During this same time period, the applicant must provide public notice of the project as outlined in NMAC 20.6.2.3108, and provide OCD with proof of this activity.

Following this, OCD has 30 days to notify any affected parties including federal, state and local regulatory agencies. Within 60 days after OCD determines that the application is complete and all required technical information is available, OCD will notify the applicant if the permit was approved or denied and provide public notice of this decision. Following the public notice, a 30 day period is set aside for public comments. If sufficient public interest is identified during this period, OCD will hold a public hearing. Once the administrative record is complete including a public hearing if needed, OCD will notify the applicant within 30 days whether the permit was approved, modified or denied.

## National Pollution Discharge Elimination System Permit

The National Pollution Discharge Elimination System (NPDES) program requires that all point source discharges into U.S. waters obtain permits. NPDES permits contain limits on what can be discharged and other provisions to ensure that the discharge does not harm water quality or the public's health. Discharge of low temperature geothermal fluids to surface waters would most likely require an NPDES permit. The federal Environmental Protection Agency (EPA) currently retains "primacy" for the NPDES program in New Mexico. This means that EPA Region 6 is responsible for permitting and enforcing all NPDES permits in the state. OCD must certify the permit once issued by EPA and may also require an NPDES permitted project to also obtain a groundwater discharge permit if groundwater is impacted.



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EPA Region 6 has developed procedures with respect to NPDES permits. Under current practices, EPA will inform OCD when permits are applied for and will provide OCD copies of the application. EPA then issues a draft permit and posts a public notice that the state will consider 401 certification. After considering public comments, EPA prepares a proposed final permit and provides this permit to OCD for certification. OCD typically

has 30 days to provide or deny certification. Subsequent to OCD's certification decision, EPA will make its final decision regarding the NPDES permit and issue a final permit.

The most likely permit forms covering a direct use, geothermal application are EPA NPDES forms 1 and 2D or 2E. Form 1 collects general information from the applicant and must be filled out in addition to a supplemental form. Form 2D covers projects which discharge wastewater. Form 2E was designed by the US Environmental Protection Agency to cover projects which do not discharge process wastewater. Non-contact, direct use geothermal projects will typically need to complete Form 2E, however discussions with EPA staff to determine the correct form should take place. EPA contact information can be found in Appendix A. NPDES forms can be downloaded from the EPA Region 6 website by clicking <u>here.</u> EPA also has on-line a software program to assist in the completion of NPDES forms. The software program, called Permit Application Software System or PASS, can be downloaded by clicking <u>here</u>.

An NPDES applicant will need to provide mapping information, flow data, an estimate of the type and quantities of pollutants discharged and a brief description of any planned treatment. This information will be used to determine the conditions of the permit including appropriate control or treatment strategies, monitoring and reporting requirements. Since most direct use applications involve non-contact geothermal heat exchange, the water quality of the source water is unaffected. For these type of projects, permit conditions should be strait-forward. Even so, a developer may still be required to cool the geothermal water before discharging into a surface water source.

In some instances a developer may be able to proceed with a general permit versus an individual permit. A general permit covers a set of like facilities, such as a coal facility or a fish farm. Here, a set of conditions are already developed which meet the general operating conditions of these similar facilities. In these cases, a developer would complete Form 1 to see if they qualify under the general permit. If eligible the developer would also need to submit a Notice of Intent form or equivalent, which provides additional information needed by the resources agency administering the NPDES program. The advantage of the general form is that the resource agency can issue the permit as soon as all information needs are satisfied. For individual permits, there is an additional 30 day public notice process, as well as the potential for intervention on the terms and conditions of the permit.

8
### Appendix A

### **State Contact Information**

### **General Geothermal Information**

Energy Conservation and Management Division New Mexico Energy, Minerals and Natural Resources Department 1220 South St Francis Drive Santa Fe, New Mexico, 87505 Brian Johnson Phone 505/476-3313 Email: <u>bkjohnson@state.nm.us</u>

Southwest Technology Development Institute New Mexico State University Box 30001, MSC 3SOLAR Las Cruces, New Mexico 88003-8001 Tel: (505) 646-1846 Fax: (505)646-2960 Website: http://www.nmsu.edu/~tdi/geothermal.htm

### Water Rights and Production Well Permitting

Oil Conservation Division New Mexico Energy, Minerals and Natural Resources Department 1220 South St Francis Drive Santa Fe, New Mexico, 87505 Roy Johnson Phone: 505/476-3470

State Engineers Office

District 1 - Rio Grande, Estancia, Bluewater, Gallup, Sandia, San Juan ground water basins Office of the State Engineer 121 Tijeras, NE, Suite 2000 Albuquerque NM 87102 1-505-764-3888 Fax: 1-505-764-3892

Washington State University Extension Energy Program-2003

District 2 - Roswell, Carlsbad, Lea County, Portales, Hondo, Penasco, Jal, Fort Sumner, Capitan, Curry County groundwater basins Office of the State Engineer 1900 West Second Street Roswell NM 88201 1-505-622-6521 Fax: 1-505-623-8559

District 3 - Mimbres Valley, Virden Valley, Animas Valley, Playas Valley, Gila-San Francisco, San Simon, Lordsburg Valley, Nutt-Hockett groundwater basins Office of the State Engineer PO Box 844 216 South Silver Deming NM 88031 1-505-546-2851 Fax: 1-505-546-2290

District 4 - Hot Springs, Hueco, Lower Rio Grande, Las Animas Creek, Salt, Tularosa groundwater basins Office of the State Engineer P.O. Box 729 1680 Hickory Loop, Suite J Las Cruces NM 88004 1-505-524-6161 Fax: 1-505-524-6160

### Santa Fe Office - Canadian River, Tucumcari,

Upper Pecos ground water basins Office of the State Engineer Water Rights Division PO Box 25102 Bataan Memorial Building Santa Fe NM 87504 1-505-827-6120 Fax: 1-505-827-6682

Aztec Sub-Office - San Juan area. Office of the State Engineer Aztec Sub-Office 112 South Mesa Verde Aztec NM 87410 1-505-334-9481 Fax: 1-505-334-3168

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### **Underground Injection Well Permit**

David Catanach Oil Conservation Division 1220 South St. Francis Dr. Santa Fe, New Mexico 87505 Phone: (505) 476-3466 Email: <u>dcatanach@state.nm.us</u>

.

### **Groundwater Discharge Permit**

Bill Olson Oil Conservation Division 1220 South St. Francis Dr. Santa Fe, New Mexico 87505 Phone: 505-476-3470 Email: <u>WOlson@state.nm.us</u>

### National Pollution Discharge Elimination System (NPDES) Permit

EPA Region 6 Compliance Assurance and Enforcement Division Water Enforcement Branch (6EN-W) 1445 Ross Avenue Dallas, Texas 75202-2733

Main Branch Phone: (214)665-6468 <u>24 Hour Hotline</u>: (214)665-6595 Fax: (214)665-2168 Website: <u>http://www.epa.gov/earth1r6/6en/w/cwa.htm</u>

### Appendix B Geothermal References and Contacts

### References

Bloomquist, R.G., Black, G. L., Parker, D. S., Sifford, A., Simpson, S. J., Street, L.V., 1985, Evaluation and Ranking of Geothermal Resources for Electrical Generation or Electrical Offset in Idaho, Montana, Oregon and Washington: Bonneville Power Administration, US Department of Energy, pp. 1-504

Bloomquist, R. Gordon., Nimmons, John. T., Rafferty, Kevin, 1988, District Heating Development Guide, Legal, Institutional and Marketing Issues, Volume 1: for the Washington State Energy Office, funded by the US Department of Energy, pp. 1-268.

Bloomquist, R. Gordon, 1991, Geothermal, A Regulatory Guide to Leasing, Permitting, and Licensing in Idaho, Montana, Oregon and Washington: Bonneville Power Administration, 1-277.

Lund, John W., Lienau, Paul J., Lunis, Ben C., 1998, Geothermal Direct-Use Engineering and Design Guidebook: Geo-Heat Center Oregon Institute of Technology, sponsored by the US Department of Energy Idaho Operations Office, pp. 1-454.

Rafferty, Kevin, 2000, Geothermal Power Generation, A Primer on Low-Temperature, Small-Scale Applications: Oregon Institute of Technology, pp. 1-11.

Lund, John W., **date**, Pavement Snow Melting, Geo-Heat Center Oregon Institute of Technology, pp1-13.

Rafferty, Kevin, 2001, An Information Survival Kit for the Prospective Geothermal Heat Pump Owner: Geo-Heat Center, Oregon Institute of Technology, Grant No. DE-FG07-90ID 13040, pp. 1-23.

Rafferty, Kevin, 2001, Small Geothermal Systems: A Guide For The Do-It Yourselfer: Geo-Heat Center, Oregon Institute of Technology, Contract No. FG01-99-EE35098, pp. 1-30.

Lund, John W., **date**, Balneological Use of Thermal Waters: Geo-Heat Center, Oregon Institute of Technology, pp. 1-10.

Boyd, Tanya, Rafferty, Kevin, **date**, Aquaculture Information Package: Geo-Heat Center, Oregon Institute of Technology, Contract No. DE-FG07-90ID 13040, pp. 1-60.

Washington State University Extension Energy Program-2003

Rafferty, Kevin, Boyd, Tonya, **date**, Geothermal Greenhouse Information Package: Geo-Heat Center, Oregon Institute of Technology, Contract No. DE-FG07-90ID 13040, pp.1-80.

### Contacts

, .

> Geo-Heat Center Website: <u>www.oit.edu/-geoheat</u>

Geothermal Education Office Website: <u>www.geothermal.marin.org</u>

Geothermal Resources Council Website: <u>www.geothermal.org</u>

Geothermal Heat Pump Consortium Website: <u>www.geoexchange.org</u>

International Ground-Source Heat Pump Association Website: <u>www.igshpa.okstate.edu</u>

U.S. Department of Energy Website: <u>www.eren.doe.gov/geothermal</u>

Washington State University Energy Program Website: <u>http://www.energy.wsu.edu/projects/renewables/geothermal.cfm</u>

Washington State University Extension Energy Program-2003

### Chavez, Carl J, EMNRD

From:	Chavez, Carl J, EMNRD
Sent:	Friday, April 16, 2010 7:21 AM
То:	Heber, David, OSE
Cc:	Hall, John, NMENV; Johnson, Mike S., OSE; Heber, David, OSE; Altomare, Mikal, EMNRD;
	Lucero, Stephen A., EMNRD; Olson, Bill, NMENV; Fesmire, Mark, EMNRD;
	'Mike_Smith@blm.gov'; Martinez, Lisa, RLD; 'Adrienne.Brumley@blm.gov'; Brooks, David K.,
	EMNRD; Dalmy, Andy ., RLD; Baca, Jerome T., RLD; Pacheco, Rem, RLD; Aragon, Fermin ,
	RLD; VonGonten, Glenn, EMNRD; Chavez, Carl J, EMNRD; Rappuhn, Doug H., OSE;
	'rcerdlac@cleansed.net'
Subject:	FW: HP Regulatory Survey - Your state info review by April 19, 2010
Attachments:	NM.xls

### David:

Thanks for sharing this survey, which seems to be comprehensive is scope for direct heat (open, closed and other types of systems) applications with construction, environmental, etc. issues with and without boreholes, wells, etc.

I'm sharing this with the group and adding an agenda item for discussion. One question is do you need the geothermal regulations working group to provide any feedback to you for consideration in response to the questionnaire by noon on April 19, 2010 to consider in reply?

Thank you.

Carl J. Chavez, CHMM New Mexico Energy, Minerals & Natural Resources Dept. Oil Conservation Division, Environmental Bureau 1220 South St. Francis Dr., Santa Fe, New Mexico 87505 Office: (505) 476-3490 Fax: (505) 476-3462 E-mail: <u>CarlJ.Chavez@state.nm.us</u> Website: <u>http://www.emnrd.state.nm.us/ocd/</u>index.htm (Pollution Prevention Guidance is under "Publications")

From: Heber, David, OSE Sent: Thursday, April 15, 2010 4:56 PM To: Chavez, Carl J, EMNRD Subject: FW: HP Regulatory Survey - Your state info review

Hi Carl,

The attached survey might serve as a discussion topic for future meetings. The survey is quite extensive but may bring up some questions worth exploring.

Thanks, David

From: Michael Becher [mailto:MBecher@industryinsights.com]
Sent: Thursday, April 15, 2010 11:15 AM
To: Heber, David, OSE
Subject: HP Regulatory Survey - Your state info review

Hi David,

Thank you again for your participation in the State HP Regulatory Survey which was sponsored by the Geothermal Heat Pump Consortium (GeoExchange), the Ground Water Protection Council, the International Ground Source Heat Pump Association, and the National Ground Water Association.

To create an incentive to participate, the results were promised to be provided to all those who participated in the survey. Since state by state information will be provided and shared, we wanted to offer you the opportunity to review the data for your state before they are finalized. Your state's information is in the attached file.

Please review and let me know of any changes by Monday, April 19th. If you have any changes, please feel free to use the attached Excel sheet and highlight any cells that have changed.

Thank you again for helping make this important study a success.

Michael Becher, CPA Project Director Industry Insights, Inc. 6235 Emerald Parkway Dublin, OH 43016 Direct: 614.389.2100 x114 Fax: 614.389.3816

# **New Mexico**

**Open** loop

### **Open loop**

(single well for water (single well for water withdrawal, water returned to a surface returned to a second source)

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withdrawal, water well)

Is this system configuration regulated by your state?

Yes

No

Not at this time, but anticipate within 12 mos.

If your state does not currently regulate this geothermal system, are there plans to establ regulations?

Yes No

Not at this time, but anticipate within 12 mos.

At what governmental level is regulator oversight most closely administered for geothermal system in your state?

State Oversight is Primary County Oversight is Primary Local (city, town, village) is Primary No regulatory oversight at this time

Describe if one or more of these state boards ave developed specific regulations for jeothermal system technologies in your

### **Building Board**

Yes No Don't know

### **Plumbing Board**

Yes No Don't know

### **Electrical Board**

Yes No Don't know

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### Water Well Board

Yes No Don't know

### **HVAC Board**

Yes No Don't know

Other State Entity

Indicate if these actions must occur related to this geothermal system installations within your/state:

### Construction permit and fee charged

Yes Yes, but no fee No If yes, fee amount:

### Specific geothermal installation permit and fee

charged Yes Yes, but no fee No If yes, fee amount:

# Approval of geothermal system designand fee charged

Yes Yes, but no fee No If yes, fee amount:

### Operating permit or registration and fee charged

Yes Yes, but no fee No If yes, fee amount:

Well log, drilling or geologic recording requirements for geothermal systems

None required One for entire project One for each borehole

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Our agency does not track installation of these systems

Systems known to exist, but cannot tabulate or estimate number

Not known if systems of this type exist Not allowed by regulation

### Number of Systems (sum of five years)

If you provided data for "number of systems" above the corresponding number was determined by:

Estimate only Specific geothermal installation permit Construction permit Geothermal system design approval System operating permit Drilling log

### Who must be licensed, registered, or certified by your state for this geothermal system?

### Individual and/or company designing system

Yes – govt. license Yes – govt. registration Yes – govt. certification Yes – third party certification Other Nothing required

## Individual and/or company constructing the well or borehole

Yes – govt. license Yes – govt. registration Yes – govt. certification Yes – third party certification Other Nothing required

# Individual and/or company involved with any ground water pump installation

Yes – govt. license Yes – govt. registration Yes – govt. certification Yes – third party certification Other Nothing required

### Individual and/or company constructing system

Yes – govt. license Yes – govt. registration Yes – govt. certification Yes – third party certification Other Nothing required

### Individual and/or company operating system

Yes – govt. license Yes – govt. registration Yes – govt. certification Yes – third party certification Other Nothing required

For this geothermalisystem, does your state require evidence of successfully completed geothermalisystem installer training (for those installing the entire system, not just for those doing a portion of the total system, such as the well or borehole) prior to doing this work in your state?

Individual and/or company designing system Yes

No

Individual and/or company constructing the well or borehole

Yes

No

Individual and/or company involved with any ground water pump installation

Yes

No

Individual and/or company constructing system Yes No Individual and/or company operating system Yes

No

For this geothermal system, does your state require evidence of successfully completed geothermal system installer continuing education in order to maintain authorization to do this work in your state?

Individual and/or company designing system Yes No

Individual and/or company constructing the well or borehole

Yes

No

Individual and/or company involved with any ground water pump installation

Yes

No

Individual and/or company constructing system Yes No

Individual and/or company operating system Yes

No



### Volumetric flow rates

Yes

No

### Well Depth(s)

Yes No

Number of wells or boreholes Yes No

### Heat load

Yes No

### Water quality

Yes

No

Does your state allow non-well drilling companies (for example, blasting companies with drilling rigs) to drill wells/boreholes for this geothermal systems?

Yes

No Does not apply

In your, state are there standards/regulations for construction, operation, and abandonment for this geothermal system?

Construction

Yes No

Operation

Yes No

Abandonment

Yes

No

How is this system classified in your state?

Water well Boring Closed loop hole Other

### Heat transfer to the earth calculations

Yes No

Not at this time, but anticipated within 12 mos.

# Limits to temperature ranges in earth over lifecycle of system

Yes No

Not at this time, but anticipated within 12 mos.

### **Use of Refrigerant R-22**

Yes No

Not at this time, but anticipated within 12 mos.

### **Use of Refrigerant R-410A**

Yes No

Not at this time, but anticipated within 12 mos.

For this system, does your state establish specific criteria for .

### Location of system on a property plot

Yes

No

Not at this time, but anticipated within 12 mos.

### Setback distance from structures, including

### potable water wells

Yes No

Yes No

NO

Not at this time, but anticipated within 12 mos.

Depth of installed heat exchanger components	
Yes No	
Not at this time, but anticipated within 12 mos.	

Formations penetrated by heat exchanger components


Not at this time, but anticipated within 12 mos.

For this system, does your state establish specific criteria for....

### Heat transfer fluids and refrigerants

Yes

No

Not at this time, but anticipated within 12 mos.

### Water additives

Yes

No

Not at this time, but anticipated within 12 mos.

# Spacing of wells or boreholes from other wells or boreholes used in the system

Yes

No

Not at this time, but anticipated within 12 mos.

# Manufactured materials used (i.e., loop pipe, fittings, etc.)

Yes No

Not at this time, but anticipated within 12 mos.

# Which heat transfer fluids are authorized by your state for use in this geothermal system?

State has no specification at this time Potable water Methanol Ethanol Propylene glycol Potassium acetate CMA Urea



### Well Casing Requirements

**Overall Maximum Length** 

Length into Bedrock

Material types:

Annulus grouting requirements

Type of grout material:

How soon following drilling must grout be emplaced:

Methods for grout emplacement:

Does your state allow the dual use of a well used for an open loop geothermal/system also as a source of potable or nonpotable water? What entity has made this determination (water well board, public health agency, etc.)?

**Potable Dual Use Allowed?** 

Yes No

Non-potable Dual Use Allowed?

Yes No

**Determining agency?** 

Water well board Plumbing board Public health agency Other

Does your state have requirements or restrictions associated with an open loop geothermal system's discharge of return flow water back to the environment (for example, are there limits on the receiving geologic strata, return water temperature, return water quality, return water/quantity, degree of mixing of salt water and fresh water)?

Receiving geologic strata parameters Yes

No

Return water temperature parameters

Yes

No

**Return water quantity** 

Yes No

Ratio parameters for mixing of fresh water and salt or brackish water

Yes No

vstems, directexa pe systems, does your state re

Pre-start up pressurization test

Yes

No

Ongoing operational scheduled pressure testing

Yes

No

Posted signage identifying anti-freeze or refrigerant type

Yes No

0.0 For DX or concentric pipe geothermalisystems, does your state require installation of a corrosic control mechanism? If so, what type

**Corrosion Control Mechanism** None required Yes, required

Type required:

Does your state require: The West in the second

Geologic / hydrogeologic prior review for potential surrounding environmental impacts Yes, under all circumstances

Yes, but under certain combinations of factors, such as water quality, withdrawal rate, system bleed, proximity to sensitive receptors, etc.

Not ever

Ground water quality testing

Yes

No

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Surface water quality testing

Yes No

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# Ongoing system operation and maintenance requirements

No

Yes, and there is a reporting requirement Yes, but there is no reporting requirement

### Does your state require notification should heat transfer fluid or refrigerant be released to subsurface?

No

Yes, by anyone with knowledge

Yes, by property owner

Yes, by drilling contractor

Yes, by geothermal system contractor

Yes, by geothermal system designer

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If ground water or surface water quality testing is associated by your state with the this geothermal system: list the specific constituents that are tested, the testing frequency and the associated water quality standards:

### Ground water quality testing parameters

Not required

Constituents tested for (if space is too small, enter a Web address where these constituents may be found):

Testing frequency: ______ Associated water quality standard:

### Surface water quality testing parameters

Not required

Constituents tested for (if space is too small, enter a Web address where these constituents may be found):

Testing frequency:

Associated water quality standard:

Does your state have requirements or restrictions associated with open loop geothermal systems discharge of thermal "bleed" water to the environment (for example, are there limits on the types of structures that receive discharge bleed water. location, quantity, quality of thermal "bleed" water)?

Discharge type parameters? Yes No

Where may the discharge go:

How much thermal "bleed" water may be discharged

Where does your state see its regulation of this geothermal system technology evolving to over the next 3 years?

Increasing Staying the same Decreasing Unknown

### In general, how would you describe your agency's attitude toward each of this potential system designs?

Supportive Undecided Not supportive Unknown

What, at the present time, does your state offer regarding these questions for this geothermal, system?

# Financial incentives for geothermal system installation?

Yes

Not up to this time and we do not anticipate so in the next 12 months

No, but we anticipate something within the next 12 months

# Assessed the energy savings associated with geothermal systems?

Yes

Not up to this time and we do not anticipate so in the next 12 months

No, but we anticipate something within the next 12 months

# Developed guidelines for optimizing the energy savings from geothermal systems?

Yes

Not up to this time and we do not anticipate so in the next 12 months

No, but we anticipate something within the next 12 months

# Assessed the typical payback period from the use of geothermal systems?

Yes

Not up to this time and we do not anticipate so in the next 12 months

No, but we anticipate something within the next 12 months

### What, at the present time, does your state offer regarding these questions for this geothermal system?

Documented the occurrence of adverse environmental imipacts from one or more geothermal system installations of this type Yes

Not up to this time and we do not anticipate so in the next 12 months

No, but we anticipate something within the next 12 months

### Proposed a moratorium for some date in the next 6 months on the future installation of this type

Yes

Not up to this time and we do not anticipate so in the next 12 months

No, but we anticipate something within the next 12 months

How does your agency deal with and document problem geothermal systems or their consequences on neighbors' systems or drinking water wells, etc.?

Don't deal with Document problems Case-by-case, no guidance in place

Problem systems are documented and investigated

How/does/your agency monitor system

Don't monitor One-time follow-up monitoring Routine monitoring schedule

How does your agency enforce against problem systems? No enforcement No guidance in place, case-by-case Fines issued Require remedy or closure

How is your agency being funded for this geothermal system's related work?

No additional funding source provided for agency's oversight Permit fees General fund allocation to agency Other

Based upon your experience to date, have you identified any specific issues; including research needs, that should be coordinated or addressed nationally (or regionally)? If there is one or more relevant Web sites where interested parties can find your states geothermal system requirements and geothermalsystem contact information please list the address (es) heres

(1) (2)

(3)

Standing column	Closed loop	Closed loop	Closed loop	Direct exchange (DX)
(single well for water withdrawal and water return)	(vertical boreholes)	(subsurface trenched, or other configuration, but not vertical boreholes)	(surface water body emplacement)	(vertical boreholes)
х	х	x	x	Х

х

### Chavez, Carl J, EMNRD

From: Sent:	Chavez, Carl J, EMNRD Thursday, April 15, 2010 7:14 AM
To:	Hall, John, NMENV; Johnson, Mike S., OSE; Heber, David, OSE; Altomare, Mikal, EMNRD; Lucero, Stephen A., EMNRD; Olson, Bill, NMENV; Fesmire, Mark, EMNRD;
	'Mike_Smith@blm.gov'; Martinez, Lisa, RLD; 'Adrienne.Brumley@blm.gov'; Brooks, David K., EMNRD; Dalmy, Andy ., RLD; Baca, Jerome T., RLD; Pacheco, Rem, RLD; Aragon, Fermin , BLD: VonGonten, Glenn, EMNRD; Bappubn, Doug H, OSE: 'rcerdlac@cleansed.net'
Subject:	RE: Geothermal Regulations Stakeholder Meeting- Upcoming May 5, 2010 Meeting at CID/RLD

John:

Re: In response to # 5 below (5/5/10 Draft Meeting Agenda), GWQB will not develop a specific application, but I have included our Notice of Intent form that should be filled out by any large ground source/direct heat projects for GWQB to evaluate and make a Discharge Permit requirement determination.

Thanks for providing a copy of NMED's NOI Form. OCD has a generic geothermal form that may apply or be modified in include closed-loop and/or banked heat direct heat systems for residential, commercial and industrial buildings that it will compare to NMED's to see if it could meet the intent of tracking the lion's share of geothermal direct heat projects in New Mexico. OCD may also need to consider a filing fee for the closed loop geothermal applications. An OCD WQCC Discharge Permit would not likely be required by the OCD if there is no injection or discharges and threats to USDW from injection or production wells occurring from the design of these types of systems under WQCC 20.6.2 NMAC and WQCC 20.6.4 NMAC.

If the group could please examine NMED's NOI (see attachment below) and OCD generic geothermal application form (<u>http://www.emnrd.state.nm.us/ocd/documents/dp_apps.pdf</u>) for comment at the next meeting.

Thanks.



Thank you.

Carl J. Chavez, CHMM New Mexico Energy, Minerals & Natural Resources Dept. Oil Conservation Division, Environmental Bureau 1220 South St. Francis Dr., Santa Fe, New Mexico 87505 Office: (505) 476-3490 Fax: (505) 476-3490 Fax: (505) 476-3462 E-mail: <u>CarlJ.Chavez@state.nm.us</u> Website: <u>http://www.emnrd.state.nm.us/ocd/</u>index.htm (Pollution Prevention Guidance is under "Publications")

From: Hall, John, NMENV Sent: Monday, April 12, 2010 10:19 AM

**To:** Chavez, Carl J, EMNRD; Johnson, Mike S., OSE; Heber, David, OSE; Altomare, Mikal, EMNRD; Lucero, Stephen A., EMNRD; Olson, Bill, NMENV; Fesmire, Mark, EMNRD; 'Mike_Smith@blm.gov'; Martinez, Lisa, RLD; 'Adrienne.Brumley@blm.gov'; Brooks, David K., EMNRD; Dalmy, Andy ., RLD; Baca, Jerome T., RLD; Pacheco, Rem, RLD; Aragon, Fermin , RLD; VonGonten, Glenn, EMNRD; Rappuhn, Doug H., OSE; 'rcerdlac@cleansed.net' **Subject:** RE: Geothermal Regulations Stakeholder Meeting- Continuation of 3/30 Meeting at OCD Carl,

Unfortunately I am not available starting May 3rd until sometime between July 31st to August 31. I will be working on UIC database development. I will be in my office early in the mornings until 8:30 and sometime after 3:30 in the afternoons for a bit, but I expect that I will be swamped as I will be trying to attend to my usual duties as well. Please keep me in the loop on the emails and I will try to respond to them as appropriate.

In response to # 5 below, GWQB will not develop a specific application, but I have included our Notice of Intent form that should be filled out by any large ground source/direct heat projects for GWQB to evaluate and make a Discharge Permit requirement determination.

Thanks,

John S. Hall UIC Coordinator Ground Water Quality Bureau New Mexico Environment Dept. (505)-827-1049

----Original Appointment----From: Chavez, Carl J, EMNRD
Sent: Thursday, April 08, 2010 5:07 PM
To: Hall, John, NMENV; Johnson, Mike S., OSE; Heber, David, OSE; Altomare, Mikal, EMNRD; Lucero, Stephen A., EMNRD; Olson, Bill, NMENV; Fesmire, Mark, EMNRD; Mike_Smith@blm.gov; Martinez, Lisa, RLD; Adrienne.Brumley@blm.gov; Brooks, David K., EMNRD; Dalmy, Andy ., RLD; Baca, Jerome T., RLD; Pacheco, Rem, RLD; Aragon, Fermin , RLD; VonGonten, Glenn, EMNRD; Chavez, Carl J, EMNRD; Rappuhn, Doug H., OSE; rcerdlac@cleansed.net
Subject: Geothermal Regulations Stakeholder Meeting- Continuation of 3/30 Meeting at OCD
When: Wednesday, May 05, 2010 10:00 AM-12:00 PM (GMT-07:00) Mountain Time (US & Canada).
Where: OSE or CID/RLD?

Stakeholders:

Preliminary meeting date and time to follow-up on "Who Does What" at the last meeting.... A location at CID/RLD or OSE may be appropriate to familiarize stakeholders with your respective locations for future meetings, visits, etc. to your offices. Is CID/RLD interested in hosting the next meeting? Just a thought as OCD can continue with meetings in our office.... All we need is a phone line for teleconference capability. Website access w/ projector may be appropriate if agencies wish to show their resources pages with application forms, process, etc.?

### Similar to past meetings, from any location, OCD can provide a call in number w/ code entry for callers to participate....

Request for your agenda items:

- Water well driller certification/requirements on geothermal projects (OSE)? Bring Doug Rappuhn's (OSE) correspondences after last 2 meetings. Also, Jerome Baca (RLD) can bring his correspondence related to Doug's correspondence for discussion.....
- 2) Who does what- review and amend OCD's Geothermal Resource Page together (OCD Publications Webpage) Handout passed out by OCD at 3/30 meeting.
- 3) Tentative "Direct Use or Not Direct Use- Closed Loop Heat Storage" Richard Erdlac (Erdlac Energy Consulting)
- 4) Each stakeholder shall pass out their geothermal application forms and or permit associated w/ their geothermal permitting program for OCD to be aware of and possibly to reproduce for its program? OCD will also hand out its forms.
- 5) What are agencies willing to let go and/or what do agencies want to keep on doing? OCD may want this to continue for some period of indefinitely, i.e., OSE continuing to be part of the CID/RLD direct heat process, but OCD will likely need to develop a direct heat form application to track projects. Has NMED developed an application form for direct heat applications? Application process?

- 6) Possible Geothermal Working Group (not to be confused with our "Geothermal Regulations Stakeholder Group) "Geothermal Oil & Gas Coproduction" in the oil patch Symposium ~ September 2010. Steve Lucero ECMD organizing. BLM, OSE (water scarcity and appropriation issues) and OCD (permitting, down hole new and reworking well issues, potash and mineral rights issues?), and geothermal company presentations.
- 7) Website visitation of geothermal resources, i.e., permitting, process, etc.
- 8) Other issues and concerns?
- 9) Miscellaneous



,

1.	Name and mailing address of person proposing	g to discharge:
		Work Phone:
		Cell/Home Phone:
		Fax:
		Email:
2.	Name of facility:	
3.	Physical location of discharge (if applicable, gi closest town or landmark, directions to facility	ive street address, township, range, section, distance from , location map):
4.	Type of operation generating the discharge (e.	g., truck wash, food processing plant, restaurant, etc.):
5.	Source(s) of the discharge. Describe how the v disposed at your facility are generated. Identif	wastewater, sludge, or other discharges processed and/or y all sources. Attach additional pages if needed:
6.	Expected contaminants in the discharge (e.g., Include estimated concentration if known, and	nitrate-nitrogen, metals, organic compounds, salts, etc.) copies of results of laboratory analyses, if available:
7.	Describe all components of wastewater proces grease interceptor, lagoon, septic tank/leachfie specifications, etc. if available:	ssing, treatment, storage, and disposal system (e.g., eld, etc.) Include sizes, site layout map, plans and
8.	Estimated maximum daily discharge volume in	n gallons per day (or other units):
9.	Estimated depth to ground water (ft):	
Si	gnature:	Uate:
۲r –	inted name:	
<u>Pl</u> NM P.0 Sa	<u>ease return this form to:</u> MED Ground Water Quality Bureau O. Box 5469 anta Fe, New Mexico 87502-5469	Telephone: 505-827-2900 Fax: 505-827-2965
De No	cember 4, 2008 Page 1 of 1 Ground V tice of Intent	Nater Quality Bureau – Pollution Prevention Section Notice of Intent

<u>Dis</u> 162 <u>Dis</u> 130 <u>Dis</u> 100 <u>Dis</u> 122	strict I 25 N. French Dr., Hobbs, NM 88240 <u>strict II</u> 21 W. Grand Avenue, Artesia, NM 88210 <u>strict III</u> 20 Rio Brazos Road, Aztee, NM 87410 <u>strict IV</u> 20 S. St. Francis Dr., Santa Fe, NM 87505	State of Ne Energy Minerals and Oil Conservat 1220 South S Santa Fe, N	w Mexico l Natural Resources tion Division t. Francis Dr. NM 87505	Revised June 10, 2003 Submit Original Plus 1 Copy to Santa Fe 1 Copy to Appropriate District Office
	DISCHARGE PLAN APPL REFINERIES, C ANI (Refer to the OC	<b>ICATION FOR S</b> COMPRESSOR, G D CRUDE OIL PU D Guidelines for assistar	ERVICE COMPANI EOTHERMAL FAC MP STATIONS Ice in completing the applica	ES,GAS PLANTS, ILITES tion)
	□ N	Jew 🗌 Renewal	Modification	
1.	Туре:			
2.	Operator:			
	Address:			
	Contact Person:		Phone:	
3.	Location:/4Submit	/4 Section large scale topographic r	Township nap showing exact location.	Range
4.	Attach the name, telephone number	and address of the landov	wner of the facility site.	
5.	Attach the description of the facility	with a diagram indicatin	g location of fences, pits, dik	ces and tanks on the facility.
6.	Attach a description of all materials	stored or used at the faci	lity.	
7.	Attach a description of present source must be included.	ces of effluent and waste	solids. Average quality and	daily volume of waste water
8.	Attach a description of current liquid	d and solid waste collecti	on/treatment/disposal proced	lures.
9.	Attach a description of proposed mo	difications to existing co	llection/treatment/disposal sy	ystems.
10.	Attach a routine inspection and mai	ntenance plan to ensure p	permit compliance.	
11.	Attach a contingency plan for repor	ting and clean-up of spill	ls or releases.	
12.	Attach geological/hydrological info	ormation for the facility.	Depth to and quality of grou	nd water must be included.
13.	Attach a facility closure plan, and o rules, regulations and/or orders.	ther information as is need	cessary to demonstrate comp	liance with any other OCD
1 t	4. CERTIFICATIONI hereby certify best of my knowledge and belief.	/ that the information sub	mitted with this application i	is true and correct to the
١	Name:		Title:	
S	Signature:		Date:	

E-mail Address:_____

**Oil Conservation Division** 

1220 South St. Francis Dr.

Santa Fe, NM 87505

Submit Original Plus 1 Copy to Santa Fe 1 Copy to Appropriate District Office

### DISCHARGE PLAN APPLICATION FOR SERVICE COMPANIES, GAS PLANTS, REFINERIES, COMPRESSOR, GEOTHERMAL FACILITES AND CRUDE OIL PUMP STATIONS

(Refer to the OCD Guidelines for assistance in completing the application)

	New Renewal Modification
1.	Туре:
2.	Operator:
	Address:
	Contact Person:Phone:
3.	Location:/4/4 SectionTownshipRange
	Submit large scale topographic map showing exact location.
4.	Attach the name, telephone number and address of the landowner of the facility site.
5.	Attach the description of the facility with a diagram indicating location of fences, pits, dikes and tanks on the facility.
6.	Attach a description of all materials stored or used at the facility.
7.	Attach a description of present sources of effluent and waste solids. Average quality and daily volume of waste water must be included.
8.	Attach a description of current liquid and solid waste collection/treatment/disposal procedures.
9.	Attach a description of proposed modifications to existing collection/treatment/disposal systems.
10	. Attach a routine inspection and maintenance plan to ensure permit compliance.
11.	. Attach a contingency plan for reporting and clean-up of spills or releases.
12	. Attach geological/hydrological information for the facility. Depth to and quality of ground water must be included.
13.	. Attach a facility closure plan, and other information as is necessary to demonstrate compliance with any other OCD rules, regulations and/or orders.
14	. Project type:
	Standing Column (single well for water withdrawal and water return)
	Close-loop (vertical boreholes)
	Close-loop (sub-surface trenched, or other configuration, but not vertical boreholes)
	Close-loop (surface water body emplacement)

### Direct exchange (vertical boreholes)

Note: All direct heat applications through Consumer Industry Division / Regulatory License Division shall require a certified drinking water well driller and other certified professionals as required. Applicants must contact the appropriate federal, state, and / or local government agencies responsible for royalty or tax assessment.

15. CERTIFICATIONI hereby certify that the information submitted with this application is true and correct to the best of my knowledge and belief.

Name:	Title:
Signature:	Date:
Signature:E-mail Address:	Date:

STATE OF NEW MEXICO ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT Oil Conservation Division 1220 South St. Francis Dr. Santa Fe, New Mexico 87505

### **APPLICATION FOR AUTHORIZATION TO INJECT**

II. OPERATOR:	I.	PURPOSE:Secondary Recovery Application qualifies for administrative approval?	Pressure Maintenance Yes	DisposalStorage
ADDRESS:	II.	OPERATOR:		-
CONTACT PARTY:		ADDRESS:		
III.       WELL DATA: Complete the data required on the reverse side of this form for each well proposed for injection. Additional sheets may be attached if necessary.         IV.       Is this an expansion of an existing project?       Yes		CONTACT PARTY:	······	PHONE:
1V.       Is this an expansion of an existing project?       Yes	III.	WELL DATA: Complete the data required on the reverse side Additional sheets may be attached if necessar	e of this form for each wel y.	l proposed for injection.
<ul> <li>V. Attach a map that identifies all wells and leases within two miles of any proposed injection well with a one-half mile radius circ drawn around each proposed injection well. This circle identifies the well's area of review.</li> <li>VI. Attach a tabulation of data on all wells of public record within the area of review which penetrate the proposed injection zone. Such data shall include a description of each well's type, construction, date drilled, location, depth, record of completion, and a schematic of any plugged well illustrating all plugging detail.</li> <li>VII. Attach data on the proposed operation, including: <ol> <li>Proposed average and maximum daily rate and volume of fluids to be injected;</li> <li>Whether the system is open or closed;</li> <li>Proposed average and maximum injection pressure;</li> <li>Sources and an appropriate analysis of injection fluid and compatibility with the receiving formation if other than reinjected produced water; and,</li> <li>If injection is for disposal purposes into a zone not productive of oil or gas at or within one mile of the proposed well, attac chemical analysis of the disposal zone formation water (may be measured or inferred from existing literature, studies, neart wells, etc.).</li> </ol> </li> <li>*VIII. Attach appropriate geologic data on the injection zone including appropriate lithologic detail, geologic name, thickness, and depth. Give the geologic name, and depth to bottom of all underground sources of drinking water (aquifers containing waters total dissolved solids concentrations of 10,000 mg/l or less) overlying the proposed injection zone as well as any such sources known to be immediately underlying the injection interval.</li> <li>IX. Describe the proposed stimulation program, if any.</li> <li>*X. Attach appropriate logging and test data on the well. (If well logs have been filed with the Division, they need not be resubmittied and no evidence of open faults or any other hydrologic connection between the disposal zone and any undergro</li></ul>	IV.	Is this an expansion of an existing project? Ye If yes, give the Division order number authorizing the project	sNo :	
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NAME:TITLE:	XIV.	Certification: I hereby certify that the information submitted and belief.	with this application is tru	e and correct to the best of my knowledge
SIGNATURE:DATE:DATE:DATE:DATE:		NAME:		3:
E-MAIL ADDRESS		SIGNATURE:		DATE:
		E-MAIL ADDRESS:		

* If the information required under Sections VI, VIII, X, and XI above has been previously submitted, it need not be resubmitted. Please show the date and circumstances of the earlier submittal: Side 2

### III. WELL DATA

- A. The following well data must be submitted for each injection well covered by this application. The data must be both in tabular and schematic form and shall include:
  - (1) Lease name; Well No.; Location by Section, Township and Range; and footage location within the section.
  - (2) Each casing string used with its size, setting depth, sacks of cement used, hole size, top of cement, and how such top was determined.
  - (3) A description of the tubing to be used including its size, lining material, and setting depth.

(4) The name, model, and setting depth of the packer used or a description of any other seal system or assembly used.

Division District Offices have supplies of Well Data Sheets which may be used or which may be used as models for this purpose. Applicants for several identical wells may submit a "typical data sheet" rather than submitting the data for each well.

- B. The following must be submitted for each injection well covered by this application. All items must be addressed for the initial well. Responses for additional wells need be shown only when different. Information shown on schematics need not be repeated.
  - (1) The name of the injection formation and, if applicable, the field or pool name.
  - (2) The injection interval and whether it is perforated or open-hole.
  - (3) State if the well was drilled for injection or, if not, the original purpose of the well.
  - (4) Give the depths of any other perforated intervals and detail on the sacks of cement or bridge plugs used to seal off such perforations.
  - (5) Give the depth to and the name of the next higher and next lower oil or gas zone in the area of the well, if any.

### XIV. PROOF OF NOTICE

All applicants must furnish proof that a copy of the application has been furnished, by certified or registered mail, to the owner of the surface of the land on which the well is to be located and to each leasehold operator within one-half mile of the well location.

Where an application is subject to administrative approval, a proof of publication must be submitted. Such proof shall consist of a copy of the legal advertisement which was published in the county in which the well is located. The contents of such advertisement must include:

- (1) The name, address, phone number, and contact party for the applicant;
- (2) The intended purpose of the injection well; with the exact location of single wells or the Section, Township, and Range location of multiple wells;
- (3) The formation name and depth with expected maximum injection rates and pressures; and,

(4) A notation that interested parties must file objections or requests for hearing with the Oil Conservation Division, 1220 South St. Francis Dr., Santa Fe, New Mexico 87505, within 15 days.

## NO ACTION WILL BE TAKEN ON THE APPLICATION UNTIL PROPER PROOF OF NOTICE HAS BEEN SUBMITTED.

NOTICE: Surface owners or offset operators must file any objections or requests for hearing of administrative applications within 15 days from the date this application was mailed to them.

INJECTION WELL DATA SHEET

Side 1

OPERATOR				
WELL NAME & NUMBER:				
WELL LOCATION:				
FOOTAGE LOCATION	UNIT LETTER	SECTION	TOWNSHIP	RANGE
WELLBORE SCHEMATIC		<u>WELL CONS</u> Surface Casii	<u>TRUCTION DATA</u> I <u>B</u>	
	Hole Size:	C	asing Size:	
	Cemented with:			ft ³
	Top of Cement:	M	[ethod Determined:	
		Intermediate Ca	sing	
	Hole Size:	C	asing Size:	
	Cemented with:	8X. 0		ft3
	Top of Cement:	Z	lethod Determined:	
		Production Cas	sing	
	Hole Size:	C	asing Size:	
	Cemented with:	SX. 0		ft ³
	Top of Cement:	W	[ethod Determined:	
	Total Depth:			
		Injection Inter	val	
		feet to		
		Darforstad or Onen Hole:	indicata which)	

(Perforated or Open Hole; indicate which)

	<b>INJECTION WELL DATA SHEET</b>	
Tub	ing Size: Lining Material:	1
Typ	e of Packer:	
Pac	ker Setting Depth:	
Oth	er Type of Tubing/Casing Seal (if applicable):	1
	Additional Data	
<u></u>	Is this a new well drilled for injection? Yes No	
	If no, for what purpose was the well originally drilled?	
5.	Name of the Injection Formation:	
3.	Name of Field or Pool (if applicable):	1
4.	Has the well ever been perforated in any other zone(s)? List all such perforated intervals and give plugging detail, i.e. sacks of cement or plug(s) used.	
ù.	Give the name and depths of any oil or gas zones underlying or overlying the proposed injection zone in this area:	•

# Closed Loop Heat Storage Richard J. Erdlac, Jr., Ph.D., P.G. (TX, PA Lot Direct CSe. Direct Use O Erdlac Energy Consulting



The Ferth

# DEFINITION:

- Heat (thermal) derived from the earth (geo). - It is the thermal energy contained in the
- rock and fluid (that fills the fractures and
- pores within the rock) in the earth's crust.

Inner core

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# CLASSIFICATION:

Moderate temp (90°-150° C or 194°- 302° F) - Low temp. (< 90°C or 194° F)

(Depollo) fulles

Temperatures In the Fadh

- High temp. (> 150°C or 302° F)
- Geo-Heat Cent
- **Oregon Institute of Technology**

- 7,200
- **Geothermal Education Office**

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# Geoexchange Is About Heat Management

Managing and moving heat from one place to another is the job of a equipment, human activity, and a small amount that conducts from geoexchange system. This means using the soil, rock, and any insystem, with this volume of earth acting as a rechargeable battery. The heat in the building is sourced from the sun, appliances and place fluid at shallow depths (~300 ft or less) as a heat storage the ground through a building's foundation naturally.





- Ground source heat pumps allow for heat magement by storing heat underground when not in e and extracting heat from underground when needed.	-The primary source of building heat is from the sun, rking appliances and equipment, and human activity.	Underground heat storage is not "closed". Heat will be and enter any specified volume of rock naturaly. Is some of the heat used to heat the air in a building	
1 - Gre use an use an	2 - Tr Workin	S - Un thus so	

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by 2015 that includes GHP systems. Collecting a royalty on heat use by CHP systems would defeat the purpose of these incentives and requirements, increasing GHP expense and leading to their disuse b
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Ideredons 2 Rovaltes - Electrical Power	y on "heat" is not like royalty on oil or gas, which are tangible. Heat is not tangible.	of the heat produced from a well is or can be used to generate Only 5 to 10 % (at best) efficiency exists in converting heat to What about the unused portion of produced heat that goes ground (if not linked to a direct use application)? Collecting heat is like trying to collect royalty on sunlight or airIT DONE. And if it can, the industry may die before it starts. Case it would be easier to collect <u>royalty on the net electricity</u> by geothermal. This would be a fair way to treat geothermal, wind when produced on state land.
	1 - Royalty on "heat in nature. Heat is no	2 - Not all of the head electricity. Only 5 to electricity. What ab back into ground (if royalty on heat is lik royalty on heat is lik CANT BE DONE. A 3 - In this case it wo produced by geothe solar, and wind whe

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CODS CODS CODS CODS CODS CODS CODS CODS
ROVALTES - DIRECT USE APPLICATIONS
1 - If a product is being made, then like electricity the <u>rovalty</u> should be <u>collected on the product</u> . The cost to the user for the energy plus the
royalty should be less than what the cost would be to the user if they consumed another form of energy, such as natural gas. Otherwise the
producer will use another energy resource and the state will receive no royalty based on geothermal usage.
2 - New Mexico has 77 hot springs throughout the state. If any of them
you exercise a royalty when the hot springs themselves are natural at
q the earth S surface Y ou cannot stop the not springs from Howing.



# New Mexico Geothermal Energy Working Group Meeting May 19 – 20, 2009 Macey Center, New Mexico Tech, Socorro, New Mexico

# **Summary of Discussion**

### Facilitator and Recorder: Lucy Moore

**Overview:** This conference for the New Mexico Geothermal Energy Working Group was sponsored by a grant provided by the Department of Energy and coordinated by the Energy Conservation and Management Division of the New Mexico Department of Energy, Minerals and Natural Resources. The event included a field trip to the Bosque del Apache Wildlife Refuge the afternoon of the 19th. Participants learned about the wildlife and birds in the area, as well as the geology of this active and interesting part of the state. Richard Chamberlin, Mark Person, Jim Witcher and Colin Cinkoski spoke with the group during the field tour about the geology of the area including Rio Grande Rift structural processes, heat flow and groundwater hydrology. Following the field trip, participants attended a group dinner and heard speakers Roger Cook and David Duchane.

Roger Cook spoke to the group about his work with Perma Works high temperature well monitoring tool technologies for geothermal electricity production. Roger also described work that has been conducted with this technology in Iceland. Horizontal drilling combined with EGS technology was also discussed.

Dave Duchane spoke with the group about the history of the Fenton Hill Hot Dry Rock pilot project in the Jemez Mountains. This project was described in detail from the issues of drilling issues, hydrogeology, groundwater chemistry, flow diagrams, remaining issues, results and future steps.

The next day was filled with presentations and discussion. The following summarizes the highpoints of that discussion and ideas for moving the geothermal agenda forward.

**Introductions:** Conference organizer Stephen Lucero, ECMD, welcomed the group and emphasized his agency's commitment to supporting geothermal research and projects wherever appropriate. He introduced Lucy Moore, who served as facilitator for the conference. She welcomed Brendan Miller, NM Economic Development Department and head of the Governor's Green Jobs Cabinet. Brendan assured the group of the Governor's commitment to renewable energy, including geothermal.

**New Mexico Geothermal Resource Assessment: Jim Witcher:** With 30 years experience in geothermal exploration and development, Jim is particularly interested in the low-temperature geothermal resources here in New Mexico.

Jim spoke about geothermal basic technologies and applications in New Mexico. He also provided in depth technical information on geologic conditions that support geothermal

resources in New Mexico. Several important topics were presented to the group including: geothermal economics, resource assessment data, resource classification, project case studies and site specific geology. This presentation provided an excellent introduction to the technical presentations for this day.

<u>Discussion</u>: There were questions about the number and types of jobs related to electricitygenerating geothermal projects. A participant asked about the relationship between faults and siting conductive geothermal projects. Jim explained that a fault can provide the "hydrogeologic window" necessary for the conductive heat source. In addition, the damaged zone can be permeable, although the core will be less so. There was discussion about the difficulty of locating these zones. Many saw the potential for geothermal-heated and cooled greenhouses in the rural and agricultural parts of southern New Mexico, and perhaps even the Albuquerque and Socorro areas, where fresh water is available. This led to a discussion about the overappropriated waters of the state, and the need to buy or lease water rights from existing users, or identify water that is so deep (over 2,500 feet) or of such poor quality that the State Engineer has no jurisdiction.

**Ground Source Heat Pumps in NM Schools: Pat Gibson**: With over 28 years of HVAC and related experience, Pat is now co-owner and vice president of operations for Energy Control Inc. (ECI), Pat described the geothermal work EIC is doing in schools around the state. He installs ground source heat pumps to provide both heat and cooling for the school facilities. The technology is relatively simple, with no cooling towers or boilers, and it provides consistent temperature control year-round. With the pump and other equipment underground, the roof is free of clutter, and the technology is safe from vandalism. Funding can be put together in a variety of ways – bonds, capital outlay, mil levies, etc. School districts are eager to "go green," and geothermal is an attractive option, for existing schools or newly constructed ones, like the latest ECI project, the Amy Biehl School in Santa Fe.

<u>Discussion</u>: Pat explained that at the Amy Biehl School ECI found a consistent temperature of 65 - 67 degrees F at 300 feet. The source can be either above or below the groundwater. Wells are spaced about 20 feet apart. The Amy Biehl School has two vaults with 140 wells and ten circuits. Schools are ideal for these projects because of the large areas – parking lots, playgrounds, etc. – for wells and equipment. Retrofitting is more difficult because ground must be disturbed; installing during construction of a new school is ideal.

**REHAU Construction: Phil Marquez:** An account manager for REHAU, Phil supports customers in New Mexico, Arizona and Colorado. Phil described REHAU's new PEXa pipe for use in the geothermal gound source heat exchange pump. An alternative to HDPE, the PEXa is proving superior in stability, flexibility, resistance to heat and chemical reactions. The pipe is polyethelene that is 85% cross-linked through a special extruding process. The pipe returns to its original shape if kinked, can bend 5 times its diameter, and stretch 400%. It is available in single or double u-bends.

<u>Discussion</u>: In answer to questions, Phil said that PEXa was about 30% more expensive that HDPE, but that savings could be achieved in installation time and the use of fewer wells. With a

longevity of 200 years, repairs are minimal. A disadvantage of PEXa is its sensitivity to ultraviolet rays. Again the question arose about the role of the State Engineer. Although he admitted that it is a gray area, Phil felt that if the wells are dry, no permit is needed.

**Ground Source Heat Pump Technologies: Jay Maze:** Jay has worked for Dahl Santa FE for 11 years. A licensed plumber in New Mexico and Colorado, he has worked with ground source heat pumps for over five years. Jay described several projects in northern New Mexico – two private homes, a ranch/conference center, and a spa/hotel. At Ojo Caliente, Dahl designed a system to capture the hot waste water from the hot springs to heat the hotel and pre-heat the domestic hot water for the facility. At the Blackstone Ranch, he designed a dual generation system for both hot water and air conditioning, using ice batteries. The pumps are turned on by the heating call and the cooling call. Putting the private home system underground reduced noise. Jay emphasized the benefit of including these applications in the development phase of subdivisions, commercial centers, schools, etc. for maximum efficiency.

<u>Discussion</u>: In answer to questions, Jay said that he believes the "climate is changing" with respect to clients' willingness to spend money upfront in order to use alternative energy and save money later. He gave more detail on the benefits of dual generation. The technology can heat and cool at the same time, by moving energy from place to place. It can pull heat out of the building and store the energy to heat hot water for use in the building.

**Geothermal Greenhouse Case Study: Jim Witcher:** Jim described the Radium Springs greenhouse project. Redesigning the conventional boiler, Jim installed a heat exchange system for this large greenhouse near Las Cruces which included shallow injection wells and deep production wells, which produce water at 600 degrees F. The facility uses hot water radiant heating to deal with sharp temperature drops at night. Energy costs for the greenhouse are 10 - 20% of what they were previously. The client is considering electrical generation as well.

<u>Discussion</u>: Jim is able to give tours of the greenhouse with advance notice. The building cost of geothermal greenhouses varies from \$ 4 to \$ 14 a square foot. In some cases, it is necessary to use reverse osmosis, or other treatment, to remove salts or contaminants and maintain an adequate water quality for the plants. Again, the question of water rights arose. NM water law requires a water right holder to divert water and put it to beneficial use. In this case, if water is injected back into the ground, the Office of the State Engineer usually grants a conditional water right.

Geothermal Systems of the Basin & Range & New Mexico: Mark Person: Mark described two different flow processes: forced convection and free convection. He also provided examples of fault-controlled, natural convection geothermal systems. He described two geothermal resource areas in Nevada and presented hydrologic data on the Socorro area. Also of great interest, Mark provided action items for future characterization of NM geothermal resources.

**The USGS National Geothermal Resource Assessment: Marshall Reed:** Geothermal Assessment Lead Geologist for the USGS in Menlo Park, California, Marshall evaluates characteristics of subsurface hot water and steam for a nationwide assessment. Although

electrical generation from geothermal resources has existed since 1904 in Italy and since 1960 in the US, its potential remains untapped. To produce electricity a system needs a heat source above 90 degrees centigrade, water as a heat exchange medium, and permeability in the reservoir. In 20 years, he explained, this country will need 30% more electricity or an additional 300 kMWe than is used today. One challenge to geothermal electrical production is the inevitable loss of megawatts as the reservoir loses pressure as a result in the loss of fluid in the system. Acquiring water rights can be difficult, and in some cases, sewage water has been injected.

<u>Discussion</u>: There were questions about the appropriateness of using the Hubbard curve. Marshall felt it was not appropriate because of different economic and political factors governing geothermal development. In answer to another question, Marshall explained that most of the heat loss happens in transmission, resistance to wires, etc. The closer to the source the energy is used the better, he said. There were questions about the location of geothermal sites in the assessment. The 241 points – 6 of which are in New Mexico -- will be on the internet.

**The Business of Geothermal Power: Richard Erdlac:** A private consultant, Richard has over 20 years experience working as a structural geologist for the oil and gas industry in West Texas. He spoke of a proposed power classification system that would show how geology, economics, engineering and other fields relate to the production of energy. He believes there is a wealth of information valuable for geothermal on seismic activity, temperature, reservoir structure and more, within the oil and gas community. Drillers hit hot water frequently – as hot as 400 degrees F -- and cap it as a nuisance. In Texas alone, 600,000 wells – as deep as 29,000 feet -- have been drilled, and there is data on each one. Furthermore, deepening these wells for geothermal would be much easier than drilling new wells. In addition, rights of way and transmission lines are in place for many of these locations. The oil and gas lease may even include the right to the heat found in hot water. Richard estimated the cost of a 20 MW project with wells 2,000 feet deep would cost 4 - 5 million. Much of the initial risk in exploring for geothermal could be reduced by using oil and gas data and existing wells. Richard sees a natural economic partnership between the two industries.

<u>Discussion</u>: Some of the data from oil and gas drillers may be proprietary, but much of it is found in well logs which can be found on the NM Tech or OCD websites.

The Capitan Aquifer - Ellenburger Production Wells – Geothermal Engine Source?: Prentice Creel: With over 29 years in the petroleum industry, Prentice is Senior Reservoir Engineer for Kinder Morgan CO2 in Midland. He showed the group maps and flow charts showing the subsurface structure under southeastern New Mexico and western Texas. Geothermal, he said, requires a large amount of hot water and a continual flow, to avoid having to lift it. The Capitan Reef formation, which includes Carlsbad Caverns, affords this opportunity. The subsurface is fractured in different directions at different depths, he said, and when water hits the Capitan Shelf both the rate and volume of flow increase, carrying the hot water east and down to the Ellenberger, which is highly fractured. From here it can be retrieved via wells. Prentice added that successful geothermal development depends on fracture capability and engineering, regulatory acceptance, meeting environmental standards, and funding. <u>Discussion</u>: There were questions about the legal status of "produced" water that is treated. Once clean, it becomes the property of the State of New Mexico and is regulated by the OSE.

**Raser Technologies Lightning Dock Geothermal Project: Michael Albrecht:** Currently a Project Development Manager and Senior Geophysicist with Raser Technologies in Utah, Michael has been involved in the geothermal industry for 20 years and has published several papers. Michael estimates that there are 8,000 MW that could be produced with geothermal resources in 22 countries, an amount which would provide 30 million people with electricity each year. Raser has 400,000 acres of geothermal interests in Washington, Oregon, Nevada, Utah and New Mexico. He explained his company's binary system which uses a heat exchange tank to flash the water to vapor, and then send it through turbines. The vapor is cooled and the resulting water is sent down the injection wells and circulated through hot rocks, to be drawn up again. The two systems are separate; the fluids never mix. There are no emissions. Raser is ready to build the Lightning Dock Project, but it is currently under protest from neighbors. Power capacity tests show temperatures of 200 degrees F at 200 feet, and a production of 4-7 MW.

<u>Discussion</u>: In answer to a question, Michael encouraged others planning projects to prevent, or resolve early on, any disputes. He hoped that those in conflict could sit down together and talk about all possibilities. His company hopes to work with the community to find applications that will be beneficial, even if it means additional permits and negotiation time. In the Lightning Dock situation, flow measurement data is in question. Michael offered to try to obtain the original flow data.

**Terra Thermal Geothermal Reservoir Engineering: Michael Timlin**: CEO of Terra Thermal, Mike offers services in exploration, development and production for geothermal producers. As a reservoir engineer, he plays a role in all three phases of a geothermal project. During exploration he analyzes data, logs and outputs from geoscientists. During development he refines estimates, works with models, reviews injection and re-injection strategies. During production, he monitors the reservoir performance, reviews the well testing plan, refines reserves and performs forecasts. Mike described an electric producing geothermal facility in New Zealand that utilizes a separator that carries dry steam in one pipe and water for transportation in the other. A condenser converts the wet steam to liquid, leaving waste heat to be disposed of. Mike emphasized the importance of identifying a variety of funding – low interest loans, tax credits, etc.

<u>Discussion</u>: There were questions about the model relating to reservoir evaporation and precipitation. The model does not account for precipitation, Mike said. The model also does not depict faults in the cap rock, which would probably result in different vegetation and other effects, like geysers, on the surface. There were also questions about who pays for the plants. Mike said funding is "all over the map," from the companies to government grants to loans and renewable energy credits (REC). The valuation of the REC can vary from \$ 10 to \$ 100 for a megawatt hour. Mike predicts that the federal government will establish a regulated market for trading credits.

Geothermal Studies in the Albuquerque Basin and Along La Ristra Seismic Profile, New Mexico: Marshall Reiter: Marshall has been a professor at the Earth and Environmental

Sciences Department at New Mexico Tech since 1975. He began subsurface temperature logging in 1965, and described to the group his heat flow findings in the Rio Grande region. He believes that there has been an increase in temperature in the region of almost 8 degrees F in the last 25 years, as a result of the vast expanses of asphalt. He and his researchers have also discovered a magma chamber 100 meters thick with liquid of 1200 degrees centigrade, over an area that is approximately 60 miles by 35 miles, and 19,000 feet below Socorro. This hot spot over the Rio Grande rift is in contrast to the relatively cool upper mantle of the neighboring Colorado Plateau. Marshall continues to do monitoring and measuring work in the Albuquerque Basin, and has preliminary data on an upper crustal thermal source in the Belen area south of Albuquerque.

<u>Discussion</u>: During the discussion Marshall emphasized the importance of communication and cooperation among federal and state agencies, the oil and gas industry, and others with an interest and something to offer the geothermal field. There are significant economic implications from the development of geothermal resources, which must be studied and understood.

**General Discussion:** Prior to lunch, and at the end of the conference, Stephen Lucero asked the group how his program could help those interested in promoting and developing geothermal resources. These two discussions are combined below.

### Legal and regulatory issues:

<u>State Lands</u>: There were questions about state lands and how geothermal development is handled. Apparently, it is similar to federal lands, with a competitive bid system, lease and 10% royalty. Some suggested that state land offices may be more interested in pursuing geothermal leases than the feds who are distracted with so many current crises. The contact for the NM State Land Office is Brian Bingham:

Renewable Energy Division Director Phone: (505)827-1252 E-mail: bbingham@slo.state.nm.us

<u>Definition of heat</u>: A participant asked how heat is defined in New Mexico. In Texas, it is a mineral; in New Mexico, on federal land, heat is a mineral.

In New Mexico, on federal land, heat is a mineral. On state or private land, it depends on the use and temperature. For example, above 250 degrees, it is considered a mineral and falls within the jurisdiction of the Oil Conservation Division (OCD) for power generation and the Office of the State Engineer (OSE) for water adjudicatory issues. Below 250 degrees, it is still a mineral and falls within the jurisdiction of the New Mexico Environment Department (NMED) for direct heat use when wells are installed and/or the OSE for water adjudicatory issues or when heat pumps instead of wells are used for direct heat or geothermal purposes. Heat is not considered a mineral at all if the geothermal extraction is only incidental to a beneficial use of the water, in which case the water is not considered geothermal and it falls only within the jurisdiction of the OSE. Contact person at OCD is Carl Chavez who can be reached at 505-476-3490, carlj.chavez@state.nm.us <u>Federal BTU meter requirements</u>: There was discussion about the federal requirement of a BTU meter on greenhouses, which was challenged by the OSE. Congress has acted to remove that requirement and replace it with a straight fee on the acreage.

<u>Transmission lines:</u> A participant asked about jurisdiction over transmission lines in New Mexico. WECC, WAPA and others have jurisdiction depending on the area of the state.

<u>Water rights:</u> There is confusion about the jurisdiction of the State Engineer over geothermal resources, given the factors of temperature, depth and quality.

The group was concerned about the need to maintain pressure in the reservoir if water is being lost to either evaporation or cooling towers, or both. Acquiring additional water resources in a water-scarce state, in time of drought, will be a challenge. Participants spoke about the opposition – on economic, cultural, and environmental grounds -- to buying agricultural water rights in many parts of the state.

<u>Water quality:</u> The NM Environment Department, Groundwater Bureau, is concerned with protecting groundwater quality from contamination, such as anti-freeze or other fluids found in groundwater heat source pump systems. The Department issues discharge permits for injection wells. Those wanting more information should contact John Hall 505-827-1049. John suggested anyone planning a project contact him. For larger projects, he asked for a Notice of Intent.

<u>CID</u>: There was an objection to the way that CID regulates the wages of well drillers. The agency mandates the same wage for those drilling shallow wells as those drilling deep wells, perhaps because the activity is publicly funded, suggested a participant. Another was concerned that CID, with jurisdiction over fluids in pumps, require adequate measures to protect the water resources that are encountered in drilling.

### Need to enlarge the conversation:

Many spoke of the need to better understand the roles of regulatory and advocacy agencies at the federal, state and local levels with respect to geothermal energy. An intergovernmental regulatory flow chart would be very useful. Other entities and interests were identified that need to be part of the conversation, including public power companies, rural electric coops, oil and gas industry, and state agencies (CID, OSE, NMED, Taxation and Revenue, and more).

There was particular interest in engaging with the oil and gas developers because of their vast experience and data on deep drilling, often encountering [unwanted] water sources. The thought was that these operators have critical knowledge, and a natural interest in maximizing underground resources.

Finally there was a strong recommendation to address potential conflict over geothermal development early. Participants recognize that there are those with a variety of interests – cultural, historical, environmental, agricultural, economic – who may oppose geothermal projects. The projects are very complex, even for the scientifically trained, and educating a skeptical and wary public is a challenge that must be undertaken. Getting together with these interests early,

both for educational outreach and for an honest, respectful discussion, will be critical in the ultimate success of any project. A participant suggested the state establish a stakeholder council to begin these discussions immediately, even prior to a site-specific project.

# Information gathering:

Participants asked the agency to: 1) compile existing information now scattered among many entities, and to 2) gather new site specific data on potential geothermal sites. Several spoke of the need for good, comprehensive maps and data bases showing geothermal resources, perhaps with overlays showing other relevant information – surface flows, temperatures, distribution lines, land ownership, oil and gas activity, etc. Well logs are now housed in different locations; creating a clearinghouse of data from well logs would be very useful. This kind of data, in one place, clear and accurate, could go a long way toward reducing risk for exploration. A second step should be the development of educational outreach programs to begin familiarizing citizens with the reality of geothermal.

### Funding and technical support:

When federal funding is available, it can be lost if state matching funds cannot be found. Anticipating this need and making state matches accessible would help those seeking to propose projects.

A participant also noted that the state program should advocate funding for RITA so that renewable energy transmission lines are available when geothermal electricity is produced.

Project proponents also need help responding to the very quick turnaround for the federal stimulus package funds. Those who want to apply for funds must submit a proposal to NMEMNRD by June 26, 2009. The agency is putting on a "webinar" to offer technical assistance on June 1.

Another participant pointed out that, although money is always needed, there is a wealth of equipment and manpower lying idle. If the state or feds could give an advance credit on royalties, or some other upfront funding mechanism, these resources could be put to work exploring and developing. This kind of incentive could help oil and gas exploration companies and drillers make the move to geothermal, bringing with them vast knowledge of the landscape.

Some pointed out that the industry itself needs help understanding the larger landscape of a geothermal project – the funding, the technology, regulations, natural features, environmental protection needs, cultural and political considerations. These factors, including the human factor, can determine the feasibility of a project.

Industry also often needs help responding to deadlines.

### Focus on shallow development:

Some felt that the DOE had little interest in the low temperature geothermal potential in New Mexico. Congress is pressuring the agency to focus on power generation, but participants pointed out that significant reduction in greenhouse gases can be achieved with low temperature

heat exchange systems for heating and cooling buildings. Reducing the demand for power through shallow projects, they said, is a valuable part of the renewable energy picture.

Additional submission: At the end of the conference, Lucy invited participants to contact her with any additional ideas about the role of the NMEMNRD Geothermal Program. Carl Chavez, Oil Conservation Division, EMNRD, offered the following:

At least two large geothermal projects are recommended to show how valuable, beneficial, and the magnitude of geothermal power production can be in New Mexico. One in the NW where NM Tech indicated there is good potential for high temp geothermal power production; and one in southern NM- McGregor Range? or Dona Ana area where a transmission grid may already be readily available. Certainly, the new power grid should be located near to these big geothermal project areas. EMNRD may want to hire a qualified consultant to provide a recommended list of preferred locations for large geothermal power plant generation with an emphasis on isolated areas or areas with existing grid system(s) with significant resources (i.e., water volume, sustainable flow rate, available hydrogeologic data, testing, etc.) needed to support major power producing operations quickly. The consultant may also be able to assist with SLO preferred locations for geothermal leasing?

Also, the SLO should be contacted to begin laying the foundation for geothermal land leasing sales. The OCD has placed its geothermal high temperature and low temperature information on its OCD Online website in order to observe past geothermal study areas in the State at <u>http://ocdimage.emnrd.state.nm.us/imaging/AEOrderCriteria.aspx</u> (search for "GTLT" or "GTHT" to see locations of past geothermal studies in the OCD files). The State Land Office may want to indentify the locations for future geothermal land leasing?

And, from Roger Cook, PermaWorks:

It would be great if your office, or some other official group would keep track of all geothermal projects in the state. I would really like to be able to see a total of the electrical cost savings due to using geothermal (at least for commercial uses and the total revenue generated (like the green house project that was reported on). I don't know how big this would be but it should get more significant with time and might be something that would help us get geothermal on the map while we are figuring out the electrical generation part of this.

Drilling in the right spots is clearly a complicated proposition as many of the presentations showed. However, it seems to me the state has a ton of data already. Clearly we need a comprehensive mapping effort to continue to look for new opportunities but I would like to see the state pick 3 - 5 of the best known sites and commit to putting in some electrical generation capabilities - and at least one of these should be reusing an oil or gas well that is used up. My assertion is that if we don't start doing something and getting some electrical generation on-line (like wind and solar) then we will always be left behind. It's not enough to go to meetings and pontificate about how we ought to be

doing geothermal, we need to mount a serious and organized approach and get this off the ground.

I personally agreed with the person who said our number one priority should be going after some of the stimulus money for geothermal power generation. Perhaps if we got the right heads together, we could identify the top choice in the state and go after just one with that money.

If the state is serious about this, you should set up a committee or sub-team and give them the task of getting this thing rolling. Otherwise, I'm afraid folks will just go back and publish more papers and not much of anything will really happen.

**Conclusion:** Stephen Lucero thanked the group for their attendance and contributions during the day. He said he looks forward to continuing to work in support of geothermal development in the state and in deepening the relationships within the group, as well as expanding to include others.

Summary prepared by Lucy Moore. Please contact her with comments or questions: 505-820-2166 or lucymoore@nets.com

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# **Summary of Discussion**

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Jim spoke about geothermal basic technologies and applications in New Mexico. He also provided in depth technical information on geologic conditions that support geothermal resources in New Mexico. Several important topics were presented to the group including: geothermal economics, resource assessment data, resource classification, project case studies and site specific geology. This presentation provided an excellent introduction to the technical presentations for this day.

<u>Discussion</u>: There were questions about the number and types of jobs related to electricitygenerating geothermal projects. A participant asked about the relationship between faults and siting conductive geothermal projects. Jim explained that a fault can provide the "hydrogeologic window" necessary for the conductive heat source. In addition, the damaged zone can be permeable, although the core will be less so. There was discussion about the difficulty of locating these zones. Many saw the potential for geothermal-heated and cooled greenhouses in the rural and agricultural parts of southern New Mexico, and perhaps even the Albuquerque and Socorro areas, where fresh water is available. This led to a discussion about the overappropriated waters of the state, and the need to buy or lease water rights from existing users, or identify water that is so deep (over 2,500 feet) or of such poor quality that the State Engineer has no jurisdiction.

**Ground Source Heat Pumps in NM Schools: Pat Gibson**: With over 28 years of HVAC and related experience, Pat is now co-owner and vice president of operations for Energy Control Inc. (ECI), Pat described the geothermal work EIC is doing in schools around the state. He installs ground source heat pumps to provide both heat and cooling for the school facilities. The technology is relatively simple, with no cooling towers or boilers, and it provides consistent temperature control year-round. With the pump and other equipment underground, the roof is free of clutter, and the technology is safe from vandalism. Funding can be put together in a variety of ways – bonds, capital outlay, mil levies, etc. School districts are eager to "go green," and geothermal is an attractive option, for existing schools or newly constructed ones, like the latest ECI project, the Amy Biehl School in Santa Fe.

<u>Discussion</u>: Pat explained that at the Amy Biehl School ECI found a consistent temperature of 65 - 67 degrees F at 300 feet. The source can be either above or below the groundwater. Wells are spaced about 20 feet apart. The Amy Biehl School has two vaults with 140 wells and ten circuits. Schools are ideal for these projects because of the large areas – parking lots, playgrounds, etc. – for wells and equipment. Retrofitting is more difficult because ground must be disturbed; installing during construction of a new school is ideal.

**REHAU Construction: Phil Marquez:** An account manager for REHAU, Phil supports customers in New Mexico, Arizona and Colorado. Phil described REHAU's new PEXa pipe for use in the geothermal gound source heat exchange pump. An alternative to HDPE, the PEXa is proving superior in stability, flexibility, resistance to heat and chemical reactions. The pipe is polyethelene that is 85% cross-linked through a special extruding process. The pipe returns to its original shape if kinked, can bend 5 times its diameter, and stretch 400%. It is available in single or double u-bends.

<u>Discussion</u>: In answer to questions, Phil said that PEXa was about 30% more expensive that HDPE, but that savings could be achieved in installation time and the use of fewer wells. With a

longevity of 200 years, repairs are minimal. A disadvantage of PEXa is its sensitivity to ultraviolet rays. Again the question arose about the role of the State Engineer. Although he admitted that it is a gray area, Phil felt that if the wells are dry, no permit is needed.

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**Ground Source Heat Pump Technologies: Jay Maze:** Jay has worked for Dahl Santa FE for 11 years. A licensed plumber in New Mexico and Colorado, he has worked with ground source heat pumps for over five years. Jay described several projects in northern New Mexico – two private homes, a ranch/conference center, and a spa/hotel. At Ojo Caliente, Dahl designed a system to capture the hot waste water from the hot springs to heat the hotel and pre-heat the domestic hot water for the facility. At the Blackstone Ranch, he designed a dual generation system for both hot water and air conditioning, using ice batteries. The pumps are turned on by the heating call and the cooling call. Putting the private home system underground reduced noise. Jay emphasized the benefit of including these applications in the development phase of subdivisions, commercial centers, schools, etc. for maximum efficiency.

<u>Discussion</u>: In answer to questions, Jay said that he believes the "climate is changing" with respect to clients' willingness to spend money upfront in order to use alternative energy and save money later. He gave more detail on the benefits of dual generation. The technology can heat and cool at the same time, by moving energy from place to place. It can pull heat out of the building and store the energy to heat hot water for use in the building.

**Geothermal Greenhouse Case Study: Jim Witcher:** Jim described the Radium Springs greenhouse project. Redesigning the conventional boiler, Jim installed a heat exchange system for this large greenhouse near Las Cruces which included shallow injection wells and deep production wells, which produce water at 600 degrees F. The facility uses hot water radiant heating to deal with sharp temperature drops at night. Energy costs for the greenhouse are 10 - 20% of what they were previously. The client is considering electrical generation as well.

<u>Discussion</u>: Jim is able to give tours of the greenhouse with advance notice. The building cost of geothermal greenhouses varies from \$ 4 to \$ 14 a square foot. In some cases, it is necessary to use reverse osmosis, or other treatment, to remove salts or contaminants and maintain an adequate water quality for the plants. Again, the question of water rights arose. NM water law requires a water right holder to divert water and put it to beneficial use. In this case, if water is injected back into the ground, the Office of the State Engineer usually grants a conditional water right.

**Geothermal Systems of the Basin & Range & New Mexico: Mark Person:** Mark described two different flow processes: forced convection and free convection. He also provided examples of fault-controlled, natural convection geothermal systems. He described two geothermal resource areas in Nevada and presented hydrologic data on the Socorro area. Also of great interest, Mark provided action items for future characterization of NM geothermal resources.

The USGS National Geothermal Resource Assessment: Marshall Reed: Geothermal Assessment Lead Geologist for the USGS in Menlo Park, California, Marshall evaluates characteristics of subsurface hot water and steam for a nationwide assessment. Although

electrical generation from geothermal resources has existed since 1904 in Italy and since 1960 in the US, its potential remains untapped. To produce electricity a system needs a heat source above 90 degrees centigrade, water as a heat exchange medium, and permeability in the reservoir. In 20 years, he explained, this country will need 30% more electricity or an additional 300 kMWe than is used today. One challenge to geothermal electrical production is the inevitable loss of megawatts as the reservoir loses pressure as a result in the loss of fluid in the system. Acquiring water rights can be difficult, and in some cases, sewage water has been injected.

<u>Discussion</u>: There were questions about the appropriateness of using the Hubbard curve. Marshall felt it was not appropriate because of different economic and political factors governing geothermal development. In answer to another question, Marshall explained that most of the heat loss happens in transmission, resistance to wires, etc. The closer to the source the energy is used the better, he said. There were questions about the location of geothermal sites in the assessment. The 241 points – 6 of which are in New Mexico -- will be on the internet.

**The Business of Geothermal Power: Richard Erdlac:** A private consultant, Richard has over 20 years experience working as a structural geologist for the oil and gas industry in West Texas. He spoke of a proposed power classification system that would show how geology, economics, engineering and other fields relate to the production of energy. He believes there is a wealth of information valuable for geothermal on seismic activity, temperature, reservoir structure and more, within the oil and gas community. Drillers hit hot water frequently – as hot as 400 degrees F -- and cap it as a nuisance. In Texas alone, 600,000 wells – as deep as 29,000 feet -- have been drilled, and there is data on each one. Furthermore, deepening these wells for geothermal would be much easier than drilling new wells. In addition, rights of way and transmission lines are in place for many of these locations. The oil and gas lease may even include the right to the heat found in hot water. Richard estimated the cost of a 20 MW project with wells 2,000 feet deep would cost \$4 - 5 million. Much of the initial risk in exploring for geothermal could be reduced by using oil and gas data and existing wells. Richard sees a natural economic partnership between the two industries.

<u>Discussion</u>: Some of the data from oil and gas drillers may be proprietary, but much of it is found in well logs which can be found on the NM Tech or OCD websites.

The Capitan Aquifer - Ellenburger Production Wells – Geothermal Engine Source?: Prentice Creel: With over 29 years in the petroleum industry, Prentice is Senior Reservoir Engineer for Kinder Morgan CO2 in Midland. He showed the group maps and flow charts showing the subsurface structure under southeastern New Mexico and western Texas. Geothermal, he said, requires a large amount of hot water and a continual flow, to avoid having to lift it. The Capitan Reef formation, which includes Carlsbad Caverns, affords this opportunity. The subsurface is fractured in different directions at different depths, he said, and when water hits the Capitan Shelf both the rate and volume of flow increase, carrying the hot water east and down to the Ellenberger, which is highly fractured. From here it can be retrieved via wells. Prentice added that successful geothermal development depends on fracture capability and engineering, regulatory acceptance, meeting environmental standards, and funding. <u>Discussion</u>: There were questions about the legal status of "produced" water that is treated. Once clean, it becomes the property of the State of New Mexico and is regulated by the OSE.

**Raser Technologies Lightning Dock Geothermal Project: Michael Albrecht:** Currently a Project Development Manager and Senior Geophysicist with Raser Technologies in Utah, Michael has been involved in the geothermal industry for 20 years and has published several papers. Michael estimates that there are 8,000 MW that could be produced with geothermal resources in 22 countries, an amount which would provide 30 million people with electricity each year. Raser has 400,000 acres of geothermal interests in Washington, Oregon, Nevada, Utah and New Mexico. He explained his company's binary system which uses a heat exchange tank to flash the water to vapor, and then send it through turbines. The vapor is cooled and the resulting water is sent down the injection wells and circulated through hot rocks, to be drawn up again. The two systems are separate; the fluids never mix. There are no emissions. Raser is ready to build the Lightning Dock Project, but it is currently under protest from neighbors. Power capacity tests show temperatures of 200 degrees F at 200 feet, and a production of 4-7 MW.

<u>Discussion</u>: In answer to a question, Michael encouraged others planning projects to prevent, or resolve early on, any disputes. He hoped that those in conflict could sit down together and talk about all possibilities. His company hopes to work with the community to find applications that will be beneficial, even if it means additional permits and negotiation time. In the Lightning Dock situation, flow measurement data is in question. Michael offered to try to obtain the original flow data.

**Terra Thermal Geothermal Reservoir Engineering: Michael Timlin**: CEO of Terra Thermal, Mike offers services in exploration, development and production for geothermal producers. As a reservoir engineer, he plays a role in all three phases of a geothermal project. During exploration he analyzes data, logs and outputs from geoscientists. During development he refines estimates, works with models, reviews injection and re-injection strategies. During production, he monitors the reservoir performance, reviews the well testing plan, refines reserves and performs forecasts. Mike described an electric producing geothermal facility in New Zealand that utilizes a separator that carries dry steam in one pipe and water for transportation in the other. A condenser converts the wet steam to liquid, leaving waste heat to be disposed of. Mike emphasized the importance of identifying a variety of funding – low interest loans, tax credits, etc.

<u>Discussion</u>: There were questions about the model relating to reservoir evaporation and precipitation. The model does not account for precipitation, Mike said. The model also does not depict faults in the cap rock, which would probably result in different vegetation and other effects, like geysers, on the surface. There were also questions about who pays for the plants. Mike said funding is "all over the map," from the companies to government grants to loans and renewable energy credits (REC). The valuation of the REC can vary from \$ 10 to \$ 100 for a megawatt hour. Mike predicts that the federal government will establish a regulated market for trading credits.

Geothermal Studies in the Albuquerque Basin and Along La Ristra Seismic Profile, New Mexico: Marshall Reiter: Marshall has been a professor at the Earth and Environmental

Sciences Department at New Mexico Tech since 1975. He began subsurface temperature logging in 1965, and described to the group his heat flow findings in the Rio Grande region. He believes that there has been an increase in temperature in the region of almost 8 degrees F in the last 25 years, as a result of the vast expanses of asphalt. He and his researchers have also discovered a magma chamber 100 meters thick with liquid of 1200 degrees centigrade, over an area that is approximately 60 miles by 35 miles, and 19,000 feet below Socorro. This hot spot over the Rio Grande rift is in contrast to the relatively cool upper mantle of the neighboring Colorado Plateau. Marshall continues to do monitoring and measuring work in the Albuquerque Basin, and has preliminary data on an upper crustal thermal source in the Belen area south of Albuquerque.

<u>Discussion</u>: During the discussion Marshall emphasized the importance of communication and cooperation among federal and state agencies, the oil and gas industry, and others with an interest and something to offer the geothermal field. There are significant economic implications from the development of geothermal resources, which must be studied and understood.

**General Discussion:** Prior to lunch, and at the end of the conference, Stephen Lucero asked the group how his program could help those interested in promoting and developing geothermal resources. These two discussions are combined below.

### Legal and regulatory issues:

<u>State Lands</u>: There were questions about state lands and how geothermal development is handled. Apparently, it is similar to federal lands, with a competitive bid system, lease and 10% royalty. Some suggested that state land offices may be more interested in pursuing geothermal leases than the feds who are distracted with so many current crises. The contact for the NM State Land Office is Brian Bingham:

Renewable Energy Division Director Phone: (505)827-1252 E-mail: bbingham@slo.state.nm.us

<u>Definition of heat:</u> A participant asked how heat is defined in New Mexico. In Texas, it is a mineral; in New Mexico, on federal land, heat is a mineral.

In New Mexico, on federal land, heat is a mineral. On state or private land, it depends on the use and temperature. For example, above 250 degrees, it is considered a mineral and falls within the jurisdiction of the Oil Conservation Division (OCD) for power generation and the Office of the State Engineer (OSE) for water adjudicatory issues. Below 250 degrees, it is still a mineral and falls within the jurisdiction of the New Mexico Environment Department (NMED) for direct heat use when wells are installed and/or the OSE for water adjudicatory issues or when heat pumps instead of wells are used for direct heat or geothermal purposes. Heat is not considered a mineral at all if the geothermal extraction is only incidental to a beneficial use of the water, in which case the water is not considered geothermal and it falls only within the jurisdiction of the OSE. Contact person at OCD is Carl Chavez who can be reached at 505-476-3490, carlj.chavez@state.nm.us

<u>Federal BTU meter requirements</u>: There was discussion about the federal requirement of a BTU meter on greenhouses, which was challenged by the OSE. Congress has acted to remove that requirement and replace it with a straight fee on the acreage.

<u>Transmission lines</u>: A participant asked about jurisdiction over transmission lines in New Mexico. WECC, WAPA and others have jurisdiction depending on the area of the state.

<u>Water rights:</u> There is confusion about the jurisdiction of the State Engineer over geothermal resources, given the factors of temperature, depth and quality.

The group was concerned about the need to maintain pressure in the reservoir if water is being lost to either evaporation or cooling towers, or both. Acquiring additional water resources in a water-scarce state, in time of drought, will be a challenge. Participants spoke about the opposition – on economic, cultural, and environmental grounds -- to buying agricultural water rights in many parts of the state.

<u>Water quality:</u> The NM Environment Department, Groundwater Bureau, is concerned with protecting groundwater quality from contamination, such as anti-freeze or other fluids found in groundwater heat source pump systems. The Department issues discharge permits for injection wells. Those wanting more information should contact John Hall 505-827-1049. John suggested anyone planning a project contact him. For larger projects, he asked for a Notice of Intent.

<u>CID</u>: There was an objection to the way that CID regulates the wages of well drillers. The agency mandates the same wage for those drilling shallow wells as those drilling deep wells, perhaps because the activity is publicly funded, suggested a participant. Another was concerned that CID, with jurisdiction over fluids in pumps, require adequate measures to protect the water resources that are encountered in drilling.

### Need to enlarge the conversation:

Many spoke of the need to better understand the roles of regulatory and advocacy agencies at the federal, state and local levels with respect to geothermal energy. An intergovernmental regulatory flow chart would be very useful. Other entities and interests were identified that need to be part of the conversation, including public power companies, rural electric coops, oil and gas industry, and state agencies (CID, OSE, NMED, Taxation and Revenue, and more).

There was particular interest in engaging with the oil and gas developers because of their vast experience and data on deep drilling, often encountering [unwanted] water sources. The thought was that these operators have critical knowledge, and a natural interest in maximizing underground resources.

Finally there was a strong recommendation to address potential conflict over geothermal development early. Participants recognize that there are those with a variety of interests – cultural, historical, environmental, agricultural, economic – who may oppose geothermal projects. The projects are very complex, even for the scientifically trained, and educating a skeptical and wary public is a challenge that must be undertaken. Getting together with these interests early,

both for educational outreach and for an honest, respectful discussion, will be critical in the ultimate success of any project. A participant suggested the state establish a stakeholder council to begin these discussions immediately, even prior to a site-specific project.

### Information gathering:

Participants asked the agency to: 1) compile existing information now scattered among many entities, and to 2) gather new site specific data on potential geothermal sites. Several spoke of the need for good, comprehensive maps and data bases showing geothermal resources, perhaps with overlays showing other relevant information – surface flows, temperatures, distribution lines, land ownership, oil and gas activity, etc. Well logs are now housed in different locations; creating a clearinghouse of data from well logs would be very useful. This kind of data, in one place, clear and accurate, could go a long way toward reducing risk for exploration. A second step should be the development of educational outreach programs to begin familiarizing citizens with the reality of geothermal.

### Funding and technical support:

When federal funding is available, it can be lost if state matching funds cannot be found. Anticipating this need and making state matches accessible would help those seeking to propose projects.

A participant also noted that the state program should advocate funding for RITA so that renewable energy transmission lines are available when geothermal electricity is produced.

Project proponents also need help responding to the very quick turnaround for the federal stimulus package funds. Those who want to apply for funds must submit a proposal to NMEMNRD by June 26, 2009. The agency is putting on a "webinar" to offer technical assistance on June 1.

Another participant pointed out that, although money is always needed, there is a wealth of equipment and manpower lying idle. If the state or feds could give an advance credit on royalties, or some other upfront funding mechanism, these resources could be put to work exploring and developing. This kind of incentive could help oil and gas exploration companies and drillers make the move to geothermal, bringing with them vast knowledge of the landscape.

Some pointed out that the industry itself needs help understanding the larger landscape of a geothermal project – the funding, the technology, regulations, natural features, environmental protection needs, cultural and political considerations. These factors, including the human factor, can determine the feasibility of a project.

Industry also often needs help responding to deadlines.

### Focus on shallow development:

Some felt that the DOE had little interest in the low temperature geothermal potential in New Mexico. Congress is pressuring the agency to focus on power generation, but participants pointed out that significant reduction in greenhouse gases can be achieved with low temperature

heat exchange systems for heating and cooling buildings. Reducing the demand for power through shallow projects, they said, is a valuable part of the renewable energy picture.

Additional submission: At the end of the conference, Lucy invited participants to contact her with any additional ideas about the role of the NMEMNRD Geothermal Program. Carl Chavez, Oil Conservation Division, EMNRD, offered the following:

At least two large geothermal projects are recommended to show how valuable, beneficial, and the magnitude of geothermal power production can be in New Mexico. One in the NW where NM Tech indicated there is good potential for high temp geothermal power production; and one in southern NM- McGregor Range? or Dona Ana area where a transmission grid may already be readily available. Certainly, the new power grid should be located near to these big geothermal project areas. EMNRD may want to hire a qualified consultant to provide a recommended list of preferred locations for large geothermal power plant generation with an emphasis on isolated areas or areas with existing grid system(s) with significant resources (i.e., water volume, sustainable flow rate, available hydrogeologic data, testing, etc.) needed to support major power producing operations quickly. The consultant may also be able to assist with SLO preferred locations for geothermal leasing?

Also, the SLO should be contacted to begin laying the foundation for geothermal land leasing sales. The OCD has placed its geothermal high temperature and low temperature information on its OCD Online website in order to observe past geothermal study areas in the State at <a href="http://ocdimage.emnrd.state.nm.us/imaging/AEOrderCriteria.aspx">http://ocdimage.emnrd.state.nm.us/imaging/AEOrderCriteria.aspx</a> (search for "GTLT" or "GTHT" to see locations of past geothermal studies in the OCD files). The State Land Office may want to indentify the locations for future geothermal land leasing?

And, from Roger Cook, PermaWorks:

It would be great if your office, or some other official group would keep track of all geothermal projects in the state. I would really like to be able to see a total of the electrical cost savings due to using geothermal (at least for commercial uses and the total revenue generated (like the green house project that was reported on). I don't know how big this would be but it should get more significant with time and might be something that would help us get geothermal on the map while we are figuring out the electrical generation part of this.

Drilling in the right spots is clearly a complicated proposition as many of the presentations showed. However, it seems to me the state has a ton of data already. Clearly we need a comprehensive mapping effort to continue to look for new opportunities but I would like to see the state pick 3 - 5 of the best known sites and commit to putting in some electrical generation capabilities - and at least one of these should be reusing an oil or gas well that is used up. My assertion is that if we don't start doing something and getting some electrical generation on-line (like wind and solar) then we will always be left behind. It's not enough to go to meetings and pontificate about how we ought to be

doing geothermal, we need to mount a serious and organized approach and get this off the ground.

I personally agreed with the person who said our number one priority should be going after some of the stimulus money for geothermal power generation. Perhaps if we got the right heads together, we could identify the top choice in the state and go after just one with that money.

If the state is serious about this, you should set up a committee or sub-team and give them the task of getting this thing rolling. Otherwise, I'm afraid folks will just go back and publish more papers and not much of anything will really happen.

**Conclusion:** Stephen Lucero thanked the group for their attendance and contributions during the day. He said he looks forward to continuing to work in support of geothermal development in the state and in deepening the relationships within the group, as well as expanding to include others.

Summary prepared by Lucy Moore. Please contact her with comments or questions: 505-820-2166 or lucymoore@nets.com

# Chavez, Carl J, EMNRD

From:	Chavez, Carl J, EMNRD
Sent:	Friday, April 30, 2010 7:27 AM
То:	Hall, John, NMENV; Johnson, Mike S., OSE; Heber, David, OSE; Altomare, Mikal, EMNRD; Lucero, Stephen A., EMNRD; Olson, Bill, NMENV; Fesmire, Mark, EMNRD;
	'Mike_Smith@blm.gov'; Martinez, Lisa, RLD; 'Adrienne.Brumley@blm.gov'; Brooks, David K.,
	EMNRD; Dalmy, Andy ., RLD; Baca, Jerome T., RLD; Pacheco, Rem, RLD; Aragon, Fermin ,
	RLD; VonGonten, Glenn, EMNRD; Chavez, Carl J, EMNRD; Rappuhn, Doug H., OSE;
	'rcerdlac@cleansed.net'
Cc:	'robert.prael@mms.gov'; 'Bailey, Jami'; Kessler, Gale M., TRD; Severson, Valdean H., TRD
Subject:	FW: Geothermal Who Does What 4-29-2010mma.docx
Attachments:	Geothermal Who Does What 4-29-2010mma.docx

Here's OCD's final draft going into next week's meeting at CID.

OCD hopes that you will discuss the attached Draft with your management in advance of the meeting, since this lays out the group's position on the geothermal program(s) in New Mexico. I will note that CID/RLD is not represented in the "Who Does What" and I think you guys fit in there somewhere..... Please help.. Also, a resource link to CID/RLD should probably be added into this future web page.... I think OCD is focused on direct use and royalty and taxation issues associated with power generation and direct use applications of the heat for heating buildings under CID/RLD, etc., since we've had little experience with issues in this area. The recent survey shared with the group from OSE provides key insight into the type of direct heat applications with environmental concerns for possible development by OCD/OSE/CID/RLD into a Form for direct use applications. What should permit fees be for direct use applications...... Should royalties be assessed on direct heat applications for heating residences, office buildings and/or commercial buildings.....?

Please note that representative from the NM State Land Office, Tax & Revenue Division & Federal Department of Interior (Minerals Management Services) have been copied, since they were notified of the New Mexico push to become the No. 1 Leader in Renewable Energy by the Governor of NM, and on a separate issue OCD's recent findings (February 2010) that it is indeed responsible for all aspects of geothermal use under its Geothermal Regulations. The attached DRAFT resource page serves to update stakeholders (fed & state) involved with geothermal through links to OCD Regulations and other agency resource pages and/or programs moving forward with the Governor of NM.

Thank you in advance......

Carl J. Chavez, CHMM New Mexico Energy, Minerals & Natural Resources Dept. Oil Conservation Division, Environmental Bureau 1220 South St. Francis Dr., Santa Fe, New Mexico 87505 Office: (505) 476-3490 Fax: (505) 476-3462 E-mail: <u>CarlJ.Chavez@state.nm.us</u> Website: <u>http://www.emnrd.state.nm.us/ocd/</u>index.htm (Pollution Prevention Guidance is under "Publications")

New Mexico Energy, Minerals and Natural Resources Department

# Oil Conservation Division (OCD) Geothermal Power Application, Direct Use Application, Bonding, Forms & Resource Information

(Draft Revised: 04/28/2010)

# Who Does What?

In New Mexico, on federal land, geothermal heat is considered to be a mineral and the BLM is involved with all direct use and power generation applications. On federal, state or private land, and on federal land where state involvement is also required, designation of geothermal heat as a "mineral" or "geothermal resource" it-depends on the use and whether it such use is "incidental" use of the heat."-. For example, it is considered a "mineral" and falls-therefore within the jurisdiction regulatory authority of the Oil Conservation Division (OCD) Geothermal Regulations whenever heat is extracted for direct use applications or power production. Tand the Office of the State Engineer (OSE) where has authority over issues of ground water appropriation issues exist.

Heat is not considered a mineral at all if Where the geothermal extraction is only "incidental" to a beneficial use of the water that is being extracted or appropriated, in which case the heat carried by that water is not considered a "mineral" and it the extraction or appropriation falls only solely within the jurisdiction of the OSE for purposes of regulation of where ground water is being appropriatedion. In such circumstances, the water extraction would *not* be regulated by the OCD.

ProjectsI involving geothermal extraction without the appropriation off ground water is not being appropriated, it falls outside of the realm-jurisdiction of the OSE but still fall within the purview of the OCD's regulatory duties, which. OCD is involved withencompass all uses of the "mineral" of geothermal heat as defined by statute. at temperatures below and above the boiling point. Some common threshold temperature ranges are: low temperature (< 90° C or 194° F), moderate temperature (90 – 150° C or 194 – 302° F), and/or high temperature (> 150° C or 302° F).

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# Geothermal Regulations:

WQCC Delegation of Authority to OCD for Geothermal Activities in New Mexico

Chapter 71: Energy & Minerals Article 5: Geothermal Resources Conservation Act Chapter 71, Article 5 NMSA 1978 Title 19: Natural Resources & Wildlife Title 19, Chapter 14 NMAC (11-15-83 Recompiled 12-31-01) Chapter 14: Geothermal Power Legislative Reference: New Mexico Annotated Code Title 19 Chapter 14-1; Title 19 Chapter 2-7; Title 19 Chapter 13-7 to 13-12 Water Quality Control Commission (WQCC) 20.6.2 NMAC (Class V Injection Well Designation) and 20.6.4 NMAC Geothermal (Required with all applications and/or sole application for direct heat projects w/o borings or wells with \$100 Filing Fee & 5-Yr. General Permit Fee Permit to Inject (C-108) (Required where production and/or injection wells are installed with \$100 Filing Fee & 5-Yr. Discharge Permit Fee \$1,700) Drilling & Work Over (G-101, 102 & 103), Well Test & Bond Forms: Geothermal Exploration & Production Forms (see "Geothermal Well Forms") Bonding (see "Bond Forms" GT-B-1 and GT-B-2) State Land Lease Agency: <u>New Mexico State Land Office</u> Leasing: Leases are available on a non-competitive basis. However, the Commissioner of Public Lands may at his/her discretion reject any application and offer the tract or tracts at public auction. Lands classified as "known geothermal fields" are leased through public auction through either sealed or oral bidding procedure. Lease Terms: 5 years Primary:

**Renewal:** Primary term can be renewed for additional 5 years and thereafter so long as geothermal resources are being produced or utilized or are capable of being produced or utilized in commercial quantities. **Rentals:** \$1.00 per acre or fraction thereof per year (escalates to \$5.00 per acre per year after primary lease term).

Royalties: 10 % of the gross revenue from the sale or use of steam, brines or hot water, associated gases or other forms of heat or energy derived from production with a minimum of \$2.00 per acre or fraction thereof per year. A royalty of not less than 2 % nor more than 5 % of the gross revenue received for the sale of mineral products or chemical compounds recovered from geothermal fluids. A royalty of 8 % of the net revenue for the operation of an energy producing plant on the leased land. A royalty of not less than 2 % nor more than 10 % of the gross revenue received from the operation of the geothermal resource for recreational, space heating, or health purposes.

### **Geothermal Resources:**

**Geo-Heat Center** Geothermal Education Office Geothermal Resources Council Annual Meeting New Mexico Bureau of Geology & Mineral Resources New Mexico Collocated Resources New Mexico Energy Conservation & Management Division Geothermal Website New Mexico Geothermal Working Group  $\Omega M$ New Mexico Oil Conservation Division Geothermal Search Engine (enter order type as "GTLT" or "GTHT") New Mexico State University- A Strategic Plan For New Mexico Geothermal Resources Development US Bureau of Land Management Geothermal Leasing in the Western United States Geothermal Leasing PEIS A User's Guide Geothermal Resource Maps Geothermal Resource Needs in New Mexico 100 Geothermal Technologies Program USGS Assessment of Moderate and High Temperature Geothermal Resources of the US USGS National Geothermal Resource Assessment **Contacts:** Conoga

Field Code Changed

<u>New Mexico Bureau of Geology & Mineral Resources</u> (Marshall Reiter 575-835-5306)

New Mexico Bureau of Land Management (Michael Smith 575-525-4421)

<u>New Mexico Economic Development Department (Brendan.miller@state.nm.us)</u>

<u>New Mexico Energy Conservation & Management Division</u> (Stephen Lucero 505-476-3324)

New Mexico Environment Department- Ground Water Quality Bureau (Direct Heat Contact John Hall 505-827-1049)

<u>New Mexico Office of the State Engineer</u> (Contact District Supervisor)

New Mexico Office of Taxation & Revenue (505-827-0825)

New Mexico Oil Conservation Division (Carl Chavez 505-476-3490)

New Mexico State Land Office (Brian Bingham 505-827-5760)

U.S. Geological Survey (Marshall J. Reed 650-329-5620)

U.S. Department of Energy (Curtis Framel 303-275-4872)

# Chavez, Carl J, EMNRD

From:	Chavez, Carl J, EMNRD
Sent:	Thursday, April 29, 2010 1:07 PM
То:	Bailey, Jami C.
Cc:	Altomare, Mikal, EMNRD; Bemis, John H.
Subject:	RE: royalty question regarding geothermal resources

Thanks Jami. The Department of Interior will address Federal royalty issues. Thanks again.

Carl J. Chavez, CHMM New Mexico Energy, Minerals & Natural Resources Dept. Oil Conservation Division, Environmental Bureau 1220 South St. Francis Dr., Santa Fe, New Mexico 87505 Office: (505) 476-3490 Fax: (505) 476-3462 E-mail: <u>Carl J. Chavez@state.nm.us</u> Website: <u>http://www.emnrd.state.nm.us/ocd/</u>index.htm (Pollution Prevention Guidance is under "Publications")

From: Bailey, Jami [mailto:]Bailey@slo.state.nm.us]
Sent: Thursday, April 29, 2010 12:39 PM
To: Chavez, Carl J, EMNRD
Cc: Altomare, Mikal, EMNRD; Bemis, John H.
Subject: RE: royalty question regarding geothermal resources

Carl,

I'm sorry, but no one from the SLO is available next week to meet with your group. I trust that the statute and SLO rule citations that I gave you yesterday will be sufficient to answer the questions concerning geothermal leases and royalty rates on state trust lands. However, if you need additional information, the SLO website may also be helpful. <u>http://www:nmstatelands.org</u> is our web address.

Thank you for the invitation, but we must decline at this time.

Jami Bailey

From: Chavez, Carl J, EMNRD [mailto:CarlJ.Chavez@state.nm.us]
Sent: Wednesday, April 28, 2010 2:39 PM
To: Bailey, Jami
Cc: Altomare, Mikal, EMNRD
Subject: FW: royalty question regarding geothermal resources

Jami:

Good afternoon. As a follow-up to our telephone call this afternoon regarding royalty issues on state lands, I am writing to request a State Land Office Representative to informally discuss royalty regulations or issues associated with geothermal extraction of heat on state lands to the OCD Geothermal Regulations Stakeholder Group on Wednesday, May 5, 2010 anytime between 10 a.m. and Noon either in person or via telephone conference call.

I have forwarded an earlier communiqué from Ms. Mikal Altomare regarding royalty issues in case this may assist the SLO in understanding OCD's inquiry(ies).

Thank you in advance.
Carl J. Chavez, CHMM New Mexico Energy, Minerals & Natural Resources Dept. Oil Conservation Division, Environmental Bureau 1220 South St. Francis Dr., Santa Fe, New Mexico 87505 Office: (505) 476-3490 Fax: (505) 476-3462 E-mail: <u>Carl J. Chavez@state.nm.us</u> Website: <u>http://www.emnrd.state.nm.us/ocd/</u>index.htm (Pollution Prevention Guidance is under "Publications")

From: Altomare, Mikal, EMNRD
Sent: Wednesday, April 28, 2010 2:27 PM
To: Chavez, Carl J, EMNRD
Subject: FW: royalty question regarding geothermal resources

This is the email I sent to the SLO – this is the individual listed on their site who is apparently in charge of royalty stuff.



Assistant General Counsel Oil Conservation Division Energy, Minerals & Natural Resources Department 1220 South St. Francis Drive Santa Fe, NM 87505 Tel 505.476.3480 ~ Fax 505.476.3462 <u>mikal.altomare@state.nm.us</u>

From: Altomare, Mikal, EMNRD Sent: Tuesday, March 30, 2010 2:14 PM To: 'gchavez@slo.state.nm.us' Subject: royalty question regarding geothermal resources

Ms. Chavez-

Hello - I am one of the attorneys over at the Oil Conservation Division, and although we are not involved in the collection of royalties, I have a couple of questions regarding the SLO's collection of royalties for geothermal resources that I was hoping you might be willing to help me out with.

I am currently involved in a Geothermal Resources working-group, along with a number of other individuals from the OCD and several other agencies (ECMD, NMED, BLM, OSE, etc.). In the course of our discussions regarding the Geothermal Resources Conservation Act and the definition of "geothermal resource" in New Mexico, we discussed the exclusion articulated at Section 71-5-2.1 (and which was further clarified by the NM Court of Appeals in the 2007 *Rosette v. U.S. Dept of Interior* case(142 NM 717)). Of course, our primary interest is with regard to the definition of "geothermal resource" as it relates to what does and does not fall within the scope of our regulatory duties/authority under the Act for purposes of issuing permits, etc.; however, that same exclusion and the *Rosette* line of cases also establishes the delineation between those instances for which royalties are due and those for which they are not. It was my impression after the working group meeting that there is some uncertainty regarding whether royalties are currently being paid by geothermal resource users/collected by the SLO for resources below 250 degrees that do not meet the 71-5-2.1 exception.

Can you advise regarding what your office's current practice is for royalty collection and compliance enforcement with regard to Geothermal resources, and whether royalties are sought/collected from GT resource users of resources below 250 degrees that are either a direct use of the heat or power production (i.e. not a mere incidental loss or extraction of heat)? If you are, does this apply to/is this being enforced as to small scale/residential projects? Public/government

buildings, schools, etc., as well? What about projects where no water is involved – i.e. closed loop, direct-heat-exchange systems?

I would appreciate any information you might be able to provide in this regard. If you are not the appropriate person to make these inquiries to, please feel free to forward it to the appropriate person/refer me to the appropriate person.

Thanks you, Mikal Altomare



Assistant General Counsel Oil Conservation Division Energy, Minerals & Natural Resources Department 1220 South St. Francis Drive Santa Fe, NM 87505 Tel 505.476.3480 ~ Fax 505.476.3462 <u>mikal.altomare@state.nm.us</u>

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### Not Direct Cse

# Closed Loop Heat Storage

Richard J. Erdlac, Jr., Ph.D., P.G. (TX, PA) Erdlac Energy <u>C</u>onsulting







## DEFINITION:

 Heat (thermal) derived from the earth (geo). rock and fluid (that fills the fractures and It is the thermal energy contained in the 1

pores within the rock) in the earth's crust.

CLASSIFICATION:

Low temp. (< 90°C or 194° F)

- Moderate temp (90°-150° C or 194°- 302° F) - High temp: (>150°C or 302°F)

Oregon Institute of Technology

Geo-Heat Cent

TING EEMIN Mann Outer co



**Geothermal Education Office** 









Working fluid brought into building and transfers heat through GHP units located throughout the building.



A polyethylene vault collects and controls outside heat transfer fluid between building mechanical system and underground heat exchanger.



Geoexchange Is About Heat Management

Managing and moving heat from one place to another is the job of a geoexchange system. This means using the soil, rock, and any inequipment, human activity, and a small amount that conducts from system, with this volume of earth acting as a rechargeable battery. The heat in the building is sourced from the sun, appliances and place fluid at shallow depths (-300 ft or less) as a heat storage the ground through a building's foundation naturally.





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requirements, increasing GHP expense and leading to their disuse by the public at a time when energy efficiency and savings is needed.
by 2015 that includes GHP systems. Collecting a royalty on heat used by GHP systems of these incentives and
2 - New Mexico passed GHP tax credits (personal, corporate), and is
then using the rock to "bank" excessive heat derived from other sources does not constitute a strict geothermal direct use application.
discussed (heat derived from sources other than geothermal). If surface property owner "owns" the ground (minus minerals) under their feet,
1 - Should be <u>EXCLUDED</u> from royalty payment for reasons already
ROVALIES - GHP
Cobcord Cobcord Cobcord

Craticans 2 Rovaltes - electrical power	"heat" is not like royalty on oil or gas, which are tangible.	he heat produced from a well is or can be used to generate ly 5 to 10 % (at best) efficiency exists in converting heat to hat about the unused portion of produced heat that goes und (if not linked to a direct use application)? Collecting it is like trying to collect royalty on sunlight or <u>airIT</u> <u>NE</u> . And if it can, the industry may die before it starts.
Rov Rov	1 – Royalty on "heat" in nature. Heat is no	2 - Not all of the heat electricity. Only 5 to electricity. What abo back into ground (if r royalty on heat is like royalty on heat is like CAN'T BE DONE. An CAN'T BE DONE. An CAN'T BE DONE. An orduced by geother produced by geother solar, and wind when

Gonstons S Rovaltes - Drectuse	I – If a product is being made, then like electricity the <u>royalty</u> should be collected on the product. The cost to the user for the energy plus the oyalty should be less than what the cost would be to the user if they consumed another form of energy, such as natural gas. Otherwise the producer will use another energy resource and the state will receive no oyalty based on geothermal usage.	P – New Mexico has 77 hot springs throughout the state. If any of them ine used for balneology (mineral bathing) as part of a business, how do you exercise a royalty when the hot springs themselves are natural at he earth's surface? You cannot stop the hot springs from flowing.
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### Chavez, Carl J, EMNRD

Subject:	Jay Stimmell Draft OCD Document
Location:	Office
Start:	Thu 5/6/2010 1:00 PM
End:	Thu 5/6/2010 5:00 PM
Recurrence:	(none)
Organizer:	Chavez, Carl J, EMNRD

Get the OCD draft reviewed by Glenn and Steve L. and sent to Jay Stemmell by 5/7/2010 COB, since I'm off on Monday, 5/10 when Jay want's OCD Draft.

Thanks for meeting with me this morning. It was a very informative meeting.

I've attached electronic copies of all of the documents that I distributed at the meeting.

- 1. the submission template
- 2. the draft submission for the Air Quality Bureau, which is an example of a submission
- 3. the Green Industries In NM document
- 4. the applicable section of the EMNRD 2008 Permit Requirements document for OCD
- 5. the applicable section of the EMNRD 2002 Permit Requirements document for OCD

### Chavez, Carl J, EMNRD

Subject: Location:	Clean Energy Geothermal Air Permitting Meeting Reminder OCD (Wendell Chino Bldg. 3rd Florr, 1220 South St. Francis Dr., Santa Fe, NM)	
Start: End:	Wed 4/28/2010 9:00 AM Wed 4/28/2010 10:00 AM	
Recurrence:	(none)	
Meeting Status:	Meeting organizer	
Organizer: Required Attendees:	Chavez, Carl J, EMNRD Stimmel, Jay, NMENV; VonGonten, Glenn, EMNRD; Chavez, Carl J, EMNRD; Lucero, Stephen A., EMNRD	

Carl and Glenn,

A Clean Energy Advisory Group was formed to develop a renewable energy project and green industry permitting guide.

The specific task as identified in the Governor's Executive Order 2010-001 is:

Directive III, Implementation of Clean Energy Economy Actions

3. New Mexico Environment Department ("NMED"): NMED shall implement and abide by the following directive:

a. NMED shall convene an advisory group to develop a permitting guide for renewable energy projects and green industries. The guide shall incorporate general permitting information, contacts for relevant regulatory agencies, and any additional information that could facilitate the permitting process. The advisory group shall include representatives of the Department of Game and Fish, the Office of the State Engineer, EMNRD's Oil Conservation Division, EDD and other stakeholders deemed appropriate by NMED, and shall consult with the Public Regulation Commission and other interested parties. NMED shall present the guide to the Green Jobs Cabinet and the Governor no later than June 30, 2010.

Richard Ezeanyim was identified as the representative for OCD. However, yesterday Richard identified the two of you as better contacts for this project.

I'll be out of the office for the rest of the day. If you have any questions please send an email and I'll respond when I return this evening.

Jay

Jay Stimmel New Source Review NMED Air Quality Bureau 1301 Siler Rd., Santa Fe, NM 87507 (505)476-4353/ fax (505)476-4375

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From: Stimmel, Jay, NMENV
Sent: Wednesday, April 21, 2010 8:05 AM
To: VonGonten, Glenn, EMNRD
Cc: Ezeanyim, Richard, EMNRD
Subject: RE: Clean Energy Permitting Advisory Group

Glenn,

I would like to meet with you to discuss EMNRD Geothermal Resource Permits and Effluent Discharge Plans. I do not have any time available until next Tuesday. I am available Tuesday morning, Tuesday afternoon after 3 PM and anytime on Wednesday. Tuesday at 3 PM would be optimal because I will be returning from Runnels to Siler and I could stop by EMNRD.

Jay

Jay Stimmel Air Quality Bureau New Mexico Environment Department 1301 Siler Rd., Santa Fe, NM 87507 (505)476-4353/ fax (505)476-4375

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From: Ezeanyim, Richard, EMNRD Sent: Tuesday, April 20, 2010 4:47 PM To: Stimmel, Jay, NMENV Subject: RE: Clean Energy Permitting Advisory Group - Submission Reminder

Jay:

Glenn Von Gonten – 476-3488 already submitted to you in my earlier e-mail, and Carl Chavez -476-3490. Note that even though we belong to one Department, we have very diverse Divisions dealing with some types of permits that I am not familiar with at all. That is why I sent you those names who deal with those permits directly. Before I sent their names to you, I contacted them individually and told them that you might be asking for these information from them. Thank you.

Richard

### Chavez, Carl J, EMNRD

From:Stimmel, Jay, NMENVSent:Wednesday, April 28, 2010 3:23 PMTo:Chavez, Carl J, EMNRD; VonGonten, Glenn, EMNRD; Lucero, Stephen A., EMNRDSubject:Clean Energy Permitting Guide

Categories: Red Category

Thanks for meeting with me this morning. It was a very informative meeting.

I've attached electronic copies of all of the documents that I distributed at the meeting.

- 1. the submission template
- 2. the draft submission for the Air Quality Bureau, which is an example of a submission
- 3. the Green Industries In NM document
- 4. the applicable section of the EMNRD 2008 Permit Requirements document for OCD
- 5. the applicable section of the EMNRD 2002 Permit Requirements document for OCD











Permit Submission Template v2.... S

AQB Permitting Green Industries in Submission rev1... NM.PDF

EMNRD - OCD 2008.doc

EMNRD - OCD 2002.doc

The tentative submission date for the draft submissions is May 10th. Please feel free to contact me if you have any questions. I will be out of the office tomorrow and Friday, but I will be checking my voicemail throughout the day and my email at the beginning and end of each day.

Jay

Jay Stimmel Air Quality Bureau New Mexico Environment Department 1301 Siler Rd., Santa Fe, NM 87507 (505)476-4353/ fax (505)476-4375



Please consider the environment before printing this e-mail

### PERMIT SUMMARIES TEMPLATE

All comments are in green text. Clickable links, which are underlined and in blue text, have been added throughout the document. The current hyperlinks are for the Air Quality Bureau. The links may be customized for your organization by right clicking on the link. Click on "Edit Hyperlink." Change the "Text to Display" and "Address" as necessary for your organization. If no link is required, click on "Remove Link" and the link will be converted to normal text. Use specific links whenever possible.

Keep it simple and be concise. Use links to information instead of detailed explanations.

- 1. X DEPARTMENT Enter department
- **1.1 X DIVISION** Enter Division
- **1.1.1 X BUREAU** Enter Bureau

**INTRODUCTION** This section contains an overview of your organization, permitting/approval requirements and types of permits.

**Permit Administration** - Description of administering agency and its role. Describe your agency and its authorities and responsibilities. Also identify any limitations such as, the agency does not have primacy, it does not have authority on tribal land, etc.

When a permit or other action is required - Identify when a permit, license, certification, registration, lease or other approval is required. (The term permit will be used for the rest of this document to represent any type of required action.) Identify actions, processes and limits that require permits.

Types of permits or other actions - Identify the types of permits that may be required by green industries (see *Green Industries in NM* document). Also identify activities that may be exempt from the permitting process.

**1.0 NAME OF PERMIT OR APPROVAL** Enter the name of the permit with notation indicating mandate by State (S), Federal (F), or county (C) government.

### A. STATUTORY AUTHORITY:

• Title of State statutes authorizing permit and the legal citations of each with notation indicating pending changes (P) to the statute(s); § - section, §§ - sections.

### B. **REGULATIONS**:

• State and/or Fedreral <u>regulation(s)</u> which apply to permit with notation indicating <u>pending changes</u> (P) to the regulation(s). Identify all pertinent regulations.

### C. SUMMARY OF PERMIT/APPROVAL PROCESS:

Summary of major steps involved in the permit/approval process.

### 1. Applicability

Identify all applicable activities and thresholds that require this permit.

### 2. <u>General Requirements</u>

Conditions which must be met by the project applicant before a permit can be acquired, excluding submission of operations requirements. Identify when in the sequence of events the permit is required. Address modifications and revisions to existing permits.

### 3. Submission Requirements

Types of information which the project sponsor must include in the application for the permit. Provide a link to the <u>application</u> or other appropriate document.

### 4. Procedures for Obtaining Permit or Approval

Includes information on items such as submittal procedures, completeness and technical review, public notice, comment and hearing periods, preliminary and final decisions, inspections. Identify time limits for issuance of a permit or if it is open-ended, provide a reasonable estimate of the time required with language to identify that this is only an estimate and under extenuating circumstances, the estimate may not be accurate.

### 5. Operations Requirements

Conditions which are established by the regulatory agency following permit approval and which must be met by the permittee in order to continue operations.

### 6. <u>Fees</u>

Costs incurred for obtaining and maintaining the permit.

### 7. Appeal Process

Process whereby decisions concerning permit approval/denial that are made by a regulatory agency can be appealed.

### D. AVAILABLE ASSISTANCE:

Identify any agency programs or processes that may provide assistance such as: <u>small business programs</u>, <u>pollution prevention assistance</u>, pre-application meetings, consultant lists, and any other available assistance. Only identify assistance that is specific to this permitting action. A separate section will identify generic assistance that is available.

• See section three of this guide for additional assistance resources.

### E. INCENTIVES

Identify any incentives that are available, such as tax breaks and loans. Only identify incentives that are specific to this permitting action. A separate section will identify generic incentives that are available.

• See section one of this guide for additional information about incentives.

### F. GREEN INDUSTRY SPECIFIC INFORMATION

• Identify specific considerations or requirements for green industries. The major target industries for this project are:

- 1. Renewable energy facilities
  - 1. Solar backup gas fired boilers
  - 2. Wind painting
  - 3. Geothermal
  - 4. Biomass combustion sources
- 2. Clean technology manufacturing
  - 1. Solar component- combustion sources
  - 2. Wind turbines combustion sources, surface coating, bead blasting
- 3. Biofuels
  - 1. Algae
  - 2. Crop-based
- 4. Bio-gas Production
  - 1. Manure-based
  - 2. Landfill-based
  - 3. Wastewater treatment
- 5. Sustainable Agriculture
  - 1. Humate crushing and screening
- 6. Other

A more detailed list of green industries is listed in the *Green Industries in NM* document.

### G. ADDITIONAL INFORMATION:

- Expedited or streamlined processes
- Frequently asked questions
- Provide a link to a contact list if available. XXXXX Bureau Contact List

- Compliance/enforcement information
- Any additional relevant information.

### H. ADMINISTERING AGENCY:

Provide **permitting point of contact**, telephone number address and email address. Name of agency, address, telephone number and website address (if applicable).

Joe Permitwriter 505-476-XXXX joe.permitwriter@state.nm.us

XXXX Bureau XXXXX Department 1301 Siler Rd., Building B Santa Fe, New Mexico 87507 (505)476-4300 Web site: http://www.nmenv.state.nm.us/agb/

Name of the counterpart federal agency and its head, address, and telephone number, website address, and e-mail address (if applicable).

### 2.0 NAME OF PERMIT OR APPROVAL

### A. STATUTORY AUTHORITY:

Only the initial introduction section is required. Provide sections A-H for every type of permitting action.

### 1. New Mexico Environment Department

### **1.1** Environmental Protection Division

### 1.1.1 Air Quality Bureau

### Introduction

### Permit Administration

Air quality construction and operating permits are issued and enforced by the New Mexico Environment Department Air Quality Bureau and can also be enforced by the United States Environmental Protection Agency (USEPA). The Air Quality Bureau is responsible for the review and issuance or denial of permit requests. This authority applies to all New Mexico counties **except** Bernalillo County and Indian Lands.

The AQB administers most Federal Air Programs, which include: New Source Performance Standards (NSPS) National Emission Standards for Hazardous Air Pollutants (NESHAPS) Prevention of Significant Deterioration (PSD) Title V Operating Permits Title III Air Toxics Title IV Acid Rain

### When a permit or other action is required

- A construction permit is required for facilities that have a potential emission rate (PER) that is greater than 10 pounds per hour (pph) and 25 tons per year (tpy). Refer to <u>20.2.72.200 NMAC</u> for applicability.
- A Notice of Intent is not a permit, but is required for facilities that have a PER of less than 10 pph, but more than 10 tpy of any regulated air contaminant. Refer to <u>20.2.73.200 NMAC</u> for applicability.
- Some common green industry equipment that are subject to one of the above permitting actions: engines, gas-fired heaters and ovens, boilers, and surface coating equipment.
- There are few exemptions to the permit requirement. The Construction Permits regulation, 20.2.72.202 NMAC provides a complete list. Some examples include:
  - o Standby generators operated less than 500 hours per year
  - o Enclosed abrasive blasting operations
  - Painting of equipment resulting in less than 10 pph and 2 tpy of emissions of volatile organic compounds
  - o Maintenance of equipment (excluding painting) and facilities.
- Do I need a permit?

### Types of Permits or other actions

<u>No permit required</u> - Facilities that emit less than 10 tons per year of any criteria pollutant do not need an air quality permit nor do they need a Notice of Intent.

Notice of Intent - See previous section

Construction permit - See previous section

<u>Title V Operating permit</u> - Major sources that have a potential to emit more than 100 tons per year for criteria pollutants require a Title V permit. In addition, TV major sources also include facilities that have the potential to emit greater than ten tons per year of a single Hazardous Air Pollutant, or 25 tons per year of any combination of Hazardous Air Pollutants (HAP). These facilities are subject to and the associated operating permits are issued pursuant to regulation <u>20.2.70 NMAC</u>.

<u>Prevention of Significant Deterioration permit</u> - Facilities subject to Prevention of Significant Deterioration standards must obtain a PSD permit prior to construction or modification.

### **1.0 NAME OF PERMIT OR APPROVAL: Construction Permit (S)**

### A. STATUTORY AUTHORITY

Air Quality Control Act, NMSA 1978, §§ 74-2-1 through 74-2-17 (specifically, § 74-2-7).

### **B. REGULATIONS**

- <u>20.2 NMAC</u>, Air Quality (Statewide)
  - o <u>20.2.3 NMAC</u>, Ambient Air Quality Standards.
  - o <u>20.2.72 NMAC</u> Permits (Construction or Modification).
  - o <u>20.2.73 NMAC</u>, Notice of Intent and Emissions Inventory Requirements.
  - o <u>20.2.75 NMAC</u>, Filing and Permit Fees.
  - o 20.2.77 NMAC, New Source Performance Standards.
  - <u>20.2.78 NMAC</u>, National Emission Standards for Hazardous Air Pollutants (NESHAP).

Additional regulations may apply.

Proposed changes to the regulations.

### C. SUMMARY OF PERMIT/APPROVAL PROCESS

1. <u>Applicability</u>

Construction Permit Threshold Requirements:

• Potential to emit more than 10 pounds per hour or more than 25 tons per year (20.2.72 NMAC, Minor source permit required prior to construction or modification).

- Facilities for which New Source Performance Standards or National Emission Standards for Hazardous Air Pollutants apply, 20.2.72 NMAC permit required prior to construction or modification.
- Facilities with Toxic air pollutant emissions above the threshold in 20.2.72 NMAC, require a permit prior to construction or modification.
- 2. <u>General Requirements</u>
  - Affected sources must obtain an Air Quality Permit before beginning construction or modification.
- 3. <u>Submission Requirements</u>
  - Completed application including \$500.00 application fee
  - <u>Dispersion modeling</u> to show compliance with ambient concentration requirements. See <u>dispersion modeling guidelines</u> for information about modeling waivers.

### 4. Procedures for Obtaining Permit or Approval

- Submit application to AQB.
- 30 (+) days completeness review period Within 30 days of receiving an application and application fee, AQB reviews package and notifies applicant of any additional information required to rule the application administratively complete. The completeness review period can take as long as it takes applicant to provide any missing information.
- 90-day evaluation period. After the application is ruled complete the AQB has 90 days to evaluate the permit, and issue or deny it. During the evaluation period a 30-day public comment period is provided.
- If during the public comment period a public hearing is requested and granted, there is a minimum 30 day notice requirement to advertise the hearing, and additional time to conduct the hearing process.

### 5. Operations Requirements

- Applicant must comply with all applicable emission limit regulations or the emission rates specified in the application, whichever is lower as necessary to meet ambient standards, and any other conditions placed in the permit.
- Performance tests and/or facility inspection may be required within 60 days of full production but not more than 180 days from start-up.
- The Construction Permit does not require periodic renewal.
- 20.2.73 NMAC lists the emission inventory requirements.
- A permit may be cancelled:
  - 1) If construction or modification does not begin within 2 years of permit issuance;
  - 2) If construction or modification is suspended for a total of 1 year; or
  - 3) If operation ceases for 5 years.

- 6. <u>Fees</u>
  - \$500.00 application fee.
  - Permit fees will be assessed based on type of permit and emission levels and are determined by the schedule in the <u>fee regulation</u>, which correlates to the amount of work required to process the application.
  - Permit fee must be paid within 30 days of the invoice. Failure to pay is grounds for permit denial.
  - All facilities issued a permit are subject to an <u>annual fee</u> that changes every year based on the Consumer Price Index.

### 7. <u>Appeal Process</u>

Participants in the permitting process have a right to <u>appeal</u> (20.2.72.207 NMAC) the final permit decision to the <u>Environmental Improvement Board</u>, and subsequently to the New Mexico Court of Appeals

### D. AVAILABLE ASSISTANCE

- <u>Pollution prevention assistance</u> is available
- Small business assistance is available at 505-222-9507 or 505-222-9583.
- A list of consultants can be provided.
- Pre-application meetings are available and recommended prior to submission of the application.
- See section three of this guide for additional assistance resources.

### E. INCENTIVES

- Permitting and annual fees are reduced for small businesses.
- See section one of this guide for additional information about incentives.

### F. GREEN INDUSTRY SPECIFIC INFORMATION

Activities, equipment and processes have been identified that may generate sufficient emissions to require a permit. Whether or not a permit will be required must be determined on a case by case basis.

- **1.** Renewable energy facilities
  - a. Solar backup gas fired boilers
  - b. Wind painting
  - c. Geothermal
  - d. Biomass combustion sources, size reduction equipment
- 2. Clean technology manufacturing
  - a. Solar component- combustion sources

- b. Wind turbines combustion sources, surface coating, bead blasting
- **3.** Biofuels
  - a. Algae
  - b. Crop-based
- 4. Bio-gas Production
  - a. Manure-based
  - b. Landfill-based
  - c. Wastewater treatment
- 5. Sustainable Agriculture
  - a. Humate crushing and screening
- 6. Other

Note: This section is still incomplete.

### G. ADDITIONAL INFORMATION

- There are no expedited or streamlined processes for green industry construction permits.
- Frequently asked questions (FAQs)/Small Business FAQs
- Air Quality Bureau contact list for specific topics

### H. ADMINISTERING AGENCY

Permitting contact: Jay Stimmel 505-476-4353 jay.stimmel@state.nm.us

Agency Information: <u>Air Quality Bureau</u> (S) <u>New Mexico Environment Department</u> 1301 Siler Rd., Building B Santa Fe, New Mexico 87507 505-476-4300 <u>http://www.nmenv.state.nm.us/aqb/</u>

Environmental Protection Agency: Chief, SIP Section (F) U.S. EPA Region 6, 6PD-L 1445 Ross Avenue Dallas, Texas 75202-2733 (214)655-7242 http://www.epa.gov/earth1r6/6pd/air/sip/sip.htm

### 2.0 PERMIT OR APPROVAL: QUALIFIED GENERATING FACILITY CERTIFICATION

- A. STATUTORY AUTHORITY
- B. REGULATIONS
- C. SUMMARY OF PERMIT/APPROVAL PROCESS
- D. AVAILABLE ASSISTANCE
- E. INCENTIVES
- F. GREEN INDUSTRY SPECIFIC INFORMATION
- G. ADDITIONAL INFORMATION
- H. ADMINISTERING AGENCY

### Green industries in New Mexico

### 1. Renewable energy generation

- a. Scale
  - i. Utility scale
  - ii. Community scale
  - ili. Customer scale
- b. Technology
  - i. Solar
  - ii. Wind
  - iii. Geothermal
  - iv. Biomass
- 2. Biofuels research, development and production
  - a. Feed stocks
    - i. Algae blofuels
    - ii. Camelina and other crop-based biofuels
  - b. Developmental stage
    - i. R&D
    - ii. Production
- 3. Bio-gas producers
  - a. Manure-based
  - b. Landfill-based
  - c. Wastewater treatment
- 4. Smart grid / green grid
  - a. R&D
  - b. Technical deployment
  - c. Management and operation
  - d. Renewable energy / carbon credit trading
- 5. Energy efficiency and green building
  - a. Job types
    - i. Rating
      - ii. Design, architecture
      - ili. Construction
      - iv. Weatherization
  - b. New or existing
    - I. New construction
    - ii. Retrofits and remodels
  - c. Building types
    - i. Commercial
    - il. Industrial
    - iii. Residential
    - iv. Institutional

- d. Criteria
  - i. Build Green NM
  - il. LEED
  - ili. HERS
- 6. Clean Technology Manufacturing
  - a. Solar thermal component manufacturing
  - b. Solar PV component manufacturing
  - c. Water purification manufacturing
  - d. Air purification manufacturing
  - e. Wind, geothermal, biomass component manufacturing
  - f. Green building products and modular building manufacturing
- 7. Recycling and reuse
  - a. Recycling processors
  - b. Recycled product manufacturing
  - c. Waste oil processors and component manufacturing
- 8. Low-carbon transportation
  - a. Mass transit
  - b. Hybrid, electric and CNG vehicles
- 9. Efficient fossil-fuels technology and carbon
  - capture and sequestration
    - a. Advanced extraction
      - b. Carbon capture and sequestration
- 10. Air and water quality
  - a. Protection
  - b. Products
- 11. Sustainable agriculture
  - a. Organic and low-impact farming and ranching
  - b. Local food security
- 12. Ali industries
  - a. Energy efficiency and material waste reduction
  - b. Environmental compliance and protection

(In addition, the NMGC believes it is important to address indirect green jobs, such as bookkeepers, purchasing agents, and many others.)

### 2.2. OIL CONSERVATION DIVISION

### 2.2.1. DISTRICT OFFICES – OIL, NATURAL GAS, AND GEOTHERMAL RESOURCES PERMITS

### INTRODUCTION

The Oil Conservation Division (OCD) of the New Mexico Energy, Minerals and Natural

Resources Department has responsibility for issuance of permits pertaining to the drilling,

development and production of oil, natural gas and geothermal resources under the

authority of the Oil and Gas Act, Geothermal Resources Act and Water Quality Act. The

purpose of these permits is to prevent waste and protect correlative rights, and to protect

oil, gas, potash, geothermal water or other fresh waters. A publication titled "Rules and

Regulations" summarizestheserequirementsandisavailable from the OCD.

### A. NAME OF PERMIT OR APPROVAL

•Various permits and titles for drilling, production, transportation, storage, enhan ced recovery, disposal of coproduced fluids, and related activities relative to oil, natural gas, carbon dioxide and geothermal resources. (S, F)

### **B. STATUTORY AUTHORITY**

- Oil and Gas Act, NMSA 1978, §§7021 et seq.
- Geothermal Resources Conservation Act, NMSA 1978, §7151 et seq.

### C. TITLE OF REGULATIONS

- 19.15 NMAC, Oil and Gas.
- 19.14 NMAC, Geothermal Power.

### D. SUMMARY OF PERMIT/APPROVAL PROCESS

- Applicant submits application on appropriate
- OCD forms, or in accordance with appropriate rules, to OCD.
- Administrative and technical review by OCD staff.
- Final approval by OCD.
- Compliance of application with appropriate rules and policy.

### 1. Applicability

• Activities relative to oil, natural gas, carbon dioxide and geothermal

resources such as drilling, transportation of crude product, fluid disp osal, production, storage and enhanced recovery.

- 2. General Requirements
  - Each of the permits must be obtained prior to initiation of the ap plicable activity.
- 3. Submission Requirements
  - Various specific requirements for each permit are included in Rules a nd Regulations and appropriate policy memoranda.

4. Procedures for Obtaining Permit or Approval

- Vary according to each permit.
- Applicant submits application to applicable agency.
- Applications to drill in conformance with rulesmay be approved immediately.
- 0

Applications for administrative orders require a waiting period of 15 to 30 days.

• • Applications for hearing must be published 10 days in advance of the hearing.

- Time review and approval by applicable agency.
- Estimated processing time, 46 weeks.

5. Operations Requirements

 Permittees must follow general rules and regulations, any appropri ate special

pool rules and any special conditionsset out in the permit.

- 6. Fees
  - O None.

7. Appeal Process

- Concerned parties may request a public hearing.
- A de novo and rehearing process is provided.
- Further action must be pursued in District Court.

### E. ADMINISTERING AGENCY

Director, Oil Conservation Division(S) Energy, Minerals and Natural ResourcesDepartment Wendell ChinoBuilding 122 0 South St. Francis Drive Santa Fe, NM87505 Phone: (505) 4763440 Fax: (505) 4763462 www.emnrd.state.nm.us/OCD

New Mexico State Director (F) Bureau of Land Management U.S. Department of the Interior 1474 Rodeo Road P.O. Box 27115 Santa Fe, NM 875027115 Phone: (505) 4387400 Fax: (505) 4387426 www.blm.gov/nm/st/en.html

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### 2.2.2. ENVIRONMENTAL BUREAU – EFFLUENT DISCHARGE PLAN

### INTRODUCTION

The Oil Conservation Division (OCD) of the New Mexico Energy, Minerals and Natural

Resources Department has responsibility for approval of effluent discharge plans under

the authority of the Water Quality Act. The purpose of this permit is to prevent discharge

of pollutants into underground water supplies, which would cause ground water to be

contaminated.

### A. NAME OF PERMIT OR APPROVAL

- Effluent Discharge Plan Approval. (S)
- **B. STATUTORY AUTHORITY** 
  - New Mexico Water Quality Act, NMSA 1978, §§7461 et seq.

### C. TITLE OF REGULATION

• 20.6.2.3000 NMAC, Permitting and Ground Water Standards.

### D. SUMMARY OF PERMIT/APPROVAL PROCESS

• Natural gas processors, crude oil

refiners, geothermal resource users, brine manufacturing facilities, oil field service co mpanies and users whose operations may result in a directly related effluent shall su bmit a discharge plan to prevent

and remediate ground water contaminated due to oil, gas or geothermal operations. Plans must be submitted in triplicate in accordance with the Water

Quality Control Commission Regulations to OCD.

- Final review and approval by OCD.
  - 1. Applicability
    - This plan approval applies to effluent disposal that may move directly or indirectly into ground waters having total dissolved solids concentrations of 10,000 mg/l or less. (The purpose is to maintain contaminant levels at or below those set out in 20.6.2.3103 NMAC.)
  - 2. General Requirements
    - New applicants must obtain plan approval prior to initiation of discharge activities unless notified by OCD that a plan is not necessary. Existing facilities must submit plan for approval after OCD notification.
  - 3. Submission Requirements
    - The comprehensive report should contain complementary chart

s and diagrams outlining the methodology and processes to be used for disposing of effluent and protection of ground water.

4. Procedures for Obtaining Permit or Approval

- Applicant submits notice to submit a discharge plan to OCD.
- Technical review of plan by OCD (60 days).
- Public notice and comment period (30 days).
- Public hearing notice, if required (30 days).
  - 5. Operations Requirements
- Applicant must operate in accordance with approved discharge plan.

• Applicant submits periodic data and results of testing as set forth in each discharge plan to OCD.

• OCD has the right to inspect the discharge plan facilities and copy records of test data.

### 6. Fees

Fees have been assessed since 1991 based upon size of discharge.
 For further information, contact the OCD Environmental Bureau at (505) 4763490.

7. Appeal Process

• Discharger files written request to the Director of OCD seeking the Water Quality Control Commission's consideration.

• Discharger can appeal the Commission's findings to the Court of Appeals und er NMSA 1978, §7465.

### E. ADMINISTERING AGENCY

Chief, Environmental Bureau (S) Energy, Minerals and Natural ResourcesDepartment Wendell ChinoBuilding 1220 South St. Francis Drive Santa Fe, NM87505 Phone: (505) 4763440 Fax: (505) 4763462 www.emnrd.state.nm.us/OCD

### OIL CONSERVATION DIVISION

### 2.7 OIL, NATURAL GAS, AND GEOTHERMAL RESOURCES PERMITS

### INTRODUCTION

The Oil Conservation Division (OCD) of the New Mexico Energy, Minerals and Natural Resources Department has responsibility for issuance of permits pertaining to drilling, development, and production of oil, natural gas, and geothermal resources under the authority of the Oil and Gas Act, Geothermal Resources Act, and Water Quality Act. The purpose of these permits is to prevent waste and protect correlative rights, and to protect oil, gas, potash, geothermal water, or other fresh waters. A publication titled "Rules and Regulations" summarizes these requirements and is available from the OCD.

### A. NAME OF PERMIT OR APPROVAL

 Various permits and titles for drilling, production, transportation, storage, enhanced recovery, disposal of co-produced fluids, and related activities relative to oil, natural gas, carbon dioxide and geothermal resources. (S, F)

### B. STATUTORY AUTHORITY

- Oil and Gas Act, NMSA 1978, §§70-2-1 et seq.
- Geothermal Resources Conservation Act, NMSA 1978, §71-5-1.

### C. TITLE OF REGULATIONS

- 19.15 NMAC, Oil and Gas.
- 19.14 NMAC, Geothermal Power.

### D. SUMMARY OF PERMIT/APPROVAL PROCESS

- Applicant submits application on appropriate OCD forms or in accordance with appropriate rules to OCD.
- Administrative and technical review by OCD staff.
- Final approval by OCD.
- Compliance of application with appropriate rules and policy.
  - 1. Applicability
    - Activities relative to oil, natural gas, carbon dioxide and geothermal resources such as drilling, transportation of crude product, fluid disposal, production, storage, and enhanced recovery.
  - 2. General Requirements

- Each of the permits must be obtained prior to initiation of the applicable activity.
- 3. Submission Requirements
  - Various, specific requirements for each permit are included in Rules and Regulations and appropriate policy memoranda.
- 4. Procedures for Obtaining Permit or Approval
  - $\succ$  Vary according to each permit.
  - > Applicant submits application to applicable agency.
  - Applications to drill in conformance with rules may be approved immediately.
    - Applications for administrative orders require a waiting period of 15 to 30 days.
    - Applications for hearing must be published 10 days in advance of the hearing.
  - Time review and approval by applicable agency.
  - > Estimated processing time, 4-6 weeks.
- 5. Operations Requirements
  - Permittees must follow general rules and regulations, any appropriate special pool rules, and any special conditions set out in the permit.
- 6. Fees
  - None.
- 7. Appeal Process
  - Concerned parties may request a public hearing.
  - A de novo and rehearing process is provided.
  - > Further action must be pursued in District Court.

### E. ADMINISTERING AGENCY

Director, Oil Conservation Division (S) Energy, Minerals and Natural Resources Department 1220 South St. Francis Drive Santa Fe, NM 87505 (505) 476-3440 www.emnrd.state.nm.us/ocd New Mexico State Director (F) Bureau of Land Management P.O. Box 27115 Santa Fe, NM 87502-7115 (505)438-7400 http://www.blm.gov/nm/st/en.html
## 2.8 OIL, NATURAL GAS, AND GEOTHERMAL RESOURCES ENVIRONMENTAL BUREAU – EFFLUENT DISCHARGE PLAN

## INTRODUCTION

The Oil Conservation Division (OCD) of the New Mexico Energy, Minerals and Natural Resources Department has responsibility for approval of effluent discharge plans under the authority of the Water Quality Act. The purpose of this permit is to prevent discharge of pollutants into underground water supplies, which would cause groundwater to be contaminated.

## A. NAME OF PERMIT OR APPROVAL

• Effluent Discharge Plan Approval. (S)

## B. STATUTORY AUTHORITY

• New Mexico Water Quality Act, NMSA 1978, §§74-6-1 et seq.

## C. TITLE OF REGULATION

• 20.6.2.3000 NMAC, Permitting and Ground Water Standards.

## D. SUMMARY OF PERMIT/APPROVAL PROCESS

- Natural gas processors, crude oil refiners, and geothermal resource users, brine manufacturing facilities and oil field service companies, and users whose operations may result in a directly related effluent shall submit a discharge plan to prevent and remediate ground water contaminated due to oil, gas or geothermal operations. Plans must be submitted in triplicate in accordance with the Water Quality Control Commission Regulations to OCD.
- Final review and approval by OCD.
  - 1. Applicability
    - This plan approval applies to effluent disposal that may move directly or indirectly into ground waters having total dissolved solids concentrations of 10,000 mg/l or less. (The purpose is

to maintain contaminant levels at or below those set out in 20.6.2.3103 NMAC.)

- 2. General Requirements
  - New applicants must obtain plan approval prior to initiation of discharge activities unless notified by OCD that a plan is not necessary. Existing facilities must submit plan for approval after OCD notification.
- 3. Submission Requirements
  - The comprehensive report should contain complementary charts and diagrams outlining the methodology and processes to be used for disposing of effluent and protection of ground water.
- 4. Procedures for Obtaining Permit or Approval
  - > Applicant submits notice to submit a discharge plan to OCD.
  - > Technical review of plan by OCD (60 days).
  - Public notice and comment period (30 days).
  - $\succ$  Public hearing notice, if required (30 days).
- 5. Operations Requirements
  - Applicant must operate in accordance with approved discharge plan.
  - Applicant submits periodic data and results of testing as set forth in each discharge plan to OCD.
  - OCD has the right to inspect the discharge plan facilities and copy records of test data.
- 6. Fees
  - Fees have been assessed since 1991 based upon size of discharge. For further information contact the OCD Environmental Bureau at 476-3490.
- 7. Appeal Process
  - Discharger files written request to the Director of OCD seeking the Water Quality Control Commission's consideration and can appeal the Commission's findings to the Court of Appeals under NMSA 1978, §74-6-5.

## E. ADMINISTERING AGENCY

Chief, Environmental Bureau (S) Oil Conservation Division Energy, Minerals and Natural Resources Department 1220 South St. Francis Drive Santa Fe, NM 87505 (505)476-3440 www.emnrd.state.nm.us/ocd

## Chavez, Carl J, EMNRD

From:	Chavez, Carl J, EMNRD
Sent:	Friday, April 16, 2010 7:21 AM
То:	Heber, David, OSE
Cc:	Hall, John, NMENV; Johnson, Mike S., OSE; Heber, David, OSE; Altomare, Mikal, EMNRD; Lucero, Stephen A., EMNRD; Olson, Bill, NMENV; Fesmire, Mark, EMNRD; 'Mike_Smith@blm.gov'; Martinez, Lisa, RLD; 'Adrienne.Brumley@blm.gov'; Brooks, David K., EMNRD; Dalmy, Andy ., RLD; Baca, Jerome T., RLD; Pacheco, Rem, RLD; Aragon, Fermin , RLD; VonGonten, Glenn, EMNRD; Chavez, Carl J, EMNRD; Rappuhn, Doug H., OSE; 'rcerdlac@cleansed.net'
Subject:	FW: HP Regulatory Survey - Your state info review by April 19, 2010
Attachments:	NM.xls

#### David:

Thanks for sharing this survey, which seems to be comprehensive is scope for direct heat (open, closed and other types of systems) applications with construction, environmental, etc. issues with and without boreholes, wells, etc.

I'm sharing this with the group and adding an agenda item for discussion. One question is do you need the geothermal regulations working group to provide any feedback to you for consideration in response to the questionnaire by noon on April 19, 2010 to consider in reply?

Thank you.

Carl J. Chavez, CHMM New Mexico Energy, Minerals & Natural Resources Dept. Oil Conservation Division, Environmental Bureau 1220 South St. Francis Dr., Santa Fe, New Mexico 87505 Office: (505) 476-3490 Fax: (505) 476-3462 E-mail: <u>Carl J. Chavez@state.nm.us</u> Website: <u>http://www.emnrd.state.nm.us/ocd/</u>index.htm (Pollution Prevention Guidance is under "Publications")

From: Heber, David, OSE Sent: Thursday, April 15, 2010 4:56 PM To: Chavez, Carl J, EMNRD Subject: FW: HP Regulatory Survey - Your state info review

Hi Carl,

The attached survey might serve as a discussion topic for future meetings. The survey is quite extensive but may bring up some questions worth exploring.

Thanks, David

From: Michael Becher [mailto:MBecher@industryinsights.com]
Sent: Thursday, April 15, 2010 11:15 AM
To: Heber, David, OSE
Subject: HP Regulatory Survey - Your state info review

Hi David,

Thank you again for your participation in the State HP Regulatory Survey which was sponsored by the Geothermal Heat Pump Consortium (GeoExchange), the Ground Water Protection Council, the International Ground Source Heat Pump Association, and the National Ground Water Association.

To create an incentive to participate, the results were promised to be provided to all those who participated in the survey. Since state by state information will be provided and shared, we wanted to offer you the opportunity to review the data for your state before they are finalized. Your state's information is in the attached file.

Please review and let me know of any changes by Monday, April 19th. If you have any changes, please feel free to use the attached Excel sheet and highlight any cells that have changed.

Thank you again for helping make this important study a success.

.

Michael Becher, CPA Project Director Industry Insights, Inc. 6235 Emerald Parkway Dublin, OH 43016 Direct: 614.389.2100 x114 Fax: 614.389.3816

# **New Mexico**

Open loop

#### **Open** loop

(single well for water (single well for water withdrawal, water returned to a surface returned to a second source)

Х

withdrawal, water well)

Х

Is this system configuration regulated by your state? 2. Follow 20 7

## Yes

No

Not at this time, but anticipate within 12 mos.

If your state does not currently regulate this geothermal system, are there plans to establ regulations?

Yes No

Not at this time, but anticipate within 12 mos.

At what governmental level is regulatory oversight most closely administered for this geothermal system in your state?

State Oversight is Primary County Oversight is Primary Local (city, town, village) is Primary No regulatory oversight at this time

Describe if one or more of these state boards have developed specific regulations for this geothermal system technologies in your

#### **Building Board**

Yes No Don't know

#### **Plumbing Board**

Yes No Don't know

#### **Electrical Board**

Yes No Don't know

Х

Х

## Water Well Board

Yes No Don't know

## **HVAC Board**

Yes No Don't know

Other State Entity

Indicate if these actions must occurrelated to this geothermal system installations within your state:

### Construction permit and fee charged

Yes Yes, but no fee No If yes, fee amount:

## Specific geothermal installation permit and fee

charged Yes Yes, but no fee No If yes, fee amount:

## Approval of geothermal system designand fee charged

chargeu

Yes Yes, but no fee No If yes, fee amount:

#### Operating permit or registration and fee charged

Yes Yes, but no fee No If yes, fee amount:

# Well log, drilling or geologic recording requirements for geothermal systems

None required One for entire project One for each borehole



Our agency does not track installation of these systems

Systems known to exist, but cannot tabulate or estimate number

Not known if systems of this type exist Not allowed by regulation

### Number of Systems (sum of five years)

If you provided data for "number of systems" above, the corresponding number was determined by:

Estimate only Specific geothermal installation permit Construction permit Geothermal system design approval System operating permit Drilling log

Who must be licensed, registered, or certified by your state for this geothermal system?

#### Individual and/or company designing system

Yes – govt. license Yes – govt. registration Yes – govt. certification Yes – third party certification Other Nothing required

### Individual and/or company constructing the well or borehole

Yes – govt. license Yes – govt. registration Yes – govt. certification Yes – third party certification Other Nothing required

## Individual and/or company involved with any ground water pump installation

Yes – govt. license Yes – govt. registration Yes – govt. certification Yes – third party certification Other Nothing required

#### Individual and/or company constructing system

Yes – govt. license Yes – govt. registration Yes – govt. certification Yes – third party certification Other Nothing required

### Individual and/or company operating system

Yes – govt. license Yes – govt. registration Yes – govt. certification Yes – third party certification Other Nothing required

For this geothermal system, does your state require evidence of successfully completed geothermal system installer training (for those installing the entire system, not just for those doing a portion of the total system, such as the well or borehole) prior to doing this work in your state?

Individual and/or company designing system Yes

No

Individual and/or company constructing the well or borehole

Yes

No

Individual and/or company involved with any ground water pump installation

Yes

No

Individual and/or company constructing system Yes No Individual and/or company operating system Yes

No

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Individual and/or company designing system Yes No

Individual and/or company constructing the well or borehole

Yes

No

Individual and/or company involved with any ground water pump installation

Yes

No

Individual and/or company constructing system Yes No

Individual and/or company operating system Yes

No



## Volumetric flow rates

Yes

No

## Well Depth(s)

Yes No

Number of wells or boreholes Yes No

## Heat load

Yes No

#### Water quality

Yes

No

Does your state allow non-well drilling companies (for example, blasting companies with drilling rigs) to dtill wells/boreholes for this geothermal systems?

Yes No

Does not apply

In your state are there standards/regulations for a construction, operation, and abandonment for this geothermal system?

### Construction

Yes No

### Operation

Yes No

### Abandonment

Yes

No

## How is this system classified in your state?

Water well Boring Closed loop hole Other

For this system, are there state regulations .

### Heat transfer to the earth calculations

Yes No

Not at this time, but anticipated within 12 mos.

## Limits to temperature ranges in earth over lifecycle of system

Yes No

Not at this time, but anticipated within 12 mos.

### Use of Refrigerant R-22

Yes No

Not at this time, but anticipated within 12 mos.

### Use of Refrigerant R-410A

Yes

No

Not at this time, but anticipated within 12 mos.

For this system; does your state establish specific criteria for.....

### Location of system on a property plot

Yes

No

Not at this time, but anticipated within 12 mos.

## Setback distance from structures, including

#### potable water wells Yes

No

Not at this time, but anticipated within 12 mos.

## Depth of installed heat exchanger components



Yes No

Not at this time, but anticipated within 12 mos.

## Formations penetrated by heat exchanger components

Yes No

	·····	 

Not at this time, but anticipated within 12 mos.

For this system, does your state establish specific criteria for

#### Heat transfer fluids and refrigerants

Yes

No

Not at this time, but anticipated within 12 mos.

#### Water additives

Yes No

Not at this time, but anticipated within 12 mos.

## Spacing of wells or boreholes from other wells or boreholes used in the system

Yes No

NO

Not at this time, but anticipated within 12 mos.

## Manufactured materials used (i.e., loop pipe, fittings, etc.)

Yes No

Not at this time, but anticipated within 12 mos.

## Which heat transfer, fluids are authorized by your state for use in this geothermal system?

State has no specification at this time Potable water Methanol Ethanol Propylene glycol Potassium acetate CMA Urea



### **Well Casing Requirements**

**Overall Maximum Length** 

Length into Bedrock

Material types:

Annulus grouting requirements

Type of grout material:

How soon following drilling must grout be emplaced:

Methods for grout emplacement:

Does your state allow the dual use of a well used for an open loop geothermal system also as a source of potable or nonpotable water? What entity has made this determination (water well board, public health agency, etc.)?

Potable Dual Use Allowed? Yes

No

Non-potable Dual Use Allowed? Yes

No

Determining agency? Water well board

Plumbing board Public health agency Other

Does your state have requirements or restrictions associated with an open loop geothermal system's discharge of return flow water back to the environment (for example, are there limits on the receiving geologic strata, return water temperature, return water quality, return water quantity, degree of mixing of salt water and fresh water)?

Receiving geologic strata parameters Yes

No

Return water temperature parameters

Yes

No

**Return water quantity** 

Yes No

Ratio parameters for mixing of fresh water and salt or brackish water

Yes

No

For closed loop systems; direct exchange, and concentric pipe systems, does your state require?

Pre-start up pressurization test

Yes

No

Ongoing operational scheduled pressure testing

Yes

No

Posted signage identifying anti-freeze or refrigerant type

Yes

No

For DX or concentric pipe geothermal systems, does your state require installation of a corrosion control mechanism? If so, what type?

**Corrosion Control Mechanism** None required Yes, required

Type required:

Does your state require:

Geologic / hydrogeologic prior review for potential surrounding environmental impacts Yes, under all circumstances

Yes, but under certain combinations of factors, such as water quality, withdrawal rate, system bleed, proximity to sensitive receptors, etc.

Not ever

Ground water quality testing

Yes

No

Surface	water	quality	testing	

Yes No



Ongoing system operation and maintenance requirements

No

Yes, and there is a reporting requirement Yes, but there is no reporting requirement

Does your state require notification should heat transfer fluid or refrigerant be released to subsurface?

No

Yes, by anyone with knowledge

Yes, by property owner

Yes, by drilling contractor

Yes, by geothermal system contractor

Yes, by geothermal system designer

If ground water or surface water quality testing is associated by your state with the this geothermal system, list the specific constituents that are tested, the testing frequency and the associated a water quality standards.

### Ground water quality testing parameters

Not required

Constituents tested for (if space is too small, enter a Web address where these constituents may be found):

Testing frequency: ______ Associated water quality standard:

### Surface water quality testing parameters

Not required

Constituents tested for (if space is too small, enter a Web address where these constituents may be found):

Testing frequency:

Associated water quality standard:

Does your state have requirements or restrictions associated with open loop geothermal systems discharge of thermal "bleed" water to the environment (for example, are ) there limits on the types of structures that receive discharge bleed water, location, quantity, quality of thermal "bleed" water)?

**Discharge type parameters?** Yes No

Where may the discharge go:

How much thermal "bleed" water may be discharged

Where does your state see its regulation of this geothermal system technology evolving to over the next 3 years?

Increasing Staying the same Decreasing Unknown

### In general, how would you describe your agency's attitude toward each of this potential system designs?

Supportive Undecided Not supportive Unknown

What, at the present time, does your state offer regarding these questions for this geothermal system?

## Financial incentives for geothermal system installation?

Yes

Not up to this time and we do not anticipate so in the next 12 months

No, but we anticipate something within the next 12 months

## Assessed the energy savings associated with geothermal systems?

Yes

Not up to this time and we do not anticipate so in the next 12 months

No, but we anticipate something within the next 12 months

## Developed guidelines for optimizing the energy savings from geothermal systems?

Yes

Not up to this time and we do not anticipate so in the next 12 months

No, but we anticipate something within the next 12 months

## Assessed the typical payback period from the use of geothermal systems?

Yes

Not up to this time and we do not anticipate so in the next 12 months

No, but we anticipate something within the next 12 months

What at the p	resent time, does your state offer
TA A COLUMN STREET, OFT MALES	C. PHILES
regarding the	seiquestions for this geothermal.
system?	

Documented the occurrence of adverse environmental imipacts from one or more geothermal system installations of this type

Yes

Not up to this time and we do not anticipate so in the next 12 months

No, but we anticipate something within the next 12 months

Proposed a moratorium for some date in the next 6 months on the future installation of this type

Yes

Not up to this time and we do not anticipate so in the next 12 months

No, but we anticipate something within the next 12 months



Don't deal with Document problems Case-by-case, no guidance in place

Problem systems are documented and investigated

How does your agency monitor system

Don't monitor One-time follow-up monitoring Routine monitoring schedule

How does your agency enforce against problem systems?

No enforcement No guidance in place, case-by-case Fines issued Require remedy or closure

How is your agency being funded for this.
geothermal system's related work?

No additional funding source provided for agency's oversight Permit fees General fund allocation to agency Other

Based upon your experience to date; have you identified any specific issues, including research needs, that should be coordinated or addressed nationally (or regionally)? If there is one or more relevant Web sites where, interested partles can find your states geothermal system requirements and geothermal

system contact information please list the address (es) here:

(1)

(2)

(3)

Standing column	Closed loop	Closed loop	Closed loop	Direct exchange (DX)
(single well for water withdrawal and water return)	(vertical boreholes)	(subsurface trenched, or other configuration, but not vertical boreholes)	(surface water body emplacement)	(vertical boreholes)
x	х	x	x	x

Х

## Chavez, Carl J, EMNRD

From: Sent:	Chavez, Carl J, EMNRD Thursday, April 15, 2010 7:14 AM
То:	Hall, John, NMENV; Johnson, Mike S., OSE; Heber, David, OSE; Altomare, Mikal, EMNRD;
	Lucero, Stephen A., EMNRD; Olson, Bill, NMENV; Fesmire, Mark, EMNRD; 'Mike_Smith@blm.gov'; Martinez, Lisa, RLD; 'Adrienne.Brumley@blm.gov'; Brooks, David K., EMNRD; Dalmy, Andy ., RLD; Baca, Jerome T., RLD; Pacheco, Rem, RLD; Aragon, Fermin ,
Subject:	RLD; VonGonten, Glenn, EMNRD; Rappuhn, Doug H., OSE; 'rcerdlac@cleansed.net' RE: Geothermal Regulations Stakeholder Meeting- Upcoming May 5, 2010 Meeting at CID/RLD

John:

Re: In response to # 5 below (5/5/10 Draft Meeting Agenda), GWQB will not develop a specific application, but I have included our Notice of Intent form that should be filled out by any large ground source/direct heat projects for GWQB to evaluate and make a Discharge Permit requirement determination.

Thanks for providing a copy of NMED's NOI Form. OCD has a generic geothermal form that may apply or be modified in include closed-loop and/or banked heat direct heat systems for residential, commercial and industrial buildings that it will compare to NMED's to see if it could meet the intent of tracking the lion's share of geothermal direct heat projects in New Mexico. OCD may also need to consider a filing fee for the closed loop geothermal applications. An OCD WQCC Discharge Permit would not likely be required by the OCD if there is no injection or discharges and threats to USDW from injection or production wells occurring from the design of these types of systems under WQCC 20.6.2 NMAC and WQCC 20.6.4 NMAC.

If the group could please examine NMED's NOI (see attachment below) and OCD generic geothermal application form (<u>http://www.emnrd.state.nm.us/ocd/documents/dp_apps.pdf</u>) for comment at the next meeting.

Thanks.



Thank you.

Carl J. Chavez, CHMM New Mexico Energy, Minerals & Natural Resources Dept. Oil Conservation Division, Environmental Bureau 1220 South St. Francis Dr., Santa Fe, New Mexico 87505 Office: (505) 476-3490 Fax: (505) 476-3462 E-mail: <u>CarlJ.Chavez@state.nm.us</u> Website: <u>http://www.emnrd.state.nm.us/ocd/</u>index.htm (Pollution Prevention Guidance is under "Publications")

From: Hall, John, NMENV Sent: Monday, April 12, 2010 10:19 AM

**To:** Chavez, Carl J, EMNRD; Johnson, Mike S., OSE; Heber, David, OSE; Altomare, Mikal, EMNRD; Lucero, Stephen A., EMNRD; Olson, Bill, NMENV; Fesmire, Mark, EMNRD; 'Mike_Smith@blm.gov'; Martinez, Lisa, RLD; 'Adrienne.Brumley@blm.gov'; Brooks, David K., EMNRD; Dalmy, Andy ., RLD; Baca, Jerome T., RLD; Pacheco, Rem, RLD; Aragon, Fermin , RLD; VonGonten, Glenn, EMNRD; Rappuhn, Doug H., OSE; 'rcerdlac@cleansed.net' **Subject:** RE: Geothermal Regulations Stakeholder Meeting- Continuation of 3/30 Meeting at OCD

Carl,

Unfortunately I am not available starting May 3rd until sometime between July 31st to August 31. I will be working on UIC database development. I will be in my office early in the mornings until 8:30 and sometime after 3:30 in the afternoons for a bit, but I expect that I will be swamped as I will be trying to attend to my usual duties as well. Please keep me in the loop on the emails and I will try to respond to them as appropriate.

In response to # 5 below, GWQB will not develop a specific application, but I have included our Notice of Intent form that should be filled out by any large ground source/direct heat projects for GWQB to evaluate and make a Discharge Permit requirement determination.

Thanks,

John S. Hall UIC Coordinator Ground Water Quality Bureau New Mexico Environment Dept. (505)-827-1049

----Original Appointment----From: Chavez, Carl J, EMNRD
Sent: Thursday, April 08, 2010 5:07 PM
To: Hall, John, NMENV; Johnson, Mike S., OSE; Heber, David, OSE; Altomare, Mikal, EMNRD; Lucero, Stephen A., EMNRD; Olson, Bill, NMENV; Fesmire, Mark, EMNRD; Mike_Smith@blm.gov; Martinez, Lisa, RLD;
Adrienne.Brumley@blm.gov; Brooks, David K., EMNRD; Dalmy, Andy ., RLD; Baca, Jerome T., RLD; Pacheco, Rem, RLD;
Aragon, Fermin , RLD; VonGonten, Glenn, EMNRD; Chavez, Carl J, EMNRD; Rappuhn, Doug H., OSE; rcerdlac@cleansed.net
Subject: Geothermal Regulations Stakeholder Meeting- Continuation of 3/30 Meeting at OCD
When: Wednesday, May 05, 2010 10:00 AM-12:00 PM (GMT-07:00) Mountain Time (US & Canada).
Where: OSE or CID/RLD?

Stakeholders:

Preliminary meeting date and time to follow-up on "Who Does What" at the last meeting.... A location at CID/RLD or OSE may be appropriate to familiarize stakeholders with your respective locations for future meetings, visits, etc. to your offices. Is CID/RLD interested in hosting the next meeting? Just a thought as OCD can continue with meetings in our office.... All we need is a phone line for teleconference capability. Website access w/ projector may be appropriate if agencies wish to show their resources pages with application forms, process, etc.?

## Similar to past meetings, from any location, OCD can provide a call in number w/ code entry for callers to participate....

Request for your agenda items:

- Water well driller certification/requirements on geothermal projects (OSE)? Bring Doug Rappuhn's (OSE) correspondences after last 2 meetings. Also, Jerome Baca (RLD) can bring his correspondence related to Doug's correspondence for discussion.....
- 2) Who does what- review and amend OCD's Geothermal Resource Page together (OCD Publications Webpage) Handout passed out by OCD at 3/30 meeting.
- 3) Tentative "Direct Use or Not Direct Use- Closed Loop Heat Storage" Richard Erdlac (Erdlac Energy Consulting)
- 4) Each stakeholder shall pass out their geothermal application forms and or permit associated w/ their geothermal permitting program for OCD to be aware of and possibly to reproduce for its program? OCD will also hand out its forms.
- 5) What are agencies willing to let go and/or what do agencies want to keep on doing? OCD may want this to continue for some period of indefinitely, i.e., OSE continuing to be part of the CID/RLD direct heat process, but OCD will likely need to develop a direct heat form application to track projects. Has NMED developed an application form for direct heat applications? Application process?

- 6) Possible Geothermal Working Group (not to be confused with our "Geothermal Regulations Stakeholder Group) "Geothermal Oil & Gas Coproduction" in the oil patch Symposium ~ September 2010. Steve Lucero ECMD organizing. BLM, OSE (water scarcity and appropriation issues) and OCD (permitting, down hole new and reworking well issues, potash and mineral rights issues?), and geothermal company presentations.
- 7) Website visitation of geothermal resources, i.e., permitting, process, etc.
- 8) Other issues and concerns?
- 9) Miscellaneous



1. Name and mailing address of person prop	posing to discharge:
	Work Phone:
	Cell/Home Phone:
	Fax:
	Email:
2. Name of facility:	
3. Physical location of discharge (if applicat closest town or landmark, directions to fa	ole, give street address, township, range, section, distance from cility, location map):
4. Type of operation generating the discharg	ge (e.g., truck wash, food processing plant, restaurant, etc.):
5. Source(s) of the discharge. Describe how disposed at your facility are generated. Is	the wastewater, sludge, or other discharges processed and/or dentify all sources. Attach additional pages if needed:
<ol> <li>Expected contaminants in the discharge ( Include estimated concentration if known</li> </ol>	(e.g., nitrate-nitrogen, metals, organic compounds, salts, etc.) , and copies of results of laboratory analyses, if available:
7. Describe all components of wastewater p grease interceptor, lagoon, septic tank/lea specifications, etc. if available:	rocessing, treatment, storage, and disposal system (e.g., achfield, etc.) Include sizes, site layout map, plans and
8. Estimated maximum daily discharge volu	me in gallons per day (or other units):
9. Estimated depth to ground water (ft):	
Signature:	Date:
Printed name:	Title:
<u>Please return this form to:</u> NMED Ground Water Quality Bureau P.O. Box 5469 Santa Fe, New Mexico 87502-5469	Telephone: 505-827-2900 Fax: 505-827-2965
December 4, 2008 Page 1 of 1 Grou Notice of Intent	und Water Quality Bureau – Pollution Prevention Section Notice of Intent

Signatura	Date	
Name:	Title:	
14. CERTIFICATIONI hereby certibles best of my knowledge and belief.	fy that the information submitted with the	nis application is true and correct to the
<ol> <li>Attach a facility closure plan, and rules, regulations and/or orders.</li> </ol>	other information as is necessary to dem	nonstrate compliance with any other OCD
12. Attach geological/hydrological in	formation for the facility. Depth to and	quality of ground water must be included.
11. Attach a contingency plan for rep	orting and clean-up of spills or releases.	
10. Attach a routine inspection and m	aintenance plan to ensure permit complia	ance.
9. Attach a description of proposed r	nodifications to existing collection/treatm	nent/disposal systems.
8. Attach a description of current liqu	id and solid waste collection/treatment/o	disposal procedures.
<ol> <li>Attach a description of present sou must be included.</li> </ol>	rces of effluent and waste solids. Avera	ge quality and daily volume of waste water
6. Attach a description of all materia	s stored or used at the facility.	
5. Attach the description of the facili	ty with a diagram indicating location of t	fences, pits, dikes and tanks on the facility.
4. Attach the name, telephone number	r and address of the landowner of the fac	cility site.
3. Location:/4	/4 Section Tow it large scale topographic map showing e	nshipRange exact location.
Contact Person:	Р	Phone:
Address:		
2. Operator:		
1. Type:		
	New Renewal Mod	lification
DISCHARGE PLAN APP REFINERIES, AN (Refer to the O	LICATION FOR SERVICE ( COMPRESSOR, GEOTHER D CRUDE OIL PUMP STAT CD Guidelines for assistance in complet	COMPANIES,GAS PLANTS, MAL FACILITES TIONS ting the application)
1220 S. St. Francis Dr., Santa Fe, NM 87505	Santa Fe, NM 87505	
<u>District III</u> 1000 Rio Brazos Road, Aztec, NM 87410 <u>District IV</u>	Oil Conservation Division 1220 South St. Francis Dr.	Plus 1 Copy to Santa Fe 1 Copy to Appropriate
1625 N. French Dr., Hobbs, NM 88240 <u>District II</u> 1301 W. Grand Avenue, Artesia, NM 88210	Energy Minerals and Natural Resc	Durces Submit Original

E-mail Address:

_____

## Chavez, Carl J, EMNRD

From:	Chavez, Carl J, EMNRD
Sent:	Wednesday, April 14, 2010 4:23 PM
To:	Hall, John, NMENV; Johnson, Mike S., OSE; Heber, David, OSE; Altomare, Mikal, EMNRD; Lucero, Stephen A., EMNRD; Olson, Bill, NMENV; Fesmire, Mark, EMNRD;
	EMNRD; Dalmy, Andy ., RLD; Baca, Jerome T., RLD; Pacheco, Rem, RLD; Aragon, Fermin , RLD; VonGonten, Glenn, EMNRD; Chavez, Carl J, EMNRD; Rappuhn, Doug H., OSE;
0	Dede Bondy EMNIRD: Seneher Deniel L. EMNIRD: Hill Larry EMNIRD: Derrin Charlie
LC:	EMNRD; Martin, Ed, EMNRD
Subject:	Geothermal Regulations Stakeholder Working Group (GRSWG) Direct Heat Information in
Attachments:	New Mexico
Automito.	( termented par

Ladies and Gentlemen:

FYI, pdf file on direct heat in New Mexico and website link below provided by OCD Artesia District Office to consider going forward.....

http://www.energy.wsu.edu/documents/renewables/NewMexico.pdf

Please consider as resources for next meeting. Thanks.

Carl J. Chavez, CHMM New Mexico Energy, Minerals & Natural Resources Dept. Oil Conservation Division, Environmental Bureau 1220 South St. Francis Dr., Santa Fe, New Mexico 87505 Office: (505) 476-3490 Fax: (505) 476-3490 Fax: (505) 476-3462 E-mail: <u>Carl J. Chavez@state.nm.us</u> Website: <u>http://www.emnrd.state.nm.us/ocd/</u>index.htm (Pollution Prevention Guidance is under "Publications")

## A Regulatory Guide to Geothermal Direct Use Development

Prepared by Kim Lyons of the Washington State University Extension Energy Program.

## **NEW MEXICO**

### Introduction

Geothermal resource temperatures range from low temperatures of 50 to 80 degrees F (10 to 27 °C), to temperatures exceeding 650 degrees F (343°C). Although power can be generated economically from resources as low as 218 degrees F (103° C), power generation projects typically favor resource temperatures above 300 degrees F (149° C). High temperature resources (>300 degrees F, 149° C) can also be used for direct-use applications. However, lower temperature resources (< 212° F, 100° C) are often better suited for these projects

Low temperature, direct-use projects cover a variety of applications. Projects may include traditional space heating applications, as well as greenhouse heating, spas and swimming pools, aquaculture, crop drying, industrial processing and other activities requiring lower temperatures. Because these projects are primarily water use applications, they often fall under a different regulatory process than high temperature, power generation projects. Typically this process is shaped by water and wastewater laws and regulations, and administered by their respective state, and in some cases, federal water and wastewater resource agencies.

The intent of this document is to help guide developers of direct use geothermal projects through the regulatory process of drilling, using and disposing of low temperature geothermal fluids in New Mexico. This guide will provide background on the state regulatory process and identify contact information necessary for completing the various applications and permits. This guide; however, cannot substitute for direct communication with the regulatory agencies. These agencies need to be contacted early in the process so that any regulatory hurdles are identified upfront and in time. Projects that are located on federal lands are regulated according to the national Geothermal Steam Act and related federal regulations.

### **Regulatory Process for Direct Use Applications**

In New Mexico, there are 359 discrete thermal wells and springs which have been identified. Of these, 12 communities, in eight counties, have been identified as potential sites to use geothermal energy for district heating and other applications. The eight counties are Doña Ana, Grant, Hidalgo, McKinley, Rio Arriba, San Miguel, Sandoval and Valencia. The Energy Conservation and Management Division of the New Mexico Energy, Mines and Natural Resources maintains a website that has information on New Mexico's geothermal resources including a geothermal map of the state. This site can be accessed by clicking <u>here</u>. A developer interested in low temperature geothermal

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resources may also want to contact the Geo-Heat Center, located in Klamath Falls, Oregon. The Center maintains an extensive database covering wells and springs greater than 50 °C (122 °F) for 16 western states, including New Mexico. Information on the database can be found at <u>http://geoheat.oit.edu/database.htm</u>.

Specific statutes pertaining to geothermal resources are codified in the New Mexico Geothermal Resources Conservation Act under NMSA 71-5. These statutes can be viewed by clicking <u>here</u>. The Act defines geothermal resources "as *the natural heat of the earth or the energy, in whatever form, below the surface of the earth present in, resulting from, created by or which may be extracted from this natural heat and all minerals in solution or other products obtained from naturally heated fluids, brines, associated gases and steam, in whatever form, found below the surface of the earth, but excluding oil, hydrocarbon gas and other hydrocarbon substances.*" The Act further defines low temperature geothermal resources as "*a geothermal reservoir containing low-temperature thermal water, which is defined as naturally heated water, the temperature of which is less than boiling at the altitude of occurrence, which has additional value by virtue of the heat contained therein and is found below the surface of the earth or in warm springs at the surface.*"

The Act identifies the New Mexico Oil Conservation Commission as having jurisdiction over geothermal resources with respect to the conservation of geothermal resources and the prevention of waste of potash as a result of geothermal operations. These powers are enumerated in NMSA 71-5-8.

The Geothermal Resources Act also has a clause allowing concurrent jurisdiction with other state agencies having regulatory jurisdiction. Storage and disposal for geothermal fluids are typically regulated under the New Mexico Water Quality Control Commission (WQCC) regulations, while drilling and production operations fall under the jurisdiction of OCC regulations and orders. The Oil Conservation Division (OCD) of the New Mexico Energy, Minerals and Natural Resources Department provides direct staffing for the Oil Conservation Commission. In cooperation with the State Engineer's Office, the OCD oversees the permitting of geothermal wells, including but not limited to greenhouse heating, warm water aquaculture, space heating, irrigation swimming pools and spas. These wells are regulated in accordance with the rules and statutes governing groundwater appropriation and well drilling regulations.

As a result, a developer must acquire the geothermal resource by means of an application, permit and license similar to that required for a commercial water well. The regulations governing low temperature, direct use geothermal projects differ from conventional water development projects however, in that direct use projects also need to dispose of the water once it has been used for its design application. Disposal is typically accomplished through direct injection of the geothermal water via an injection well, or through surface disposal. The OCD in cooperation with the New Mexico Environment Department (NMED), has regulatory authority over geothermal discharge plans in the state. The OCD will also coordinate with the U.S. EPA Region 6, which has authority over wastewater discharge to surface waters in New Mexico. In addition to working with

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state resource agencies, local and county agencies should be contacted early on in the development process to determine any local zoning issues and for construction permits.

The regulatory process for developing a low temperature, direct use geothermal project consists of the following steps:

- Gain access to lands either through lease or direct ownership.
- Contact local and/or county agencies to ensure compliance with local land use laws including building permits and zoning restrictions.
- Secure water right. (OCD/SEO)
- Obtain well construction permit/develop production well. (SEO/OCD)
- Determine fluid disposal plan and obtain permits for either underground injection or surface disposal. (NMED/OCD)
- Contact state fish and wildlife agency if developing an aquaculture project.

Two additional state resources may be of interest to a developer of direct use geothermal projects. The Energy Management and Conservation Division of the New Mexico Energy, Minerals and Natural Resources Department has resource staff available to discuss geothermal projects. Their website can be accessed by clicking <u>here</u>. The Southwest Technology Development Institute (SWTDI) has been involved with geothermal developments in New Mexico for a number of years. SWDTI is affiliated with the New Mexico State University in Las Cruces and maintains a helpful website on geothermal resources in New Mexico. The SWDTI website can be accessed by clicking <u>here</u>. Contact information for both of these organizations is presented in Appendix A.

## Water Rights

### Background

The constitution and statutes of the State of New Mexico guarantee the right to appropriate the public waters of the state for beneficial uses including the utilization of geothermal fluids for direct use applications. The New Mexico State Engineers Office (SEO) administers the rules and regulations governing groundwater withdrawals and use in the State of New Mexico. The state statutes governing groundwater appropriations are codified in Chapter 72, Article 12 NMSA 1978, which can be accessed by clicking here.

#### Permit process

Under the Geothermal Resources Act, the Oil Conservation Division (OCD) has statutory control over geothermal resources. However, the Act does not pre-empt the State Engineer's Office (SEO) control over ground water use. Accordingly, the SEO has prior right of approval for geothermal production wells drilled on state, private and federal lands for water under 250 degrees F (121 °F). The OCD has primacy for projects exceeding this temperature.

The process for obtaining a right to appropriate groundwater for geothermal use mirrors that of a conventional water well application. The first step is to file an application with the State Engineer's Office. The permit is entitled *Application for Permit to Appropriate Underground Water* or form WR-05. The form requires the applicant to submit information on the location of the well, the amount of water to be withdrawn, the source, the intended use, and other related data. The form is available on-line by clicking here, or can be obtained from SEO District offices. The application fee is \$25. Appendix 1 includes SEO regional contacts for water right forms and other related issues.

Upon filing, SEO mails the applicant a legal notice of appropriation, which the applicant must post in a local newspaper for 3 weeks. If there are no protests, the SEO reviews the application for completeness and decides whether to approve, modify or deny the application. If the application is approved, the SEO sends a letter approving the permit application including permit conditions. This process takes approximately 6 to 8 weeks, provided there are no protests. If the application is challenged, the SEO will conduct hearings to determine whether the application should be approved, modified or denied.

Once approved, a developer can begin to drill a well. The well must be constructed in full compliance with the terms of the permit and the rules and regulations governing well construction in the state, including the use of a licensed well driller. To assist developers, the State Engineer's Office has published a guidebook entitled *Rules and Regulations Governing Drilling of Wells and the Appropriation of Groundwater in New Mexico*. The guidebook can be downloaded from the SEO website by clicking <u>here</u>.

As soon as practicable after completing the well an applicant should submit a Proof of Completion form, and if required by the permit, a Final Inspection and Report form. Both of these forms can be obtained from a district office, or can be downloaded by clicking <u>here</u>. The SEO does no collect a fee for the Proof of Completion form, however, a \$25 filling fee is charged for the Final Inspection report. If required by permit, the final inspection form is generally prepared by a registered Professional Engineer or by a registered land surveyor.

Upon receipt of the Final Inspection and Report from or the Proof of Completion form, and any other provisions required by the permit, the SEO will issue a "Certificate and License to Appropriate".

### **Disposal of Geothermal Fluids**

The regulations governing the disposal of low temperature geothermal fluids will depend on the type of application. Non contact geothermal projects, where the geothermal fluids are kept in a closed system and do not come in contact with outside contaminants, will typically have an easier compliance path then projects where contact with potential contaminants is made. When contact is made and water quality is potentially degraded, regulatory requirements may become more stringent to ensure that water quality is maintained. There are basically three disposal options available to a developer of a direct use geothermal project: underground injection; disposal to surface waters; and/or, disposal to the ground or land application. In some cases, the regulatory agency(s) will specify the preferred disposal method. For example, in critical groundwater areas, reinjection may be required to ensure that the aquifer is maintained. However, in most cases, it will be up to the project developer to determine the best disposal method based on regulatory requirements and the cost of compliance.

The New Mexico Oil Conservation Division (OCD) administers, through delegation, all New Mexico Water Quality Control Commission (WQCC) regulations pertaining to surface and ground water at geothermal installations. However, the New Mexico Environment Department Ground Water Quality Bureau (GWQB) may take the lead for projects involving heat pump return flow wells. Storage and disposal for geothermal fluids are regulated under <u>WQCC Regulations</u> Part 3 and Part 5 and under the Geothermal Resource Conservation Act.

## Underground Injection Control

The Underground Injection Control (UIC) Program was established in 1982 when Congress passed the Safe Drinking Water Act. This program regulates, to one degree or the other, every "injection" of "fluid" into the subsurface. An "injection" is the emplacement of "fluids" regardless of whether the injection requires the application of pressure or not, and a fluid is defined as any liquid, gas or semisolid which can be made to flow. The intent of the program is to preserve and protect underground water from becoming polluted.

From a resource perspective, the preferred method of disposing of geothermal fluids is to return them to the ground by way of injection wells. Underground injection wells are wells that are used as an entry point for some type of fluid (such as geothermal fluid), which is injected underground for temporary or permanent disposal or storage. To protect groundwater from contamination by injection wells, the federal government established the Underground Injection Control (UIC) Program as part of the Safe Drinking Water Act.

New Mexico has primacy for administration of the UIC Program, which is jointly implemented by the New Mexico Environment Department Ground Water Quality Bureau (GWQB) and the New Mexico Energy, Minerals & Natural Resources Department - Oil Conservation Division (OCD). These agencies administer the UIC Program under authority granted by the New Mexico Water Quality Act and Water Quality Control Commission (WQCC) Regulations, the New Mexico Oil and Gas Act, and the New Mexico Geothermal Resources Act. The OCD is the lead agency in regulating geothermal injection wells. Both of these agencies maintain useful websites explaining the UIC Program and their respective roles. Click <u>here</u> to view the OCD website. The NMED website can be accessed by clicking <u>here</u>. Geothermal facilities that discharge fluids into UIC wells are required to have ground water discharge permits approved by the Oil Conservation Division (OCD). Discharge permits contain operational, monitoring, contingency, and closure plans with specific requirements to prevent and remediate any negative impacts that UIC wells may have on ground water quality. These requirements are presented under Part 5 of WQCC regulations. A public hearing may be held on each application. At this point, the operator of the proposed project may be required to present evidence demonstrating that the injected fluids will not migrate out of the injection zone. The application process will also require a description of how the well(s) will be constructed to ensure it is properly sealed. A copy of the application form can be downloaded by clicking <u>here</u>. It is the same form as that used for permitting groundwater discharges.

If the Division approves the project, the operator submits an application to drill new injection wells, and/or convert producing wells, to the appropriate <u>OCD District Office</u>. District Field Inspectors inspect various phases of well construction. After a completed injection well has been successfully tested for mechanical integrity, the District office issues a permit to inject. An injection pressure limitation is specified for each well to prevent fracturing of the rock above the injection zone which could lead to fluid migrating into the fresh water aquifers above.

Periodically thereafter, the wells are inspected and tested under the supervision of District Field Inspectors to ensure that they have not developed leaks. Operators must report the volume and pressure of injected fluids monthly. When the well is no longer being used for injection, it must be safely plugged in a manner approved by the OCD District Supervisor.

### Surface Disposal of Geothermal Fluids

The New Mexico Water Quality Control Commission Regulations (NMAC 20.6.2) sets forth the administrative rules governing water quality in the state of New Mexico. Discharges to water of the State (surface and groundwater) and discharges to municipal wastewater treatment plants are covered under these regulations. The Oil Conservation Division of the New Mexico Energy, Minerals and Natural Resources Department administers the treatment and disposal of geothermal fluids in the state.

In general, surface disposal to ground is preferable to discharging into surface waters. Discharging to ground minimizes the chance of degrading existing water quality. Land or ground application also keeps the water within the same geographic resource area. Regardless of whether a project proposes to discharge to the surface or groundwater, a developer will need to submit a discharge plan application to OCD. The application is one page in length and can be downloaded by clicking <u>here.</u> Based on the information provided in the notice, OCD will determine whether a groundwater discharge permit is needed.

Groundwater Discharge Permit

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The state of New Mexico has initiated various groundwater protection efforts and pollution abatement strategies to protect New Mexico's groundwater resources and to prevent water pollution to the maximum degree possible. As part of this effort, geothermal projects that are discharging fluids either to the ground surface or to underground injection wells may need to obtain a Groundwater Discharge Permit if OCD determines that the project may jeopardize ground water resources. The discharge permit application requires information on the location, operation, monitoring, contingency and closure plans appropriate for the proposed treatment and disposal system as per WQCC regulations. The application must be submitted in triplicate to OCD, and must be accompanied by a \$100 filing fee. A copy of the form can be downloaded by clicking <u>here.</u>

The OCD must review the application for technical and administrative completeness within 30 days of submittal and notify the applicant of their findings. During this same time period, the applicant must provide public notice of the project as outlined in NMAC 20.6.2.3108, and provide OCD with proof of this activity.

Following this, OCD has 30 days to notify any affected parties including federal, state and local regulatory agencies. Within 60 days after OCD determines that the application is complete and all required technical information is available, OCD will notify the applicant if the permit was approved or denied and provide public notice of this decision. Following the public notice, a 30 day period is set aside for public comments. If sufficient public interest is identified during this period, OCD will hold a public hearing. Once the administrative record is complete including a public hearing if needed, OCD will notify the applicant within 30 days whether the permit was approved, modified or denied.

## National Pollution Discharge Elimination System Permit

The National Pollution Discharge Elimination System (NPDES) program requires that all point source discharges into U.S. waters obtain permits. NPDES permits contain limits on what can be discharged and other provisions to ensure that the discharge does not harm water quality or the public's health. Discharge of low temperature geothermal fluids to surface waters would most likely require an NPDES permit. The federal Environmental Protection Agency (EPA) currently retains "primacy" for the NPDES program in New Mexico. This means that EPA Region 6 is responsible for permitting and enforcing all NPDES permits in the state. OCD must certify the permit once issued by EPA and may also require an NPDES permitted project to also obtain a groundwater discharge permit if groundwater is impacted.

EPA Region 6 has developed procedures with respect to NPDES permits. Under current practices, EPA will inform OCD when permits are applied for and will provide OCD copies of the application. EPA then issues a draft permit and posts a public notice that the state will consider 401certification. After considering public comments, EPA prepares a proposed final permit and provides this permit to OCD for certification. OCD typically

has 30 days to provide or deny certification. Subsequent to OCD's certification decision, EPA will make its final decision regarding the NPDES permit and issue a final permit.

The most likely permit forms covering a direct use, geothermal application are EPA NPDES forms 1 and 2D or 2E. Form 1 collects general information from the applicant and must be filled out in addition to a supplemental form. Form 2D covers projects which discharge wastewater. Form 2E was designed by the US Environmental Protection Agency to cover projects which do not discharge process wastewater. Non-contact, direct use geothermal projects will typically need to complete Form 2E, however discussions with EPA staff to determine the correct form should take place. EPA contact information can be found in Appendix A. NPDES forms can be downloaded from the EPA Region 6 website by clicking here. EPA also has on-line a software program to assist in the completion of NPDES forms. The software program, called Permit Application Software System or PASS, can be downloaded by clicking here.

An NPDES applicant will need to provide mapping information, flow data, an estimate of the type and quantities of pollutants discharged and a brief description of any planned treatment. This information will be used to determine the conditions of the permit including appropriate control or treatment strategies, monitoring and reporting requirements. Since most direct use applications involve non-contact geothermal heat exchange, the water quality of the source water is unaffected. For these type of projects, permit conditions should be strait-forward. Even so, a developer may still be required to cool the geothermal water before discharging into a surface water source.

In some instances a developer may be able to proceed with a general permit versus an individual permit. A general permit covers a set of like facilities, such as a coal facility or a fish farm. Here, a set of conditions are already developed which meet the general operating conditions of these similar facilities. In these cases, a developer would complete Form 1 to see if they qualify under the general permit. If eligible the developer would also need to submit a Notice of Intent form or equivalent, which provides additional information needed by the resources agency administering the NPDES program. The advantage of the general form is that the resource agency can issue the permit as soon as all information needs are satisfied. For individual permits, there is an additional 30 day public notice process, as well as the potential for intervention on the terms and conditions of the permit.

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## Appendix A

## **State Contact Information**

#### **General Geothermal Information**

Energy Conservation and Management Division New Mexico Energy, Minerals and Natural Resources Department 1220 South St Francis Drive Santa Fe, New Mexico, 87505 Brian Johnson Phone 505/476-3313 Email: <u>bkjohnson@state.nm.us</u>

Southwest Technology Development Institute New Mexico State University Box 30001, MSC 3SOLAR Las Cruces, New Mexico 88003-8001 Tel: (505) 646-1846 Fax: (505)646-2960 Website: http://www.nmsu.edu/~tdi/geothermal.htm

## Water Rights and Production Well Permitting

Oil Conservation Division New Mexico Energy, Minerals and Natural Resources Department 1220 South St Francis Drive Santa Fe, New Mexico, 87505 Roy Johnson Phone: 505/476-3470

State Engineers Office

District 1 - Rio Grande, Estancia, Bluewater, Gallup, Sandia, San Juan ground water basins Office of the State Engineer 121 Tijeras, NE, Suite 2000 Albuquerque NM 87102 1-505-764-3888 Fax: 1-505-764-3892

Washington State University Extension Energy Program-2003

District 2 - Roswell, Carlsbad, Lea County, Portales, Hondo, Penasco, Jal, Fort Sumner, Capitan, Curry County groundwater basins Office of the State Engineer 1900 West Second Street Roswell NM 88201 1-505-622-6521 Fax: 1-505-623-8559

District 3 - Mimbres Valley, Virden Valley, Animas Valley, Playas Valley, Gila-San Francisco, San Simon, Lordsburg Valley, Nutt-Hockett groundwater basins Office of the State Engineer PO Box 844 216 South Silver Deming NM 88031 1-505-546-2851 Fax: 1-505-546-2290

District 4 - Hot Springs, Hueco, Lower Rio Grande, Las Animas Creek, Salt, Tularosa groundwater basins Office of the State Engineer P.O. Box 729 1680 Hickory Loop, Suite J Las Cruces NM 88004 1-505-524-6161 Fax: 1-505-524-6160

## Santa Fe Office - Canadian River, Tucumcari, Upper Pecos ground water basins Office of the State Engineer Water Rights Division PO Box 25102 Bataan Memorial Building Santa Fe NM 87504 1-505-827-6120 Fax: 1-505-827-6682

Aztec Sub-Office - San Juan area. Office of the State Engineer Aztec Sub-Office 112 South Mesa Verde Aztec NM 87410 1-505-334-9481 Fax: 1-505-334-3168

Washington State University Extension Energy Program-2003

## **Underground Injection Well Permit**

David Catanach Oil Conservation Division 1220 South St. Francis Dr. Santa Fe, New Mexico 87505 Phone: (505) 476-3466 Email: <u>dcatanach@state,nm.us</u>

## **Groundwater Discharge Permit**

Bill Olson Oil Conservation Division 1220 South St. Francis Dr. Santa Fe, New Mexico 87505 Phone: 505-476-3470 Email: <u>WOlson@state.nm.us</u>

## National Pollution Discharge Elimination System (NPDES) Permit

EPA Region 6 Compliance Assurance and Enforcement Division Water Enforcement Branch (6EN-W) 1445 Ross Avenue Dallas, Texas 75202-2733

Main Branch Phone: (214)665-6468 <u>24 Hour Hotline</u>: (214)665-6595 Fax: (214)665-2168 Website: <u>http://www.epa.gov/earth1r6/6en/w/cwa.htm</u>
# Appendix B Geothermal References and Contacts

### References

Bloomquist, R.G., Black, G. L., Parker, D. S., Sifford, A., Simpson, S. J., Street, L.V., 1985, Evaluation and Ranking of Geothermal Resources for Electrical Generation or Electrical Offset in Idaho, Montana, Oregon and Washington: Bonneville Power Administration, US Department of Energy, pp. 1-504

Bloomquist, R. Gordon., Nimmons, John. T., Rafferty, Kevin, 1988, District Heating Development Guide, Legal, Institutional and Marketing Issues, Volume 1: for the Washington State Energy Office, funded by the US Department of Energy, pp. 1-268.

Bloomquist, R. Gordon, 1991, Geothermal, A Regulatory Guide to Leasing, Permitting, and Licensing in Idaho, Montana, Oregon and Washington: Bonneville Power Administration, 1-277.

Lund, John W., Lienau, Paul J., Lunis, Ben C., 1998, Geothermal Direct-Use Engineering and Design Guidebook: Geo-Heat Center Oregon Institute of Technology, sponsored by the US Department of Energy Idaho Operations Office, pp. 1-454.

Rafferty, Kevin, 2000, Geothermal Power Generation, A Primer on Low-Temperature, Small-Scale Applications: Oregon Institute of Technology, pp. 1-11.

Lund, John W., **date**, Pavement Snow Melting, Geo-Heat Center Oregon Institute of Technology, pp1-13.

Rafferty, Kevin, 2001, An Information Survival Kit for the Prospective Geothermal Heat Pump Owner: Geo-Heat Center, Oregon Institute of Technology, Grant No. DE-FG07-90ID 13040, pp. 1-23.

Rafferty, Kevin, 2001, Small Geothermal Systems: A Guide For The Do-It Yourselfer: Geo-Heat Center, Oregon Institute of Technology, Contract No. FG01-99-EE35098, pp. 1-30.

Lund, John W., **date**, Balneological Use of Thermal Waters: Geo-Heat Center, Oregon Institute of Technology, pp. 1-10.

Boyd, Tanya, Rafferty, Kevin, **date**, Aquaculture Information Package: Geo-Heat Center, Oregon Institute of Technology, Contract No. DE-FG07-90ID 13040, pp. 1-60.

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Rafferty, Kevin, Boyd, Tonya, **date**, Geothermal Greenhouse Information Package: Geo-Heat Center, Oregon Institute of Technology, Contract No. DE-FG07-90ID 13040, pp.1-80.

### Contacts

Geo-Heat Center Website: <u>www.oit.edu/-geoheat</u>

Geothermal Education Office Website: <u>www.geothermal.marin.org</u>

Geothermal Resources Council Website: <u>www.geothermal.org</u>

Geothermal Heat Pump Consortium Website: <u>www.geoexchange.org</u>

International Ground-Source Heat Pump Association Website: <u>www.igshpa.okstate.edu</u>

U.S. Department of Energy Website: <u>www.eren.doe.gov/geothermal</u>

Washington State University Energy Program Website: <u>http://www.energy.wsu.edu/projects/renewables/geothermal.cfm</u>

Washington State University Extension Energy Program—2003

# Geothermal Regulations & Programs Stakeholders Teleconference Meeting OCD 3rd. Floor Conference Room (Wendell Chino Building) Santa Fe, NM Tuesday, March 30, 2010

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# Draft Agenda with Meeting Minutes

Attendees: Teleconference:	See Sign-in Sheet belo Doug Rappuhn OSE Mike Smith, BLM	ЭW		
	GeoHurmal	Regs - program Lecting (3/30/	S Stakehol 2010	der
Name	Ca	Title	ph.	E-mail
Carl Chavez	NMOCD	Env. Engr.	505-476-3490	Carlj. Charez@ State nm. US
JOHN 4942	- NMED	Hypeszobist	527-1049	NM - MS
Fermin Ardy	or CID	Gen Const Buseon	Chiel 476-4672	Cornsi No aragose Chete
Remijio Pache	CO CID-E	ELEC BUREAU CALET	= 505 476 4679	vem. pochecoestate.n
Verom T. 5	aca CID m/p.	mech. Bureau Chi	ef 505-4-76-466	1 - brome by atotale.
Andy Dakin	7 CID	Licensing Ngv.	505.670.6	078 ander, galino,
Stere Lucen	NM EMNKD	Clean Energy Specialist	476-3329	O statem. 65 t stephen. Lucero
MIKE JOHNSC	NMOSE	BUREAU CHIEF	827-3867	estate no us mike.johuson
DAVID HEB	ER NMOSE	water resource sh	z 827.6102	@ state. nm. us david heber @ sta
David Brook	22 NMOCD	Legal Epaminer	476-3450	dlorooks@ state.nm.v.s
Adrienne Bru	nley BLM-NM80	Petroleum Ensin	ur 954-2140	Adrienne Brundey @ 61m-gov
Mikel Altomare	NACO	attorney	476-3480 m	ikel altomares
LIJA MATCTINEZ	CID	DIRECTOR	476.4689 415	Stur. nm. us
Nitle Smi	the BLM.	$\overline{}$		571775- NM. U.S
Buple	Reption OSE	Telephone		
Lisa Ma	rting Director	end		
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- 1) Do BLM, CID/RLD, NMED, and OSE agree with OCD's Geothermal Regulatory Interpretation?
  - There was no disagreement with OCD interpretation of OCD Geothermal Regulations that also apply on Federal and Mineral Estate Lands. OCD grappling with taking over entire program.
- 2) Consumer Industry Division (CID)/Regulatory Licensing Division (RLD) geothermal heat exchangers in closed-loop systems, licensee requirements and the inspection process?
  - There may be multiple licensed heating contractor doing work, i.e., down hole heat exchanger & coil installers. Other licensed individuals by extension for electrical, plumbing, and construction of buildings may be needed on its projects. By Order.....Statute prohibits bidders w/o license from bidding on this type of work.
  - No royalties have or are being paid by users of direct heat for homes, offices, etc. that it is aware about. OCD mentioned that this doesn't mean they shouldn't be paying royalties, etc. under the regulations.
  - There is no injection of working fluids into subsurface formations, but thermal energy is recirculated in a closed loop system in subsurface pipe or casing. Issue of whether banked storage or closed loop systems constitute use of the heat under geothermal regulations?
  - OSE also requires that a licensed water well driller under its programs drill any wells for direct heat applications with the CID/RLD. Question of whether all geothermal drillers should be OSE licensed for water well drilling?
- 3) If so in No. 2 above, the stakeholder will brainstorm under the various geothermal applications to determine "Who Does What?"

NMED: Incidental use role identification. No correlative rights between users. Not constituent agency in Regulations, only WQCC Regulations. High and low temperature geothermal use may involve both NMED GW Permit and OCD to track correlative rights under geothermal regulations? If not correlative rights, then NMED would issue the DP under WQCC? May be useful to study WQCC "Delegation of Authorities" document back from 1989? Incidental use or not..... NMED has no hydrothermal responsibilities. Perhaps the WQCC "Delegation of Authority" document could be revised to specify the above? NMED issues DP under WQCC. How do we determine incidental use? How do we determine correlative rights issues? New Rules or Regulations would be helpful. Example of incidental use of heat is the "PRR Sandoval Co. Desalinization Project." Start with a 5M gpd deep confined aquifer desalinization treatment. For potable water use w/ expansion from Rio Ranch to West projected at 20 years to 30M gpd. Water in formation is 3000 ft. below ground level and is about 140 F. They want to use some of heat in the process for waste water treatment. Dump heat exchange and possible geothermal waste. Look at in terms of above example. OCD determines correlative rights under Geothermal Act. Does OCD do UIC GW Permitting? Yes. Injection into

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deep formations under UIC Program and OCD addresses correlative rights, but if OCD decides it does not need to track correlative rights for geothermal, then NMED could permit.

OSE: Who handles royalties or permits NMED or OCD? SLO handles royalties. Is there an "appropriation of water?" If so, this would be OSE's jurisdiction. If direct heat for office buildings, RLD and OSE can work together on this? Yes. OCD Attorneys thinks royalty is due to state for use of office heat or direct heat too, not just power production.... Is closed-loop or banked storage heat transfer systems used for home and office heating considered incidental use? NMED has deferred to OSE and CID to do direct heat where no injection into underground formation where USDWs exist. NMED involved where USDW involved and injection is into underlying formation(s). If no toxic fluids are being injected, NMED didn't require Notice of Intent or WOCC Discharge Permit. If it is a very large office building complex, NMED may permit it? Should there be exclusion for private residences.....closed loop systems? OSE does not want to be involved anymore with closed loop systems and OSE permit appropriations of water, since there is no appropriation where the working fluid is recirculated in a closedloop and no ground water is being used, but OSE wants drillers to be licensed water well drillers under the OSE Programs. OCD thinks if water used or consumed, is changed or not useable for any purposes, operator should still include OCD as water is still consumed.... Closed loop systems do not involve OSE. Whoever is responsible for closed-loop heat system, make sure installers are Certified OSE water well drillers. Licensed drillers w/o concepts of installing heating systems. OSE should be out of it. License from CID/RLD needed and OSE would not be involved. CID cited this example for the question of who would permit? The Space Port Project near T or C. This project involved the creation of a geothermal mound, ground source preheated air in mound. This project came to CID's attention recently, the working fluid is air that is preheat or cooled. Who would be involved in permitting air as the geothermal working fluid for heat exchange? Nobody knows? OSE permits water well drillers. Issue of installer hired OSE certified drillers. OCD could develop quick permits to track projects? Thinks it already has a generic non-number geothermal application form that could work for direct heat applications without injection wells. Common to drop shaft.... could hit USDW, but still closed-loop. Contractors may need to have two licenses on these projects, i.e., one for drilling and one for heat exchanger installation? CID if contractor is licensed, can do portion of work to install. If not removing water for consumption, OSE not involved. Appropriating water for beneficial use? Don't think projects even drill through water bearing zone. OSE licensing could be expansion of current OSE water well driller certification program licensing requirement? OSE deals w/ geothermal systems where water appropriations are applicable to geothermal power generation plants.

**BLM:** If incidental use, that's fine and out of our perview. BTU value to heat is something of interest on Federal Lands only. Federal Courts incidental use regulated by State and State Geothermal Regulations apply on Federal Lands similar to State Lands. BLM or Federal Agencies need to be involved in geothermal applications when they are on Federal Lands. If Federal mineral estate, direct use or power generation, expect compensation or royalty to be paid for it. Direct use, any heating or application outside

of electricity generation. As long as State Regulations don't conflict with Federal Regulations. Dual bonding is an issue between State and Federal Governments that could be worked out in an MOU to require only State Bonding. For example, a system could be worked out deferring to the State to hold the bond on behalf of both Agencies. MOU to see who does what? State's geothermal bonding amounts are thought to be minimal and OCD should consider raising the bond amounts in its geothermal regulations. BLM thinks its bond amounts on Raser's power project near Animas is higher than state. Redundancy in Federal and State Bonding could be eliminated via MOU on dual bonding? Incidental use situations may not require a permit, and in this situation, if working on Federal mineral estate, if no State Discharge Permit, state should refer operators to BLM to meet Federal requirements. Must also meet any State permitting requirements. Direct heat definition, if direct use on Federal Estate, refer to Federal Government. Complications can occur. Example, on military lands.... can get complicated.

**OCD:** Under current OCD Attorney findings, OCD is responsible for all geothermal applications in the state and we welcome participation by the involved agencies to date to possibly continue as we have in the past; however, OSE makes clear case on closed-loop systems where would not be the agency partnering with CID/RLD on these projects, it would be OCD. OSE wants licensed water well drillers only to be involved with these projects, but OCD would not require licensed water well drillers under its geothermal regulations, but would observe CID/RLD licensing requirements. OCD could encourage contractors to be OSE water well driller certified, but because its regulations do not stipulate the requirement, OCD could not require it. OCD thinks that similar to water well drillers not having geothermal or oil and gas drilling experience, there are geothermal, oil and gas drillers that do not have drinking water well drilling experience; however, they are still required to protect fresh water (<= 10,000 ppm TDS) and 20.6.2.3103 NMAC water quality standards. Therefore, OCD feels with its WQCC delegation of authority to protect surface and ground water in the state coupled with its complete Primacy over the Federal UIC Program in New Mexico that it will, similar to OSE, ensure the protection of fresh water in the state.

4) Innovative ways for OCD to handle the magnitude of the permitting process. Seems like OCD needs to evaluate scenarios where the heat is incidental to main use of the water resource, type applicants needing to use the resource, etc. OCD may need to adopt an efficient strategy where the situation may be deemed incidental heat that is unpermitted, which cases must be permitted, etc. Aquifers with greater than 10,000 ppm that may be exempt from WQCC Discharge Permit, but still regulated under Geothermal Regulations (including injection, development, disposal, exploratory wells, etc), i.e., Enhanced Geothermal Systems where there is no USDW or aquifer in the bedrock, fractures are artificially created through controlled fracing, and a generally fixed volume of water is injected into the artificially created fracture(s), and a generally fixed volume is injected and recirculated to create a closed-loop ground recirculating system (again, WQCC Permitting may not apply, or may apply only for Class V Geothermal Injection wells, and any production/development wells, etc.)?

**NMED:** Exclusion in Geothermal Act, GW WQCC permitting falls to NMED if exclusion is met. OCD may permit Class V under Federal UIC Program. OCD handles where does not meet the exclusion. Talk more with NMED Management and review delegation of authorities adopted before geothermal use. Anything except incidental use... Restriction of potable water restricts what would be excluded. Take fluid w/ heat of non-potable nature? What is potable water defined as less than 1000 ppm TDS? Not defined anywhere and certainly not in geothermal. If water won't kill you, and is used incidentally, meets exception. No permitting or goes to NMED.

**OSE:** If permit to appropriate water, OSE has jurisdiction and water rights permitting authority and well driller licensing for construction of well requirements. Closed-loop systems don't fall into water appropriations, so OSE not involved with these projects. Artesian wells inspected by OSE.

**CID/RLD:** Construction of installed direct heat (low temp) systems must be performed by licensed heating contractor for closed-loop systems. Licensed individuals required and by extension electrical and construction of buildings too. Statute prohibits bidders w/o proper license(s) from bidding on these projects.

**OCD:** Wherever injection wells are permitted as Class V under UIC Program or geothermal wells under Geothermal Regulations are installed. OCD is now grappling with other geothermal aspects of the regulations besides the high temperature permitting it has been doing.

**BLM:** If on federal lands and mineral lands w/ split estates, BLM involved. MOU for bonding could follow up on....

- 5) Evaluate the scenarios where the heat may be deemed "incidental" and where it should be deemed a use requiring permitting..... (i.e, a school using the water potable and agricultural use, but wants to use the heat for direct applications for the school?).
  - Does the state want to require a school, church, prison, etc. to obtain a geothermal permit with royalty payments?
  - Will there be exclusions? OCD Attorney doesn't think so.
  - What won't be excluded? OCD Attorney- no exclusions.
  - Is primary use direct heat or use of water? OCD and OSE have to work together-OSE Chapter 32. If meets exclusion (incidental use of heat), back to OSE. Rules needed other than OCD's. Chpt 72 beneficial use in Chpt. 71 Geothermal both agencies have power to adopt similar rules.
- 6) Agency Issues:
  - What can be declared "incidental use of heat" that may require permitting, but no royalty is due to the state?
  - Royalties should be paid to the state regardless of whether electricity is produced, i.e., BTUs extracted from ground water through a production/development well,

and the applicant is a Church, School, Prison, Private, Federal or State Govt. Building, etc. No Exclusions!

- Licensing and Certification Issues?
- All geothermal projects must be considered by OCD under its Geothermal Regulations. Incidental vs. direct use poses a significant issue for the OCD as any/all geothermal projects will need to be tracked and a discharge permit determination made based on each application, and it expects a major application load on direct heat projects w/ closed loop and/or bank heat storage systems.
- Does OCD take the place of OSE or does OSE wish to keep its interaction with CID/RLD? OSE understands that OCD may not require well drillers on former OSE/RLD projects to be licensed water well drillers. 7205 Application of potable water to beneficial use, residential use water well, install coil, combination use withdrawing water, CID and OSE could work out as domestic use of water where OSE is involved with CID. One boring for 2 purposes. 100 boreholes, closed loop, how to interact with mechanical Contractor, submit detailed plan w/ construction submittals, code compliance, permit work construction permit for mechanical work and some permit overlap to electrical permitting.... Approved products with qualifications... safe fluids eco friendly... terminate heating system per code and system works.
- Are direct heat and/or banked heat storage closed-loop geothermal systems considered incidental use? The closed-loop nature of system is not drawing water from formations to remove heat and injecting back into a formation with concerns about USDWs. Richard Erdlac will speak on this subject at next meeting. If it is not an "incidental use", OCD will have to develop a vast residential, commercial and industrial permitting process to track the lion's share of ongoing geothermal projects in New Mexico in addition to power projects with production and injection wells, etc.... According to NMED, GWQB will not develop a specific application, but NMED has a Notice of Intent (NOI) Form that should be filled out by any large ground source/direct heat projects for GWQB to evaluate and make a Discharge Permit requirement determination. OCD has a generic geothermal form that is similar and may work for closed-loop geothermal direct heat applications. OCD also has a Form C-108 for any injection or production/development wells geothermal applications.
- OSE wants Certified Water Well Drillers only to be allowed to install wells at geothermal project areas. OCD believes that this would hamper its duties, responsibilities, and slow down the administration of the program, especially for geothermal power projects where OCD feels water well drillers lack expertise in geothermal drilling methods and geothermal may lack expertise in water well drilling; however, geothermal drillers know how to seal off fresh water zones (<= 10,000 mg/L TDS). OCD is also a delegated agency for the WQCC in oil, gas and geothermal activities in New Mexico. OCD has full Primacy for the Federal UIC Program in New Mexico. Under the current Governor Executive Order, New Mexico is looking to streamline the permitting process and multiple agency involvement would only slow down the process. OCD can recommend that geothermal drillers obtain OSE Certification to drill drinking water wells, but cannot require it under its current geothermal regulations.</li>

- Discuss RLD geothermal heat exchangers in closed loop systems, licensee requirements and the inspection process. No other comments.... Systems and who does what is new to all of us? Struggling on licensing requirements, permitting requirements, CID side to have things in order.... Across the board on renewable power projects not just geothermal. Flesh out nuances to work collaboratively. Licensed well drillers also use licensed well drillers. Require licensed well drillers permit to appropriate water. Closed-loop not the case..... Not involved...
- Innovative ways for OCD to handle the magnitude of the permitting process. Seems like OCD needs to evaluate scenarios where the heat is incidental to main use of the water resource, type applicants needing to use the resource, etc. OCD may need to adopt an efficient strategy where the situation may be deemed incidental heat that is unpermitted, which cases must be permitted, etc. Aquifers with greater than 10,000 ppm that may be exempt from a WQCC Discharge Permit, but still regulated under Geothermal Regulations (including injection, development, disposal, exploratory wells, etc.; EGSs where there is no aquifer in the bedrock, fractures are artificially created, and a generally fixed volume is injected to create a closed-loop ground recirculating system (again, WQCC Permitting may not apply, or may apply for Class V Geothermal injection wells, and any production/development wells; etc.).
- Exclusions carve out chunk not paying royalties. OCD cares about what we don't regulate. OCD interprets court of appeals under 250 is regulated by OCD. SLO get w/ program to collect revenues. OCD not tied up into this issue. BLM Mike Smith Mikal pulled info from web to get finding, one thing is heating of public buildings. Klamath Falls Oregon example of direct use.
- Most traditional geothermal projects focus on the facet of the extraction of heat for whatever purpose. Closed loop systems ("direct use" was the terminology used today) are essentially a two-season HVAC system, responsible for providing relative warmth from the ground source to a facility's HVAC system during coldair seasons, and providing relative coolness from the ground source to a facility's HVAC system during hot-air seasons. The ground source would not be used to any substantial extent during the mild-air seasons, much the way we individuals do not run our heat/air-conditioning systems during the milder spring and fall seasons (yes to fan use and no to use of the heat or cool source).
- Royalties may be going uncollected as use of closed loop systems increases. I would question the right to collect royalties on a two-season system not tapping a defined geothermal resource that extracts ground heat during winter HVAC use, but **recharges** ground heat during summer HVAC use. If the local power company was billing a facility that both consumed and returned power (such as for facilities with solar cells or wind turbines), their billing process would bill for a netted-out effect.
- The CID/RLD may be best able to offer comment about actual extent of summer use of the closed-loop systems, and their records would likely reflect that the closed-loop systems are being built where funds are available or green-thinking individuals make the choice... not where the systems tap a designated geothermal resource. Perhaps the deplete/recharge cycle that occurs with the use of ground

- source heat pumps / closed loop systems requires further definition before being swept into certain geothermal categories premised solely on heat extraction.
- The project discussed during the meeting with air as transfer media or working fluid in ground water mound is confusing to the CID/RLT. Who would install such a system? Civil work and not construction work... Isolated case.... Treat as utility 5 ft. from structures. Heads up? Looking at licensing of individuals doing construction work close to well head, electrical component as we consider private source of water. Electrical has jurisdiction. Connections to pumps.....? What does CID/RLD do with drillers, even borings, do we require licenses/Certifications? Exclusion for oil and gas drillers? Does it mention geothermal? Don't think OSE exclusion includes geothermal.... Classification in place to fit driller and directional drillers come to mind....

### 7) Miscellaneous:

- This working group is a good opportunity for the agencies to promote dialogue, inventory its programs, communication about its programs, interaction and setup a process the agencies all agree upon for interested applicants seeking green renewable geothermal energy in New Mexico. The OCD hopes that the agencies will continue to participate in this working group until we feel we have reached the point in our meetings where no more meetings are necessary and we have developed a network for future communication with each other.
- 8) Path Forward:
  - Next meeting May 5, 2010 10 a.m. to Noon at CID/RLD in Santa Fe [Capitol West Campus: Tony Anaya Building; 2550 Cerrillos Road; Santa Fe, NM (call J. T. Baca 505-476-4661 if you have questions)]
  - Discuss NMED NOI and OCD Geothermal Form
  - Review OCD Draft "Who Does What" for it geothermal resource page on its website.

Note: The draft agenda items above are presented to assist the group with forward thinking in anticipation of the meeting and nothing is final nor should any items above or discussed during work group meetings be misconstrued to mean we are seeking ways to by bypass Geothermal Regulations, etc.

From: Sent: To: Subject: Baca, Jerome T., RLD Monday, April 12, 2010 10:35 AM Chavez, Carl J, EMNRD RE: Geothermal Regulations Stakeholder Meeting- Continuation of 3/30 Meeting at OCD

Carl, I will get with Fermin and Rem about date and we would be glad to host at CID provided the conference rooms are available. Thanks, J. T.

From: Hall, John, NMENV

Sent: Monday, April 12, 2010 10:19 AM

**To:** Chavez, Carl J, EMNRD; Johnson, Mike S., OSE; Heber, David, OSE; Altomare, Mikal, EMNRD; Lucero, Stephen A., EMNRD; Olson, Bill, NMENV; Fesmire, Mark, EMNRD; 'Mike_Smith@blm.gov'; Martinez, Lisa, RLD; 'Adrienne.Brumley@blm.gov'; Brooks, David K., EMNRD; Dalmy, Andy ., RLD; Baca, Jerome T., RLD; Pacheco, Rem, RLD; Aragon, Fermin, RLD; VonGonten, Glenn, EMNRD; Rappuhn, Doug H., OSE; 'rcerdlac@cleansed.net' **Subject:** RE: Geothermal Regulations Stakeholder Meeting- Continuation of 3/30 Meeting at OCD

<< File: Notice_of_Intent.doc >> Carl,

Unfortunately I am not available starting May 3rd until sometime between July 31st to August 31. I will be working on UIC database development. I will be in my office early in the mornings until 8:30 and sometime after 3:30 in the afternoons for a bit, but I expect that I will be swamped as I will be trying to attend to my usual duties as well. Please keep me in the loop on the emails and I will try to respond to them as appropriate.

In response to # 5 below, GWQB will not develop a specific application, but I have included our Notice of Intent form that should be filled out by any large ground source/direct heat projects for GWQB to evaluate and make a Discharge Permit requirement determination.

Thanks,

John S. Hall UIC Coordinator Ground Water Quality Bureau New Mexico Environment Dept. (505)-827-1049

-----Original Appointment----From: Chavez, Carl J, EMNRD
Sent: Thursday, April 08, 2010 5:07 PM
To: Hall, John, NMENV; Johnson, Mike S., OSE; Heber, David, OSE; Altomare, Mikal, EMNRD; Lucero, Stephen A., EMNRD; Olson, Bill, NMENV; Fesmire, Mark, EMNRD; Mike_Smith@blm.gov; Martinez, Lisa, RLD; Adrienne.Brumley@blm.gov; Brooks, David K., EMNRD; Dalmy, Andy ., RLD; Baca, Jerome T., RLD; Pacheco, Rem, RLD; Aragon, Fermin , RLD; VonGonten, Glenn, EMNRD; Chavez, Carl J, EMNRD; Rappuhn, Doug H., OSE; rcerdlac@cleansed.net
Subject: Geothermal Regulations Stakeholder Meeting- Continuation of 3/30 Meeting at OCD
When: Wednesday, May 05, 2010 10:00 AM-12:00 PM (GMT-07:00) Mountain Time (US & Canada).
Where: OSE or CID/RLD?

Stakeholders:

Preliminary meeting date and time to follow-up on "Who Does What" at the last meeting.... A location at CID/RLD or OSE may be appropriate to familiarize stakeholders with your respective locations for future meetings, visits, etc. to your offices. Is CID/RLD interested in hosting the next meeting? Just a thought as OCD can continue with meetings in our

office.... All we need is a phone line for teleconference capability. Website access w/ projector may be appropriate if agencies wish to show their resources pages with application forms, process, etc.?

### Similar to past meetings, from any location, OCD can provide a call in number w/ code entry for callers to participate....

Request for your agenda items:

- 1) Water well driller certification/requirements on geothermal projects (OSE)? Bring Doug Rappuhn's (OSE) correspondences after last 2 meetings. Also, Jerome Baca (RLD) can bring his correspondence related to Doug's correspondence for discussion....
- 2) Who does what- review and amend OCD's Geothermal Resource Page together (OCD Publications Webpage) Handout passed out by OCD at 3/30 meeting.
- 3) Tentative "Direct Use or Not Direct Use- Closed Loop Heat Storage" Richard Erdlac (Erdlac Energy Consulting)
- 4) Each stakeholder shall pass out their geothermal application forms and or permit associated w/ their geothermal permitting program for OCD to be aware of and possibly to reproduce for its program? OCD will also hand out its forms.
- 5) What are agencies willing to let go and/or what do agencies want to keep on doing? OCD may want this to continue for some period of indefinitely, i.e., OSE continuing to be part of the CID/RLD direct heat process, but OCD will likely need to develop a direct heat form application to track projects. Has NMED developed an application form for direct heat applications? Application process?
- 6) Possible Geothermal Working Group (not to be confused with our "Geothermal Regulations Stakeholder Group) "Geothermal Oil & Gas Coproduction" in the oil patch Symposium ~ September 2010. Steve Lucero ECMD organizing. BLM, OSE (water scarcity and appropriation issues) and OCD (permitting, down hole new and reworking well issues, potash and mineral rights issues?), and geothermal company presentations.
- 7) Website visitation of geothermal resources, i.e., permitting, process, etc.
- 8) Other issues and concerns?
- 9) Miscellaneous

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- 8) Other issues and concerns?
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}

From:	Rappuhn, Doug H., OSE
Sent:	Thursday, April 08, 2010 8:20 AM
То:	Chavez, Carl J, EMNRD; Baca, Jerome T., RLD
Cc:	Hall, John, NMENV; Johnson, Mike S., OSE; Heber, David, OSE; Altomare, Mikal, EMNRD; Lucero, Stephen A., EMNRD; Olson, Bill, NMENV; Fesmire, Mark, EMNRD; 'Mike, Smith@hlm.gov': Martinez, Lisa, BLD: 'Adrienne Brumley@hlm.gov': Brooks, David K
	EMNRD; Dalmy, Andy ., RLD; Baca, Jerome T., RLD; Pacheco, Rem, RLD; Aragon, Fermin, RLD; VonGonten, Glenn, EMNRD
Subject:	RE: Applicable license for drillers of geothermal and closed loop geothermal wells

I'm routing this older e-mail chain to the Geothermal Regulations Stakeholder Group, as Carl requests in the bottom email. Sorry if it is a re-send to anyone:

From: Rappuhn, Doug H., OSE
Sent: Wednesday, February 24, 2010 2:11 PM
To: Chavez, Carl J, EMNRD; Lucero, Stephen A., EMNRD
Cc: Johnson, Mike S., OSE; Heber, David, OSE
Subject: FW: Closed loop ground source heat pump systems installed in subsurface boreholes

Thank you for arranging today's informative meeting. It was good to hear the topics discussed.

Jerome Baca of the CID (see below) sounds like a good contact to include in the geothermal work group, and may be particularly helpful with unraveling the shallower, closed loop/heat exchange jurisdiction. As the OSE folks noted today, some (many?) of these systems are drilled/completed to depths above the water table, further complicating the concept of OSE jurisdiction.

From: Baca, Jerome T., RLD
Sent: Wednesday, April 15, 2009 11:04 AM
To: Rappuhn, Doug H., OSE
Cc: Winkel, Heather, RLD; Aragon, Fermin , RLD
Subject: RE: Closed loop ground source heat pump systems installed in subsurface boreholes

Doug Rappuhn,

Yes, CID has inspection jurisdiction on ground source loop systems and the installed coils are a component of said systems.

The general concept of a ground source loop heating or cooling system is to utilize a large coil of circulating water or media that is buried and absorbs the ambient earth's temperature to precondition the circulating water or media. Usually the loop is terminated at a heat exchanger within the cooling and or heating system it serves. Though not new, this technology has become increasingly popular in the current Green movement based on its potential to save energy. There are several designs for coil configurations on these systems. We are starting to see the shaft configuration (slinky) more often as it tends to be space friendly and allows more control of temperature based on depth. Naturally well diggers can dig these shafts as demands call for them. However by licensing requirements it should be a heating contractor and the proper journeyman who install the heating or cooling systems and their components. They shall also be permitted by and inspected by the respective construction inspector. You can find more information on licensing in New Mexico Administrative Code in Title 14. Please feel free to contact me if I can be of further assistance. Thanks, J. T.

Jerome T. Baca Mechanical Bureau Chief, CID 505-476-4661 office 505-490-2997 cell From: Winkel, Heather, RLD On Behalf Of RLDCID, RLD
Sent: Tuesday, April 07, 2009 8:34 AM
To: Baca, Jerome T., RLD
Subject: FW: Closed loop ground source heat pump systems installed in subsurface boreholes

Hi, JT: Fermin suggested this be sent to you for response.

Thank you, Heather

From: Rappuhn, Doug H., OSE
Sent: Monday, April 06, 2009 6:42 PM
To: RLDCID, RLD
Subject: Closed loop ground source heat pump systems installed in subsurface boreholes

Dear Sirs -

I am a Hydrologist with the Office of the State Engineer, and work on a regular basis with the state's water well drillers, who are becoming increasingly called on to drill holes for closed loop ground source heat pumps. OSE regulations NMAC 19.27.4 (copy attached) appear to provide an element of jurisdiction in the manner in which these boreholes are to be completed, specifically the need for annular seals (such as a cement or bentonite grout that fills the borehole around the closed loop piping) to ensure against infiltration of surface water and inter-aquifer exchange of water. I had assumed OSE jurisdiction based on the broad 19.27.4.7.E definition of "well", and the natural progression of the regulations regarding whether non-artesian or artesian condition were encountered, if a water-bearing stratum/strata was encountered, but there appears to be a statutory problem.

From talking to some loop industry contacts, it appears that encountering ground water with the loop borehole is not required to provide a capable loop heat exchanger, and that in many cases the desired heat exchange may occur simply from good contact between the borehole wall and the subsurface loop piping. If a water-bearing stratum was not penetrated, and there had been no intention to penetrate one, the closest the OSE's 19.27.4 regulations would come regarding jurisdiction appears to be the 19.27.4.30.C(1) provision for plugging a well that did not encounter a water bearing stratum. That said, I have recently heard in-house that our 19.27.4 regulations may have drifted past their statutory jurisdiction in addressing this kind of "well" when written in 2005, and that the 19.27.4.7.E "well" definition may need revision to therefore specifically exclude wells of a geothermal nature.

Could you please tell me if the CID has, or if you are aware of any other agency having regulations regarding the design /construction of these closed loop systems? The systems can be sized for commercial or residential use. I have been in touch with Stephen Lucero and Carl Chavez from the New Mexico Energy, Minerals and Natural Resources Department, and James Hall from the New Mexico Environment Department, but have not found specific mention made of this subsurface closed-loop heat exchanger system. The Oil Conservation Division of NMEMNRD has regulations regarding the manner in which geothermal wells are constructed, but they do not seem to include these closed loop heat exchange systems that use subsurface temperature <u>differentials</u> in both winter (when they gain warmth) and summer (when they gain coolness) seasons to reduce HVAC costs, rather than tapping a defined geothermal reservoir.

Thanks,

Douglas H. Rappuhn Hydrology Bureau / New Mexico Office of the State Engineer 121 Tijeras NE, Suite 2000 Albuquerque, NM 87102 Phone: 505-765-2018 / Fax: 505-764-3892 e-mail: doug.rappuhn@state.nm.us From: Chavez, Carl J, EMNRD
Sent: Thursday, April 08, 2010 6:42 AM
To: Rappuhn, Doug H., OSE; Baca, Jerome T., RLD
Cc: Hall, John, NMENV; Johnson, Mike S., OSE; Heber, David, OSE; Altomare, Mikal, EMNRD; Lucero, Stephen A., EMNRD; Olson, Bill, NMENV; Fesmire, Mark, EMNRD; Mike_Smith@blm.gov; Martinez, Lisa, RLD;
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Aragon, Fermin , RLD; VonGonten, Glenn, EMNRD; Chavez, Carl J, EMNRD
Subject: RE: Applicable license for drillers of geothermal and closed loop geothermal wells

Doug and Jerome:

Thanks for the communication. I have copied the "Geothermal Regulations Stakeholder Group" (GRSG) to keep everyone in the group apprised of recent communications related with the GRSG meetings. I know CID/RLD were not present at the first February 2010 meeting.

I would like to request that any issues related to the GRSG be shared with the GRSG. Doug, by receipt of this e-mail, could you please send the group your communiqués that you sent after our last 2 GRSG meetings to bring everyone up to speed on the OSE communiqués after the meetings? I think your last communiqué is captured below. Thank you.

Thank you.

Carl J. Chavez, CHMM New Mexico Energy, Minerals & Natural Resources Dept. Oil Conservation Division, Environmental Bureau 1220 South St. Francis Dr., Santa Fe, New Mexico 87505 Office: (505) 476-3490 Fax: (505) 476-3462 E-mail: <u>CarlJ.Chavez@state.nm.us</u> Website: <u>http://www.emnrd.state.nm.us/ocd/</u>index.htm (Pollution Prevention Guidance is under "Publications")

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From: Rappuhn, Doug H., OSE Sent: Tuesday, March 30, 2010 12:28 PM To: Chavez, Carl J, EMNRD Cc: Johnson, Mike S., OSE; Heber, David, OSE Subject: Closed loop / direct heat systems

Hi Carl -

Thanks for your efforts with today's geothermal work group meeting. Not being at the meeting, I find it a bit more difficult to know when to jump into a conversation, but in retrospect, I thought of a consideration that should be part of the conversation held today.

I assume most traditional geothermal projects focus on the facet of the extraction of heat for whatever purpose. It is my understanding that closed loop systems ("direct use" was the terminology used today) are essentially a two-season HVAC system, responsible for providing relative warmth from the ground source to a facility's HVAC system during cold-air seasons, and providing relative coolness from the ground source to a facility's HVAC system during hot-air seasons. The ground source would not be used to any substantial extent during the mild-air seasons, much the way we individuals do not run our heat/air-conditioning systems during the milder spring and fall seasons (yes to fan use; no to use of the heat or cool source).

We discussed that royalties may be going uncollected as use of closed loop systems increases. I would question the right to collect royalties on a two-season system not tapping a defined geothermal resource that extracts ground heat during winter HVAC use, but <u>recharges</u> ground heat during summer HVAC use. If the local power company was billing a facility that both consumed and returned power (such as for facilities with solar cells or wind turbines), their billing process would bill for a netted-out effect.

The CID folks may be best able to offer comment about actual extent of summer use of the closed loop systems, but I think their records would likely reflect that the closed loop systems are being built where funds are available or green-thinking individuals make the choice... not where the systems tap a designated geothermal resource. Perhaps the deplete / recharge cycle that occurs with the use of ground source heat pumps / closed loop systems requires further definition before being swept into certain geothermal categories premised solely on heat extraction.

### Douglas H. Rappuhn

Hydrology Bureau / New Mexico Office of the State Engineer 5550 San Antonio Drive NE Albuquerque, NM 87109-4127 Phone: 505-383-4018; Fax: 505-383-4030 e-mail: doug.rappuhn@state.nm.us

From: Chavez, Carl J, EMNRD Sent: Thursday, April 08, 2010 6:42 AM To: Rappuhn, Doug H., OSE; Baca, Jerome T., RLD
Cc: Hall, John, NMENV; Johnson, Mike S., OSE; Heber, David, OSE; Altomare, Mikal, EMNRD; Lucero, Stephen A., EMNRD; Olson, Bill, NMENV; Fesmire, Mark, EMNRD; Mike_Smith@blm.gov; Martinez, Lisa, RLD;
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Thank you.

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From:Baca, Jerome T., RLDSent:Wednesday, April 07, 2010 12:10 PMTo:Rappuhn, Doug H., OSE; Chavez, Carl J, EMNRDCc:Dalmy, Andy ., RLDSubject:RE: Applicable license for drillers of geothermal and closed loop geothermal wells

Gentlemen, below are the Mechanical and GF licenses classes that may be involved in the installation of a ground source closed loop system. Dependent upon circumstances like the location and type of work and if any of the work is subbed out. Technically an OSE licensed well driller who wants to perform this work, must hold the proper CID license class to bid or contract this type of work. As you can see below there is some overlap. I hope this answers Doug's question. Please let me know if can be of further help?

J. T.

### 14.6.6 NMAC

(a) MM-1. Plumbing. Requires four years experience. Install, alter, repair and service plumbing fixtures, and piping, including pneumatic or electric controls and control wiring not greater than 24 volts, concrete supports, and excavating, trenching and backfilling. Includes hot water heating systems not exceeding 30 p.s.i. or 400,00 b.t.u./hour input; piping for fuel, oil and gasoline and for solar energy systems; septic tanks, manholes and sewer lines; irrigation sprinkler systems; swimming pools and spas;. Does not include installation of natural gas fired appliances or natural gas piping.

(b) MM-2. Natural gas fitting. Requires four years experience. Install, alter, repair and service natural gas piping and fittings and incidental controls and control wiring, pneumatic control systems, excavating, trenching and backfilling. Includes installation of hot water systems exceeding 30 p.s.i. or 400,000 b.t.u./hour input; steam and hot water boilers; and warm air heating systems such as chimney connections, flues, refractories, burners, fittings valves, thermal insulation, accessories and incidental piping; warm air appliances and other listed gas appliances. May not install LP Gas systems.

(c) MM-3. Heating, ventilation & air conditioning (HVAC). Requires four years experience. Install, alter, repair and service HVAC air handling and refrigeration equipment and piping, including fans, coils, condensing units, self-contained packaged air conditioning and/or heating units, evaporative cooling units, solar energy systems, ductwork and pneumatic tube systems. May connect water to existing valved outlets, and install controls, and control wiring not to exceed 24 volts. May bid and contract for structural alterations, painting, electrical wiring and other work incidental to this scope of work, provided such work is performed by a properly licensed contractor.

(d) MM-4. Heating, cooling and process piping. Requires four years experience. Install, alter, repair and service hydronic heating, cooling and process piping for steam hot water systems of any temperature pressure range, chilled water systems, condensing water systems and process piping systems. Includes pressure vessels, heat exchangers, boilers, refrigeration water chillers, cooling towers, fuel oil tanks and fuel oil piping, and pneumatic or electric controls and control wiring not to exceed 24 volts. Install high pressure and process piping solar energy systems of any temperature or any pressure conveying gas or fluids other than potable water, and pneumatic tube systems.

(e) MM-98 Mechanical. Requires four years experience. Requires licensure in classifications MM-1 through MM-4 and covers all work described in these classifications, as well as work described in the MS-3, MS-6, MS-12 and MS-14.

(i) **GF-9.** Utility lines (sewage, natural gas and underground telephone cables). Requires two years experience. Construct, install, alter or repair utility lines for the transmission of sewage, natural gas and water, including excavating, grading, trenching, boring, shoring, backfilling, compacting, paving and surfacing. Construct, alter, or repair treatment plants and facilities incidental thereto. Install direct burial telephone or data cable and vaults as directed by the telephone utility. May not perform installation of electrical raceways, splicing, termination, installation of load pots, overhead cabling work, or other activities considered under the scope of the ES-7, EL-10r EE-98 electrical classifications.

(j) **GF-98.** Construct, alter or repair fixed works facilities. Requires four years experience. Requires licensure in classifications GF-1 through GF-9 and covers all work described in these classifications.

From: Rappuhn, Doug H., OSE Sent: Tuesday, April 06, 2010 7:56 PM To: Chavez, Carl J, EMNRD; Baca, Jerome T., RLD

### Cc: Johnson, Mike S., OSE; Heber, David, OSE

Subject: Applicable license for drillers of geothermal and closed loop geothermal wells

#### Hi Carl and Jerome -

As you know, I work for the OSE (as a hydrologist that often interfaces with the drilling community regarding matters of rule compliance; I am NOT a lawyer). As an agency, we issue the state's Water Well Driller License. Drillers of water wells must operate under our license and the steering regulations for the licensing and renewal process, as well as for the construction and design of water wells are within NMAC 19.27.4 (attached).

I have begun to receive inquiries from water well drillers regarding what licenses are required by your agencies for drilling wells it appears you have permitting jurisdiction for: both "traditional" geothermal wells (wells drilled to tap a defined geothermal resource, where heat extraction for whatever purpose occurs without regard to seasonality, or only during the season where extraction of heat occurs) and closed loop/ground source heat pump wells. I'll try to refine my questions a bit further below.

<u>Carl</u>: NMAC 19.27.4 does not expressly exclude geothermal drillers from needing our license to drill wells for water from an underground source (see NMAC 19.27.4.3), and NMAC 19.27.4.6.E includes (perhaps errantly) geothermal wells to be defined as wells for the purpose of 19.27.4 applicability. At this point I am unsure that the OSE water well driller license would not be necessary for a firm drilling a traditional geothermal well, so my question is, does the OCD require another type of license to cover the drilling for traditional geothermal well drilling or call out the attention of a need for the OSE's water well driller license for project drilling?

If the OCD requires use of an alternate license for drilling, could you please let me know what license that is, and provide a regulatory citation requiring drilling under that license?

<u>Jerome</u>: A similar question, but with an important difference, tailored to the drilling of boreholes for installation of tall vertical closed loop heat exchangers meant to fit in such boreholes... NMAC 19.27.4 does not expressly exclude closed loop/ground source heat pump well drillers from needing our license to drill wells, yet in these systems, the borehole drilled is not necessarily for (acquiring) water from an underground source (see NMAC 19.27.4.3), and NMAC 19.27.4.6.E includes (perhaps errantly) geothermal wells to be defined as wells for the purpose of 19.27.4 applicability. At this point I am unsure that the OSE water well driller license would not be necessary for a firm drilling a closed loop/ground source heat pump well, so my question is, does the CID require another type of license to cover the drilling for closed loop/ground source heat pump well drilling or call out the attention of a need for the OSE's water well driller license for project drilling? If the CID requires use of an alternate license <u>for drilling</u>, could you please let me know what license that is, and provide a regulatory citation requiring drilling under that license?

I seem to recall the mention of the closed loop work to be conducted under the guidance of a licensed HVAC contractor (or plumber?). Could you please confirm the type of license required by the CID, and provide a regulatory citation requiring project initiation or completion under that license.

Many thanks to both of you for what answers you may offer.

#### **Douglas H. Rappuhn** Hydrology Bureau / New Mexico Office of the State Engineer 5550 San Antonio Drive NE Albumarma NM 87100 4127

Albuquerque, NM 87109-4127 Phone: 505-383-4018; Fax: 505-383-4030 e-mail: <u>doug.rappuhn@state.nm.us</u>

From:Rappuhn, Doug H., OSESent:Wednesday, April 07, 2010 6:53 PMTo:Baca, Jerome T., RLD; Chavez, Carl J, EMNRDCc:Dalmy, Andy ., RLDSubject:RE: Applicable license for drillers of geothermal and closed loop geothermal wells

Thanks very much, Jerome. Seems there are project variables that dictate what license the CID would determine is appropriate for the job. I'm pretty sure there is no specification by the CID that the NMOSE Water Well Driller License is a requirement in for elements of a closed loop/ground source heat pump job you guys get called on to inspect, but if I have that wrong, let me know.

I do have a follow-up question, though. <u>Is there either a NMAC set of regulations, or a CID or industry set of standards</u> <u>or guidelines that dictates the manner that closed loop systems get designed or constructed (I am asking very</u> <u>specifically about the borehole drilling, loop materials and installation technique, annular grout and grouting</u> <u>technique, and we might as well include surface plumbing and electrical connection/devices to round-out things)?</u> For instance, the NMAC 19.27.4.29 through 19.27.4.37 regulations sent with my initial e-mail below dictate certain principles of well construction expected to be applied. Much more information would have to be provided to cover all the details of well construction, so we accept standards from other agencies like the American Water Works Association, ASTM, API, and NSF (the National Ground Water Association has been working their way into a role in vetted design and construction methodology too), and then note that the State Engineer gets the final call:</u>

19.27.4.29 WELL DRILLING - GENERAL REQUIREMENTS: All wells shall be constructed prevent contamination, to prevent inter-aquifer exchange of water, to prevent flood waters from contaminaquifer, and to prevent infiltration of surface water. A licensed well driller shall ensure that an appropriate primit or emergency authorization has been granted by the state engineer prior to the well drilling. A lice driller shall ensure that the well drilling activities are made in accordance with 19.27.4.30 NMAC, 19.27. NMAC, and the following requirements:

A. On-site supervision of well drilling: A licensed well driller or registered drill rig superbe present at the drilling site during well drilling.

B. Materials: Materials used in well drilling shall conform to industry standards acceptal state engineer. Acceptable standards include, but are not limited to, standards developed by the America works association (AWWA), the American standard for testing materials (ASTM), the American petrolet (API), and the national sanitation foundation (NSF). The state engineer shall make the final determinatic applicability of standards if any of the acceptable standards are different from one another. Materials use construction shall be in new or good condition. No materials shall be used that may cause water contami Only potable water shall be placed in a well during well drilling.

The referenced 19.27.4.30 and 19.27.4.31 rules deal specifically with non-artesian and artesian well construction. General design/construction elements common to both types of wells follow the passages above. More often than not, I am called on to review a drilling technique or well construction materials that require additional OSE consideration or approval. This may be in the form of addressing a NMAC 19.27.4 variance request or making the call on whether certain materials are appropriate or comparable to those noted in our rules. My sole focus therein is just reviewing well design and construction. You CID guys have the rest of the free world out there that you oversee, and I assume you have different design/construction standards or guidelines that are applied to different phases of lots of types of construction. So... I essentially want to make sure I am not overlooking standards you apply to any portion of closed loop drilling and the rest of the underlined activities above in case I am called on by the water well drilling community for advice or resolution of a problem regarding construction of closed loop boreholes and installation of the loops.

This has been helpful! Thanks again.

From: Baca, Jerome T., RLD
Sent: Wednesday, April 07, 2010 12:10 PM
To: Rappuhn, Doug H., OSE; Chavez, Carl J, EMNRD
Cc: Dalmy, Andy ., RLD
Subject: RE: Applicable license for drillers of geothermal and closed loop geothermal wells

Gentlemen, below are the Mechanical and GF licenses classes that may be involved in the installation of a ground source closed loop system. Dependent upon circumstances like the location and type of work and if any of the work is subbed out. Technically an OSE licensed well driller who wants to perform this work, must hold the proper CID license class to bid or contract this type of work. As you can see below there is some overlap. I hope this answers Doug's question. Please let me know if can be of further help?

J. T.

### 14.6.6 NMAC

(a) **MM-1. Plumbing.** Requires four years experience. Install, alter, repair and service plumbing fixtures, and piping, including pneumatic or electric controls and control wiring not greater than 24 volts, concrete supports, and excavating, trenching and backfilling. Includes hot water heating systems not exceeding 30 p.s.i. or 400,00 b.t.u./hour input; piping for fuel, oil and gasoline and for solar energy systems; septic tanks, manholes and sewer lines; irrigation sprinkler systems; swimming pools and spas;. Does not include installation of natural gas fired appliances or natural gas piping.

(b) MM-2. Natural gas fitting. Requires four years experience. Install, alter, repair and service natural gas piping and fittings and incidental controls and control wiring, pneumatic control systems, excavating, trenching and backfilling. Includes installation of hot water systems exceeding 30 p.s.i. or 400,000 b.t.u./hour input; steam and hot water boilers; and warm air heating systems such as chimney connections, flues, refractories, burners, fittings valves, thermal insulation, accessories and incidental piping; warm air appliances and other listed gas appliances. May not install LP Gas systems.

(c) MM-3. Heating, ventilation & air conditioning (HVAC). Requires four years experience. Install, alter, repair and service HVAC air handling and refrigeration equipment and piping, including fans, coils, condensing units, self-contained packaged air conditioning and/or heating units, evaporative cooling units, solar energy systems, ductwork and pneumatic tube systems. May connect water to existing valved outlets, and install controls, and control wiring not to exceed 24 volts. May bid and contract for structural alterations, painting, electrical wiring and other work incidental to this scope of work, provided such work is performed by a properly licensed contractor.

(d) MM-4. Heating, cooling and process piping. Requires four years experience. Install, alter, repair and service hydronic heating, cooling and process piping for steam hot water systems of any temperature pressure range, chilled water systems, condensing water systems and process piping systems. Includes pressure vessels, heat exchangers, boilers, refrigeration water chillers, cooling towers, fuel oil tanks and fuel oil piping, and pneumatic or electric controls and control wiring not to exceed 24 volts. Install high pressure and process piping solar energy systems of any temperature or any pressure conveying gas or fluids other than potable water, and pneumatic tube systems.

(e) MM-98 Mechanical. Requires four years experience. Requires licensure in classifications MM-1 through MM-4 and covers all work described in these classifications, as well as work described in the MS-3, MS-6, MS-12 and MS-14.

(i) **GF-9. Utility lines (sewage, natural gas and underground telephone cables).** Requires two years experience. Construct, install, alter or repair utility lines for the transmission of sewage, natural gas and water, including excavating, grading, trenching, boring, shoring, backfilling, compacting, paving and surfacing. Construct, alter, or repair treatment plants and facilities incidental thereto. Install direct burial telephone or data cable and vaults as directed by the telephone utility. May not perform installation of electrical raceways, splicing, termination, installation of load pots, overhead cabling work, or other activities considered under the scope of the ES-7, EL-10r EE-98 electrical classifications.

(j) **GF-98.** Construct, alter or repair fixed works facilities. Requires four years experience. Requires licensure in classifications GF-1 through GF-9 and covers all work described in these classifications.

From:	Rappuhn, Doug H., OSE
Sent:	Wednesday, April 07, 2010 8:05 AM
То:	Chavez, Carl J, EMNRD; Baca, Jerome T., RLD
Cc:	Johnson, Mike S., OSE; Heber, David, OSE; Altomare, Mikal, EMNRD; Brooks, David K., EMNRD
Subject:	RE: Applicable license for drillers of geothermal and closed loop geothermal wells

Thanks for the comprehensive answer, Carl. You anticipated many follow-up questions!

If you get a chance, could you confirm the definition of fresh water (relative to discussion / regulation of oil, gas, geothermal well design, and the need for those well designs to protect fresh water)? In the long run, all agencies will have to understand companion agencies' definition of fresh or potable water. I mentioned at our first work group meeting, and there was follow-up mention at the second, that the phraseology referencing <u>potable</u> water and low-temperature (any temperature?) geothermal OCD jurisdiction may have ramifications, given the tendency for warm/hot water to naturally contain elevated TDS.

Some of the OSE regulations are predicated on then-standard USGS language calling water with >1,000 mg/L TDS "non-potable". Give me a kid's chemistry set and I'll mix you some potable water with > 1,000 mg/L TDS!

From: Chavez, Carl J, EMNRD
Sent: Wednesday, April 07, 2010 7:15 AM
To: Rappuhn, Doug H., OSE; Baca, Jerome T., RLD
Cc: Johnson, Mike S., OSE; Heber, David, OSE; Altomare, Mikal, EMNRD; Brooks, David K., EMNRD
Subject: RE: Applicable license for drillers of geothermal and closed loop geothermal wells

Doug:

Re: <u>Carl</u>: NMAC 19.27.4 does not expressly exclude geothermal drillers from needing our license to drill wells for water from an underground source (see NMAC 19.27.4.3), and NMAC 19.27.4.6.E includes (perhaps errantly) geothermal wells to be defined as wells for the purpose of 19.27.4 applicability. At this point I am unsure that the OSE water well driller license would not be necessary for a firm drilling a traditional geothermal well, so my question is, does the OCD require another type of license to cover the drilling for traditional geothermal well drilling or call out the attention of a need for the OSE's water well driller license for project drilling? If the OCD requires use of an alternate license <u>for drilling</u>, could you please let me know what license that is, and provide a regulatory citation requiring drilling under that license?

The OCD does not require another type of license to cover the drilling for traditional geothermal well drilling. The OCD does not feel that this calls out the attention of the need for the OSE's water well driller license for project drilling, since the Geothermal Administrative Code includes provisions for drillers and complying with the geothermal regulations. OCD is a delegated agency of the WQCC for implementation of 20.6.2 NMAC (see injection well provisions) and 20.6.4 NMAC, coupled with complete Primacy under the Federal UIC Program in New Mexico:

The OCD does not require geothermal drillers to have a water well driller license for oil, gas and/or geothermal project drilling. To do so would deviate from the OCD's ability to administer oil, gas and geothermal projects in New Mexico There are many certified water well drillers that lack geothermal, oil and gas drilling expertise and experience and vice versa. As per 19.14.1.11 cited below, the OCD would encourage operators to utilize drilling contractors that are certified by the OSE whenever possible, and require the protection of fresh water, but would not require it. The Geothermal Administrative Code and WQCC Regulations (injection provisions- i.e., Class V Wells) requires OCD to protect fresh water resources associated with all of our respective programs.

In conclusion, 19.14.1.11 and 19.14.1.16 indicate that Geothermal Regulations shall not supersede the authority which any state department or agency has with respect to the mgt., protection, and utilization of the state lands and resources under its jurisdiction. The division may enter into arrangements with state and federal governmental agencies, industrial committees and other persons with respect to special projects, services and studies relating to conservation of geothermal resources. The OSE could require that geothermal drillers have OSE Water Well Driller Certification, but this in itself would not make water well drillers any more proficient at drilling geothermal, oil and gas wells because they have a water well driller certification.

To view OCD Geothermal Regulations, please go to: http://www.emnrd.state.nm.us/ocd/documents/OilConservationDivisionGeothermalApplicationProcess8-18-2009.pdf.

Applicable OCD Geothermal Administrative Codes:

19.14.1.17 **DESIGNATION OF AGENT:** Any person who had drilled or is drilling or proposes to drill any geothermal well shall file a "designation of agent" (on a form approved by the division) with the division. The designated agent shall be a resident of this state and shall be the repository for all well records of wells drilled by the owner or operator for whom he is agent (Rule G-200 B) [now 19.14.51.9 NMAC]. All changes of address of the agent shall be immediately reported to the division in writing. Upon termination of any agent's authority, a new designation of agent shall be filed with the division within ten days. [Rule G-100; Recompiled 12/31/01]

WELL RECORDS: The owner or operator of any geothermal resources well shall keep, or cause to be kept, a 19.14.51.9 careful and accurate well log and history of the drilling of any such 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, shall be placed in the custody of the designated agent (see Rule G-100) [now 19.14.12.17 NMAC] of the owner or operator of the well and shall remain in such custody within the state of New Mexico until all required forms and attachments pertaining to the well have been filed with the division. These data shall be subject to inspection, during normal business hours, by the division or its representatives, and by the state engineer or his representatives. [Recompiled 12/31/01]

19.14.1.10 **PROTECTION OF LIFE, HEALTH AND THE ENVIRONMENT:** All geothermal operations, exploratory, drilling and producing, shall be conducted in a manner that will afford maximum reasonable protection to human life and health and to the environment.

[Rule G-4; Recompiled 12/31/01]

19.14.1.11 OTHER DEPARTMENTS AND AGENCIES: Nothing in these rules shall be construed to supersede the authority which any state department or agency has with respect to the management, protection and utilization of the state lands and resources under its jurisdiction.

[Rule G-5; Recompiled 12/31/01]

AUTHORITY TO COOPERATE WITH OTHER AGENCIES: The division may from time to time enter into 19.14.1.16 arrangements with state and federal governmental agencies, industrial committees and other persons, with respect to special projects, services and studies relating to conservation of geothermal resources. [Rule G-10; Recompiled 12/31/01]

I will add this topic to the Geothermal Regulations stakeholders agenda for the next meeting. Please contact me if you have questions. Thanks for the communication.

Carl J. Chavez, CHMM New Mexico Energy, Minerals & Natural Resources Dept. Oil Conservation Division, Environmental Bureau 1220 South St. Francis Dr., Santa Fe, New Mexico 87505 Office: (505) 476-3490 Fax: (505) 476-3462 E-mail: CarlJ.Chavez@state.nm.us Website: http://www.emnrd.state.nm.us/ocd/index.htm (Pollution Prevention Guidance is under "Publications")

From: Rappuhn, Doug H., OSE Sent: Tuesday, April 06, 2010 7:56 PM To: Chavez, Carl J, EMNRD; Baca, Jerome T., RLD Cc: Johnson, Mike S., OSE; Heber, David, OSE Subject: Applicable license for drillers of geothermal and closed loop geothermal wells

Hi Carl and Jerome --

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As you know, I work for the OSE (as a hydrologist that often interfaces with the drilling community regarding matters of rule compliance; I am NOT a lawyer). As an agency, we issue the state's Water Well Driller License. Drillers of water wells must operate under our license and the steering regulations for the licensing and renewal process, as well as for the construction and design of water wells are within NMAC 19.27.4 (attached).

I have begun to receive inquiries from water well drillers regarding what licenses are required by your agencies for drilling wells it appears you have permitting jurisdiction for: both "traditional" geothermal wells (wells drilled to tap a defined geothermal resource, where heat extraction for whatever purpose occurs without regard to seasonality, or only during the season where extraction of heat occurs) and closed loop/ground source heat pump wells. I'll try to refine my questions a bit further below.

<u>Carl</u>: NMAC 19.27.4 does not expressly exclude geothermal drillers from needing our license to drill wells for water from an underground source (see NMAC 19.27.4.3), and NMAC 19.27.4.6.E includes (perhaps errantly) geothermal wells to be defined as wells for the purpose of 19.27.4 applicability. At this point I am unsure that the OSE water well driller license would not be necessary for a firm drilling a traditional geothermal well, so my question is, does the OCD require another type of license to cover the drilling for traditional geothermal well drilling or call out the attention of a need for the OSE's water well driller license for project drilling?

If the OCD requires use of an alternate license for drilling, could you please let me know what license that is, and provide a regulatory citation requiring drilling under that license?

<u>Jerome</u>: A similar question, but with an important difference, tailored to the drilling of boreholes for installation of tall vertical closed loop heat exchangers meant to fit in such boreholes... NMAC 19.27.4 does not expressly exclude closed loop/ground source heat pump well drillers from needing our license to drill wells, yet in these systems, the borehole drilled is not necessarily for (acquiring) water from an underground source (see NMAC 19.27.4.3), and NMAC 19.27.4.6.E includes (perhaps errantly) geothermal wells to be defined as wells for the purpose of 19.27.4 applicability. At this point I am unsure that the OSE water well driller license would not be necessary for a firm drilling a closed loop/ground source heat pump well, so my question is, does the CID require another type of license to cover the drilling for closed loop/ground source heat pump well drilling or call out the attention of a need for the OSE's water well driller license for project drilling? If the CID requires use of an alternate license for drilling, could you please let me know what license that is, and provide a regulatory citation requiring drilling under that license?

I seem to recall the mention of the closed loop work to be conducted under the guidance of a licensed HVAC contractor (or plumber?). Could you please confirm the type of license required by the CID, and provide a regulatory citation requiring project initiation or completion under that license.

Many thanks to both of you for what answers you may offer.

#### Douglas H. Rappuhn

Hydrology Bureau / New Mexico Office of the State Engineer 5550 San Antonio Drive NE Albuquerque, NM 87109-4127 Phone: 505-383-4018; Fax: 505-383-4030 e-mail: <u>doug.rappuhn@state.nm.us</u> From: Rappuhn, Doug H., OSE
Sent: Tuesday, April 06, 2010 7:56 PM
To: Chavez, Carl J, EMNRD; Baca, Jerome T., RLD
Cc: Johnson, Mike S., OSE; Heber, David, OSE
Subject: Applicable license for drillers of geothermal and closed loop geothermal wells

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Many thanks to both of you for what answers you may offer.

Douglas H. Rappuhn Hydrology Bureau / New Mexico Office of the State Engineer 550 San Antonio Drive NE Albuquerque, NM 87109-4127 Phone: 505-383-4018; Fax: 505-383-4030 e-mail: doug.rappuhn@state.nm.us

From: Sent: To: Cc: Subject: Rappuhn, Doug H., OSE Tuesday, March 30, 2010 12:28 PM Chavez, Carl J, EMNRD Johnson, Mike S., OSE; Heber, David, OSE Closed loop / direct heat systems

Hi Carl –

Thanks for your efforts with today's geothermal work group meeting. Not being at the meeting, I find it a bit more difficult to know when to jump into a conversation, but in retrospect, I thought of a consideration that should be part of the conversation held today.

I assume most traditional geothermal projects focus on the facet of the extraction of heat for whatever purpose. It is my understanding that closed loop systems ("direct use" was the terminology used today) are essentially a two-season HVAC system, responsible for providing relative warmth from the ground source to a facility's HVAC system during cold-air seasons, and providing relative coolness from the ground source to a facility's HVAC system during hot-air seasons. The ground source would not be used to any substantial extent during the mild-air seasons, much the way we individuals do not run our heat/air-conditioning systems during the milder spring and fall seasons (yes to fan use; no to use of the heat or cool source).

We discussed that royalties may be going uncollected as use of closed loop systems increases. I would question the right to collect royalties on a two-season system not tapping a defined geothermal resource that extracts ground heat during winter HVAC use, but <u>recharges</u> ground heat during summer HVAC use. If the local power company was billing a facility that both consumed and returned power (such as for facilities with solar cells or wind turbines), their billing process would bill for a netted-out effect.

The CID folks may be best able to offer comment about actual extent of summer use of the closed loop systems, but I think their records would likely reflect that the closed loop systems are being built where funds are available or green-thinking individuals make the choice... not where the systems tap a designated geothermal resource. Perhaps the deplete / recharge cycle that occurs with the use of ground source heat pumps / closed loop systems requires further definition before being swept into certain geothermal categories premised solely on heat extraction.

### Douglas H. Rappuhn

Hydrology Bureau / New Mexico Office of the State Engineer 5550 San Antonio Drive NE Albuquerque, NM 87109-4127 Phone: 505-383-4018; Fax: 505-383-4030 e-mail: doug.rappuhn@state.nm.us

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From:Rappuhn, Doug H., OSESent:Wednesday, February 24, 2010 2:11 PMTo:Chavez, Carl J, EMNRD; Lucero, Stephen A., EMNRDCc:Johnson, Mike S., OSE; Heber, David, OSESubject:FW: Closed loop ground source heat pump systems installed in subsurface boreholes

Thank you for arranging today's informative meeting. It was good to hear the topics discussed.

Jerome Baca of the CID (see below) sounds like a good contact to include in the geothermal work group, and may be particularly helpful with unraveling the shallower, closed loop/heat exchange jurisdiction. As the OSE folks noted today, some (many?) of these systems are drilled/completed to depths above the water table, further complicating the concept of OSE jurisdiction.

From: Baca, Jerome T., RLD
Sent: Wednesday, April 15, 2009 11:04 AM
To: Rappuhn, Doug H., OSE
Cc: Winkel, Heather, RLD; Aragon, Fermin , RLD
Subject: RE: Closed loop ground source heat pump systems installed in subsurface boreholes

Doug Rappuhn,

Yes, CID has inspection jurisdiction on ground source loop systems and the installed coils are a component of said systems.

The general concept of a ground source loop heating or cooling system is to utilize a large coil of circulating water or media that is buried and absorbs the ambient earth's temperature to precondition the circulating water or media. Usually the loop is terminated at a heat exchanger within the cooling and or heating system it serves. Though not new, this technology has become increasingly popular in the current Green movement based on its potential to save energy. There are several designs for coil configurations on these systems. We are starting to see the shaft configuration (slinky) more often as it tends to be space friendly and allows more control of temperature based on depth. Naturally well diggers can dig these shafts as demands call for them. However by licensing requirements it should be a heating contractor and the proper journeyman who install the heating or cooling systems and their components. They shall also be permitted by and inspected by the respective construction inspector. You can find more information on licensing in New Mexico Administrative Code in Title 14. Please feel free to contact me if I can be of further assistance. Thanks, J. T.

Jerome T. Baca Mechanical Bureau Chief, CID 505-476-4661 office 505-490-2997 cell

From: Winkel, Heather, RLD On Behalf Of RLDCID, RLD
Sent: Tuesday, April 07, 2009 8:34 AM
To: Baca, Jerome T., RLD
Subject: FW: Closed loop ground source heat pump systems installed in subsurface boreholes

Hi, JT: Fermin suggested this be sent to you for response.

Thank you, Heather

From: Rappuhn, Doug H., OSE Sent: Monday, April 06, 2009 6:42 PM

## To: RLDCID, RLD

**Subject:** Closed loop ground source heat pump systems installed in subsurface boreholes

Dear Sirs -

I am a Hydrologist with the Office of the State Engineer, and work on a regular basis with the state's water well drillers, who are becoming increasingly called on to drill holes for closed loop ground source heat pumps. OSE regulations NMAC 19.27.4 (copy attached) appear to provide an element of jurisdiction in the manner in which these boreholes are to be completed, specifically the need for annular seals (such as a cement or bentonite grout that fills the borehole around the closed loop piping) to ensure against infiltration of surface water and inter-aquifer exchange of water. I had assumed OSE jurisdiction based on the broad 19.27.4.7.E definition of "well", and the natural progression of the regulations regarding whether non-artesian or artesian condition were encountered, if a water-bearing stratum/strata was encountered, but there appears to be a statutory problem.

From talking to some loop industry contacts, it appears that encountering ground water with the loop borehole is not required to provide a capable loop heat exchanger, and that in many cases the desired heat exchange may occur simply from good contact between the borehole wall and the subsurface loop piping. If a water-bearing stratum was not penetrated, and there had been no intention to penetrate one, the closest the OSE's 19.27.4 regulations would come regarding jurisdiction appears to be the 19.27.4.30.C(1) provision for plugging a well that did not encounter a water bearing stratum. That said, I have recently heard in-house that our 19.27.4 regulations may have drifted past their statutory jurisdiction in addressing this kind of "well" when written in 2005, and that the 19.27.4.7.E "well" definition may need revision to therefore specifically exclude wells of a geothermal nature.

Could you please tell me if the CID has, or if you are aware of any other agency having regulations regarding the design /construction of these closed loop systems? The systems can be sized for commercial or residential use. I have been in touch with Stephen Lucero and Carl Chavez from the New Mexico Energy, Minerals and Natural Resources Department, and James Hall from the New Mexico Environment Department, but have not found specific mention made of this subsurface closed-loop heat exchanger system. The Oil Conservation Division of NMEMNRD has regulations regarding the manner in which geothermal wells are constructed, but they do not seem to include these closed loop heat exchange systems that use subsurface temperature <u>differentials</u> in both winter (when they gain warmth) and summer (when they gain coolness) seasons to reduce HVAC costs, rather than tapping a defined geothermal reservoir.

Thanks,

Douglas H. Rappuhn Hydrology Bureau / New Mexico Office of the State Engineer 121 Tijeras NE, Suite 2000 Albuquerque, NM 87102 Phone: 505-765-2018 / Fax: 505-764-3892 e-mail: doug.rappuhn@state.nm.us

From:	Chavez, Carl J, EMNRD
Sent:	Friday, April 09, 2010 4:07 PM
То:	Chavez, Carl J, EMNRD; Lucero, Stephen A., EMNRD
Cc:	Sanchez, Daniel J., EMNRD; Ezeanyim, Richard, EMNRD; Jones, William V., EMNRD;
	Brooks, David K., EMNRD; VonGonten, Glenn, EMNRD; Hill, Larry, EMNRD; Dade, Randy,
	EMNRD; Perrin, Charlie, EMNRD; Martin, Ed, EMNRD
Subject:	RE: EMNRD Geothermal Working Group Preliminary Data Base, Technical and Policy
-	Recommendations
Attachments:	OCD Draft Geothermal Brainstorm Sheet 4-9-2010.doc

Oops! See attachment. Thanks.

Carl J. Chavez, CHMM New Mexico Energy, Minerals & Natural Resources Dept. Oil Conservation Division, Environmental Bureau 1220 South St. Francis Dr., Santa Fe, New Mexico 87505 Office: (505) 476-3490 Fax: (505) 476-3462 E-mail: <u>CarlJ.Chavez@state.nm.us</u> Website: <u>http://www.emnrd.state.nm.us/ocd/</u>index.htm (Pollution Prevention Guidance is under "Publications")

From: Chavez, Carl J, EMNRD
Sent: Friday, April 09, 2010 4:06 PM
To: Lucero, Stephen A., EMNRD
Cc: Sanchez, Daniel J., EMNRD; Ezeanyim, Richard, EMNRD; Jones, William V., EMNRD; Brooks, David K., EMNRD; VonGonten, Glenn, EMNRD; Hill, Larry, EMNRD; Dade, Randy, EMNRD; Perrin, Charlie, EMNRD; Martin, Ed, EMNRD
Subject: EMNRD Geothermal Working Group Preliminary Data Base, Technical and Policy Recommendations

Steve:

Please find attached the OCD's above subject preliminary recommendations to the EMNRD Geothermal Working Group.

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Please contact me if you have questions. Thank you.

Carl J. Chavez, CHMM New Mexico Energy, Minerals & Natural Resources Dept. Oil Conservation Division, Environmental Bureau 1220 South St. Francis Dr., Santa Fe, New Mexico 87505 Office: (505) 476-3490 Fax: (505) 476-3462 E-mail: <u>CarlJ.Chavez@state.nm.us</u> Website: <u>http://www.emnrd.state.nm.us/ocd/</u>index.htm (Pollution Prevention Guidance is under "Publications")

## OCD Online Geothermal Work Group Folder: UIC-999

The EMNRD and Geothermal Working Group Mission is briefly stated below.

"The Geothermal Group shall oversee the development of a State-wide geothermal resource assessment and database. The purpose of the resource assessment and database shall be to sufficiently characterize the State's geothermal resource and provide a database to prospective geothermal developers that shall promote commercial-scale development of the State's geothermal resource. The Geothermal Group shall also develop technical and policy recommendations to accelerate full-scale development of New Mexico's deep-source geothermal resource."

## **Database Recommendations:**

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- 4) OCD shall require all geothermal power generation applicants (low & high temp) to obtain an RBDMS OGRID# from the OCD for all future geothermal well installation or well work over geothermal resource work in NM. OCD will also issue API#s for each existing and/or new injection and/or development well for tracking plug and abandonment purposes. The information will be scanned into OCD Online "GTLT" or "GTHT or GTLT". OCD needs to update "who does what?" with associated state stakeholder agencies based on the geothermal regulations. A geothermal regulations stakeholder working group will be created to address future geothermal permit issues. Note that older low and high-temp. Geothermal wells under OCD jurisdiction at the time were never issued API#s and well information was not entered into an RBDMS tracking system; thus, the "<u>GTLT</u>" TIFF files are scanned in by operator name and county only without database retrieval capability. NMED may need to develop an application and tracking process for all types of geothermal projects it anticipates regulating based on OCD's new interpretation of the Geothermal Regulations. (CarlC).
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### **Policy Recommendations:**

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#### Chavez, Carl J, EMNRD

From:	Chavez, Carl J, EMNRD
Sent:	Friday, April 09, 2010 4:07 PM
То:	Chavez, Carl J, EMNRD; Lucero, Stephen A., EMNRD
Cc:	Sanchez, Daniel J., EMNRD; Ezeanyim, Richard, EMNRD; Jones, William V., EMNRD; Brooks, David K., EMNRD; VonGonten, Glenn, EMNRD; Hill, Larry, EMNRD; Dade, Randy, EMNRD: Perrin, Charlie, EMNRD: Martin, Ed. EMNRD.
Subject:	BE: EMNBD Geothermal Working Group Preliminary Data Base. Technical and Policy
	Recommendations
Attachments:	OCD Draft Geothermal Brainstorm Sheet 4-9-2010.doc

Oops! See attachment. Thanks.

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From: Chavez, Carl J, EMNRD
Sent: Friday, April 09, 2010 4:06 PM
To: Lucero, Stephen A., EMNRD
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Steve:

Please find attached the OCD's above subject preliminary recommendations to the EMNRD Geothermal Working Group.

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# WHAT IS THE SCOPE OF THE OCD'S REGULATORY AUTHORITY/OBLIGATIONS WITH REGARD TO GEOTHERMAL RESOURCES?

## **Geothermal Resources Conservation Act – 71-5-1 NMSA 1978**

## <u>71-5-2.1 – EXCLUSION</u> – incidental loss or extraction of heat –

• When the application <u>of potable water to a beneficial use involves the incidental loss or</u> <u>extraction of heat, and the water is 250 degrees Fahrenheit or less</u>, then that heat is not a geothermal resource for which a royalty is due. In such a case, the use is not governed by laws related to geothermal resources but is simply governed by Chapter 72 NMSA 1978.

## <u>71-5-3</u>

- A. "geothermal, resources" = Natural heat of the earth or the energy in whatever form, below the surface of the earth present in, resulting from, created by or which may be extracted from this natural heat and all minerals in solution or other products obtained from naturally heated fluids, brines, associated gases and steam, in whatever form,
  - found below the surface of the warmth, but excluding oil, hydrocarbon gas and other hydrocarbon substances;
- G. "low-temperature thermal reservoir" = geothermal reservoir containing lowtemperature thermal water – defined as naturally heated water, the temperature of which is less than boiling at the altitude of occurrence, which has additional value by virtue of the heat contained therein – found below the surface of the earth or in warm springs on at the surface.

<u>71-5-6</u> – OCC/OCD's powers and duties include

- jurisdiction over all matters relating to the conservation of geothermal resources and prevention of waste of potash as a result of geothermal operations –
- jurisdiction authority and control of and over all persons, matters or things necessary or proper to enforce effectively the provisions of the Act, etc. –
- OCD and OCC have concurrent jurisdiction /authority to perform duties required under Act –

 $\underline{71-5-7} - OCC/OCD's$  powers/duties and to prevent waste/protect correlative rights – may make/enforce rules to effect

71-5-8 – OCC/OCD's powers enumerated:

- Collect data
- Make investigations/inspections

- Examine properties, leases, papers, books, records
- Examine, check, test, gauge geothermal resources wells ad GT resources transportation, storage and utilization facilities
- Limit and allocate production of GT resources
- Require certificates of clearance for production or transportation of GT resources
- May make rules to
  - Require noncommercial or abandoned wells to be plugged, etc., may require bond
  - o Prevent GT resources, water, etc. from escaping strata in which found
  - Require reports showing locations of all GT resources wells and require filing of logs, drilling records, etc.
  - o Prevent premature cooling of any GT stratum
  - Prevent blowouts
  - Require wells to be drilled, operated, produced to prevent injury to neighboring leases/properties & to afford reasonable protection to human life/health/environ
  - Identify ownership of GT producing leases/properties, plans, structures and transportation and utilization facilities
  - Require operation of wells efficiently
  - Fix spacing of wells
  - Classify and reclassify GT reservoirs and low temp thermal reservoirs
  - o Define and redefine horiz and vert limits
  - Permit and regulate injection of fluids in GT reserve and low temp therm reserve
  - Regulate dispo of GT resources, etc.
  - Define and redefine limits of area containing commercial potash and regulate where necessary to prohibit GT drilling so as to not unduly reduce totally quantity of commercial deposits of potash, etc.

71-5-9 – regulation of GT production-

- division may limit, allocate and distribute total amt of GT resources to be produced from reservoir upon determination that GT resources production from that reservoir is causing waste
- when allocation is limited, division must take into consideration protection of correlative rights and give equitable consideration to acreage, pressure, temperature, quantity, quality, etc.

## Chavez, Carl J, EMNRD

From: Sent: To: Cc: Subject: Rappuhn, Doug H., OSE Tuesday, March 30, 2010 12:28 PM Chavez, Carl J, EMNRD Johnson, Mike S., OSE; Heber, David, OSE Closed loop / direct heat systems

Hi Carl -

Thanks for your efforts with today's geothermal work group meeting. Not being at the meeting, I find it a bit more difficult to know when to jump into a conversation, but in retrospect, I thought of a consideration that should be part of the conversation held today.

I assume most traditional geothermal projects focus on the facet of the extraction of heat for whatever purpose. It is my understanding that closed loop systems ("direct use" was the terminology used today) are essentially a two-season HVAC system, responsible for providing relative warmth from the ground source to a facility's HVAC system during cold-air seasons, and providing relative coolness from the ground source to a facility's HVAC system during hot-air seasons. The ground source would not be used to any substantial extent during the mild-air seasons, much the way we individuals do not run our heat/air-conditioning systems during the milder spring and fall seasons (yes to fan use; no to use of the heat or cool source).

We discussed that royalties may be going uncollected as use of closed loop systems increases. I would question the right to collect royalties on a two-season system not tapping a defined geothermal resource that extracts ground heat during winter HVAC use, but <u>recharges</u> ground heat during summer HVAC use. If the local power company was billing a facility that both consumed and returned power (such as for facilities with solar cells or wind turbines), their billing process would bill for a netted-out effect.

The CID folks may be best able to offer comment about actual extent of summer use of the closed loop systems, but I think their records would likely reflect that the closed loop systems are being built where funds are available or greenthinking individuals make the choice... not where the systems tap a designated geothermal resource. Perhaps the deplete / recharge cycle that occurs with the use of ground source heat pumps / closed loop systems requires further definition before being swept into certain geothermal categories premised solely on heat extraction.

#### **Douglas H. Rappuhn**

Hydrology Bureau / New Mexico Office of the State Engineer 5550 San Antonio Drive NE Albuquerque, NM 87109-4127 Phone: 505-383-4018; Fax: 505-383-4030 e-mail: <u>doug.rappuhn@state.nm.us</u>

Geothermal Regs - programs Stakeholder Meeting (3/30/2010

Name Title Ca ph. E-mail Carlj. Chavez@ Carl Chavez NMOCI Env. Engr. 505-476-3490 State nmails JONDING STATE . JOHN 4942 HUDROLOGIST 527-1049 NMED NM-VS Cen Const Bureon Chiel 476-4672 Comming aragen Chie Fermin. Aronoo CID Remijio Pacheco CID-E ELEC BUREAU CHIEF 505 476 4679 vem. pochecoestate. nm. y Serom T. Baca CID M/P mech. Bureau Chief 505-476-4661 - brome baracolate SOS. G70. 6078 ander galmy Ostotemics Andy Daking CID Licensing NgVi Clean Energy Specialist Stere Lucero 476-3324 NMEMNKD stephen. Lucero HYDROLOGY Ostate .nm.us NMOSE MIKE JOHNSON 827-3867 mike. johnson BUREAU CHIEF DAVID, HEBER WATER REDURCE SPEC B27.6102 david heber asta NMOSE dlorooks@ David Brooks 476-3450 NMOCD Jegal Epaminer state, NM. US Adrienne. Brunley Adrienne Brumley Peholeum Ensineur 954-2140 @ blm.gov BLM-NMSO NAOC D Mikel Altimare attomey 476-3480 mikelaltomarel state.nm.us LIDA MARTINEZ 476.4689 LISA. MATERINELE DIRECTOR CID SHTE. HM. UP mittle Smith BIM Bythe performence of E Telephone

Lisa Martinez Director CID

Doug Repairdue OSE

### Chavez, Carl J, EMNRD

Subject: Location:	Geothermal Regulations Stakeholder Meeting OCD 3rd Floor Conference Room
Start: End:	Tue 3/30/2010 10:30 AM Tue 3/30/2010 12:00 PM
Recurrence:	(none)
Meeting Status:	Meeting organizer
Organizer: Required Attendees: Optional Attendees:	Chavez, Carl J, EMNRD Hall, John, NMENV; Johnson, Mike S., OSE; Heber, David, OSE; Rappuhn, Doug H., OSE; Brooks, David K., EMNRD; Altomare, Mikal, EMNRD; VonGonten, Glenn, EMNRD; Lucero, Stephen A., EMNRD; Olson, Bill, NMENV; Sanchez, Daniel J., EMNRD; Fesmire, Mark, EMNRD; Mike_Smith@blm.gov; Baca, Jerome T., RLD; Miller, Brendan, EDD Steve Crespin: Martinez, Lisa, RLD

Please submit any draft agenda items to me before the meeting.

The OCD will have a **teleconference line open** with a call in phone number and access code during the meeting in the event physical attendance is not possible or invited individuals are requested to listen in and interact in the meeting.

#### **Conference Details** Tuesday, March 30, 2010 Date: 0.4 10:30 AM Mountain Daylight Time Start Time: End Time: 11:55 AM Mountain Daylight Time Participants: 30 Web-Scheduled Standard Type of Conference Dial-in Number: 1-213-289-0500 (Los Angeles) M. *693464 (you must include the leading star key) Organizer Access Code: 13:30 Participant Access Code 4509670

#### Draft Agenda:

- 1) Does BLM, NMED, RLD and OSE agree with OCD's Geothermal Regulatory Interpretation?
- 2) Discuss RLD geothermal heat exchangers in closed loop systems, licensee requirements and the inspection process.
- 3) If so, the stakeholders will brainstorm under the various geothermal applications to determine "Who Does What?"
- 4) Innovative ways for OCD to handle the magnitude of the permitting process. Seems like OCD needs to evaluate scenarios where the heat is incidental to main use of the water resource, type applicants needing to use the resource, etc. OCD may need to adopt an efficient strategy where the situation may be deemed incidental heat that is unpermitted, which cases must be permitted, etc. Aquifers with greater than 10,000 ppm that may be exempt from a WQCC Discharge Permit, but still regulated under Geothermal Regulations (including injection, development, disposal, exploratory wells, etc.; EGSs where there is no aquifer in the bedrock, fractures are artificially created, and a generally fixed volume is injected to create a closed-loop ground recirculating system (again, WQCC Permitting may not apply, or may apply for Class V Geothermal injection wells, and any production/development wells; etc.).
- 5) Evaluate the scenarios where the heat may be deemed "incidental" and where it should be deemed a use requiring permitting..... (i.e, a school using the water potable and agricultural use, but wants to use the heat for

direct applications for the school? Does the state want to require a school, church, prison, etc. to obtain a geothermal permit with royalty payments? Will their be exclusions? What won't be excluded?

- 6) NMED Issues
- 7) OSE Issues
- 8) OCD Issues
- 9) Miscellaneous
- 10) Path Forward

Note: The draft agenda items above are presented to assist the group with forward thinking in anticipation of the meeting and nothing is final nor should any items above or discussed during work group meetings be misconstrued to mean we are seeking ways to by bypass geothermal regulations, etc.

If you have questions or need access to OCD regulations and the permit process, please go to: <u>http://www.emnrd.state.nm.us/ocd/Publications.htm</u> (see "Geothermal Regulations & Resource Page" link).

Please contact me if you have questions. Thank you.

Carl J. Chavez, CHMM New Mexico Energy, Minerals & Natural Resources Dept. Oil Conservation Division, Environmental Bureau 1220 South St. Francis Dr., Santa Fe, New Mexico 87505 Office: (505) 476-3490 Fax: (505) 476-3462 E-mail: <u>Carl J. Chavez@state.nm.us</u> Website: <u>http://www.emnrd.state.nm.us/ocd/</u>index.htm (Pollution Prevention Guidance is under "Publications")

## Chavez, Carl J, EMNRD

Subject:	OCD Geothermal Regulations Communication Meeting & OCD Perceived Authority for Low- Temp. Geothermal Resource(s) in New Mexico to Extract the Heat Telephone Conference Call from OCD Conference Room
Start: End:	Wed 2/24/2010 1:00 PM Wed 2/24/2010 2:00 PM
Recurrence:	(none)
Meeting Status:	Meeting organizer
Organizer: Required Attendees:	Chavez, Carl J, EMNRD Hall, John, NMENV; Olson, Bill, NMENV; Rappuhn, Doug H., OSE; Phillips, Haddy L., OSE; Jackson, Charles L., OSE; Sanchez, Daniel J., EMNRD; Brooks, David K., EMNRD; VonGonten, Glenn, EMNRD; Altomare, Mikal, EMNRD; Fesmire, Mark, EMNRD
Optional Attendees:	Lucero, Stephen A., EMNRD

Draft Agenda for Todays Meetiing

NM Energy, Minerals & Natural Resources Division Geothermal Stakeholder Communication Meeting Wednesday, February 24, 2010 (1:00 – 2:00 p.m.)

#### **Draft Agenda**

- Introductions: Carl Chavez, OCD (505) 476-3490 (Geothermal Power) Meeting Notice & Steve Lucero, ECMD (505) 476-3324 (Renewable Energy Stimulus Funding & Geothermal Working Group) (Note: OCD Online "<u>UIC-999</u>" for complete info. & OCD Geothermal Resource Page with Geothermal Regulations at <u>http://www.emnrd.state.nm.us/ocd/documents/OilConservationDivisionGeothermalApplicationProcess8-18-2009.pdf</u>).
- 2) Governor's Executive Order: DB to ID deep source geothermal resources; Technical and Policy Recommendations for streamlining the renewable power generation process in New Mexico.
- 3) This meeting partly stems from No. 2 and present experience with permitting issues (i.e., correlative rights, UIC Class V Injection Wells vs. Production/Development Wells under Geothermal Regulations) for the first OCD permitted power generation project (Lightning Dock) near Animas, New Mexico.
- 4) OCD Attorneys: David Brooks and Mikal Altamore discuss interpretation of OCD Geothermal Regulations and Perceived Jurisdiction.
- 5) Stakeholder Discussion
- 6) Miscellaneous
- 7) Path Forward

#### Ladies and Gentlemen:

Please call into 1-(213)-289-0500 and enter the Participant Access Code of "4509670" to enter the conference call at 1:00 p.m. tomorrow Mountain Standard Time.

# You may review the OCD's Geothermal Regulations at <u>http://www.emnrd.state.nm.us/ocd/documents/OilConservationDivisionGeothermalApplicationProcess8-18-2009.pdf</u>

Please share the above information with anyone else who would like to participate. Thank you.

Hi Carl -

Thanks for contacting us at the OSE on this matter. A counterpart or I will link up for your telephonic conference, and I expect our Water Rights Division to also call in. As you note, there are matters of appropriation of thermal waters that the OSE would likely maintain (?) a role in... that'll be a water rights issue.

Your timing on the matter is good. Over the next year, the OSE expects to review our involvement in all manners of boreholes that do not appropriate/divert groundwater, and closed loop/heat exchange wells would be one example. Will you guys be exerting jurisdiction over these wells? As it stands, we have been issuing exploratory permits for the closed loop wells, but they are a square peg in a round hole as far as our regs go. Processing the multi-well applications is time-intensive, and other than stressing adherence to good well construction principles, we don't walk away with much other than an eventual smattering of Well Records filed reflecting an abstracted overview of drilling conditions. We do have well construction concerns regarding the loop wells where artesian conditions exist or where more than one aquifer is penetrated during drilling.

OSE issues on closed loop/heat exchange wells have also included that drilling services are conducted by a licensed well driller; and appropriate abandonment of boreholes was conducted as necessary. We have also thus far monitored the grout mix being used in these wells, as there is an industry tendency to enhance thermal conductivity of the annular grout by adding heady amounts of sand to a high solids bentonite grout. Spec sheets thus far provided by ground loop contractors indicate the low permeability of the sand-bentonite grouts used is acceptable, but we worry additional sand may be used to the point of limiting the sealing effect of the bentonite matrix... an issue if multiple aquifers must be kept separated.

#### **Douglas H. Rappuhn**

Hydrology Bureau / New Mexico Office of the State Engineer 5550 San Antonio Drive NE Albuquerque, NM 87109-4127 Phone: 505-383-4018; Fax: 505-383-4030 e-mail: doug.rappuhn@state.nm.us

#### OCD Message from 2/22/2010

#### Ladies and Gentlemen:

I have contacted most of you today on the mail list above to convey OCD's preliminary interpretation of its Geothermal Regulations by OCD Attorneys in a meeting this morning. OCD has preliminarily determined that it also has jurisdiction over low-temperature geothermal resources in New Mexico, where the intent is to extract and use the heat (not incidental use).

Therefore, the OCD would like to arrange a telephone conference call between all geothermal stakeholders: Office of the State Engineer, New Mexico Environment Department (NMED) and Oil Conservation Division (OCD) to preliminarily discuss the OCD's findings and to communicate on an agreeable path forward between the stakeholder agencies. This may change the currently perceived, "Who Does What" for permitting geothermal operations in New Mexico.

The OCD findings come at an opportune time when the Geothermal Working Group headed by the Energy, Minerals, and Natural Resources Department, Energy Conservation and Management Division (ECMD) is working under an Executive Order to develop a statewide database for deep source geothermal resources for power generation, technical and policy recommendations for streamlining the commercial geothermal power generation process, etc. It would seem one permitting agency may help to streamline the process. However, NMED and OCD are aware of OSE's involvement in all adjudicatory water rights issues at all geothermal project locations....., which likely will not change.

*I will be sending out a meeting notice for a telephone conference call this coming Wednesday afternoon at 1:30 p.m. for a 1 hour meeting and will provide a phone number to call into along with a participant code to enter the telephone conference call.* 

NMED's calendar is open Wednesday only, and then on March 9 or 10, 2010 would be the soonest it could participate.

Please contact me at (505) 476-3490 if you have questions. Thank you.

New Mexico Energy, Minerals and Natural Resources Department

# Oil Conservation Division (OCD) Geothermal Power Regulations, Application, Bonding, Forms & Resource Information

(Revised: 08/18/2009)

**Geothermal Regulations:** 

Chapter 71: Energy & Minerals Article 5: Geothermal Resources Conservation Act Chapter 71, Article 5 NMSA 1978

Title 19: Natural Resources & Wildlife Chapter 14: Geothermal Power <u>Title 19, Chapter 14 NMAC (11-15-83 Recompiled 12-31-01)</u>

Geothermal Rules & Regulations

<u>Water Quality Control Commission 20.6.2 NMAC</u> (Class V Injection Well Designation)

Application Forms: Geothermal Permit to Inject (C-108)

**Drilling (G-101 & 102) & Bond Forms** (please note that bonds for Class V Injection Wells are handled separately under the WQCC Regulations (UIC Program) while geothermal production or development wells are bonded separately under the "G" Forms and associated geothermal regulations): <u>Geothermal Exploration & Production Forms</u> (see "Geothermal Well Forms") <u>Bonding</u> (see "Bond Forms" GT-B-1 and GT-B-2)

**Geothermal State Leasing- State Land Office:** 

**Legislative Reference:** New Mexico Annotated Code Title 19 Chapter 14-1; Title 19 Chapter 2-7; Title 19 Chapter 13-7 to 13-12

**State Agency Responsible for Leasing:** New Mexico State Lands Office (see US Bureau of Land Management links below for Federal lease information)

**Leasing:** Leases are available on a non-competitive basis. However, the Commissioner of Public Lands may at his discretion reject any application and offer the tract or tracts at public auction. Lands classified as "known geothermal fields" are leased through public auction through either sealed or oral bidding procedure.

## Lease Terms:

Primary: 5 years

**Renewal:** Primary term can be renewed for additional 5 years and thereafter so long as geothermal resources are being produced or utilized or are capable of being produced or utilized in commercial quantities.

**Rentals:** \$1.00 per acre or fraction thereof per year (escalates to \$5.00 per acre per year after primary lease term).

Royalties: 10 % of the gross revenue from the sale or use of steam, brines or hot water, associated gases or other forms of heat or energy derived from production with a minimum of \$2.00 per acre or fraction thereof per year. A royalty of not less than 2 % nor more than 5 % of the gross revenue received for the sale of mineral products or chemical compounds recovered from geothermal fluids. A royalty of 8 % of the net revenue for the operation of an energy producing plant on the leased land. A royalty of not less than 2 % nor more than 10 % of the gross revenue received from the operation of the geothermal resource for recreational, space heating, or health purposes.

#### **Geothermal Resources:**

<u>Geo-Heat Center</u> <u>Geothermal Education Office</u> <u>Geothermal Energy Association</u> <u>Geothermal Heat Pump Consortium</u> <u>Geothermal Resources Council Annual Meeting</u> <u>New Mexico Bureau of Geology & Mineral Resources</u> <u>New Mexico Collocated Resources</u> <u>New Mexico Energy Conservation & Management Division Geothermal Website</u> <u>New Mexico Geothermal Working Group</u> <u>New Mexico Oil Conservation Division Geothermal Search Engine</u> (enter order type as "GTLT" or "GTHT")

<u>New Mexico State University- A Strategic Plan For New Mexico Geothermal</u> Resources Development

US Bureau of Land Management

<u>Geothermal Leasing in the Western United States</u> Geothermal Leasing PEIS A User's Guide

Public & NFS Lands Open & Closed to Geothermal Leasing in New Mexico

US Department of Energy

GeoPowering the West

Geothermal Resource Maps

Geothermal Resource Needs in New Mexico

Geothermal Technologies Program

US Geological Survey

Assessment of Low-Temperature Geothermal Resources of the United States 1982 (USGS Circular 892)

Assessment of Moderate and High Temperature Geothermal Resources of the US

Current Assessment of Moderate and High-Temperature Geothermal Resources

Geothermal Related Publications & Data

National Geothermal Resource Assessment

Selected Data for Low-Temperature (less than 90°C) Geothermal Systems in the United States; Reference Data for U.S. Geological Survey (<u>Circular 892</u>, <u>USGS Open-File Report 83-250</u>)

## Who Does What?

In New Mexico, on federal land, heat is a mineral. On state or private land, it depends on the use and temperature. For example, above 250 °F it is considered a mineral and falls within the jurisdiction of the Oil Conservation Division (**OCD**) for power generation and the Office of the State Engineer (**OSE**) for water adjudicatory issues. Below 250 °F it is still a mineral and falls within the jurisdiction of the New Mexico Environment Department (**NMED**)* for direct heat use when wells are installed and/or the OSE for water adjudicatory issues or when heat pumps instead of wells are used for direct heat or geothermal purposes. Heat is <u>not</u> considered a mineral at all if the geothermal extraction is only incidental to a beneficial use of the water, in which case the water is not considered geothermal and it falls only within the jurisdiction of the OSE.

* Note that oil and gas geothermal co-production technology where the geothermal reservoir temperature is less than 250 °F may also be regulated by the OCD.

## **Contacts:**

New Mexico Bureau of Geology & Mineral Resources (Marshall Reiter 575-835-5306)

New Mexico Bureau of Land Management (Mike Smith 575-525-4421)

<u>New Mexico Economic Development Department (Brendan.miller@state.nm.us)</u> New Mexico Energy Conservation & Management Division (Stephen Lucero 505-

476-3324)

<u>New Mexico Environment Department- Ground Water Quality Bureau</u> (Direct Heat Contact John Hall 505-827-1049)

<u>New Mexico Office of the State Engineer</u> (Contact District Supervisor) New Mexico Office of Taxation & Revenue (505-827-0825)

<u>New Mexico Oil Conservation Division</u> (Power Plant Contact Carl Chavez

505-476-3490 or E-mail: <u>carlj.chavez@state.nm.us</u>)

New Mexico State Land Office (Brian Bingham 505-827-5760)

U.S. Geological Survey (Marshall J. Reed 650-329-5620)

U.S. Department of Energy (Curtis Framel 303-275-4872)