

**GTHT - 001**

**MECHANICAL  
INTEGRITY TEST  
(MIT)**

## Chavez, Carl J, EMNRD

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**From:** Chavez, Carl J, EMNRD  
**Sent:** Thursday, August 30, 2012 8:10 AM  
**To:** Janney, David (david.janney@amec.com)  
**Cc:** Sanchez, Daniel J., EMNRD; Brooks, David K., EMNRD; VonGonten, Glenn, EMNRD; Dade, Randy, EMNRD; Shapard, Craig, EMNRD  
**Subject:** Lightning Dock Geothermal Project (GTHT-001) Well 63-7 Mechanical Integrity Test Conducted August 14, 2012  
**Attachments:** EPA 5-Yr MIT 8-14-2012.pdf

Mr. Janney:

The New Mexico Oil Conservation Division (OCD) has reviewed the submitted G-103 (G-103) with Mechanical Integrity Test (MIT) Charts and Graphs with instrument calibration information from the MIT performed on the above subject well on August 14, 2012 and hereby approves or "passes" the MIT in the G-103 (see attachment) in accordance with Section 21(H) below of the OCD Discharge Permit for UIC Class V Geothermal Injection Wells. The next MIT test schedule on the subject well shall occur on or before August 14, 2017 and/or after any well work over.

\*\*\*\*\*

**Section 21: Class V Geothermal Injection Wells and Geothermal Production or Development Wells**

**H. Mechanical Integrity Testing:** *At least once every five years and after any well work over, the geothermal reservoir will be isolated from the casing or tubing annulus and the casing pressure tested at a minimum of 600 psig for 30 minutes.*

*A passing test shall be within +/- 10% of the starting test pressure. All pressure tests must be performed in accordance with the testing schedule shown below and witnessed by OCD staff unless otherwise approved.*

**Testing Schedule:**

*2009: Prior to system start-up, a 30 minute casing pressure test at a minimum of 600 psig (set packer above casing shoe to isolate formation from casing), and*

*2013: A 30 minute casing pressure test at a minimum of 600 psig (set packer above casing shoe to isolate formation from casing)*

\*\*\*\*\*

Please contact me if you have questions. 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  
Office: (505) 476-3490  
E-mail: [CarlJ.Chavez@State.NM.US](mailto:CarlJ.Chavez@State.NM.US)

Website: <http://www.emnrd.state.nm.us/ocd/>

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STATE OF NEW MEXICO  
ENERGY AND MINERALS DEPARTMENT

OIL CONSERVATION DIVISION

P. O. BOX 2088

SANTA FE, NEW MEXICO 87501

Form G-103  
Adopted 10-1-74  
Revised 10-1-78

NO. OF COPIES RECEIVED	
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File	
N. M. B. M.	
U. S. G. S.	
Operator	
Land Office	

SUNDRY NOTICES AND REPORTS  
ON  
GEOTHERMAL RESOURCES WELLS

5. Indicate Type of Lease State <input type="checkbox"/> Fee <input type="checkbox"/>
5.a State Lease No. Federal NM34790

Do Not Use This Form for Proposals to Drill or to Deepen or Plug Back to a Different Reservoir. Use "Application For Permit ..." (Form G-101) for Such Proposals.)

1. Type of well Geothermal Producer <input type="checkbox"/> Temp. Observation <input type="checkbox"/> Low-Temp Thermal <input type="checkbox"/> Injection/Disposal <input checked="" type="checkbox"/>	7. Unit Agreement Name
2. Name of Operator Los Lobos Renewable Power, LLC	8. Farm or Lease Name
3. Address of Operator 136 South Main Street, Suite 600, Salt Lake City, Utah 84101	9. Well No. LDG 63-7
4. Location of Well Unit Letter 1722 Feet From The North Line and 1420 Feet From The East Line, Section 7 Township 25S Range 19W NMPM.	10. Field and Pool, or Wildcat
15. Elevation (Show whether DF, RT, GR, etc.)	12. County Hidalgo

16. Check Appropriate Box To Indicate Nature of Notice, Report or Other Data

NOTICE OF INTENTION TO:		SUBSEQUENT REPORT OF:	
PERFORM REMEDIAL WORK <input type="checkbox"/>	PLUG AND ABANDON <input type="checkbox"/>	REMEDIAL WORK <input type="checkbox"/>	ALTERING CASING <input type="checkbox"/>
TEMPORARILY ABANDON <input type="checkbox"/>	CHANGE PLANS <input type="checkbox"/>	COMMENCE DRILLING OPNS. <input type="checkbox"/>	PLUG & ABANDONMENT <input type="checkbox"/>
PULL OR ALTER CASING <input type="checkbox"/>		CASING TEST AND CEMENT JOB <input checked="" type="checkbox"/>	
OTHER <input type="checkbox"/>		OTHER <input checked="" type="checkbox"/>	

17. Describe Proposed or completed Operations (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work) SEE RULE 203.

8/11/2012 TD 17.5" at 1,555 feet; Run 13 3/8" 54.5# K-55 butt thread/couple casing and set shoe at 1,541 feet. Circulate and cool down to 110 degrees for cement. All depths from KB.

8/12/2012 Mix and pump 440 sxs geolite lead cement and mix and pump 130 sxs geotail cement, WOC.

8/13/2012 Install 13 3/8" well head and test to 500 psi (good).

8/14/2012 Test choke manifold, master valve, and 13 3/8" casing at low 250 psi and high 1,000 psi for 30 minutes each at each pressure rating (good).

8/15/2012 Test all safety valves (including pipe rams and annular BOP) and kelly valves at low 250 psi and high 1,000 psi for 30 minutes each valve at each pressure rating (good).

Drill out cement plug from 1,555 feet to 1,560 feet and conduct formation integrity test at 156 feet and 225 psi for 30 minutes (good).

8/16/2012 Retest 13 3/8" annular BOP to 850 psi for 30 minutes (good).

Please find attached the properly signed and dated circular test charts, graphs, and Excel spreadsheet with details of the testing described above.

18. I hereby certify that the information above is true and complete to the best of my knowledge and belief.

SIGNED David J. Farney, PG TITLE Agent, Los Lobos Renewable Power, LLC DATE August 23, 2012

APPROVED BY Carl J. Chavez TITLE Environmental Engineer DATE 8/30/2012

CONDITIONS OF APPROVAL, IF ANY:



Technology & Calibration, Inc.  
"When Quality Counts"

Tech Cal Recorder Calibration Report

Report Number: 70748

## CERTIFICATE OF CALIBRATION

Tech Cal Recorder , S/N# : 02899

Issued To:

Cyrq Energy, Inc.  
Satlt Lake City, UT

This is to certify that this pressure and/or temperature recorder has been manufactured and calibrated in accordance with Technology & Calibration, Inc.'s quality assurance program, current revision. All measurements are traceable to the National Institute of Standards and Technology (NIST). Certified in accordance with ANSI/NCSL, Z540-1 and ISO 10012-1. All calibrations performed at 72 degrees F. plus or minus 4 degrees F. and less than 65% relative humidity. The collective uncertainty of the measurement standards does not exceed 25% of the acceptable tolerance for each characteristic of the measuring and test equipment being certified.

Model: 1B100 Serial Number: 02899 PO Number: 35569

Pen 1			Pen 2			Pen 3		
Range	1000.00	Units PSI	Range	N/A	Units N/A	Range	N/A	Units N/A
Standard	Actual	Error	Standard	Actual	Error	Standard	Actual	Error
0.00	0.00	0.00%	0.00	N/A	0.00%	0.00	N/A	0.00%
200.00	200.00	0.00%	0.00	N/A	ERR	0.00	N/A	ERR
400.00	400.00	0.00%	0.00	N/A	ERR	0.00	N/A	ERR
600.00	600.00	0.00%	0.00	N/A	ERR	0.00	N/A	ERR
800.00	800.00	0.00%	0.00	N/A	ERR	0.00	N/A	ERR
1000.00	1000.00	0.00%	0.00	N/A	ERR	0.00	N/A	ERR
*Accuracy +/- .5% of Range			*Accuracy +/- .5% of Range			*Accuracy +/- .5% of Range		

### NIST Traceable Standard(s)

Manufacture	Serial Number	Range	Accuracy	Recall Date
Instrulab	3506/12916	-218°C - 660°C	+/- .05°C	10/12/2013
Chandler Engineering	22028	100-30,000 PSI	+/- .020 % OR	04/24/2013
Ametek	15544	5-15,000 PSI	+/- .025 % OR	04/09/2013

NIST#s 836/8366608, 836/259990, 248833, 822/254480

Calibration Date August 13, 2012

Recall Date August 13, 2013

Calibrated By:

C. Swailes

Approval By:

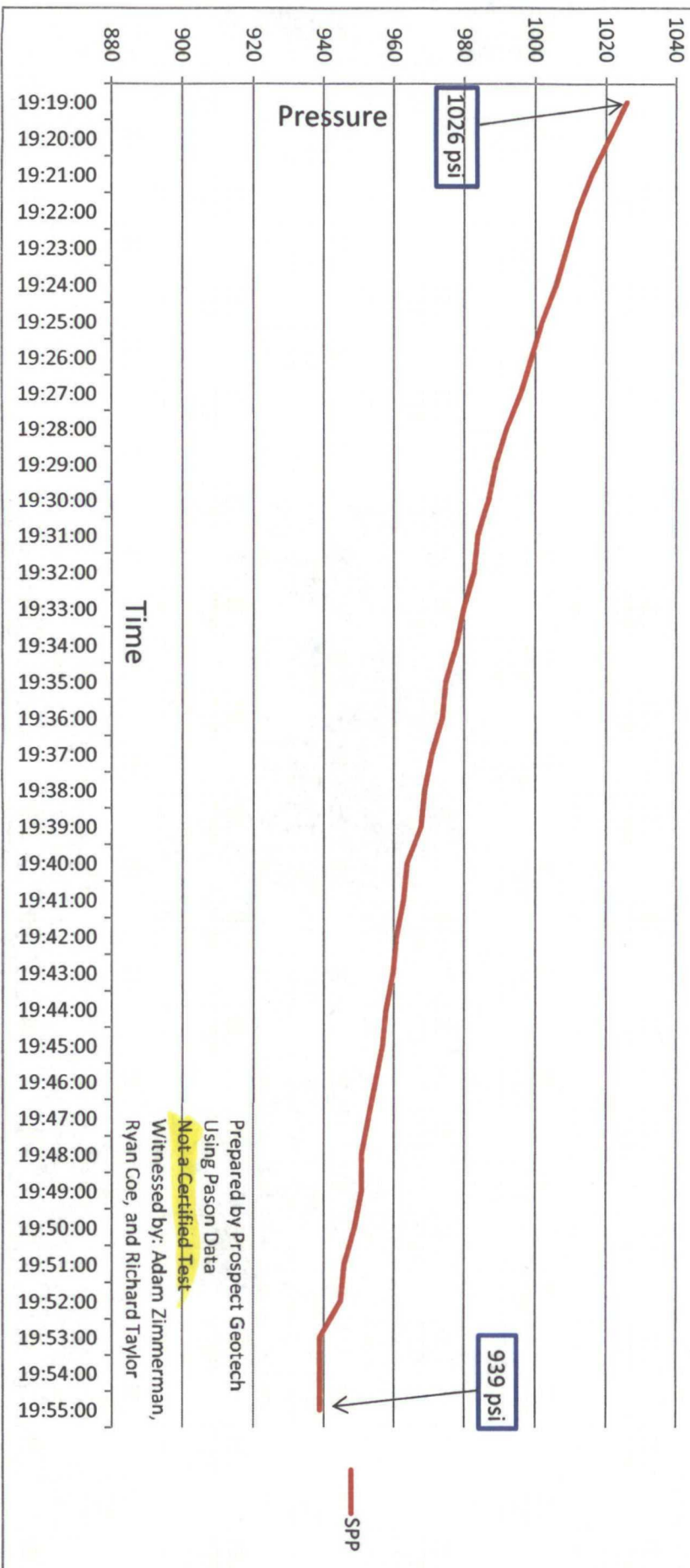
N. Green, QA Mgr.

\*This certificate shall not be reproduced except in full, without the written approval of Tech Cal.

Technology & Calibration, Inc. Houston, Texas 77018 888-546-6506 Ph 713-692-1722 Fx www.techcal.com



# LDG 63-7 Master Valve, Choke, and Casing Integrity High Pressure Test, 8/14/12



Pason PENLESS Drilling Recorder

WELL: Lightning Dock LDG 63-7 THERMASOURCE 102

DATE: 2012-Aug-14

TIME: 19:18:00

HOURS: 0.64

MINUTES F 1

TIME	SPP
19:19:00	1026
19:20:00	1021
19:21:00	1016
19:22:00	1012
19:23:00	1009
19:24:00	1006
19:25:00	1002
19:26:00	999
19:27:00	996
19:28:00	992
19:29:00	989
19:30:00	987
19:31:00	984
19:32:00	983
19:33:00	980
19:34:00	978
19:35:00	975
19:36:00	974
19:37:00	971
19:38:00	969
19:39:00	968
19:40:00	964
19:41:00	963
19:42:00	961
19:43:00	960
19:44:00	958
19:45:00	957
19:46:00	955
19:47:00	953
19:48:00	951
19:49:00	951
19:50:00	949
19:51:00	946
19:52:00	945
19:53:00	939
19:54:00	939
19:55:00	939



Mr. Randy Dade  
District 2 Supervisor  
New Mexico Oil Conservation Division  
811 South First Street  
Artesia, NM 88210  
575-748-1283  
[Randy.Dade@state.nm.us](mailto:Randy.Dade@state.nm.us)

August 23, 2012


**RE: Form G-103 for Geothermal Injection Well LDG 63-7 for Los Lobos Renewable Power, LLC, Hidalgo County, New Mexico**

Dear Mr. Dade:

On behalf of Los Lobos Renewable Power, LLC, AMEC Environment & Infrastructure, Inc. submits the attached Form G-103 (subsequent sundry notice) and copies of the pressure testing circular charts, graphs and Excel spreadsheet output for the BOP, mechanical integrity, and formation integrity testing recently conducted on the above referenced geothermal injection well for the Lightning Dock Geothermal project located in Hidalgo County, New Mexico.

As per your request, we have enclosed only one copy and Mr. Carl Chavez in your Santa Fe office will receive the original circular recorder charts for these tests. Thank you very much for your assistance in the development of this important energy project. Should you have questions regarding this sundry notice, please do not hesitate to contact me by email at [David.Janney@amec.com](mailto:David.Janney@amec.com) or by phone at (505) 821-1801.

Respectfully submitted,

  
David W. Janney, PG

Agent for Los Lobos Renewable Power, LLC

**Cc:** Carl Chavez, CHMM, NMOCD  
Nick Goodman – Los Lobos Renewable Power, LLC/Lightning Dock Geothermal, HI-01, LLC  
Michelle Henrie – Attorney for Los Lobos Renewable Power, LLC

**Attachments**

One (1) Forms G-103 for the BOP/MIT/FIT of the LDG 63-7

2012 AUG 24 A 10:48  
RECEIVED OGD



End 30 min  
Test

45

40

35

30

25

20

Start 30 min Test 15

Pressure  
8 psi off 10

5  
Pressure  
up too high

Roll 1 7/8



CHART NO. MC MP-1000-1HR

METER \_\_\_\_\_

CHART PUT ON  
8/14 @ 7:05 PM

TAKEN OFF  
8/14 8:00 PM

LOCATION LDG 63-7

REMARKS Master Valve / casing INT  
Choke  
@ High Pressure



55

60  
0

5

10

15

20

25

30

35

40

45

50

*Bill Hays*  
Graphic ControlsCHART NO. MC MP-1000-1HR  
METER \_\_\_\_\_CHART PUT ON  
8/19 @ 5:14 PM

LOCATION

LDG 63-7

REMARKS

Master Valve / Casing Int  
choke  
@ low pressureTAKEN OFF  
8/19 @ 6:09 PM*Start 30 min Test**End 30 min Test*

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45

50

55

60  
0

5

10

15

20

25

30

35

40

Graphic Controls

CHART NO. MC MP-1000-1HR

METER \_\_\_\_\_

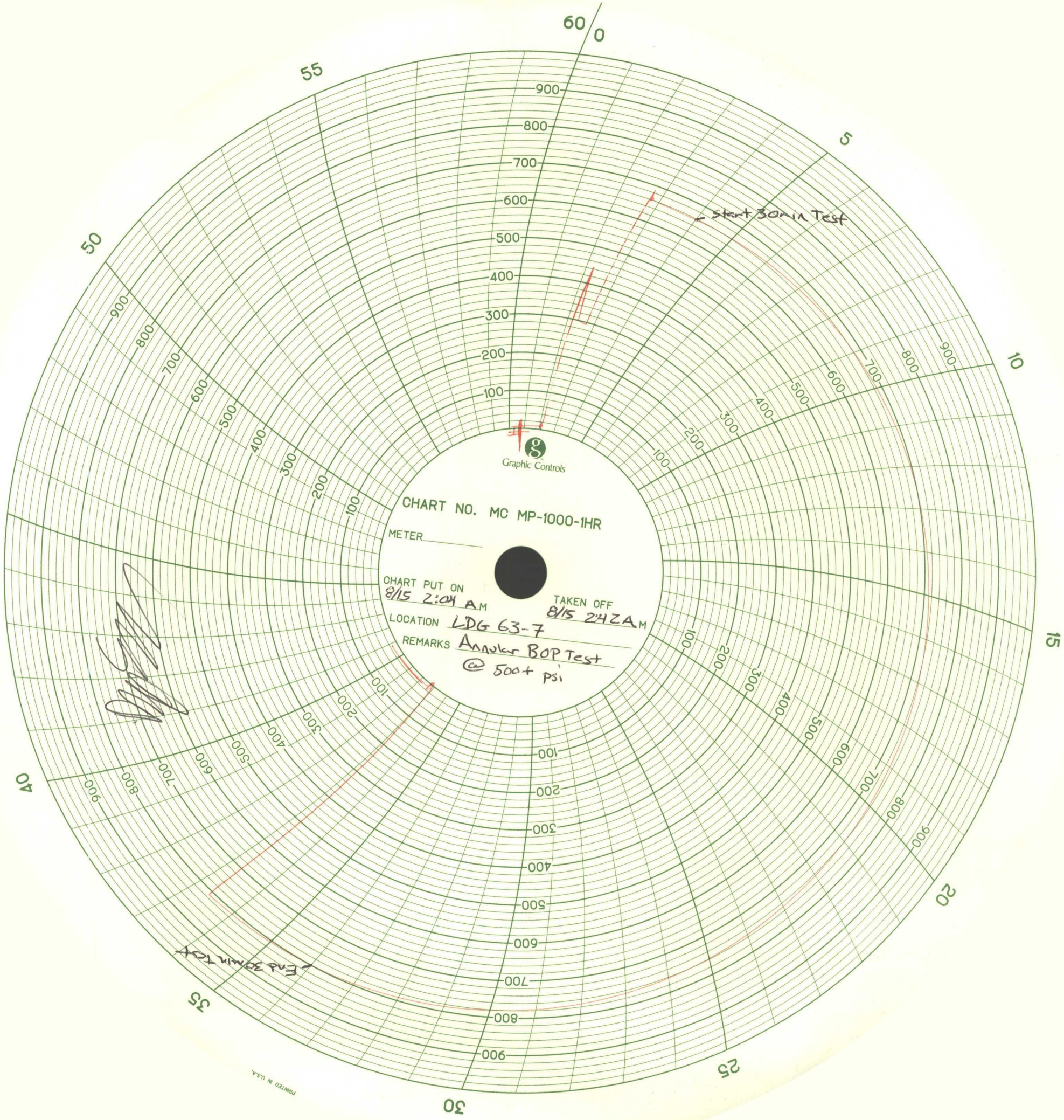
CHART PUT ON  
8/15 2:04 AMTAKEN OFF  
8/15 2:42 AM

LOCATION LDG 63-7

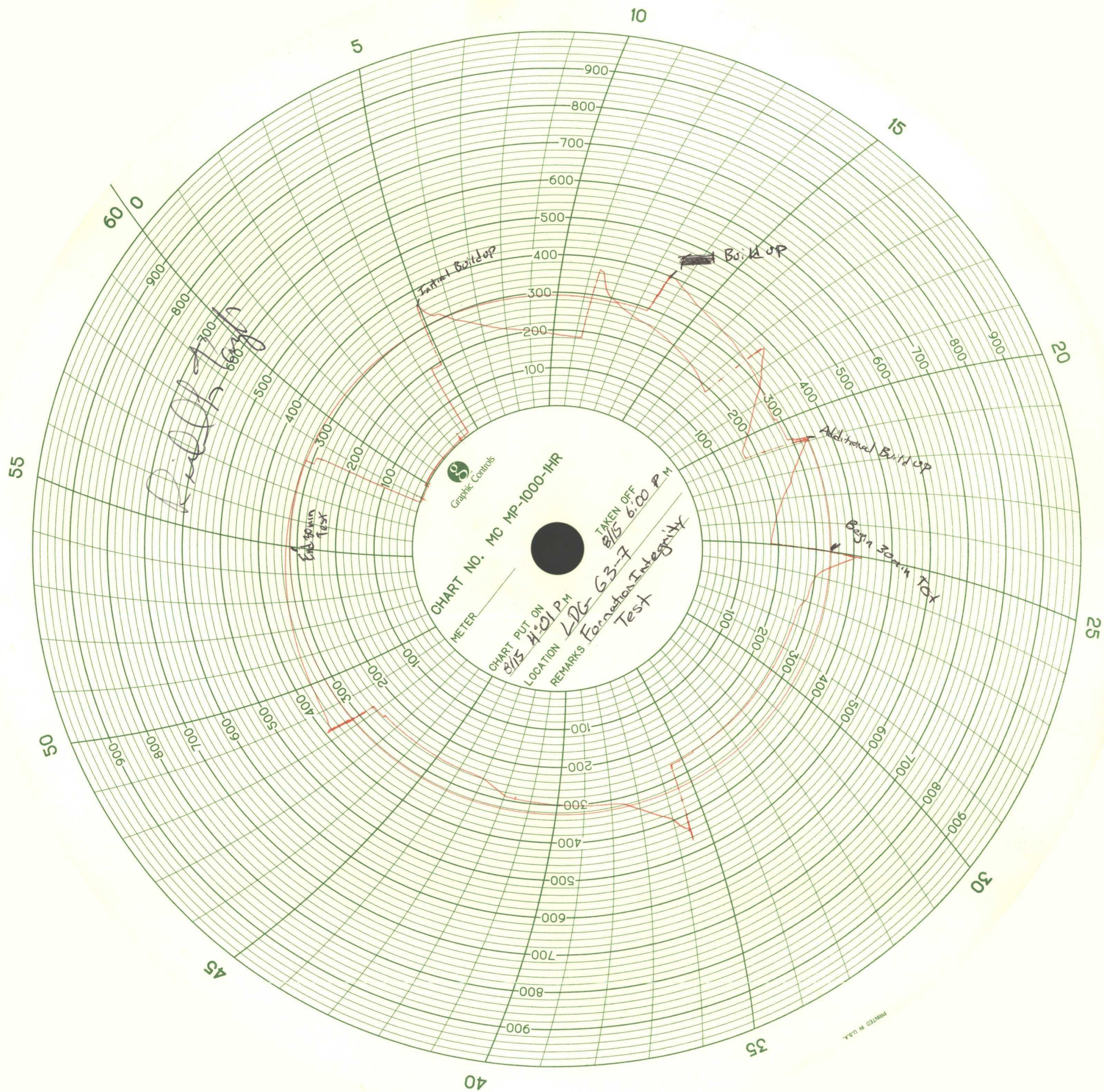
REMARKS Angular BOP Test  
@ 500+ psi

END 30 MIN TEST

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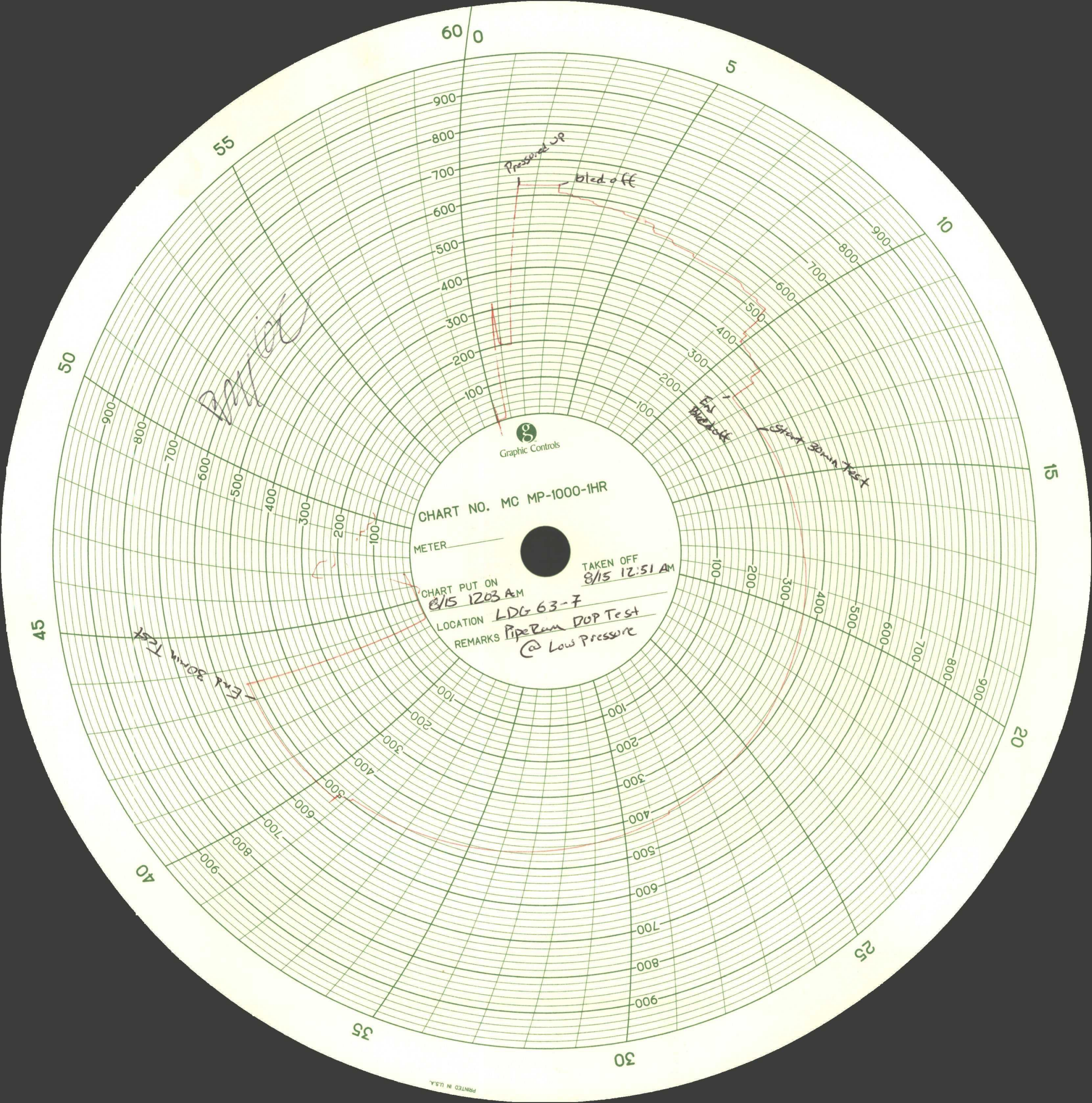




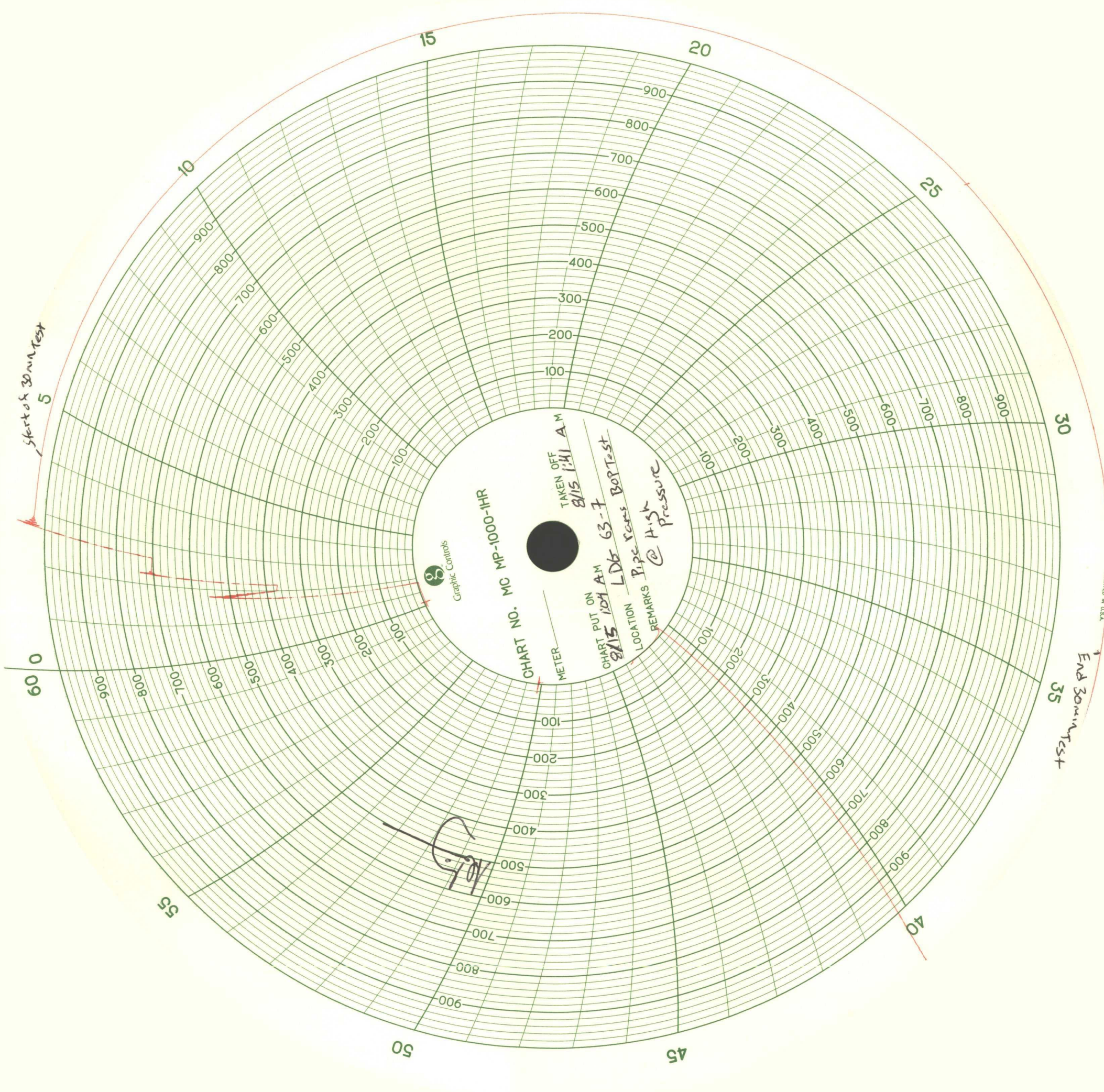


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Start of 30 min Test  
5

END 30 min Test  
35



Graphic Controls

CHART NO. MC MP-1000-1HR

TAKEN OFF  
8/15 1:41 AM

CHART PUT ON  
8/15 1:04 AM

LOCATION  
LDK 63-7

REMARKS  
Pipe runs BOP Test @ High Pressure

*[Handwritten signature]*



## Chavez, Carl J, EMNRD

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**From:** Chavez, Carl J, EMNRD  
**Sent:** Thursday, August 23, 2012 7:57 AM  
**To:** Sanchez, Daniel J., EMNRD  
**Cc:** VonGonten, Glenn, EMNRD; Shapard, Craig, EMNRD  
**Subject:** Well 63-7 UIC Class V Geothermal Injection Well EPA MIT Update

Daniel:

CF ~~Shoe~~ FYI: The OCD has accepted the MIT performed during well completion to mark the start of the EPA 5-Yr. MIT schedule for any UIC Class V Geothermal Injection/Disposal Wells. The operator is using a cement plug (~ 50 ft. pill) above casing with pressure up to 1000 psig with BOPE on well head. The issue now is receiving acceptable pressure data supporting the MIT results (+/- 10 % pass/fail).

- o Carl reviewed 8/20 G-103 MIT for Well 63-7 and requested on 8/23 MIT chart with chart recorder calibration information from David Janney to confirm MIT at well completion passed test to mark start of EPA 5-Yr. Class V Injection Well MIT.

Please let me know if you have any questions. Thanks.

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  
Office: (505) 476-3490  
E-mail: [CarlJ.Chavez@State.NM.US](mailto:CarlJ.Chavez@State.NM.US)  
Website: <http://www.emnrd.state.nm.us/ocd/>

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## Chavez, Carl J, EMNRD

---

**From:** Chavez, Carl J, EMNRD  
**Sent:** Thursday, August 23, 2012 7:34 AM  
**To:** Janney, David (david.janney@amec.com); Michelle Henrie (michelle@mhenrie.com)  
**Cc:** Sanchez, Daniel J., EMNRD; Shapard, Craig, EMNRD; VonGonten, Glenn, EMNRD  
**Subject:** FW: Lightning Dock/Los Lobos Well 63-7

David:

To mark the start of the EPA –Yr. MIT, and based on your recent submittal of the G-103 for MIT with reference to the MIT performed during well completion on August 14, 2012, please provide the highlighted chart and chart recorder record information requested below to verify that the well passed the MIT and will mark the beginning of the EPA- 5 Yr. MIT schedule. I have reviewed the August 14<sup>th</sup> driller report and observe the following:

- Test choke manifold and master valve to low pressure of 250 psi (ok) and high pressure of 1000 psi for 30 min (OK)
- Test pipe rams to 250 ps for 30 mini (OK)

I note in your recent G-103 submittal that the 1000 psi test above may have been the MIT in the G-103 submitted to OCD on August 20<sup>th</sup>? Please provide the original chart and chart recorder calibration information to me by COB on Monday, August 27<sup>th</sup>. If you did not follow the OCD instructions highlighted below (June 27<sup>th</sup> 2012 e-mail instructions), please provide the pressure information with equipment description and calibration to the OCD to determine whether it is acceptable for the EPA 5-Yr. MIT.

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  
Office: (505) 476-3490  
E-mail: [CarlJ.Chavez@State.NM.US](mailto:CarlJ.Chavez@State.NM.US)  
Website: <http://www.emnrd.state.nm.us/ocd/>

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---

**From:** Chavez, Carl J, EMNRD  
**Sent:** Wednesday, June 27, 2012 3:55 PM  
**To:** 'Michelle Henrie'; 'Cotter, Jeff'  
**Cc:** Sanchez, Daniel J., EMNRD; VonGonten, Glenn, EMNRD; Dade, Randy, EMNRD; Shapard, Craig, EMNRD; Brooks, David K., EMNRD  
**Subject:** RE: Lightning Dock/Los Lobos Well 63-7

Ms. Henrie:

Good afternoon. I believe that the OCD may be able to work with Los Lobos Renewable Power, LLC (Los Lobos) on the MIT procedure for injection wells at or near to well completion. OCD thinks that this is Los Lobo's focus right now after or near well completion of the injection wells.

There is language below in the OCD WQCC Discharge Permit that cannot be changed, for example, the “or after any well work over” requirement that appears to be absent from your proposed MIT method.

Please note the OCD comments are provide for communication and to assist the parties on agreement on MITs performed near, at or after well completion. Well work overs and/or the EPA 5-year MIT performed later are not at issue right now.

OCD Draft Review Comments:

- 1) It appears Los Lobos will be drilling and completing injection wells with 13-3/8” casing, in this instance, to a minimum depth of 2,200 ft. below ground. *There is some concern about the liner discussion because OCD generally prohibits the use of liners in injection wells due to well integrity issues and fluids moving up the backside of uncemented liners. However, since the well casing will be set to the minimum depth of 2,200 ft. with cement, I don’t think the issue of fluids moving up around the backside of an uncemented liner presents an issue to shallow fresh water supply wells based on the casing requirement. The use of liners in production wells is not an issue.*
- 2) The every 5-year EPA MIT schedule shall not deviate even if well work overs are performed between a 5-year period where an EPA MIT is performed and passes. The operator cannot mark the start of the EPA 5–year MIT from the well work over MIT, unless it occurs after the 4<sup>th</sup> year where we can agree that may be considered for the 5-year. However, in general, the well must be tested the every 5-years regardless of well work over MITs between the designated 5–year EPA MIT period. For example, the MIT date after well completion shall mark the start date of the every mandatory 5-year EPA MIT period.
- 3) The G-103 submittal time-frame of 48 hours before conducting an MIT is too short. The OCD cannot guarantee the approval date, which can vary depending on the circumstance, but can promise to expedite the requests outlined in the G-103. Agreeing on an MIT method(s) under certain circumstances, i.e., before, at or near well completion, will assist Los Lobos with procedures incorporated in the G-103 submittal for MITs on recently constructed injection wells.
- 4) The OCD mandates a 600 psig MIT test pressure minimum, but OCD may accept 500 psig if the operator has a valid explanation for requesting 500 psig.
- 5) Unless there is an H2S concern, the BOP would not be needed for MITs performed 5 years after the initial well completion unless there are H2S issues. In this context, Los Lobos is addressing MITs after injection well completion and/or during drilling the well drilling where the BOP is preferred to be left on the wellhead with at least 50 feet of cement plug above the casing shoe before conducting the MIT.

I have witnessed MITs where the BOP was the cause of leakage and failure of the MIT. The operator had to order another BOP to position on the well head (H2S rich well) in order to pass the casing MIT. As long as the operator realizes that the OCD requires a “pass” on the MIT and will not accept any excuse that the leak is from the BOP, OCD is ok. It would appear in “Procedure 5” that there will be at least 50 ft. of cement above the casing shoe for the MIT before drill out?

- 6) ~~The “either” as proposed in the context of the sentence does not make sense, as the chart recorder and chart are required for the documentation of the MIT and not “either or”.~~
- 7) I am not familiar with “FIT- Formation Integrity Test” in “Provision 8” for a geothermal well seated in fractured bedrock, but I’m wondering if Los Lobos is attempting to pressure up on the formation to assess formation characteristics and/or planning to fracture the formation during the “FIT”? An explanation for the FIT is requested? The OCD District Office will need to think about the liner in the injection well because there were concerns about well integrity under thermal conditions with a liner.....
- 8) The MIT procedure should also be reviewed and approved by the BLM for injection wells on Federal Mineral Estates and/or surface rights.

\*\*\*\*\*

**The OCD WQCC Permit MIT requirements are** (note that it applies regardless conditions in advance of the MIT):

**Section 21(H) Mechanical Integrity Testing:** At least once every five years and after any well work over, the geothermal reservoir will be isolated from the casing or tubing annulars and the casing pressure tested at a minimum of 600 psig for 30 minutes.

A passing test shall be within +/- 10% of the starting test pressure. All pressure tests must be performed in accordance with the testing schedule shown below and witnessed by OCD staff unless otherwise approved.

Testing Schedule:

2009: Prior to system start-up, a 30 minute casing pressure test at a minimum of 600 psig (set packer above casing shoe to isolate formation from casing), and

2013: A 30 minute casing pressure test at a minimum of 600 psig (set packer above casing shoe to isolate formation from casing)

**Section 21(N) Loss of Mechanical Integrity:** The owner/operator shall report to the OCD Santa Fe Office within 24 hours of its discovery of any failure of the casing, tubing or packer or movement of fluids outside of the injection zone. The owner/operator shall cease operations until proper repairs are made and the owner/operator receives OCD approval to re-start injection operations.

Please communicate further to the group based on the OCD comments above so the OCD may consider approval of the MIT for the 3 injection wells. Thank you.

\*\*\*\*\* END \*\*\*\*\*

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  
Office: (505) 476-3490  
E-mail: [CarlJ.Chavez@State.NM.US](mailto:CarlJ.Chavez@State.NM.US)  
Website: <http://www.emnrd.state.nm.us/ocd/>

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---

**From:** Michelle Henrie [<mailto:michelle@mhenrie.com>]

**Sent:** Wednesday, June 27, 2012 12:04 PM

**To:** Chavez, Carl J, EMNRD; 'Cotter, Jeff'

**Cc:** Sanchez, Daniel J., EMNRD; VonGonten, Glenn, EMNRD; Dade, Randy, EMNRD; Shapard, Craig, EMNRD; Brooks, David K., EMNRD

**Subject:** RE: Lightning Dock/Los Lobos Well 63-7

Carl, Dan,

Regarding the G-101 for well 63-7, condition #4 relating to MIT testing, here's our suggested changes (underlined).

4. A G-103 Sundry shall be submitted to the OCD- EB for approval at least 48 hours in advance of any well mechanical integrity testing (MIT), which is to be conducted either after the BOP testing but before drilling below the casing shoe or within 72-hours after well completion. A 30 minute EPA casing MIT is required with either a pressure chart recorder (meter with calibration sheet with calibration conducted within the past 90 days of MIT date) and chart (spring <= 1000 lb.) on maximum 1-hour chart. The final original test chart with witness signatures, date, time and pass/fail (+/- 10 %) of the starting test pressure (Minimum 500 psig) shall be hand delivered and/or mailed to the OCD-EB with copy to the Artesia District Office for the OCD Administrative Record.

On the issue of timing, LDG would propose to perform the MIT test after the BOP testing takes place, i.e., before drilling below the casing shoe. This allows a test the mechanical integrity of the casing, and there should not be any difference in mechanical integrity throughout the production hole section. What we would likely do is the following:

1. Set 13-3/8" casing.
2. Wait on Cement.
3. Nipple up BOPs
4. Test BOPs.
5. Run into the well and polish off the cement (inside of the casing) to within 50' of the casing shoe.
6. Perform MIT.
7. Drill out remaining cement and casing shoe plus 5' of new formation.
8. Perform FIT.
9. Drill 12-1/4" injection section.

This is a more practical approach for two reasons. (A), LDG would not need to order a packer and personnel to come to the site after the well is completed. The price tag for something like that is ~\$50K. (B) I believe that OCD would like us to have at least a 50 ft lap when running the slotted liner, however, we have to set the packer within 50' of the casing shoe. We cannot set the packer inside of the liner because it is un-cemented pressure will be lost through the lap. So it makes sense to run the MIT before running the 9-5/8" slotted liner.

Please let us know if you have any questions.

Michelle

---

**From:** Chavez, Carl J, EMNRD [<mailto:CarlJ.Chavez@state.nm.us>]

**Sent:** Thursday, June 21, 2012 7:10 AM

**To:** Michelle Henrie ([michelle@mhenrie.com](mailto:michelle@mhenrie.com)); Cotter, Jeff ([jeff.cotter@amec.com](mailto:jeff.cotter@amec.com))

**Cc:** Sanchez, Daniel J., EMNRD; VonGonten, Glenn, EMNRD; Dade, Randy, EMNRD; Shapard, Craig, EMNRD; Brooks, David K., EMNRD

**Subject:** FW: Lightning Dock/Los Lobos Well 63-7

Ms. Henrie, et al:

Good morning.

FYI, the New Mexico Oil Conservation Division (OCD) Underground Injection Control (UIC) Director Mr. Daniel Sanchez has commented on the Mechanical Integrity Test (MIT) resolution and notification to the OCD in advance of MIT below. The OCD requires the EPA 5-Year MIT on injection well casing, and or other proposed MIT methods if approved by the OCD. The OCD recommends that Los Lobos submit a proposed MIT procedure to the OCD for approval if it wishes to deviate from the EPA 5-Year UIC MIT requirements.

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

Office: (505) 476-3490

E-mail: [CarlJ.Chavez@State.NM.US](mailto:CarlJ.Chavez@State.NM.US)

Website: <http://www.emnrd.state.nm.us/ocd/>

"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:** Sanchez, Daniel J., EMNRD

**Sent:** Thursday, June 21, 2012 7:02 AM

**To:** Chavez, Carl J, EMNRD; Michelle Henrie; Brooks, David K., EMNRD; Dade, Randy, EMNRD

**Cc:** Cotter, Jeff; Michael Hayter; Janney, David; Ben Barker; VonGonten, Glenn, EMNRD; Shapard, Craig, EMNRD

**Subject:** RE: Lightning Dock/Los Lobos Well 63-7

Carl,

When the MIT issue has been resolved, the OCD is to be informed 48 hours prior to the test. Randy and I have discussed sending T.C. to inspect the location and possibly witness the MIT. Thanks.

Daniel

---

**From:** Chavez, Carl J, EMNRD  
**Sent:** Wednesday, June 20, 2012 4:40 PM  
**To:** Michelle Henrie; Brooks, David K., EMNRD; Dade, Randy, EMNRD  
**Cc:** Cotter, Jeff; Michael Hayter; Janney, David; Ben Barker; Sanchez, Daniel J., EMNRD; VonGonten, Glenn, EMNRD; Shapard, Craig, EMNRD  
**Subject:** RE: Lightning Dock/Los Lobos Well 63-7

Michelle:

Good afternoon. Please see the OCD responses to Los Lobos inquiries below in red text.

Please contact me if you have questions. 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  
Office: (505) 476-3490  
E-mail: [CarlJ.Chavez@State.NM.US](mailto:CarlJ.Chavez@State.NM.US)  
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---

**From:** Michelle Henrie [<mailto:michelle@mhenrie.com>]  
**Sent:** Tuesday, June 19, 2012 11:10 AM  
**To:** Brooks, David K., EMNRD; Chavez, Carl J, EMNRD; Dade, Randy, EMNRD  
**Cc:** Cotter, Jeff; Michael Hayter; Janney, David; Ben Barker  
**Subject:** Lightning Dock/Los Lobos Well 63-7

Good morning everyone,

I wanted to regroup on Well 63-7 and make sure we are all in the loop.

**G-101.**

- A. We all discussed the 6/6/12 Conditions of Approval for Form G-101 via teleconference 6/8/12. After that call, David Janney forwarded by email on 6/11/12 follow-up information relating to Condition 2(a) (depth of casing). OCD received OSE drill permit and is currently working to verify and confirm the actual total depth (TD) of the well from the well owner and the OSE, while reviewing OCD well files. The TD will help to finalize the OCD's G-112 review. In addition, it may also apply to the more recent G-112 for Well 45-7, for which the OCD has recently received G-104 and other associated forms from Los Lobos. Los Lobos should realize that similar to Injection Well 63-7 where public notice was required, Well 45-7 will also require public notice and Los Lobos needs to evaluate the deepest fresh water supply well TD within ½ mile from Well 45-7 and provide the information, logs, etc. to the OCD to confirm similar to the Injection Well 63-7.
- B. My “to do” list shows that you still need information relating to Condition 4 (the timing of MIT testing). Our team is working on this and I will try to get you something by the end of the day. Contrary to the last telephone discussion of deferral of the MIT procedure to another date, the OCD now requests the procedure ASAP is Los Lobos is seeking an alternative MIT method than the standard EPA 5-Year MIT. This issue was raised by Ben Barker in the past and after discussion with the OCD UIC Director and Engineering Bureau Staff was rejected. Therefore, the OCD requests the alternative MIT procedure up front in order to avoid any confusion on the MIT process for any/all injection wells in the future. The OCD requires the MIT within a specified time-frame from well completion.

- C. Our understanding is that Amended Conditions of Approval would be considered after your office received the items mentioned above. Yes, the OCD can amend the COAs and/or proceed with a G-112 approval that could modify conditions of the G-101. Either way, the OCD will communicate with Los Lobos to resolve this.

**G-112.**

- A. The 20-day waiting period for Form G-112 closed on 6/14/12. Did your office receive any requests for hearing? No.
- B. Last week my office hand delivered to your office (addressed to Carl) a rider changing the coverage of Los Lobos' bond to include 63-7. Yes, the OCD received it and is currently processing the bond rider.
- C. Also on my "to do" list, I will send you a letter today stating how the application meets the requirements of NMAC 19.14.93.8(C). Ok, David Brooks is the lead on this.
- D. Do you need anything more before you can issue the G-112? We are planning to provide Forms G-104 through -107 for 63-7 after the well has been drilled. Yes, this makes sense and the G-104 with associated G-Forms must be approved by the OCD before any injection can occur into the well.

What am I missing? We are looking forward to getting everything finalized so we can move forward with this well. I can't think of anything right now, but public notices for any injection wells should be completed similar to well 63-7. Los Lobos should research well logs for deepest fresh water supply well TDs for the ½ mile AOR associated with any/all injection well applications. The OCD is tasked with "Due Diligence" to ensure that any/all injection wells meet the 100 ft. deeper than the deepest fresh water well TD within ½ mile from an injection well is accordance with the OCD Discharge Permit (GTHT-001). If well 45-7 G-112 satisfies the above TD condition, then there should not be an issue similar to well 63-7 near AmeriCulture's State Well No. 2.

Thank you.

Thanks! Michelle



**Michelle Henrie | Attorney · LEED AP**

MHenrie | Land · Water · Law

P.O. Box 7035 · Albuquerque, New Mexico · 87194-7035

126 E. DeVargas · Santa Fe, New Mexico · 87501 · **Please note new street address effective June 1, 2012: 225 E.**

**DeVargas · Santa Fe, New Mexico · 87501**

505-842-1800 | fax 505-842-0033

[michelle@mhenrie.com](mailto:michelle@mhenrie.com)

*This email and any attachments are privileged and confidential.  
If you have received this email in error, please destroy it immediately.*



## Chavez, Carl J, EMNRD

---

**From:** Ben Barker [Ben.Barker@cyrqenergy.com]  
**Sent:** Thursday, December 15, 2011 7:57 AM  
**To:** Chavez, Carl J, EMNRD  
**Cc:** Sanchez, Daniel J., EMNRD; Brooks, David K., EMNRD; VonGonten, Glenn, EMNRD; Dade, Randy, EMNRD  
**Subject:** RE: OCD Rescindment of Recent Letter of Violation Letter

Carl,

Thank you very much. We will be in touch to discuss testing plans and to get approvals.

Best regards,  
Ben

801-616-6193  
707-508-9963

---

**From:** Chavez, Carl J, EMNRD [<mailto:CarlJ.Chavez@state.nm.us>]  
**Sent:** Thursday, December 15, 2011 7:50 AM  
**To:** Ben Barker  
**Cc:** Sanchez, Daniel J., EMNRD; Brooks, David K., EMNRD; VonGonten, Glenn, EMNRD; Dade, Randy, EMNRD  
**Subject:** OCD Rescindment of Recent Letter of Violation Letter

Ben:

Please find attached an electronic version of the Oil Conservation Division letter that we spoke about recently. A hardcopy was sent to you via mail service.

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: [CarlJ.Chavez@state.nm.us](mailto:CarlJ.Chavez@state.nm.us)

Website: <http://www.emnrd.state.nm.us/oed/>

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<http://www.emnrd.state.nm.us/oed/environmental.htm#environmental>)

## Chavez, Carl J, EMNRD

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**From:** Ben Barker [Ben.Barker@cyrqenergy.com]  
**Sent:** Thursday, December 15, 2011 7:57 AM  
**To:** Chavez, Carl J, EMNRD  
**Cc:** Sanchez, Daniel J., EMNRD; Brooks, David K., EMNRD; VonGonten, Glenn, EMNRD; Dade, Randy, EMNRD  
**Subject:** RE: OCD Rescindment of Recent Letter of Violation Letter

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**Sent:** Thursday, December 15, 2011 7:50 AM  
**To:** Ben Barker  
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Ben:

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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  
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# New Mexico Energy, Minerals and Natural Resources Department

**Susana Martinez**  
Governor

**John H. Bemis**  
Cabinet Secretary-Designate

**Brett F. Woods, Ph.D.**  
Deputy Cabinet Secretary

**Jami Bailey**  
Division Director  
**Oil Conservation Division**



**DECEMBER 14, 2011**

Mr. Ben Barker  
Cyrq Energy, Inc.  
136 S. Main Street, Suite 600  
Salt Lake City, Utah 84101

Via U.S. Certified Mail No.: 7001 1940 0004 7923 1268

Re: **RESCINDMENT OF LETTER OF VIOLATION Geothermal Discharge Permit (GTHT-001) Mechanical Integrity Tests (MITs) Hidalgo County, New Mexico [Production Wells: 45-07 and 55-07]**

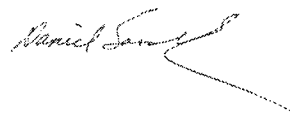
Dear Mr. Barker:

The New Mexico Oil Conservation Division (OCD) is writing to inform Cyrq Energy, Inc. (Cyrq) that the "Letter of Violation" dated October 21, 2011 has been rescinded.

Well testing requirements are prescribed in OCD Geothermal Regulations: Title 19, Chapter 14 and Water Quality Control Commission (WQCC) Regulations: § 20.6.2.5000 – 5299 NMAC, during the exploration and operational phase of a geothermal project. If the project proceeds as indicated, well test information will be required to be submitted for all wells where the operator is seeking authorization to either produce and/or inject. Cyrq has indicated to the OCD that certain production wells may be converted to injection wells during the project. An application for authorization to inject must be submitted to the OCD for its approval.

Please be advised that all disposal or injection wells require an Environmental Protection Agency (EPA) MIT after completion. An operator must provide advanced notification to the OCD in order for the MIT to be witnessed. The OCD must receive the original pressure charts in order to confirm the test results and scan the documents into the Administrative Record.

Please contact Mr. Carl Chavez of my staff at (505) 476-3490 or [CarlJ.Chavez@state.nm.us](mailto:CarlJ.Chavez@state.nm.us) if you have questions. Thank you in advance for your cooperation in this matter  
Sincerely,



**Daniel Sanchez**  
UIC Director

Mr. Ben Barker  
Cyrq Energy, Inc.  
December 14, 2011

Attachments

DS/cjc

Xc: GTHT-001 Well File "MITs" and "Enforcement"  
Mike Smith, BLM  
OCD District Office

## MECHANICAL INTEGRITY TESTING (MIT)

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

- MIT Tests

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

- MIT Procedure

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

- MIT Report

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

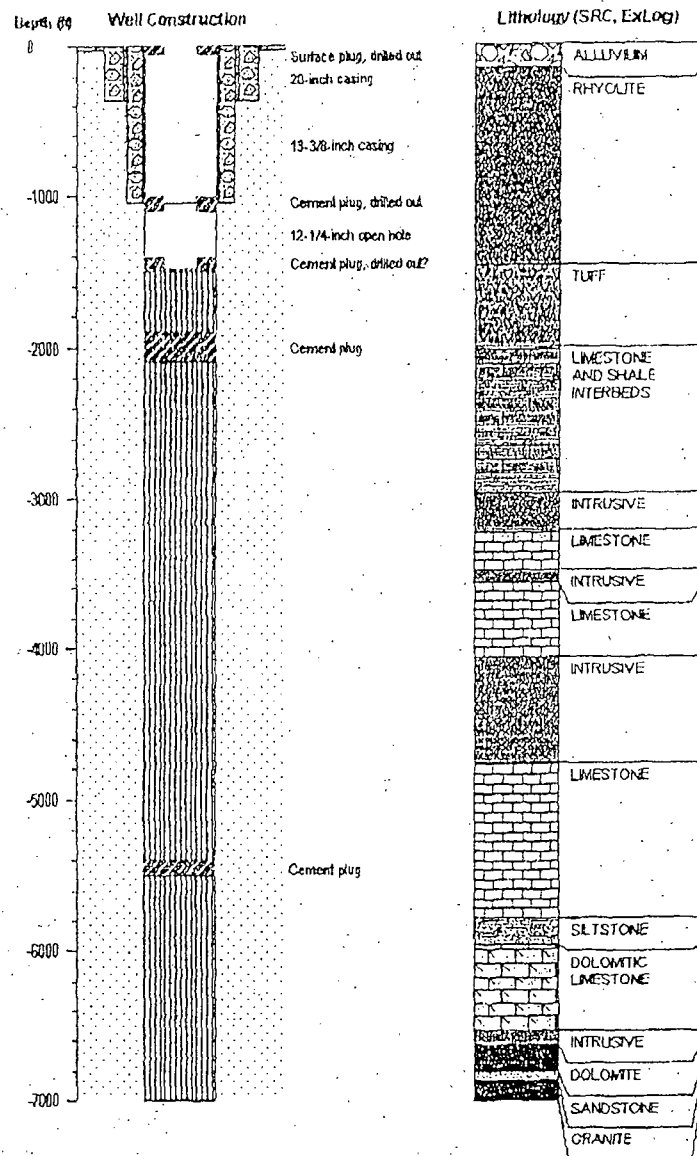


Figure 12. TFD 55-7 well construction and lithology.

Fig. 5

# New Mexico Energy, Minerals and Natural Resources Department

**Susana Martinez**  
Governor

**John H. Bemis**  
Cabinet Secretary-Designate

**Brett F. Woods, Ph.D.**  
Deputy Cabinet Secretary

**Jami Bailey**  
Division Director  
Oil Conservation Division



**OCTOBER 21, 2011**

Mr. Ben Barker  
Cyrq Energy, Inc.  
136 S. Main Street, Suite 600  
Salt Lake City, Utah 84101

Via U.S. Certified Mail No.: 7001 1940 0004 7923 1213

Re: **LETTER OF VIOLATION Geothermal Discharge Permit (GTHT-001) Mechanical Integrity Tests (MITs) Hidalgo County, New Mexico [Production Wells: 45-07 and 55-07]**

Dear Mr. Barker:

The New Mexico Oil Conservation Division (OCD) is writing to inform Cyrq Energy, Inc. (Cyrq) that it is in violation of OCD Geothermal Regulation: Title 19, Chapter 14 et seq. NMAC (see attachments). All geothermal production/development wells fall under this regulation while geothermal injection and/or disposal wells fall under Water Quality Control Commission (WQCC) Regulations: § 20.6.2.5000 – 5299 NMAC, which are implemented for the OCD Underground Injection Control (UIC) Program for UIC Class V Geothermal and/or any other type wells besides UIC Class I - IV.

Cyrq failed to conduct annual MITs before September 30, 2011, the end of the Federal Environmental Protection Agency (EPA) Fiscal Year 2011 (Oct. 1, 2010 – Sept. 30, 2011). The OCD had sent out an e-mail reminder to Cyrq (formerly known as Los Lobos, Raser Technologies, etc.) on April 15, 2011 (see attachments).

The MIT requires advanced notification to the OCD in order to witness the MIT; the original MIT pressure chart with signatures and test information that reflects a "pass/fail" on the chart; and a copy of the calibration sheet (minimum every 6 months) from the used chart recorder that OCD scans into its well file as confirmation that the MIT requirement has been met.

Please contact Mr. Carl Chavez of my staff at (505) 476-3490 or [Carl.Chavez@state.nm.us](mailto:Carl.Chavez@state.nm.us) to schedule MITs for your production wells that need to be completed before December 31, 2011. Failure to meet this date may result in escalated enforcement actions. Thank you in advance for your cooperation in this matter.

Sincerely,

Mr. Ben Barker  
Cyrq Energy, Inc.  
October 21, 2011

Daniel Sanchez  
UIC Director

Attachments

DS/eje

Xc: GTHH-001 Well File "MITs"  
Mike Smith, BLM  
OCD District Office



## Brine Well EPA 5-Yr. MIT Draft Guidance

(30 minute hydrostatic casing closed to formation)

This guidance is intended to provide technical guidance to well operators or technical means to achieve compliance with the EPA Underground Injection Control Regulations and Oil Conservation Division- Oil and Gas Regulations. Other test procedures may exist to achieve compliance with these regulations that the OCD may approve.

- 1) A work over rig must remove all tubing from the hole.
- 2) A packer or plug must be set within 20 feet of the casing shoe depth and piping must be filled, and pressured up from 300 to 500 psi (note: higher pressure is preferred). The casing/tubing annulus must be loaded with inert fluid at least 24 hours prior to testing for temperature equilibrium to be attained.
- 3) Have manpower and equipment available for pressure test. Wellhead shall be prepared for test and all valves and gauges should be in good working order.
- 4) Pumps, tanks, external lines etc. must be isolated from the wellhead during test.
- 5) A continuous recording pressure device with a 1 or 4-hour clock shall be installed on the casing annulus. The pressure range shall not be greater than 500 psig. The chart recorder spring weight shall not exceed 1000 pounds. The operator must provide proof that the pressure-recording device has been calibrated within the past 6 months of the test date.
- 6) A minimum of one pressure gauge shall be installed on the casing/tubing annulus.
- 7) OCD must be notified at least 72 hours prior to test for an opportunity to witness the beginning of test (putting chart on) and ending of test (removing chart). At the end of test operator may be required to bleed-off well pressure to demonstrate recorder and gauge response into an adequately sized flow-back containment vessel for this purpose. Flow-back fluids from this vessel must be discharged back into the well at the completion of the test.
- 8) The Operator shall supply the following information on the pressure chart:
  - A. Company Name, Well Name, API #, Legal Location.
  - B. Test Procedure: (1) EPA 5-Yr. Casing; (2) Casing + Formation; (3) Both; and (4) Other
  - C. Testing Media: Water, Inert Gas, Oil, etc.
  - D. Date, time started and ending.
  - E. Name (printed) and signature of company representative and OCD inspector

Chavez, Carl J, EMNRD

---

**From:** Chavez, Carl J, EMNRD  
**Sent:** Friday, April 15, 2011 8:18 AM  
**To:** 'Ben Barker'; 'Michael Hayter'  
**Cc:** Sanchez, Daniel J., EMNRD; VonGonten, Glenn, EMNRD; Dade, Randy, EMNRD; 'Mike\_Smith@blm.gov'  
**Subject:** Lightning Dock Geothermal Project (GTHT-001) UIC Program Mechanical Integrity Testing (MITs) of Wells  
**Attachments:** EPA 5-Yr MIT.DOC

Gentlemen:

Good morning. I'm writing to notify you that the OCD requires your well casing mechanical integrity test (MIT) information to be submitted to the OCD before the end of the Federal UIC Program Reporting Period (i.e., FY Q4 July – Sept.) or before September 30, 2011.

Please find attached the OCD requirements for reporting a successful EPA 5-Yr. MIT on the well casing. 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: [CarlJ.Chavez@state.nm.us](mailto:CarlJ.Chavez@state.nm.us)

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<http://www.emnrd.state.nm.us/oed/environmental.htm#environmental>

witnessing test

- 9) **TEST ACCEPTANCE:** The OCD will use the following criteria in determining if a well has passed the Mechanical Integrity Test:
- A. **Passes** if Zero Bleed-Off during the test.
  - B. **Passes** if Final Test Pressure is within  $\pm 10\%$  of Starting Pressure, if approved by the OCD inspector.
  - C. **Fails** if any Final Test Pressure is greater than  $\pm 10\%$  of Starting Pressure. Operators must investigate for leaks and demonstrate that mechanical integrity of the well(s) by ensuring there are no leaks in the casing, or packer, and injected/produced fluids are confined within the piping and injection zones. Wells shall not resume operations until approved by OCD.

**Note:** *OCD recognizes that different operations, well designs, formation characteristics and field conditions may cause variations in the above procedures. If operator wishes to make or anticipate changes please notify the OCD for approval. All operators are responsible to notify OCD of any procedure that may cause harm to the well system or formation. Please be advised that OCD approval does not relieve any operator of liability should operations result in pollution of surface water, groundwater, or the environment. OCD recommends that a licensed professional engineer or licensed professional geologist or designee supervise all test procedures and associated field activity.*

This rule was filed as Rule G-211.

**TITLE 19      NATURAL RESOURCES AND WILDLIFE**  
**CHAPTER 14    GEOTHERMAL POWER**  
**PART 62       ANNUAL GEOTHERMAL TEMPERATURE AND PRESSURE TESTS (FORM G-111)**

**19.14.62.1      ISSUING AGENCY:** Energy and Minerals Department, Oil Conservation Division, P.O. Box 2088, Santa Fe, New Mexico.  
[Recompiled 12/31/01]

**19.14.62.2      SCOPE:** [RESERVED]  
[Recompiled 12/31/01]

**19.14.62.3      STATUTORY AUTHORITY:** [RESERVED]  
[Recompiled 12/31/01]

**19.14.62.4      DURATION:** [RESERVED]  
[Recompiled 12/31/01]

**19.14.62.5      EFFECTIVE DATE:** [November 15, 1983]  
[Recompiled 12/31/01]

**19.14.62.6      OBJECTIVE:** [RESERVED]  
[Recompiled 12/31/01]

**19.14.62.7      DEFINITIONS:** [RESERVED]  
[Recompiled 12/31/01]

**19.14.62.8      ANNUAL GEOTHERMAL TEMPERATURE AND PRESSURE TESTS (FORM G-111):**  
Annual temperature and pressure tests shall be submitted by the owner or operator of each geothermal resource producing well in accordance with the annual testing schedule published by the division. Flowing temperatures and flowing pressure tests at the wellhead shall be recorded after at least 72 hours of continuous flow at normal producing rates. The well shall then be shut in for 24 hours and shut-in pressure at the wellhead recorded. Results of these tests shall be submitted in duplicate to the Santa Fe office of the division.  
[Recompiled 12/31/01]

**HISTORY OF 19.14.62 NMAC:**

Pre-NMAC History: The material in this Part was derived from that previously filed with the State Records Center and Archives:

Rule G-211, Annual Geothermal Temperature and Pressure Tests (Form G-111), 11/1/83.

History of Repealed Material: [RESERVED]

Form 6-111  
Adopted 10-1  
Revised 10-1

Operator

Address

Field

County

[illegible]

I hereby certify that the above information is true and complete to the best of my knowledge and belief.

Signature

Title

Date \_\_\_\_\_



## Chavez, Carl J, EMNRD

---

**From:** Chavez, Carl J, EMNRD  
**Sent:** Friday, April 15, 2011 8:18 AM  
**To:** 'Ben Barker'; 'Michael Hayter'  
**Cc:** Sanchez, Daniel J., EMNRD; VonGonten, Glenn, EMNRD; Dade, Randy, EMNRD; 'Mike\_Smith@blm.gov'  
**Subject:** Lightning Dock Geothermal Project (GTHT-001) UIC Program Mechanical Integrity Testing (MITs) of Wells  
**Attachments:** EPA 5-Yr MIT.DOC

Gentlemen:

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<http://www.emnrd.state.nm.us/oed/environmental.htm#environmental>)

## **Brine Well EPA 5-Yr. MIT Draft Guidance**

(30 minute hydrostatic casing closed to formation)

This guidance is intended to provide technical guidance to well operators or technical means to achieve compliance with the EPA Underground Injection Control Regulations and Oil Conservation Division- Oil and Gas Regulations. Other test procedures may exist to achieve compliance with these regulations that the OCD may approve.

- 1) A work over rig must remove all tubing from the hole.
- 2) A packer or plug must be set within 20 feet of the casing shoe depth and piping must be filled, and pressured up from 300 to 500 psi (note: higher pressure is preferred). The casing/tubing annulus must be loaded with inert fluid at least 24 hours prior to testing for temperature equilibrium to be attained.
- 3) Have manpower and equipment available for pressure test. Wellhead shall be prepared for test and all valves and gauges should be in good working order.
- 4) Pumps, tanks, external lines etc. must be isolated from the wellhead during test.
- 5) A continuous recording pressure device with a **1 or 4-hour clock** shall be installed on the casing annulus. The pressure range shall not be greater than 500 psig. The chart recorder spring weight shall not exceed 1000 pounds. The operator must provide proof that the pressure-recording device has been calibrated within the past 6 months of the test date.
- 6) A minimum of one pressure gauge shall be installed on the casing/tubing annulus.
- 7) OCD must be notified at least 72 hours prior to test for an opportunity to witness the beginning of test (putting chart on) and ending of test (removing chart). At the end of test operator may be required to bleed-off well pressure to demonstrate recorder and gauge response into an adequately sized flow-back containment vessel for this purpose. Flow-back fluids from this vessel must be discharged back into the well at the completion of the test.
- 8) The Operator shall supply the following information on the pressure chart:
  - A. Company Name, Well Name, API #, Legal Location.
  - B. Test Procedure: (1) EPA 5-Yr. Casing; (2) Casing + Formation; (3) Both; and (4) Other
  - C. Testing Media: Water, Inert Gas, Oil, etc.
  - D. Date, time started and ending.
  - E. Name (printed) and signature of company representative and OCD inspector



witnessing test

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- A. **Passes** if Zero Bleed-Off during the test.
  - B. **Passes** if Final Test Pressure is within  $\pm 10\%$  of Starting Pressure, if approved by the OCD inspector.
  - C. **Fails** if any Final Test Pressure is greater than  $\pm 10\%$  of Starting Pressure. Operators must investigate for leaks and demonstrate that mechanical integrity of the well(s) by ensuring there are no leaks in the casing, or packer, and injected/produced fluids are confined within the piping and injection zones. Wells shall not resume operations until approved by OCD.

**Note:** *OCD recognizes that different operations, well designs, formation characteristics and field conditions may cause variations in the above procedures. If operator wishes to make or anticipate changes please notify the OCD for approval. All operators are responsible to notify OCD of any procedure that may cause harm to the well system or formation. Please be advised that OCD approval does not relieve any operator of liability should operations result in pollution of surface water, groundwater, or the environment. OCD recommends that a licensed professional engineer or licensed professional geologist or designee supervise all test procedures and associated field activity.*