

STATE OF UTAH
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING

FORM 3

AMENDED REPORT

APPLICATION FOR PERMIT TO DRILL						1. WELL NAME and NUMBER CW-7				
2. TYPE OF WORK DRILL NEW WELL <input checked="" type="checkbox"/> REENTER P&A WELL <input type="checkbox"/> DEEPEN WELL <input type="checkbox"/>						3. FIELD OR WILDCAT WILDCAT				
4. TYPE OF WELL Gas Storage Well Coalbed Methane Well: NO						5. UNIT or COMMUNITIZATION AGREEMENT NAME				
6. NAME OF OPERATOR MAGNUM NGLS SOLUTION MINING LLC						7. OPERATOR PHONE 801 993-7001				
8. ADDRESS OF OPERATOR 3165 East Millrock Drive Suite 330, Holladay, UT, 84121						9. OPERATOR E-MAIL tjames@westernenergyhub.com				
10. MINERAL LEASE NUMBER (FEDERAL, INDIAN, OR STATE) 51573-OBA			11. MINERAL OWNERSHIP FEDERAL <input type="checkbox"/> INDIAN <input type="checkbox"/> STATE <input checked="" type="checkbox"/> FEE <input type="checkbox"/>			12. SURFACE OWNERSHIP FEDERAL <input type="checkbox"/> INDIAN <input type="checkbox"/> STATE <input checked="" type="checkbox"/> FEE <input type="checkbox"/>				
13. NAME OF SURFACE OWNER (if box 12 = 'fee')						14. SURFACE OWNER PHONE (if box 12 = 'fee')				
15. ADDRESS OF SURFACE OWNER (if box 12 = 'fee')						16. SURFACE OWNER E-MAIL (if box 12 = 'fee')				
17. INDIAN ALLOTTEE OR TRIBE NAME (if box 12 = 'INDIAN')			18. INTEND TO COMMINGLE PRODUCTION FROM MULTIPLE FORMATIONS YES <input type="checkbox"/> (Submit Commingling Application) NO <input checked="" type="checkbox"/>			19. SLANT VERTICAL <input checked="" type="checkbox"/> DIRECTIONAL <input type="checkbox"/> HORIZONTAL <input type="checkbox"/>				
20. LOCATION OF WELL		FOOTAGES		QTR-QTR	SECTION	TOWNSHIP	RANGE	MERIDIAN		
LOCATION AT SURFACE		852 FSL 91 FWL		SWSW	23	15.0 S	7.0 W	S		
Top of Uppermost Producing Zone		852 FSL 91 FWL		SWSW	23	15.0 S	7.0 W	S		
At Total Depth		852 FSL 91 FWL		SWSW	23	15.0 S	7.0 W	S		
21. COUNTY MILLARD			22. DISTANCE TO NEAREST LEASE LINE (Feet) 850			23. NUMBER OF ACRES IN DRILLING UNIT 2				
			25. DISTANCE TO NEAREST WELL IN SAME POOL (Applied For Drilling or Completed) 706			26. PROPOSED DEPTH MD: 4820 TVD: 4820				
27. ELEVATION - GROUND LEVEL 4619			28. BOND NUMBER BO08497			29. SOURCE OF DRILLING WATER / WATER RIGHTS APPROVAL NUMBER IF APPLICABLE 68-396				
Hole, Casing, and Cement Information										
String	Hole Size	Casing Size	Length	Weight	Grade & Thread	Max Mud Wt.	Cement	Sacks	Yield	Weight
COND	36	36	0 - 150	282.3	X-52 Casing	0.0	No Used	0	0.0	0.0
SURF	34	30	0 - 750	234.2	X-52 Casing	9.5	Class A	887	1.18	15.6
			1550 - 2900	245.6	X-56 Casing	10.2	Class A	2789	1.18	15.6
I1	28	24	0 - 1550	186.2	X-56 Casing	10.2	Class A	2789	1.18	15.6
			1550 - 2900	245.6	X-56 Casing	10.2	None			
I2	24	20	0 - 1500	129.3	X-56 Casing	10.2	Class G	2554	1.24	16.3
			1500 - 3300	202.9	X-56 Casing	10.2	None			
Prod	22	16	0 - 2400	97.0	N-80 Buttress	10.4	Class G	3409	1.24	16.3
			2400 - 3400	109.0	N-80 Buttress	10.4	None			
ATTACHMENTS										
VERIFY THE FOLLOWING ARE ATTACHED IN ACCORDANCE WITH THE UTAH OIL AND GAS CONSERVATION GENERAL RULES										
<input checked="" type="checkbox"/> WELL PLAT OR MAP PREPARED BY LICENSED SURVEYOR OR ENGINEER					<input checked="" type="checkbox"/> COMPLETE DRILLING PLAN					
<input checked="" type="checkbox"/> AFFIDAVIT OF STATUS OF SURFACE OWNER AGREEMENT (IF FEE SURFACE)					<input type="checkbox"/> FORM 5. IF OPERATOR IS OTHER THAN THE LEASE OWNER					
<input type="checkbox"/> DIRECTIONAL SURVEY PLAN (IF DIRECTIONALLY OR HORIZONTALLY DRILLED)					<input checked="" type="checkbox"/> TOPOGRAPHICAL MAP					
NAME Tiffany A. James			TITLE Vice President Project Development			PHONE 801 993-7001				
SIGNATURE			DATE 01/18/2014			EMAIL tjames@westernenergyhub.com				
API NUMBER ASSIGNED 43027500040000			APPROVAL  Permit Manager							



Application for Permit to Drill Magnum Cavern Well 7

Drilling Plan



Application for Permit to Drill Magnum Cavern Well 7

Drilling Plan

01/17/2014

CONFIDENTIAL

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Section 1

Drilling/Well Construction Plan

1.1 Plan Summary

This Application for a Permit to Drill (APD) has incorporated all of the sections in the DOGM APD Checklist. Additional requirements for the drilling program are listed on the Instructions page of the APD. The discussion below is intended to respond directly to the drilling program additional requirements.

1. The estimated tops of important geologic markers:

Important geologic markers are shown in **Exhibit A: Magnum Cavern Well 7 Wellhead Casing Design**. General geologic markers include clay-confining layers that generally delineate the shallow unconfined aquifer, the shallow artesian aquifer, the deep artesian aquifer, and the basement artesian aquifer. The main marker identified on site is the transition between the alluvial aquifers and the salt structure which begins generally at 3,000 feet.

2. The estimated depths at which the top and the bottom of anticipated water, oil, gas, or other mineral-bearing formations are expected to be encountered, and the owners or operator's plans for protecting such resources:

The shallow water table has been found on site to be at an approximate depth of 60 feet. Water continues to be encountered until entering the salt structure, which in and of itself is unsaturated. Significant decreases in water quality occur within the salt transition zone starting at about 2,800 feet.

Protection of the ground water resource will be ensured through the casing and cementing program proposed to be implemented as provided on **Exhibit A: Magnum Cavern Well 7 Wellhead Casing Design**, the Casing Design report, and the Well Drilling/Construction Plan.

No oil or gas has been found on site, nor is it expected.

3. The owner's or operator's minimum specifications for pressure control equipment to be used and a schematic diagram thereof showing sizes, pressure ratings or API series, proposed testing procedures and testing frequency:

See the **Exhibit A: Magnum Cavern Well 7 Wellhead Casing Design**, the "16-Inch Drilling/Well Construction Plan" and the "Conceptual 16-Inch Well Casing Program" for the descriptions of the drilling equipment and casing program.

4. Any supplementary information more completely describing the drilling equipment and casing program as shown on this form:

See the "16-Inch Drilling/Well Construction Plan" and the "Conceptual 16-Inch Well Casing Program" for the descriptions of the drilling equipment and casing program.

5. *The type and characteristics of the proposed circulating medium or mediums to be employed in drilling, the quantities and types of mud and weighting material to be maintained, and the monitoring equipment to be used on the mud system:*

The Fluids Program will be completed by the drilling contractor's mud engineer prior to well drilling. In general, the water bearing zones above 2,800 feet will be drilled with a water/bentonite mud and the salt section will be drilled with a brine/aggapulite mud. The Reserve Pit will be lined with a 20-mil HDPE liner. See **Exhibit B: Magnum Cavern Well 7 Well Pad** and **Exhibit C: Magnum Cavern Well 7 Well Pad Cross Sections** for details of the Reserve Pit.

6. *The anticipated type and amount of testing, logging, and coring:*

See the "16-Inch Drilling/Well Construction Plan."

7. *The expected bottom hole pressure and any anticipated abnormal pressures or temperatures or potential hazards, such as hydrogen sulfide, expected to be encountered, along with contingency plans for mitigating such identified hazards:*

See the "Operating Plan and Procedures" for the operating pressures. No abnormal pressures, temperatures, or potential hazards were encountered in the drilling of exploratory well MH-1, water well MH-5 or cavern wells CW-5 and CW-6, nor are they anticipated on future wells.

8. *Any other facets of the proposed operation which the lessee or operator desires to point out for the division's consideration of the application:*

None.

1.2 Welding Protocol

1. Lift ring welding and inspection to be performed in accordance with AWS (American Welding Society) D1.1 Structural Welding Code. Perform nondestructive testing (NDT) on the welds using ultrasonic shear wave equipment as specified in AWS D1.1 and interpreted by a NDT Level II or III Certified Technician who is qualified under ASNT CP-189, Standard for Qualification and Certification for Nondestructive Testing Personnel, 2006 Edition and CP-105, ASNT Standard Topical Outlines for Qualification of Nondestructive Testing Personnel, 2006 Edition..
2. Casing double joint welding shall be performed in accordance with API Standard 1104 Welding of Pipelines and Related Facilities. Pipe base material's carbon equivalency will be computed from the material composition as written in the Material Test Report (MTR) that is provided when the pipe is purchased. The welding contractor will provide a Welding Procedure Specification (WPS) that matches the base material and Procedure Qualification Report (PQR) and welders who are qualified to the WPS with Welders Qualification Report (WQR). The welding contractor will provide the WQR for each potential welder prior to beginning production welding. The field supervisor will verify that the WQR and welder's photo identification match. Perform nondestructive testing (NDT) on the butt welds using radiography as specified in API Standard 1104 and interpreted by a NDT Level II or III Certified Technician who is qualified under ASNT CP-189, Standard for Qualification and

Certification for Nondestructive Testing Personnel, 2006 Edition and CP-105, ASNT Standard Topical Outlines for Qualification of Nondestructive Testing Personnel, 2006 Edition. Each completed girth, butt weld shall be radiograph tested to API Standard 1104 qualifications. The radiograph methods and qualifications shall comply with API Standard 1104 –“Certification of Nondestructive Testing Personnel” and “Acceptance Methods for Nondestructive Testing Personnel”.

3. Casing rig welding shall be performed in accordance with API Standard 1104 Welding of Pipelines and Related Facilities. Pipe base material’s carbon equivalency will be computed from the material composition as written in the Material Test Report (MTR) that is provided when the pipe is purchased. The welding contractor will provide a Welding Procedure Specification (WPS) that matches the base material and Procedure Qualification Report (PQR) and welders who are qualified to the WPS with Welders Qualification Report (WQR). The welding contractor will provide the WQR for each potential welder prior to beginning production welding. The field supervisor will verify that the WQR and welder’s photo identification match. Perform nondestructive testing (NDT) on the butt welds using radiography as specified in API Standard 1104 and interpreted by a NDT Level II or III Certified Technician who is qualified under ASNT CP-189, Standard for Qualification and Certification for Nondestructive Testing Personnel, 2006 Edition and CP-105, ASNT Standard Topical Outlines for Qualification of Nondestructive Testing Personnel, 2006 Edition. Each completed girth, butt weld shall be nondestructively tested to API Standard 1104 qualifications. The test methods and qualifications shall comply with API Standard 1104 “Certification of Nondestructive Testing Personnel” and “Acceptance Methods for Nondestructive Testing Personnel”.

1.3 16-Inch Drilling/Well Construction Plan

The following is the general program to be used to drill Magnum Natural Gas Liquid Storage Well CW-7. Depths shown are approximate, from Ground Level. Casing lengths, grades and wall thicknesses may change as determined by availability and drilling conditions.

1. Rig up drilling rig.
2. Drill 40” hole for or drive 36” 0.75” wall thickness, 282.35lb/ft, Grade X-52 conductor pipe to approximately 150 feet.
3. Drill a 17-1/2" hole to ± 770 feet and log.
4. Open 17-1/2" hole up to 34" with hole openers as appropriate.
5. Run and cement 750 feet of 30" O.D., 0.75” wall thickness, API 5L Grade X-52 pipe. Centralizers to be placed every other casing section.
6. Allow the cement to set a minimum of 18 hours. Pressure test the casing in accordance with State rules.
7. After the cement sets, cut off the 30" casing and attach appropriate mud piping.
8. Drill a 17-1/2" hole to about 2,920 feet, slightly above top of salt structure estimated to be $\pm 3,000$ feet. Lost circulation may occur over this interval; control as necessary by the use of lost circulation material, cement plugs or drill without returns.
9. Run gamma ray, neutron, density, SP induction and resistivity logs as specified.
10. Open the 17-1/2" hole to 28" with hole openers of increasing size.
11. Run X-Y caliper log.

12. Run and cement \pm 1,550 feet of 24" O.D., 0.75" wall thickness, and 1,350 feet of 24" O.D. 1.0" wall thickness API 5L X-56 or equivalent DDS pipe to top of salt structure. *Casing string weight is approximately 650,000 pounds in air.* Use the stab-in cementing method. Centralizers to be placed every other casing section.
13. After the cement sets for 48 hours, pressure test the casing in accordance with State rules.
14. Cut off the 24" casing and connect appropriate mud flow equipment.
15. Drill out cement and shoe with 22" bit.
16. Switch to salt saturated mud after drilling out cement.
17. Drill a 12-1/4" hole to \pm 3,450 feet.
18. Run gamma ray, SP induction, neutron and bulk density logs as specified.
19. Open the 12-1/4" hole to 24" to about 3,320 feet with hole openers and underreamers of increasing size.
20. Run X-Y caliper log.
21. Run and cement 1,500 feet of 20", 0.625" wall thickness and 1,800 feet of 20", 1.0" wall thickness, X-56, DDS pipe. *Casing string weight is approximately 575,000 pounds in air.* Use the stab-in cementing method. Centralizers to be placed on each of the first 10 joints and then every other casing section.
22. Allow the cement to set a minimum of 72 hours.
23. Cut off the 20" casing and weld on a 21-1/4" flange. Nipple up an annular BOP or blind flange for testing. Pressure test the casing in accordance with State rules.
24. Drill out cement, shoe and about 5 feet of formation. Pressure test casing seat in accordance with state regulations.
25. Open the 12-1/4" hole up to 22" to about 3,420 feet using hole openers and underreamers.
26. Run X-Y caliper log.
27. Run and cement 2,400 feet of 16" 0.575" wall thickness and 1,000 feet of 16" 0.656" wall thickness, N-80 BT&C API pipe. Use the stab-in cementing method. Centralizers to be placed every casing joint.
28. Allow the cement to set a minimum of 96 hours. Pressure test the casing in accordance with State rules.
29. Install blowout preventer on 20" casing.
30. Drill out plug and ten feet of salt formation.
31. Pressure test casing shoe in accordance with the State rules and regulations.
32. Drill a 12-1/4" hole to \pm 4,820 feet.
33. Log cuttings and check for loss of drilling fluid indicating a porous formation is encountered. If so, perform a tightness test over this interval.
34. Run gamma ray, neutron and bulk density logs as specified.
35. If logs indicate a porous zone in the salt section, perform tightness test over the zone.
36. If no gas has been encountered, nipple down BOP.
37. Under ream the 12-1/4" hole to 17-1/2" down to a depth of about 4,100 feet.
38. Run X-Y caliper log.
39. Run casing inspection and cement bond logs in 16" casing from shoe to surface.
40. Run in approx. 4,000 feet of 13-3/8" 0.514" wall thickness, 72 lb/ft N-80, BT&C pipe.
41. Install and test the upper wellhead assembly.
42. Run in approx. 4,800 feet of 8-5/8" 0.4" wall thickness, 36 lb/ft, K-55, BT&C pipe.
43. Install remainder of wellhead.
44. Rig down and move out rig from location.

45. Clean up location.

1.4 Specifications for Cementing Services and Materials

This specification covers the requirements to supply cement, equipment and services for storage wells located near Delta, UT. The work will be conducted from a land rig. Cementing operations will be visually verified at the time of cementing via the observance of cement rising within the outer well annulus to the surface.

Proposed wellbore configuration (Depths RKB)

36" Conductor Pipe: 0 - Approx. 150 feet (Driven or set in 40" hole)

30" Surface Casing: 0 - Approx. 750 feet (Approx. 34" Open Hole)

24" Intermediate Casing: 0 - 2,900 feet (Approx. 28" Open Hole)

20" Next to Last Casing: 0 - 3,300 feet (Approx. 24" Open Hole)

16" Last Cemented Casing: 0 - 3,400 feet (Approx. 22" Open Hole)

Top of Salt: Approx. 3,000 feet

1. Cement specifications for the 30" Surface casing. Cement job will be pumped through a stabbed-in 5-1/2" DP.
Cement to surface: Class A (Standard) + Defoamer (if deemed necessary)
Water Ratio 5.2 gals/sack
Slurry Weight 15.6 lbs/gal.
Slurry Volume 1.18 cu. ft./sack
Excess 50% Open Hole Volume (Caliper Available)
2. Cement specifications for the 24" Intermediate. Cement job will be pumped through a stabbed-in 5-1/2" DP.
Cement to surface: Class A (Standard) + Defoamer (if deemed necessary).
Water Ratio 5.2 gals/sk
Slurry Weight 15.6 lbs/gal.
Slurry Volume 1.18 cu. ft./sack
Excess 50% Open Hole Volume (Caliper Available)
3. Cement specifications for the 20" Next to Last Casing. Cement job will be pumped through a stabbed-in 5-1/2" DP.
Cement to surface: Class G (Premium) + 37.2% Salt + Defoamer (as necessary).
Water Ratio 5.0 gals/sk
Slurry Weight 16.3 lbs/gal.
Slurry Volume 1.24 cu. ft./sack
Excess 30% Open Hole Volume (Caliper Available)
4. Cement specifications for the 16" Last Casing. Cement job will be pumped through a stabbed-in 5-1/2" DP.
Cement to surface: Class G (Premium) + 37.2% Salt + Defoamer (as necessary).
Water Ratio 5.0 gals/sk
Slurry Weight 16.3 lbs/gal.
Slurry Volume 1.24 cu. ft./sack

Excess 30% Open Hole Volume (Caliper Available)

1.5 Well Conditioning

Before commencing drilling operations (spudding the well), Magnum will provide detailed procedures for conditioning the hole prior to cementing casing. The pre-flush procedure will ensure that the wellbore is properly conditioned for cementing operations in accordance with recommendations from the cementing contractor.

The well is conditioned to circulate the drilling fluids, sweep cuttings out of the hole, obtain consistent fluid properties, and adjust the fluid viscosity and density in an attempt to prevent cement channeling through the fluid. Detailed procedures for this process have not been written at this time as it is a typical task during drilling, but when the drilling fluids contractor is hired his mud engineer will be tasked to write a program for the fluids.

1.6 Reporting

The casing cement jobs shall be documented by an affidavit from the cementing company showing the amount and type of cementing materials and the method of placement.

Three samples of the cement slurry for each of the intermediate and salt casings shall be collected in suitable sized and shaped containers so that the hardened cement can be tested for compressive strength.

Table 1-1: 16-Inch Injection Well Proposed Casing and Cementing Program

Hole Size Casing Size	Driven 36-inch	34-inch 30-inch	28-inch 24-inch	24-inch 20-inch	22-inch 16-inch
Mud Weight Type	N/A	9.5 ppg Fresh Water	10.2 ppg Fresh Water	10.2 ppg Saturated Brine	10.4 ppg Saturated Brine
Slurry Weight	N/A	15.6 ppg Fresh Water	15.6 ppg Fresh Water	16.3 ppg Saturated Brine	16.3 ppg Saturated Brine
Cement Type	N/A	Class A Standard	Class A Standard	Class G Premium	Class G Premium
Cement Yield	N/A	887 sks	2,789 sks	2,554 sks	3,409 sks
Cement Volume	N/A	1.18cu ft/sk	1.18 cu ft/sk	1.24 cu ft/sk	1.24 cu ft/sk

Section 2

Conceptual 16-Inch Injection Well Casing Program

2.1 General Well Design

The Magnum 16-inch natural gas liquids (NGLs) storage cavern wells will be drilled from the surface to more than a thousand feet into the salt. The wells will have a surface casing, water protection string cemented below the fresh water aquifers, and two casing strings (intermediate and production casings) cemented into the upper section of the salt. The casing strings will be run in a wellbore about four inches larger diameter than the casing and cemented into place. This report does not present the drilling and cementing programs for the wells.

The wells in general are sized so as to allow injection and production of natural gas liquids (NGLs) into or out of the completed cavern at 1,500 gpm with a velocity of about 10 feet per second. The casing sizes also allow use of tubing strings for mining that will maintain fluid velocities at about 16 feet per second. This is slightly faster than usual in mining operations, but is in an acceptable range.

The various casing strings are sized to withstand foreseeable collapse, burst and tensile forces that might act upon the casing. The goal of the design was to specify casing sizes and grades that allow a safety factor of about 1.0 for collapse, 1.2 for burst and 1.6 for tensile forces based on published strength data.

In normal operations collapse forces generally are greatest during cementing of the casing string when the inside of the casing is filled with drilling mud and the annulus is filled with heavier cement slurry. In normal operations, the collapse forces resulting from the weight difference between cement and drilling mud are low. At 4,000 feet this can amount to about 1,000 psi. However, in keeping with generally accepted practices (such as ERCB Directive 10) the collapse pressures are calculated with the assumption that the annulus is filled with cement and the inside of the casing is air-filled.

In the case of the outer mining tubing string, the collapse pressures also result from the use of nitrogen as a blanket material. The nitrogen blanket pressure will be greatest at the start of mining when the nitrogen blanket is at its deepest location. At the worst case (for collapse calculations) the largest pressures occur during reverse mining when the cavern is shut-in. In this instance, water is in the outer tubing string, and the brine in the cavern is unsaturated and continues to dissolve salt. The continued dissolution increases space in the cavern so that the wellhead fluid pressures fall to a vacuum. If at the same time the borehole has closed around the hanging tubing, the nitrogen pressure will be locked in at its normal operating pressure. The full nitrogen pressure of about 2,000 psi will be acting against the 13-3/8-inch tubing with a vacuum on the inside. The tubing has been sized to withstand this event, however it is unlikely.

Burst forces again are generally greatest during cementing operations but are normally very low during normal operations. The worst case occurs if the casing has been run in the well, the float shoe/collar gets stuck shut, and a gas blowout occurs at the bottom of the hole. In this event the full hydrostatic pressure of the drilling mud in the casing would be acting against a low-pressure gas-filled annulus. The pressure of the annulus was conservatively assumed to be “0” psi.

In the case of the final cemented casing, significant burst forces occur during mining operations due to the use of nitrogen as the blanket material. After mining is completed, lesser pressures will act inside the final cemented casing as a result of normal liquid storage operations.

The conceptual casing program designed for the NGLs storage wells are summarized in Table 2-1 and shown in Figure 1. In the event that these casing and pipe sizes are not available, the next higher grade, or increased wall thickness should be chosen. Calculations for forces acting on the various strings are given in Appendix A. The safety factors for the various loading scenarios are summarized in Table 2.

Table 2-1: Summary of Casings for Magnum Gas Storage Well

Casing String	Size – inches	Weight – pounds/foot	Grade	Depth – feet
Conductor	36	282.35	X-52	0 – 150
Surface	30	234.29	X-52	0 – 750
Intermediate	24	186.23	X-52	0 – 1,550
Intermediate Final cemented depth 2,900 feet	24	245.64	X-56	1,550 – 2,900
Intermediate	20	129.33	X-56	0-1,500
First Salt Final cemented depth 3,300 feet	20	202.92	X-56	1,500 – 3,300
Production (2nd Salt)	16	97	N-80	0 – 2,400
Production (2nd Salt) Final cemented depth 3,450 feet	16	109	N-80	2,400 – 3,400
Outer Mining String	13-3/8	72	N-80	0 – 4,000
Inner Mining String	8-5/8	36	K-55	0 – 4,800

Table 2-2: Summary of Calculated Factors of Safety

Casing String	Safety Factor		
	Collapse – 1.05	Burst – 1.1	Tensile – 1.6
36-inch Conductor	N/A	N/A	N/A
30-inch Surface	2.68	8.82	20.36
24-inch Intermediate	1.13	3.46	4.94
24-inch Intermediate	1.33	2.46	6.52
20-inch First Salt String	1.14	4.62	3.81
20-inch First Salt String	1.46	2.80	5.98
16-inch Production (2nd Salt String)	1.12	3.88	6.01
16-inch Production (2nd Salt String)	1.07	3.12	6.82
13-3/8-inch Outer Mining String	1.33	1.67	5.88
8-5/8-inch Inner Mining String	1.38	1.79	3.99

2.2 Casing Design Calculations

2.2.1 Conductor Pipe

36-inch, wall thickness 0.75-inch, grade X-52, plain end, welded pipe from 0 feet to approximately 150 feet. Pipe is to be cemented in an open hole.

2.2.2 Surface Casing

30-Inch, 234.29 lb/ft, wall thickness 0.75-inch, grade X-52 pipe, with Frank's DDS connections from 0 feet to 750 feet.

2.2.2.1 *Collapse Calculations*

Assume that the bottom hole depth of the 30-inch surface casing is at ± 750 feet from surface, with a welded float shoe located at the bottom of the casing string. The worst-case scenario for collapse pressure would be a full column of cement in the casing/hole annulus, and a column of gas inside the 30-inch surface casing.

1. (750 feet) (0.052 psi/ft) (15.6 lb/gal cement) = 608 psi hydrostatic pressure exerted on the exterior of the 30-inch casing, at 750 feet.
2. 0 psi hydrostatic pressure is exerted on the interior of the 30-inch casing, at 750 feet.
3. Differential pressure, (collapse pressure) annulus pressure versus pressure inside the 30-inch casing equals: $608 \text{ psi} - 0 \text{ psi} = 608 \text{ psi}$.

The 30-inch surface casing has a collapse rating of 898 psi. According to the above differential calculations, the proposed 30-inch surface casing to be used has a collapse rating of 1,631 psi, greater than any outside pressure that will be exerted against the exterior of the casing.

2.2.2.2 *Burst Calculations*

Assume that the bottom hole depth of the 30-inch surface casing is at ± 750 feet from surface, with a welded float shoe located at the bottom of the casing string. The 30-inch surface casing will be loaded with 9.5 lb per gallon drilling mud. The worst case for burst is if the float shoe becomes stuck closed and a gas blowout occurs at the shoe. In this case there would be a column of gas outside of the casing and a full column of drilling mud inside the casing.

1. (750 feet) (0.052 psi/ft/lb/gal) (9.5 lb/gal drilling mud) = 371 psi hydrostatic pressure exerted on the interior of the 30-inch casing, at 750 feet.
2. Differential pressure, (burst pressure) inside pressure versus annulus pressure on the outside of the 30-inch casing equals: $371 \text{ psi} - 0 \text{ psi} = 371 \text{ psi}$.

According to API Bulletin 5L the 30-inch surface casing has a minimum test pressure of 2,100 psi. According to the above differential calculations, the proposed 30-inch surface casing to be used has a minimum test pressure greater than any inside pressure that will be exerted against the interior of the casing.

2.2.2.3 *Tensile Calculations*

The proposed 30-inch surface casing weighs 234.29 lb/ft and will be set at approximately 750 feet, for a total string weight of 176,717.5 lbs.

The 30-inch, welded surface casing proposed has a tensile rating of 3,584,000 lbs, which is greater than tensile weight exerted by the weight of the casing.

2.2.3 Intermediate String Casing

24-inch, 186.23 lb/ft, wall thickness 0.75-inch, grade X-56 pipe, DDS connections from 0 feet to 1,550 feet.

24-inch, 245.64 lb/ft, wall thickness 1.0-inch, grade X-56 pipe, DDS connections from 1,550 feet to 2,900 feet.

2.2.3.1 Collapse Calculations

Assume that the bottom hole depth of the 24-inch 245.64 lb/ft casing (pipe) at $\pm 2,900$ feet from surface, with a welded float shoe located at the bottom of the casing string. The worst-case scenario for collapse pressure would be a full column of cement in the casing/hole annulus, and an empty column inside the 24-inch surface casing.

1. (1550 feet) (0.052 psi/ft/lb/gal) (15.6 lb/gal cement) = 1,257 psi hydrostatic pressure exerted on the exterior of the 24-inch casing, at 1,550 feet.
- 1a. (2900 feet) (0.052 psi/ft/lb/gal) (15.6 lb/gal cement) = 1,959 psi hydrostatic pressure exerted on the exterior of the 24-inch casing, at 2,900 feet.
2. Differential pressure, (collapse pressure) annulus pressure verses pressure inside the 24-inch casing at 1,550 feet equals: $1,257 \text{ psi} - 0 \text{ psi} = 1,257 \text{ psi}$.
- 2a. Differential pressure, (collapse pressure) annulus pressure verses pressure inside the 24-inch casing at 2,900 feet equals: $1,959 \text{ psi} - 0 \text{ psi} = 1,959 \text{ psi}$.

According to Frank's 2008, the 24-inch outer string casing at 1,550 feet has a collapse rating of 1,415 psi and at 2,900 feet a collapse rating of 2,612 psi. According to the above differential calculations, the proposed 24-inch outer string casing to be used has a collapse rating greater than any outside pressure that will be exerted against the exterior of the casing.

2.2.3.2 Burst Calculations

Assume that the bottom hole depth of the 24-inch surface casing is at $\pm 2,900$ feet from surface, with a welded float shoe located at the bottom of the casing string. The 24-inch surface casing will be loaded with 10.2 lb per gallon drilling mud. The actual cement process will be down drill pipe, which will be stung into the float shoe at 2,900 feet so that the casing is not filled with cement. The worst case for burst is if the float shoe becomes stuck closed and a gas blowout occurs at the shoe. In this case there would be a column of gas outside the outside of the casing and a full column of drilling mud inside the casing.

1. (1,550 feet) (0.052 psi/ft/lb/gal) (10.2 lb/gal drilling mud) = 822 psi hydrostatic pressure exerted on the interior of the 24-inch casing, at 1,550 feet.
- 1a. (2,900 feet) (0.052 psi/ft/lb/gal) (10.2 lb/gal drilling mud) = 1,538 psi hydrostatic pressure exerted on the interior of the 24-inch casing, at 2,900 feet.
2. Differential pressure, (burst pressure) inside pressure verses annulus pressure on the outside of the 24-inch casing at 1,550 feet equals: $822 \text{ psi} - 0 \text{ psi} = 822 \text{ psi}$.
- 2a. Differential pressure, (burst pressure) inside pressure verses annulus pressure on the outside of the 24-inch casing at 2,900 feet equals: $1,538 \text{ psi} - 0 \text{ psi} = 1,538 \text{ psi}$.

According to Frank's, the 24-inch outer string casing has a minimum burst pressure of 2,843 psi above 1,550 feet and 3,791 psi for the deeper segment of the string. According to the above differential calculations, the proposed 24-inch surface casing to be used has a minimum test pressure greater than any inside pressure that will be exerted against the interior of the casing.

2.2.3.3 Tensile Calculations

The proposed 24-inch outer string casing weighs 186.23 lb/ft or 245.64 lb/ft and will be set at approximately 2,900 feet, for a total string weight of 621,270.5 lbs.

The proposed 24-inch, welded intermediate casing has a tensile rating of 3,068,000 lbs, which is greater than tensile weight exerted by the casing.

2.2.4 First Salt String Casing

20-Inch, 129.33 lb/ft, wall thickness 0.625-inch, grade X-56 pipe, DDS connection, Casing from 0 to 1,500 feet.

20-Inch, 202.92 lb/ft, wall thickness 1.0-inch, grade X-56 pipe, DDS connection from 1,500 to 3,300 feet.

2.2.4.1 Collapse Calculations

Assume that the bottom hole depth of the 20-inch first salt string of casing is at $\pm 3,300$ feet from surface, with a float shoe located at the bottom of the casing string. The casing string will be made up of two weights of casing.

Above 1,500 feet the casing will be 129.33 lb/ft X-56 pipe. From 1,500 feet to 3,300 feet the casing will be 202.92 lb/ft X-56 pipe. This string will have proprietary connections on the entire string. The worst-case scenario for collapse pressure would be a full column of cement in the casing/hole annulus, and an empty inside the 20-inch surface casing.

1. (1,500 feet) (0.052 psi/ft/lb/gal) (16.3 lb/gal cement) = 1,271 psi hydrostatic pressure exerted on the exterior of the 20-inch casing, at 1500 feet.
 - 1a. (3,300 feet) (0.052 psi/ft/lb/gal) (16.3 lb/gal cement) = 2,797 psi hydrostatic pressure exerted on the exterior of the 20-inch casing, at 3300 feet.
2. At 1,500 feet, the differential pressure equals: $1,271 \text{ psi} - 0 \text{ psi} = 1,271 \text{ psi}$. According to API, the 20-inch 129.33-lb/ft casing has a collapse rating of 1,445 psi. According to the above differential calculations, the proposed 20-inch first salt string casing to be used has a collapse rating greater than any outside pressure that will be exerted against the exterior of the casing.
 - 2a. At 3,300 feet, the differential pressure equals: $2,797 \text{ psi} - 0 \text{ psi} = 2,797 \text{ psi}$. The 20-inch 202.92 lb/ft pipe has a collapse rating of 4,089 psi according to Frank's. According to the above differential calculations, the proposed 20-inch first salt string casing to be used has a collapse rating greater than any outside pressure that will be exerted against the exterior of the casing.

2.2.4.2 Burst Calculations

Assume that the bottom hole depth of the 20-inch surface casing is at $\pm 3,300$ feet from surface, with a welded float shoe located at the bottom of the casing string. The 20-inch surface casing will be loaded with 10.2 lb per gallon drilling mud. The actual cement process

will be down drill pipe, which will be stung into the float shoe at 3,300 feet so the casing will not be filled with cement. The worst case for burst considerations would be if there was a gas blowout in the salt after the casing was set but before it was cemented. This could potentially leave a column of gas along the outside of the casing and a full column of drilling mud inside the casing.

1. (1,500 feet) (0.052 psi/ft/lb/gal) (10.2 lb/gal drilling mud) = 796 psi hydrostatic pressure exerted on the interior of the 20-inch casing, at 1,500 feet.
- 1a. (3,300 feet) (0.052 psi/ft/lb/gal) (10.2 lb/gal drilling mud) = 1,750 psi hydrostatic pressure exerted on the interior of the 20-inch casing, at 3,300 feet.
2. Differential pressure (burst pressure), inside pressure verses annulus pressure on the outside of the 20-inch casing equals: $796 \text{ psi} - 0 \text{ psi} = 796 \text{ psi}$.
2. Differential pressure (burst pressure), inside pressure verses annulus pressure on the outside of the 20-inch casing equals: $1750 \text{ psi} - 0 \text{ psi} = 1,750 \text{ psi}$.

The 20-inch pipe has a minimum burst pressure of 3,675 psi above 1,500 feet and 4,900 psi for the deeper segment of the string. According to the above differential Calculations, the proposed 20-inch surface casing to be used has a minimum test pressure greater than any inside pressure that will be exerted against the interior of the casing.

2.2.4.3 **Tensile Calculations**

The 20-inch surface casing proposed weighs 129.33 lb/ft set at 1,500 feet and 202.92 lb/ft set at approximately 3,300 feet, for a total string weight of 559,251 lbs.

API 5C3 provides a tensile strength for the X-56 DDS connection pipe at the top of the string of 2,130,000 pounds, which exceeds the above-calculated weight of the 20-inch casing.

2.2.5 **Production String Casing**

16-Inch, 97 lb/ft, grade N-80 pipe, wall thickness 0.575-inch, buttress connection, casing from 0 to 2,400 feet.

16-Inch, 109 lb/ft, grade N-80 pipe, wall thickness 0.656-inch, buttress connection, casing from 2,400 to 3,400 feet.

2.2.5.1 **Collapse Calculations**

Assume that the bottom hole depth of the 16-inch production string of casing is at $\pm 3,400$ feet from surface, with a welded float shoe located at the bottom of the casing string. This string will have buttress connections. The worst-case scenario for collapse pressure would be a full column of cement in the casing/hole annulus, and gas (from a blowout) inside the 16-inch surface casing.

1. (2,400 feet) (0.052 psi/ft/lb/gal) (16.3 lb/gal cement) = 2,034 psi hydrostatic pressure exerted on the exterior of the 16-inch casing, at 2,400 feet.
- 1a. (3,400 feet) (0.052 psi/ft/lb/gal) (16.3 lb/gal cement) = 2,882 psi hydrostatic pressure exerted on the exterior of the 16-inch casing, at 3,400 feet.
2. Differential pressure, collapse pressure), annulus pressure verses pressure inside the 16-inch casing equals: $2,034 \text{ psi} - 0 \text{ psi} = 2,034 \text{ psi}$.

- 2a. Differential pressure, collapse pressure), annulus pressure verses pressure inside the 16-inch casing equals: $2,882 \text{ psi} - 0 \text{ psi} = 2,882 \text{ psi}$.

According to API, the 16-inch N-80 97 lb/ft casing has a collapse rating of 2,270 psi and the 16-inch N-80, 109-lb/ft casing has a collapse rating of 3,080 psi. According to the above differential calculations, the proposed 16-inch casing to be used has a collapse rating greater than any outside pressure that will be exerted against the exterior of the casing.

2.2.5.2 *Burst Calculations*

Assume that the bottom hole depth of the 16-inch surface casing is at $\pm 3,400$ feet from surface, with a welded float shoe located at the bottom of the casing string. The 16-inch surface casing will be loaded with 10.2 lb per gallon drilling mud. The actual cement process will be down drill pipe, which will be stung into the float shoe at 3,400 feet so the inside of the casing will not be filled with cement. The worst case for burst considerations would be if there was a gas blowout in the salt after the casing was set but before it was cemented. This could potentially leave a column of gas along the outside of the casing.

1. (2,400 feet) (0.052 psi/ft/lb/gal) (10.4 lb/gal drilling mud) = 1,298 psi hydrostatic pressure exerted on the interior of the 16-inch casing, at 2,400 feet.
- 1a. (3,400 feet) (0.052 psi/ft/lb/gal) (10.4 lb/gal drilling mud) = 1,839 psi hydrostatic pressure exerted on the interior of the 16-inch casing, at 3400 feet.
2. Differential pressure (burst pressure), inside pressure verses annulus pressure on the outside of the 16-inch casing equals: $1298 \text{ psi} - 0 \text{ psi} = 1,298 \text{ psi}$. The 16-inch casing above 2,400 feet has a minimum test pressure of 5,030 psi. According to the above differential Calculations, the proposed 16-inch surface casing to be used has a minimum test pressure greater than any inside pressure that will be exerted against the interior of the casing.
- 2a. Differential pressure (burst pressure), inside pressure verses annulus pressure on the outside of the 16-inch casing equals: $1,839 \text{ psi} - 0 \text{ psi} = 1,839 \text{ psi}$. According to API, the 16-inch casing has a minimum test pressure of 5,740 psi. According to the above differential Calculations, the proposed 16-inch surface casing to be used has a minimum test pressure greater than any inside pressure that will be exerted against the interior of the casing.
3. During mining operations, the 16" casing annulus will be filled with nitrogen used as a blanket during mining operations. At the surface, the maximum gas pressure will be about $1872 \text{ psi} / (e^{(0.00003347 * 0.58 * \text{depth})}) = 1,770 \text{ psi}$. The wellhead gas pressure is below the rated burst pressure of 5,030 psi of the 16" casing at the surface.

2.2.5.3 *Tensile Calculations*

The 16-inch surface casing proposed weighs 97 lb/ft set at 2,400 feet and 109 lb/ft set at approximately 3,400 feet, for a total string weight of 341,800 lbs.

The tensile strength for buttress end casing is about 2,229,000 pounds; which greatly exceeds the above-calculated weight of the 16-inch casing.

2.2.6 Outer String of Mining Tubing

13-3/8-inch, 72 lb/ft, wall thickness 0.514-inch, grade N-80 pipe, buttress connection, casing from 0 to 4,000 feet.

2.2.6.1 Collapse Calculations

Assume that the nitrogen roof blanket will be at a depth of $\pm 3,600$ feet from surface, the maximum differential pressure exerted against the 13-3/8-inch casing will be at the surface.

The worst-case scenario for collapse pressure would be a column of fluid in the casing (during the first steps of mining) that goes on a vacuum when the well is shut-in and the brine in the cavern continues to dissolve salt; and nitrogen is in the annulus.

1. $(3,600 \text{ feet}) (0.052 \text{ psi/ft/lb/gal}) (10.0 \text{ lb/gal brine}) = 1,872 \text{ psi}$ hydrostatic pressure exerted on the exterior of the 13-3/8-inch casing, at 3,600 feet. The nitrogen pressure on the outside of the string and the brine pressure in the cavern are balanced at this point.
 - 1a. Pressure outside the 13-3/8-inch at the surface is (nitrogen blanket pressure) / $(1.000316 \wedge \text{blanket level depth}) = 1,872 / (1.0000316 \wedge 3,600) = 1,770 \text{ psi}$
2. $(3,600 \text{ feet}) (0.052 \text{ psi/ft/lb/gal}) (10.0 \text{ lb/gal brine}) = 1,872 \text{ psi}$ hydrostatic pressure exerted on the interior of the 13-3/8-inch casing, at 3600 feet.
 - 2a. Differential pressure, collapse pressure), annulus pressure verses pressure inside the 13-3/8- casing at the surface equals: $1,770 \text{ psi} - (-100 \text{ psi}) (\text{vacuum}) = 1,870 \text{ psi}$. According to API Bulletin 5C2, the 13-3/8-inch string casing has a collapse rating of 2,670 psi. According to the above differential calculations, the proposed 13-3/8-inch casing to be used has a collapse rating greater than the pressure that will be exerted against the exterior of the casing.

2.2.6.2 Burst Calculations

Assume that the bottom hole depth of the 13-3/8-inch surface casing is at $\pm 4,000$ feet from surface, with an open end of the casing string. The 13-3/8-inch surface casing will be loaded with water during reverse mining steps. The worst case for burst considerations would be if the nitrogen blanket bled off and the bottom of the 13-3/8-inch tubing was salted into the 16-inch production casing during normal operations with a salt plug at or near the bottom of the 13-3/8" x 8-5/8" annulus. This could potentially leave a column of gas along the outside of the tubing and high-pressure fluid on the inside of the tubing string.

1. 0 psi hydrostatic pressure is exerted on the exterior of the 13-3/8-inch casing, at the 16-inch casing shoe.
2. Pump pressure (Value unknown but assumed) 780 psi exerted on the 13-3/8-inch casing.
3. Fluid pressure at 3,600 feet of $(3,600 \text{ feet}) (0.052 \text{ psi/ft/lb/gal}) (8.34 \text{ lb/gal water}) = 1,561 \text{ psi}$ exerted on the interior of the 13-3/8-inch casing at 3,600 feet.
4. Differential pressure (burst pressure), inside pressure verses annulus pressure on the outside of the 13-3/8-inch casing equals: $1,561 \text{ psi} + 780 \text{ psi}$ (assumed pump pressure) $- 0 \text{ psi} = 2,341 \text{ psi}$.

According to API Bulletin 5C2, the 13-3/8-inch casing has a minimum test pressure of 5,380 psi. According to the above differential calculations, the proposed 13-3/8-inch surface casing to be used has a minimum test pressure greater than any inside pressure that will be exerted against the interior of the casing.

2.2.6.3 Tensile Strength

At this time, the depth for the outer sting tubing is 72 lb/ft casing to 4,000 feet. Based on these depths, the maximum sting weight will be 288,000 lbs. This is well below the maximum tensile strength at the surface of 1,693,000 lbs.

2.2.7 Inner String of Mining Tubing

8-5/8-inch, 36 lb/ft, wall thickness 0.4-inch, grade K-55 pipe, buttress connection, casing from 0 to 4,800 feet

2.2.7.1 Burst and Collapse Calculations

The 8-5/8-inch inner wash string has the similar circumstance as the 13-3/8-inch outer string tubing, in that the tubing will basically have equal weight of fluids (brine water) on the outside as well as the inside, internal and external pressures will be equal. Therefore, since there will not be any differential pressures exerted externally or internally, burst and collapse calculations are not necessary. The 8-5/8-inch tubing will not have nitrogen acting against it.

2.2.7.2 Tensile Strength

At this time, the deepest depth for the inner tubing (8-5/8-inch 36 lb/ft) is estimated at approximately 4,800 feet. Based on this depth, the maximum sting weight will be 172,800 lbs. This is well below the maximum tensile 690,000 lbs.

2.3 Sources

American Petroleum Institute, Specification for Line Pipe, API Specification 5L.

American Petroleum Institute, Bulletin on Performance Properties of Casing, Tubing and Drill Pipe, API Specification 5C2.

American Petroleum Institute, Technical Report on Equations and Calculations for Casing, Tubing and Line Pipe Used as Casing or Tubing; and Performance Properties Tables for Casing and Tubing, API Technical Report 5C3.

Energy Resource Conservation Board, 2008. Minimum Casing Design Requirements, Directive 010.

Frank's Casing, 2008, DDS Double Drive Shoulder Connector.

Section 3

Mechanical Integrity Testing

Several testing methods will be employed to demonstrate mechanical integrity of the well/cavern system. These methods vary depending upon the stage of development of the well or cavern.

3.1 During Drilling

After cementing the 16-inch production casing, the casing will be tested before continuing drilling. A hydraulic pressure test of the 16-inch production casing will be conducted before drilling out the plug (shoe) and after waiting at least 72 hours to allow the cement to set. The test pressure shall be 125% of the anticipated working pressure during product storage, about 2,020 psi at the cement plug or about 405 psi at the surface. The test will last 30 minutes. The test will be considered good if the pressure loss is less than 5%.

After drilling out the cement plug and drilling about 10 feet of salt below the casing shoe, a hydraulic pressure test of casing seat and cement in 16-inch production casing will be run. The surface test pressure will be 80% of the lithostatic pressure as calculated at the casing seat minus the hydrostatic pressure of the test fluid, or about 870 psi. The test will last 60 minutes. The test will be considered good if the pressure loss is less than 5%.

3.2 Test of the 16-Inch Casing and the Cavern during Development

Prior to initiating solution mining and again at the completion of solution mining, the cavern will be tested using the nitrogen mechanical integrity technique. The test pressure at the shoe of the 16-inch cemented casing will be about 0.75 psi per foot of depth, or about 0.23 psi per foot greater than the normal operating pressure (0.52 psi per foot of depth) to ensure that the casing and cement are not leaking.

The nitrogen mechanical integrity test technique essentially involves pressuring the well, and cavern after mining, to the desired test pressure, and injecting nitrogen in the outer annulus of the well (the space between the cemented 16-inch casing and the hanging 13-3/8-inch tubing) to a depth about 50 to 100 feet below the casing shoe.

The well will then be shut-in for 24 to 48 hours to allow the nitrogen temperature to equalize with the in-situ temperature. The initial depth of the nitrogen/brine interface below the casing shoe and the temperature of the wellbore will then be measured with a wireline tool. After a period of time, not less than 24 hours, determined by the size of the borehole below the casing shoe, a second interface and temperature survey will be run. The pressure at the wellhead will be monitored and recorded continuously during testing.

The change in the calculated volume of the nitrogen between the two interface measurements will be determined from the surface nitrogen pressure, the well temperature logs and the change in the

level of the nitrogen/brine interface. The change in the nitrogen volume will then be converted to an equivalent fluid loss.

The temperature stabilization period, the duration of the test and the desired depth of the initial nitrogen/brine interface level will be determined from logs run during and after well construction. The selection of these features will be made so as to ensure that the test has a minimum detectable leak rate (test sensitivity) of no more than 500 barrels per year of nitrogen. An acceptable test will be a demonstration that the calculated leak rate is less than the minimum detectable leak rate.

All pressure monitoring instruments will be calibrated in accordance with manufacturer's recommendations. Testing will be performed under the supervision of a degreed engineer experienced in salt cavern testing. The report will be submitted to the Executive Secretary within 60 days of completion of the test.

3.3 Storage Operations

Following the post-completion mechanical integrity test, the caverns will be tested on a periodic basis using methods and procedures in accordance with requirements set forth by the State of Utah.

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Section 4

Operating Plan and Procedures

4.1 16-Inch Injection Well Operating Plan and Procedures

The injection well operating plan and procedures is outlined within the report “Conceptual Solution Mining Plans for Development of 16-Inch Injection Wells at Delta, Utah”. A Cavern Well Schematic is also shown in **Exhibit A: Magnum Cavern Well 5 Wellhead Casing Design**. The report generally defines the following operating criteria:

2. Average Daily Rate: 2,500 gpm
3. Maximum Daily Rate: 2,800 gpm
4. Volume of Fluid to be Injected during Solution Mining (1 MMbbl cavern): 12 MMbbls of brine (504 million gallons), (see DWQ UIC Modification, October 21, 2011, Permit UTU-27-AP-9232389)
5. Average Injection Pressure: 750 psi
6. Maximum Injection Pressure: 800 psi

Exhibit A: Magnum Cavern Well 7 Wellhead Casing Design and the “16-Inch Well Construction Plan” also includes information related to the mining methods and stages, tubing placements, testing, and information related to potential problems that could be associated with cavern creation.

Injected water will be obtained from local ground water sources within confined aquifers located generally at depths greater than 1,450 feet. Representative water quality data collected from exploratory well MH-1 within potential source zones was previously provided in the DWQ Underground Injection Control Permit application. Because the source of water is a new source, no quality range data is available for the source. However, little variation is expected due to the limiting nature of the confined aquifer.

Section 5

Plugging and Abandonment Plan

5.1 16-Inch Injection Well Plugging and Abandonment Plan

The following procedures are provided as a general guideline. Actual plugging measures will be submitted in advance to DWQ (prior to commencement of product storage) or DOGM (after commencement of storage operations) for approval.

1. Form DOGM-9 will be submitted (after commencement of product storage) for procedural approval.
2. All stored product will be removed and the cavern will be filled with saturated brine water.
3. All free hanging tubing will be pulled from the well.
4. The exact depth to the bottom of the cemented production casing will be determined.
5. A drillable plug capable of supporting a cement plug will be installed in the cemented casing with the bottom of the plug within 10 feet of the end of the casing.
6. The following plugs will be placed. All cement plugs will be Class G cement with no additives and the slurry weight will be 14.5 pounds per gallon or more.
 - a. Bottom plug: A 300-foot plug from the plug at the bottom of the production casing upward.
 - b. Surface casing plug: A 150-foot plug from 75 feet below the bottom of the surface casing upward.
 - c. Top plug: A 75-foot plug from 75 feet below surface grade upward to surface.
7. The casing between each of the plugs shall be filled with a non-corrosive mud slurry of at least 10 pounds per gallon weight.
8. An alternative technique that could be used involves filling the entire wellbore with cement.

Upon completion of the plugging operation, all reports will be filed in accordance with DWQ or DOGM rules as applicable.

Appendix A

Exhibits

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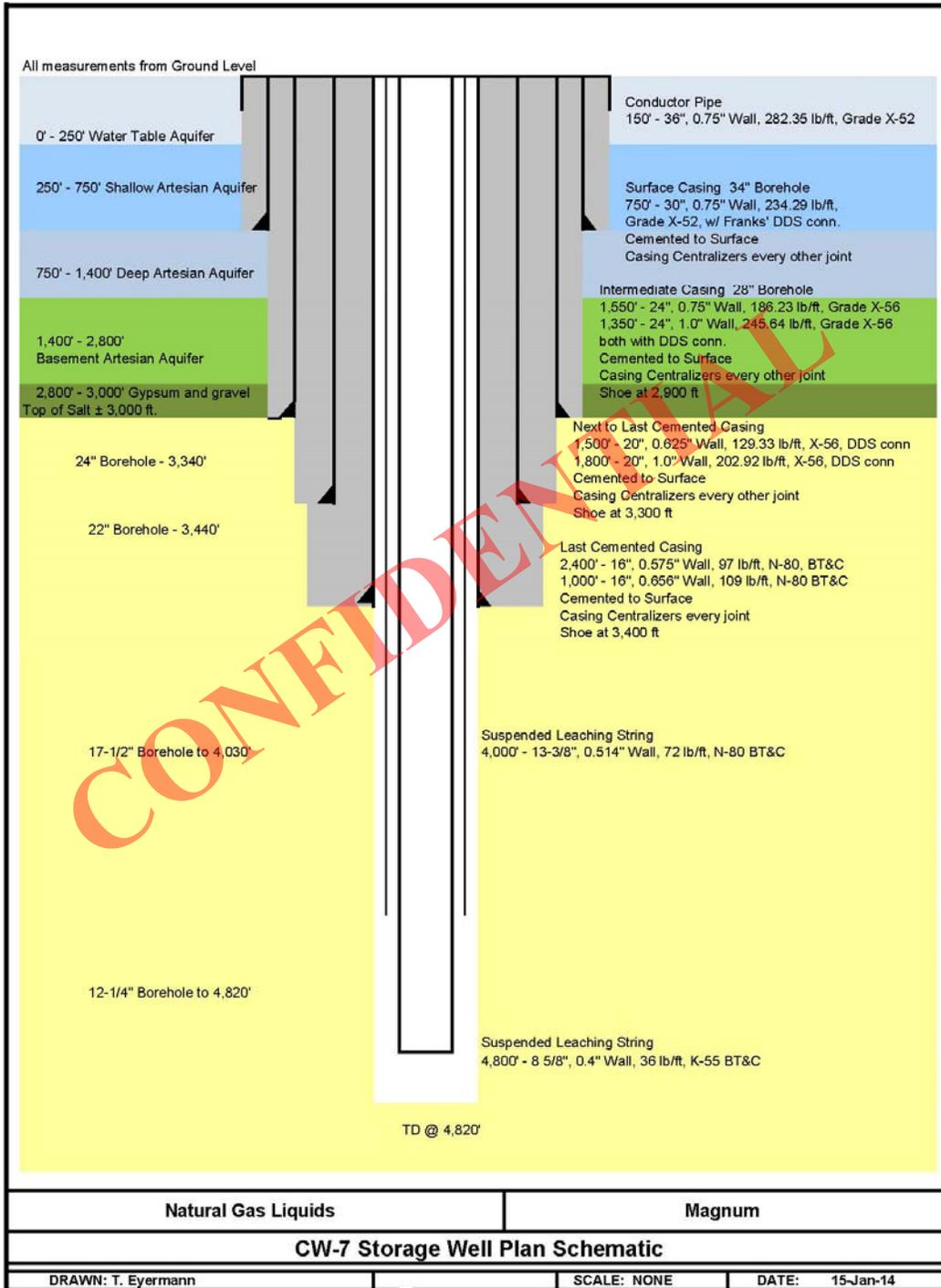


Exhibit A: Magnum Cavern Well 7 Wellhead Casing Design

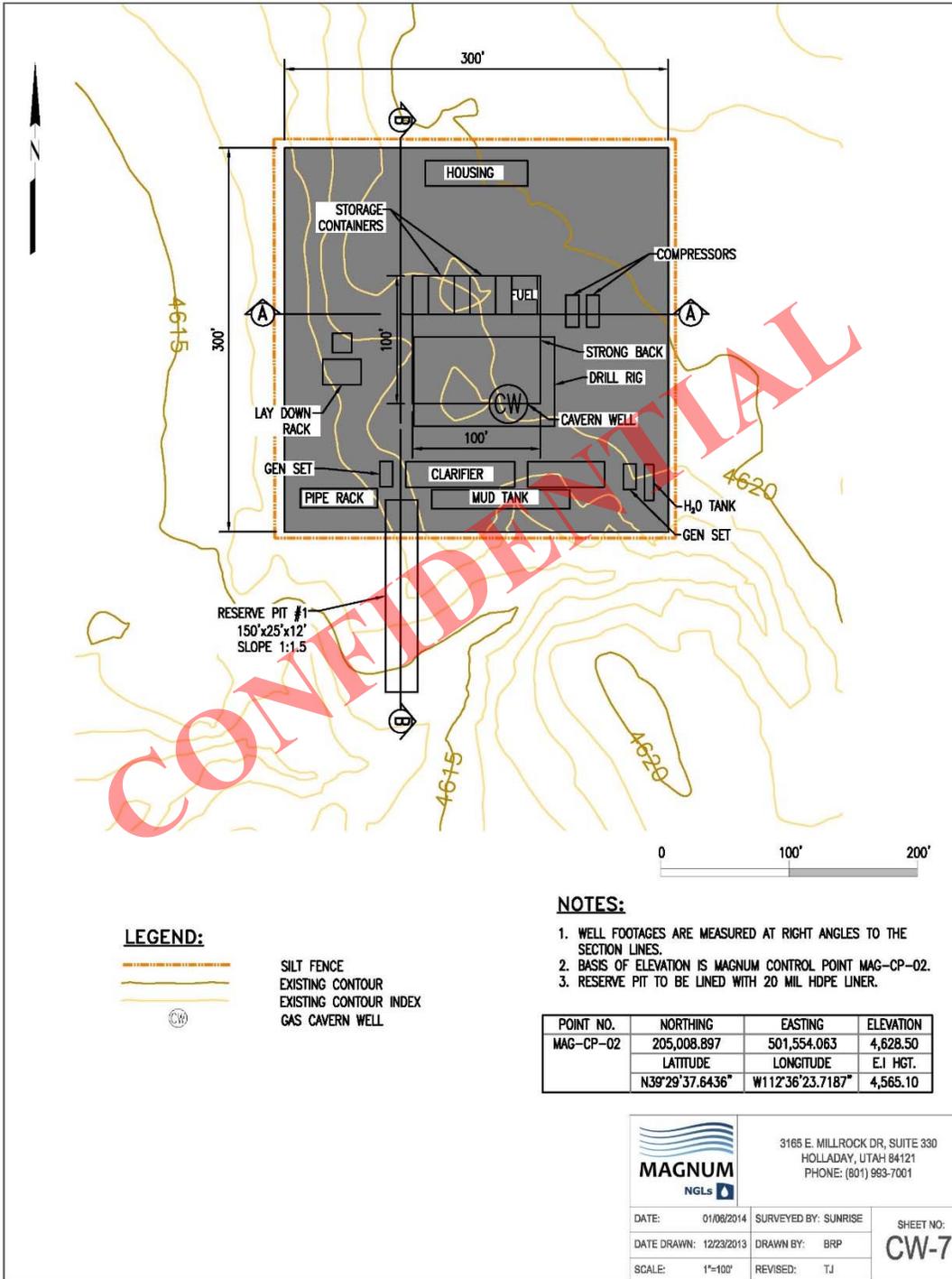


Exhibit B: Magnum Cavern Well 7 Well Pad

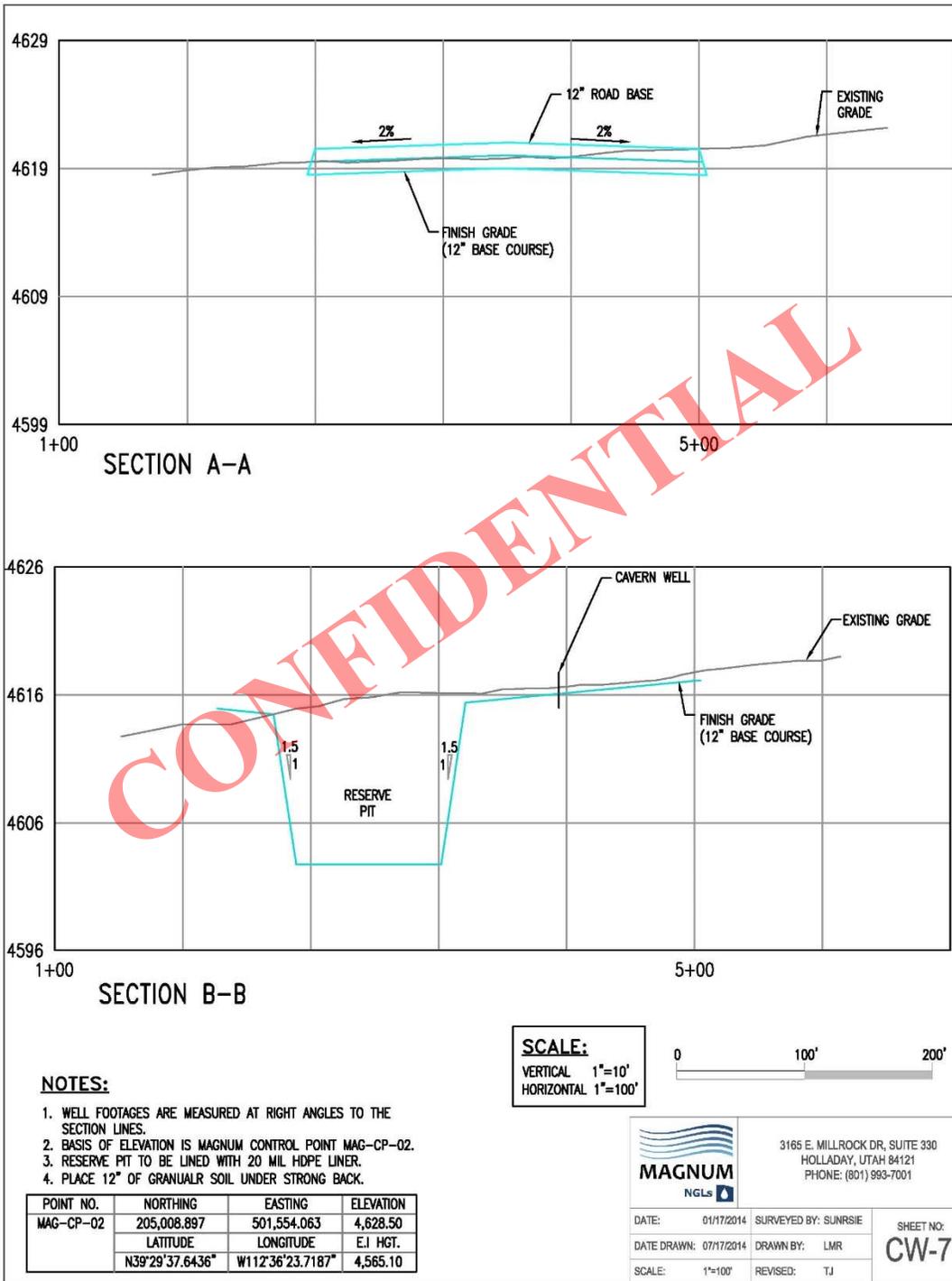


Exhibit C: Magnum Cavern Well 7 Well Pad Cross Sections

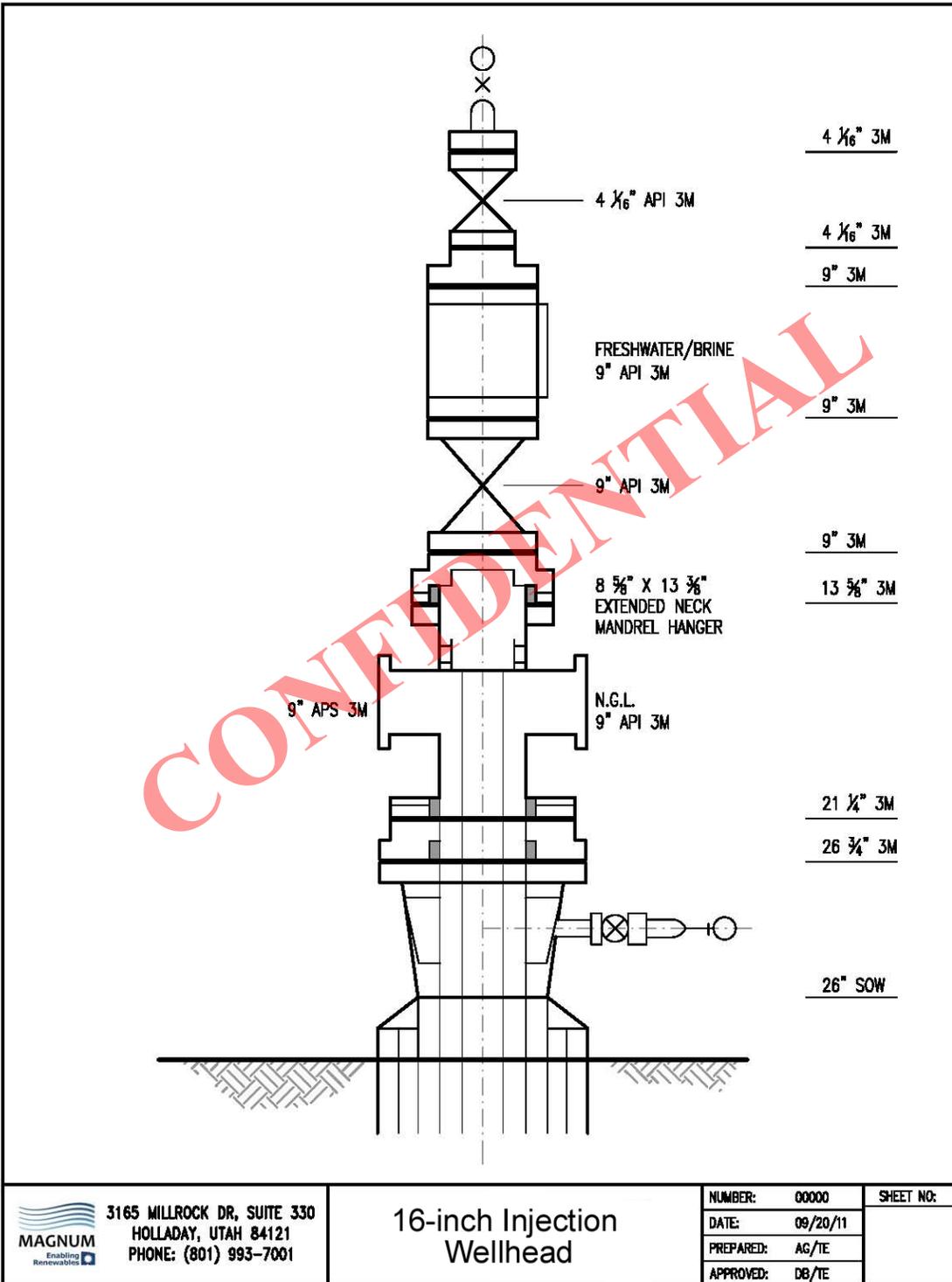


Exhibit D: Magnum Cavern Well 7 Injection Wellhead Design

Application for Permit to Drill Magnum Cavern Well 7

Certified Section Map and Plat Map

01/17/2014

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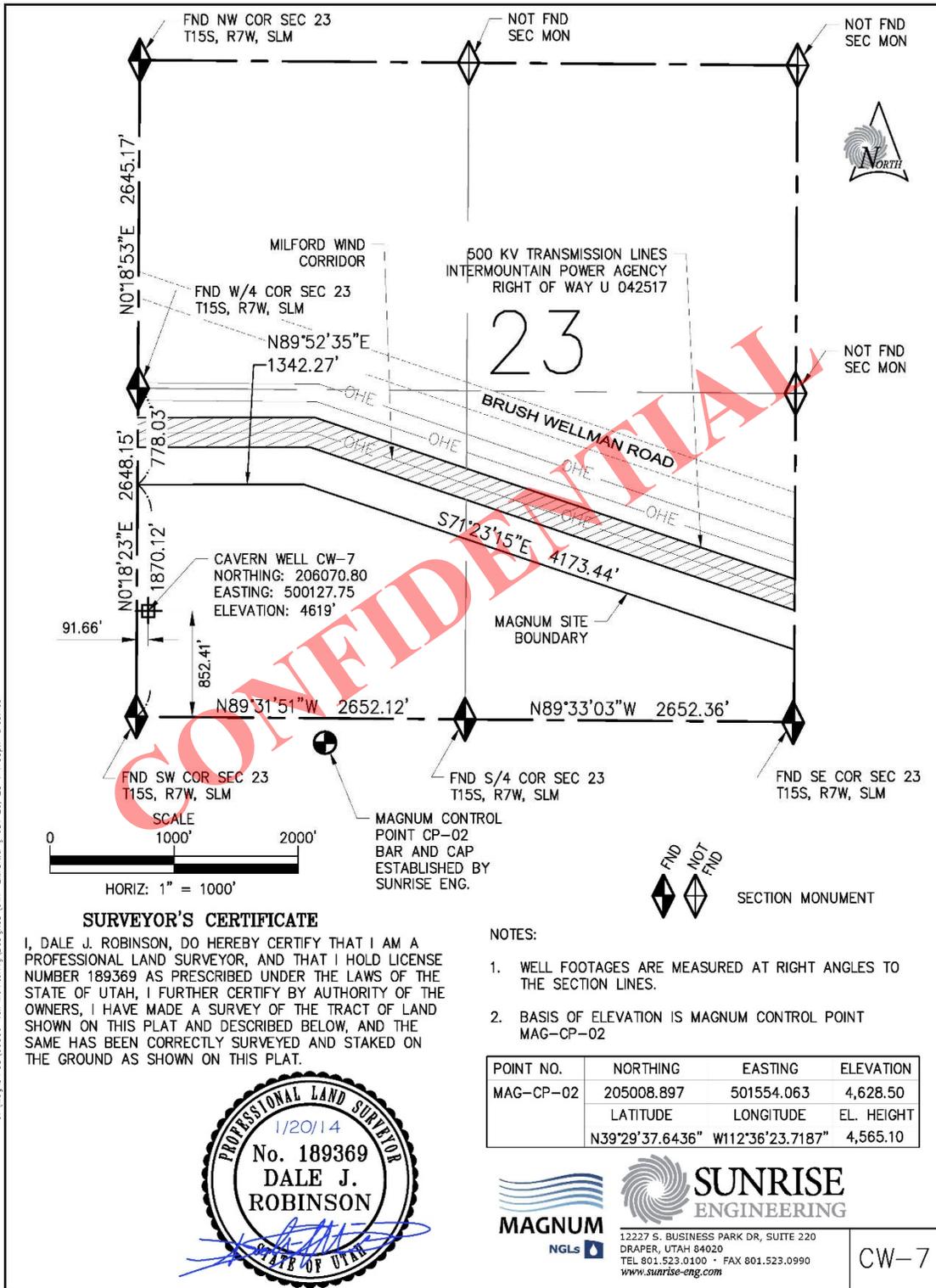
Magnum

3165 E. Millrock Dr., Suite 330

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SURVEYOR'S CERTIFICATE

I, DALE J. ROBINSON, DO HEREBY CERTIFY THAT I AM A PROFESSIONAL LAND SURVEYOR, AND THAT I HOLD LICENSE NUMBER 189369 AS PRESCRIBED UNDER THE LAWS OF THE STATE OF UTAH, I FURTHER CERTIFY BY AUTHORITY OF THE OWNERS, I HAVE MADE A SURVEY OF THE TRACT OF LAND SHOWN ON THIS PLAT AND DESCRIBED BELOW, AND THE SAME HAS BEEN CORRECTLY SURVEYED AND STAKED ON THE GROUND AS SHOWN ON THIS PLAT.



NOTES:

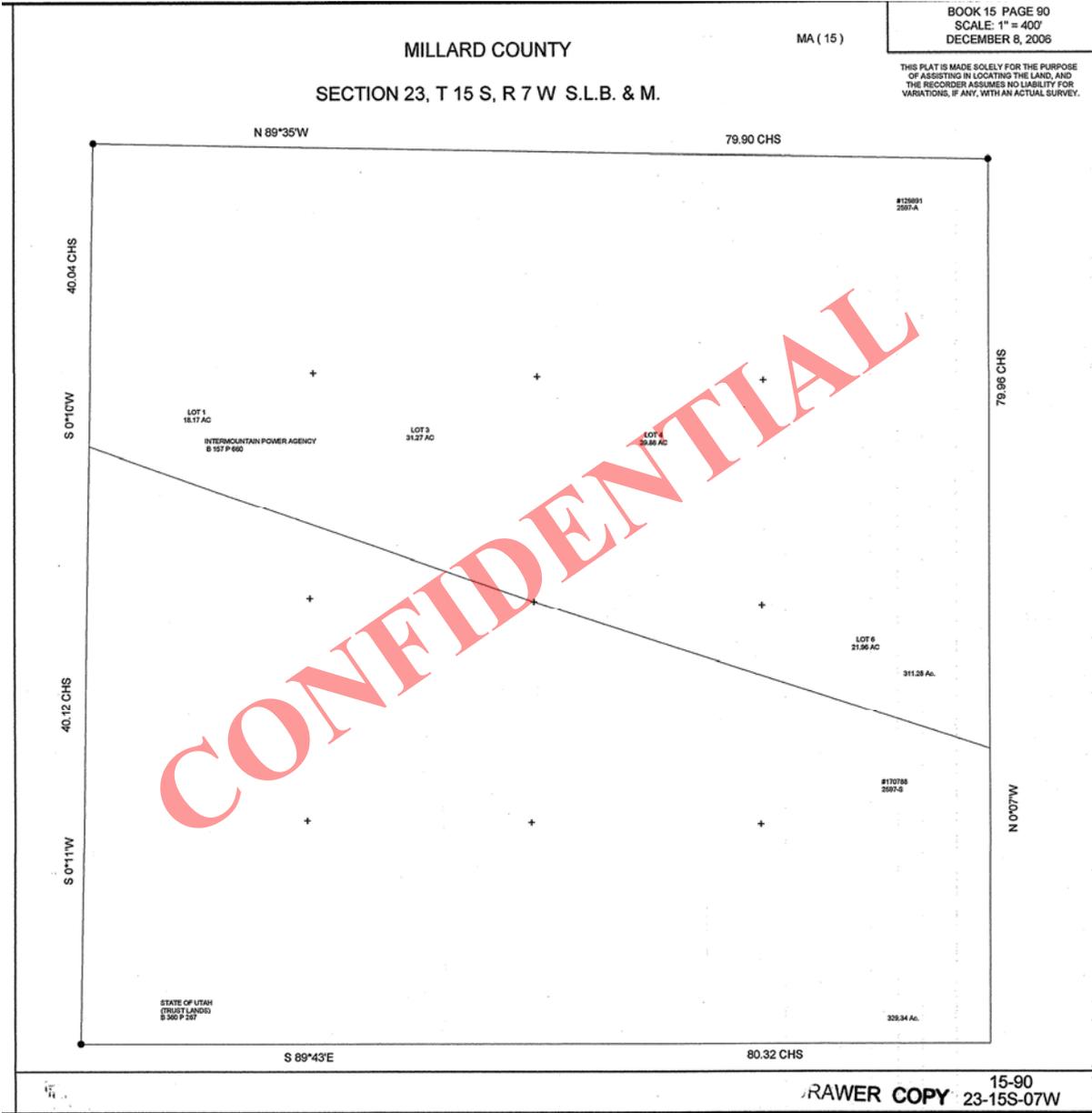
1. WELL FOOTAGES ARE MEASURED AT RIGHT ANGLES TO THE SECTION LINES.
2. BASIS OF ELEVATION IS MAGNUM CONTROL POINT MAG-CP-02

POINT NO.	NORTHING	EASTING	ELEVATION
MAG-CP-02	205008.897	501554.063	4,628.50
	LATITUDE	LONGITUDE	EL. HEIGHT
	N39°29'37.6436"	W112°36'23.7187"	4,565.10

MAGNUM NGLS **SUNRISE ENGINEERING**
 12227 S. BUSINESS PARK DR, SUITE 220
 DRAPER, UTAH 84020
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 www.sunrise-eng.com

CW-7

Magnum Cavern Well 7 Certified Section Map



Magnum Cavern Well 7 Plat Map

Application for Permit to Drill Magnum Cavern Well 7

Topographical Maps

01/17/2014

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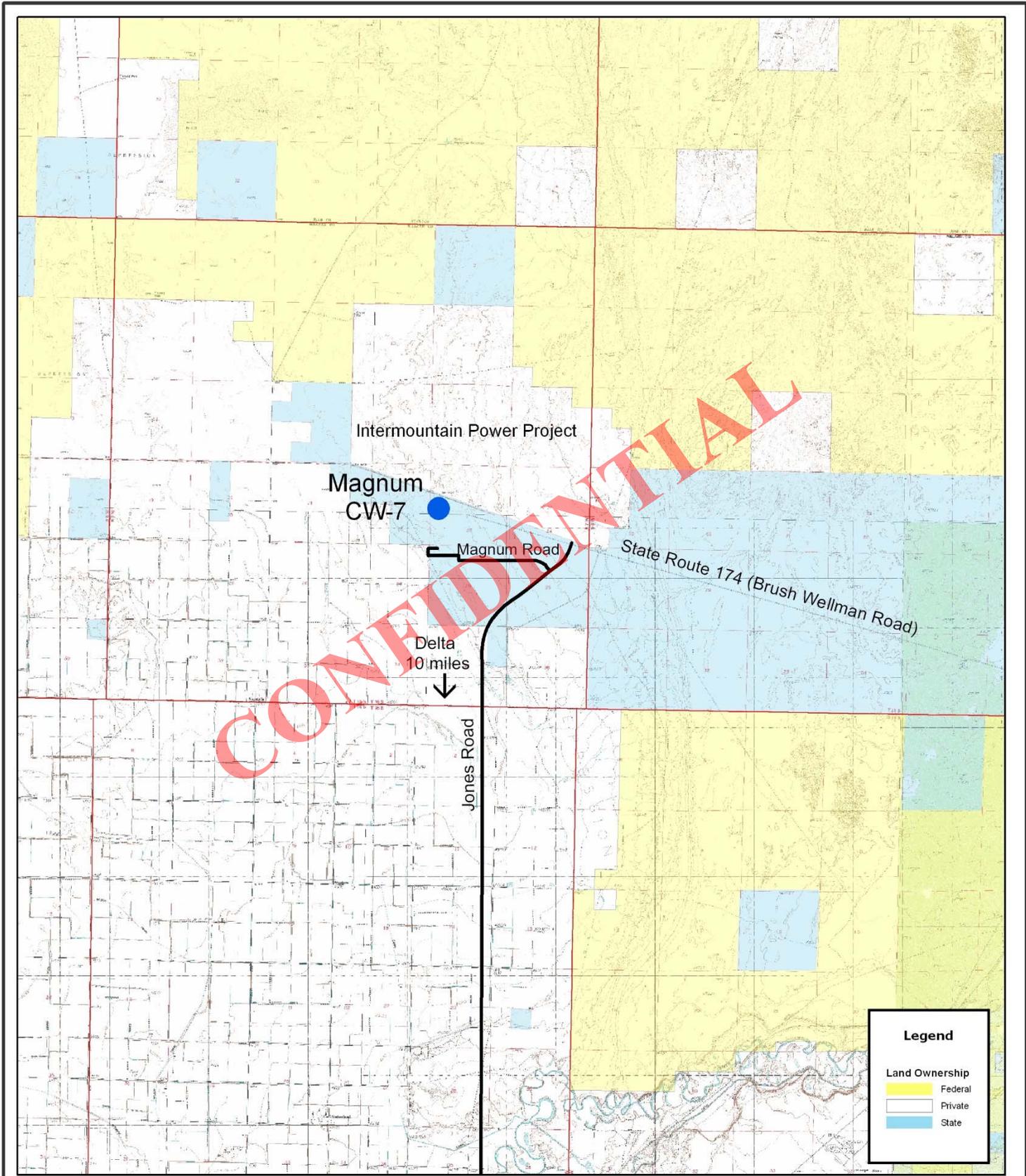
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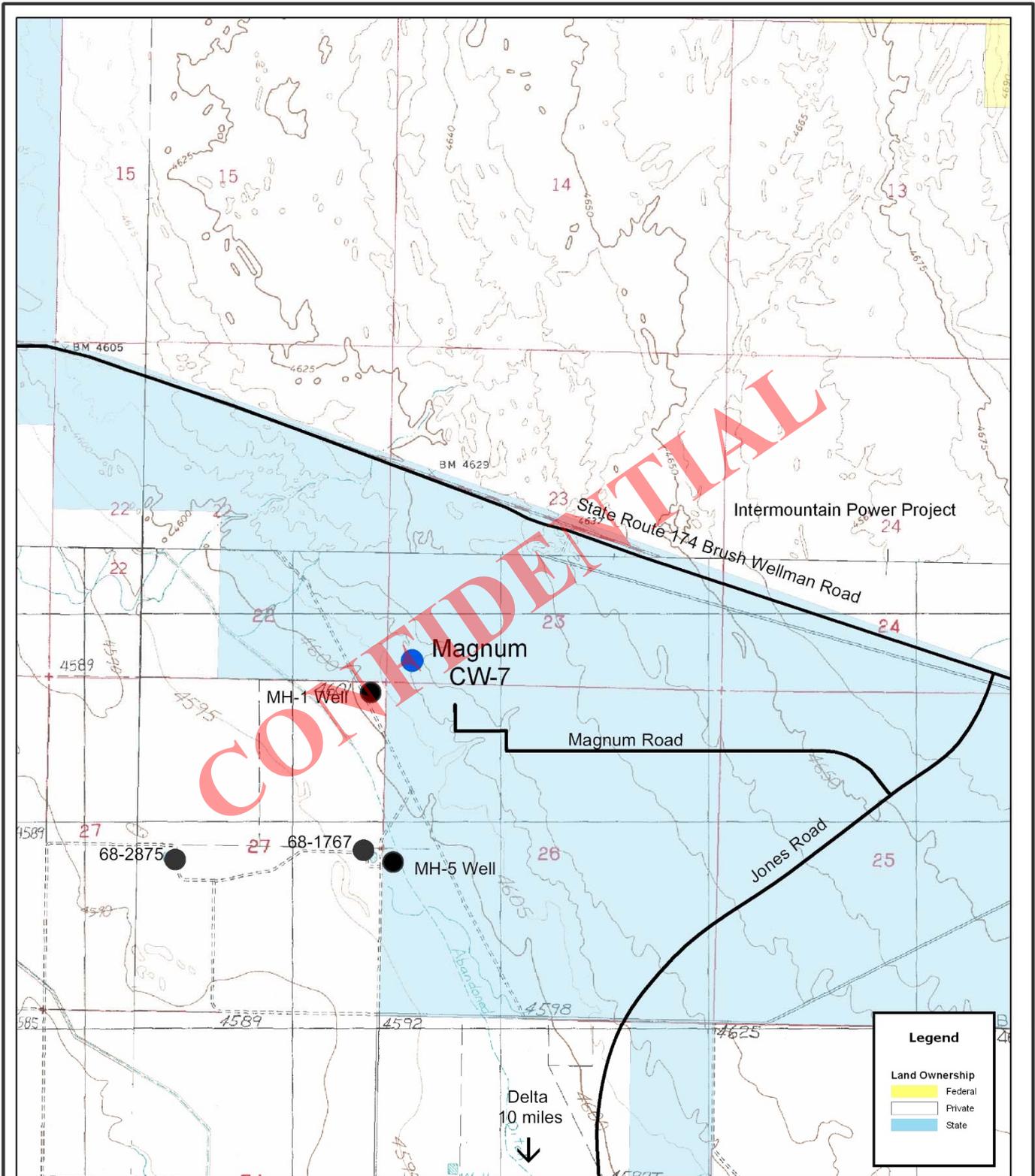


Regional Map Magnum Cavern Well 7

SW/SW Section 23, T15S, R7W

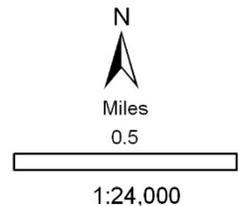


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Location Map Magnum Cavern Well 7

SW/SW Section 23, T15S, R7W



Application for Permit to Drill Storage Cavern Well 7

Affidavit of Surface Owner Agreement

01/17/2014

CONFIDENTIAL

Prepared by

Magnum

3165 E. Millrock Dr., Suite 330

Holladay, Utah 84121

Tel 801 993 7001 Fax 801 993 7025

www.westernenergyhub.com

SECOND AMENDMENT

To

ENERGY STORAGE AND DEVELOPMENT LEASE

STATE OF UTAH LEASE NUMBER 51573-OBA

Between

**THE STATE OF UTAH, acting through
the SCHOOL AND INSTITUTIONAL
TRUST LAND ADMINISTRATION,
as Lessor**

and

**MAGNUM HOLDINGS, LLC
a Utah limited liability company,
as Lessee**

Effective as March 29, 2013

CONFIDENTIAL

SECOND AMENDMENT

To

**ENERGY STORAGE AND DEVELOPMENT LEASE
STATE OF UTAH LEASE NUMBER ML 51573-OBA**

THIS SECOND AMENDMENT TO ENERGY STORAGE AND DEVELOPMENT LEASE ("Second Amendment"), is entered into effective as of the 29th day of March, 2013, by and between the **STATE OF UTAH**, acting by and through the **SCHOOL AND INSTITUTIONAL TRUST LANDS ADMINISTRATION ("Lessor")**, and **MAGNUM HOLDINGS, LLC**, a Utah limited liability company ("**Lessee**"). Lessor and Lessee are sometimes referred to herein as a "**Party**" or collectively as "**Parties.**"

RECITALS:

A. The Parties have previously entered into that certain Energy Storage and Development Lease, State of Utah Lease Number ML 51573-OBA, dated January 22, 2009 ("**Lease**"), which Lease the Parties amended effective June 1, 2009 by executing the First Amendment to Energy Storage and Development Lease, State of Utah Lease Number ML 51573-OBA ("**First Amendment**"). Capitalized terms used, but not otherwise defined in the Second Amendment, shall have the meanings assigned under the Lease and First Amendment.

B. Based on the results of planning by Lessee, the Parties desire to amend the Lease to include certain Adjacent Lands in the Leased Lands as provided in this Second Amendment and described more particularly on **Exhibit A ("Leased Lands")** and **Exhibit D ("Project Area Map")**.

C. With the exception of these adjustments in the Leased Lands, and corresponding adjustments in the annual rent and other provisions regarding Lessee's use of and Lessor's retained rights in the Leased Lands all remaining provisions of the Lease remain in full force and effect.

AGREEMENT:

IN CONSIDERATION of the foregoing recitals, the mutual promises contained herein and for other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, Lessor and Lessee hereby agree as follows:

- 1.1 Pursuant to Lease **Section 6.2(a)**, "Possible Addition of Adjacent Lands," Lessor hereby adds and Lessee hereby accepts the addition of the following lands to the Leased Lands. The Parties agree that the existing terms and conditions of the Lease constitute market based terms, and that the addition of these lands to the Leased Lands under these terms constitute a lease on market based terms is the intended meaning of Lease **Section 6.2(a)**:

<u>Township 15 South, Range 6 West, SLB&M</u>	<u>Surface/ Mineral Acres</u>
Section 31: All	639.09

- 1.2 The reference in Lease **Recital A**, as modified by First Amendment Section 1.3, to the number of surface and mineral acres in the Leased Lands is amended from "3,628" to "4,267"
- 1.3 Exhibit A, "**Leased Lands**," and Exhibit D, "**Project Area Map**" attached hereto and by this reference incorporated herein, are hereby amended and replaced in their entirety to conform with and reflect the adjustments to the Leased Lands effected by Sections 1.1 and 1.2 of this Second Amendment.
- 1.4 The following sentence is added to the end of Lease **Section 2.7**: "Lessor agrees, to the extent it is able, to cancel any grazing permits authorizing activities on the Leased Lands, or portion thereof, within ninety (90) days of a written request from Lessee."
- 1.5 The Annual Rent payable by Lessee under Lease **Sections 4.1 and 4.2**, as modified by First Amendment Section 1.5, prior to the Operations Commencement Date is amended
[REDACTED]
- 1.6 Natural gas liquids ("NGLs") shall be treated as Refined Products under the Lease, including for purposes of rent, royalty and fee calculation under Lease **Article 4**.
- 1.7 With the exception of the foregoing amendments, the Lease and its prior First Amendment, and all remaining provisions thereof, remain as currently drafted and in full force and effect, including without limitation Lessor's reserved rights under Lease **Section 2.7** to, among other things, establish new rights of way and easements upon, through or over the Leased Lands and/or execute new leases in favor of third parties to utilize the surface and mineral estate of the Leased Lands for exploration, development and extraction of oil, native natural gas, geothermal resources, metalliferous resources and all other minerals subject to lease by Lessor, so long as such grants to third parties do not unreasonably interfere with Lessee's Authorized Uses under this Lease.

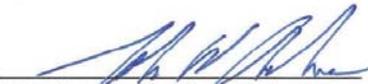
EXECUTED as of the date first written above.

LESSOR:

**STATE OF UTAH, ACTING THROUGH THE
SCHOOL AND INSTITUTIONAL TRUST
LANDS ADMINISTRATION**

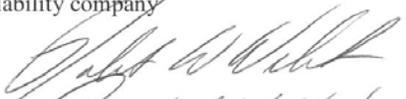
By 
Kevin Carter, Director

Approved as to Form:


John W. Andrews, Special Assistant
Attorney General

LESSEE:

MAGNUM HOLDINGS, LLC, a Utah limited liability company


By Robert W. Webster
Name/Position: CEO

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EXHIBIT A**LEASED LANDS**

<u>Township 15 South, Range 7 West, SLB&M</u>	<u>Surface/ Mineral Acres</u>
Section 16: E/2, E/2NW, SWNW, SESW	480.00
Section 21: NENE	40.00
Section 22: Lots 3 (8.65), 5 (22.21), 7 (34.95), 8 (35.45) SWNE, SE	381.26
Section 23: Lots 2 (21.95), 4 (8.82), 7 (22.70), 8 (35.45), SW, S/2SE	329.34
Section 24: Lots 3 (9.36), 4 (36.01), 6 (22.63), 8 (9.30), SWSW	117.30
Section 25: All	640.00
Section 26: All	640.00
 <u>Township 15 South, Range 6 West, SLB&M</u>	 <u>Surface/ Mineral Acres</u>
Section 19: E/2, SESW	360.00
Section 30: All (Lot 5 (39.99), N/2, SW, N/2SE, SWSE)	639.99
Section 31: All	639.09
 <u>Township 15 South, Range 7 West, SLB&M</u>	 <u>Mineral Only Acres</u>
Section 14: SW	160.00
Section 15: S/2NE, SENW, E/2SW, SE	360.00
Section 22: Lots 1 (40.34), 2 (31.73), 4 (18.13), 6 (14.08), 9 (5.05)	109.33
Section 23: Lots 1 (18.17), 3(31.27), 5 (39.88), 6 (21.26), N/2N/2, SENE	311.28

EXHIBIT D

PROJECT AREA MAP (REPLACEMENT)

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Application for Permit to Drill Magnum Cavern Well 7

Surface Use Plan



Application for Permit to Drill Magnum Cavern Well 7

Surface Use Plan

01/17/2014

CONFIDENTIAL

Prepared by

Magnum

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Holladay, Utah 84121

Tel 801 993 7001 Fax 801 993 7025

www.westernenergyhub.com

RECEIVED: January 18, 2014

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Section 1

Surface Use Plan

1.1 Existing Roads

Access to the project from the east will be on State Route 174 (Brush Wellman Road) and Jones Road from the south. Existing roads will not be improved or changed (see **Magnum Gas Storage Regional Topographical Map**).

1.1.1 Directions to location

From Delta, Utah, head north on Road N 1000 W for 1.6 miles. Just after the road turns west and into Road W 1500 N, turn north onto Jones Road for approximately 7.4 miles. Turn west onto Magnum Road (to be constructed), approximately 0.5 miles south of the intersection of Brush Wellman Road, south of the Intermountain Power Plant. Travel approximately 1.5 miles to the Magnum Holdings (MH-1) water well. From MH-1, travel northeast to Cavern Well 7 (CW-7) well pad (to be constructed).

1.2 Access Roads

An access road will be constructed from Jones Road approximately 9,259 feet west to the MH-1 well. An additional access road will be constructed from the CW-5 well pad approximately 650 feet north to the proposed CW-7 well pad. Access roads will generally be constructed to Millard County Road Design Standards. Construction will use the materials in place and additional material will be purchased from regional commercial pits and hauled to the site.

1.3 Location of Existing Wells within One Mile

There are four wells currently located within one mile of the proposed CW-7 (see **Magnum Gas Storage Location Topographical Map**):

- MH-1 supply well;
- MH-5 supply well;
- 68-1767: abandoned well; and
- 68-2875: private irrigation well.

1.4 Location of Production Facilities

Production facilities will be installed on the newly constructed drilling pad for CW-7 (see **Magnum Cavern Well 7 Location Topographical Map**). Five utility lines will be constructed:

- Electric supply line;
- Brine discharge/supply line;
- Raw water line;

- Well water supply line; and
- Natural gas products line.

All of the utility lines will enter the drilling pad from the southeast corner. All temporary disturbed areas related to production facilities will be reclaimed.

1.5 Location and Type of Water Supply

Water for drilling will be supplied by Magnum MH-1 and MH-5 wells. Both MH-1 and MH-5 are located to the south of the proposed CW-7 well (See **Magnum Cavern Well 5 Location Topographical Map**).

1.6 Construction Materials

Soil for construction will come from the site. Gravel will be purchased from a local supply vendor. Piping will be purchased from a supply vendor and stored on site.

1.7 Methods of Disposing of Waste Materials

Drill cuttings will settle out in the reserve pit. The reserve pit will be lined with a 20-mil HDPE liner (see **Magnum Cavern Well 7 Well Pad**). Liquids in the pit will be evaporated and the cuttings will be covered with a 20-mil HDPE liner, covered with 3 foot of soil, and reclaimed. Sewage facilities and disposal will be furnished and maintained by a local vendor. All garbage will be stored in appropriate containers and regularly hauled off-site to an approved facility.

1.8 Ancillary Facilities

After drilling is complete, modular solution mining facilities will be installed in the southeast portion of the CW-7 well pad for solution mining of the storage cavern.

1.9 Well Site Layout

Magnum Cavern Well 7 Well Pad and Magnum Cavern Well 7 Cross Sections depicts the well site layout. As shown: the drill rig will be set up in the center portion of the pad east of the CW-7; the reserve pit will be located to the south of the pad; the pipe racks will be located in the southwest corner of the pad.

1.10 Plan for Restoration of Surface

Restoration of all temporarily disturbed areas around the CW-7 well pad will be graded and reseeded according to The Utah School and Institutional Trust Lands Administration (SITLA) requirements.

1.11 Surface Ownership

SITLA is the owner and land administrator for Section 23 T15S, R7W. Magnum Holdings, LLC currently holds an Energy Storage and Development Lease (Number 51573-OBA) from SITLA to develop the property. A redacted copy of the Second Amendment to the Lease Agreement describing the leased land has been provided in the Affidavit of Surface Owner Agreement. SITLA can be reached at:

State Institutional Trust Lands Administration
675 East 500 South
Suite 500
Salt Lake City, UT 84102
801-538-5100
Attn: LaVonne Garrison

1.12 Evidence of Water Rights

The State Engineer has approved multiple Temporary Change Applications allowing use of existing water rights at the Project site. The Order approving the Temporary Change Application for the City of Delta (Number 68-396) is representative of the Orders received by Magnum for the Project. A copy of the Order has been provided in **Appendix A**. At this time, water will be withdrawn from the existing MH-1 and MH-5 wells (see **Magnum Cavern Well 7 Location Topographical Map** for details).

1.13 Other Information

- Current vegetation at the site consists of open scrub/shrub with sagebrush, greasewood, rabbitbrush, saltbush, and mixed bunchgrasses.
- Magnum has received all environmental clearances from Division of Wildlife Resources and Utah State Historic Preservation Office.

1.14 Company Representative

Tiffany A. James
Vice President, Project Development
and Government Affairs
Magnum NGLs Solution Mining, LLC
3165 East Millrock Drive, Suite 330
Holladay, UT 84121
Phone: (801) 993-7001
Cell: (801) 719-9131
tjames@westernenergyhub.com

Appendix A

Evidence of Water Rights

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GARY R. HERBERT
Governor
GREG BELL
Lieutenant Governor

State of Utah
DEPARTMENT OF NATURAL RESOURCES
Division of Water Rights

MICHAEL R. STYLER KENT L. JONES
Executive Director State Engineer/Division Director

ORDER OF THE STATE ENGINEER
For Temporary Change Application Number 68-396 (t38640)

Temporary Change Application Number 68-396 (t38640) in the name of Delta City Corporation, was filed on January 7, 2013, to change the points of diversion, places of use, uses, and storage of 1029.29 acre-feet (af) of water as evidenced by Water Right Numbers 68-2835, 68-2909, and 68-396. Heretofore, the water has been diverted from the following points located: (1) Well - North 4517 feet and West 1173 feet from the SE Corner of Section 3, T17S, R6W, SLB&M (existing 16-inch well, 580 feet deep); (2) Well - North 2761 feet and West 144 feet from the E $\frac{1}{4}$ Corner of Section 12, T17S, R7W, SLB&M (existing 12-inch well, 860 feet deep); (3) Well - South 594 feet and West 1334 feet from the NE Corner of Section 12, T17S, R7W, SLB&M (existing 10-inch well, 703 feet deep); (4) Well - North 1590 feet and East 719 feet from the SW Corner of Section 6, T17S, R6W, SLB&M (existing 14-inch well, 737 feet deep); (5) Well - South 30 feet and West 20 feet from the NE Corner of Section 17, T17S, R6W, SLB&M (existing 16-inch well, 834 feet deep); (6) Well - South 340 feet and West 1550 feet from the E $\frac{1}{4}$ Corner of Section 12, T17S, R7W, SLB&M (existing 16-inch well, 856 feet deep); (7) Well - North 1590 feet and East 719 feet from the SW Corner of Section 6, T17S, R7W, SLB&M (existing 14-inch well, 737 feet deep); (8) Well - South 331 feet and West 1517 feet from the E $\frac{1}{4}$ Corner of Section 12, T17S, R7W, SLB&M (existing 16-inch well, 856 feet deep). The water was used for municipal purposes within the service area of Delta. The water was used in all or portion(s) of Section 33, T16S, R6W, SLB&M; Section 34, T16S, R6W, SLB&M; Section 3, T17S, R6W, SLB&M; and Section 4, T17S, R6W, SLB&M.

Hereafter, it is proposed to divert 998.49 acre-feet of water to points of diversion changed to: (1) Well - North 345 feet and East 1205 feet from the SW Corner of Section 23, T15S, R7W, SLB&M (20-inch well, 1500-2300 feet deep); (2) Well - North 1070 feet and East 1305 feet from the SW Corner of Section 23, T15S, R7W, SLB&M (20-inch well, 1500-2300 feet deep); (3) Well - North 715 feet and East 780 feet from the SW Corner of Section 23, T15S, R7W, SLB&M (20-inch well, 1500-2300 feet deep); (4) Well - North 420 feet and East 2320 feet from the SW Corner of Section 23, T15S, R7W, SLB&M (20-inch well, 1500-2300 feet deep); (5) Well - South 110 feet and West 125 feet from the NE Corner of Section 27, T15S, R7W, SLB&M (20-inch well, 1500-2300 feet deep); (6) Well - South 2390 feet and East 140 feet from the NW Corner of Section 26, T15S, R7W, SLB&M (20-inch well, 1500-2300 feet deep); (7) Well - South 2205 feet and East 2735 feet from the NW Corner of Section 26, T15S, R7W, SLB&M (20-inch well, 1500-2300 feet deep). The water is to be used for other purposes. The water is to be used for industrial purposes (Industrial processes and associated activities to create underground gas caverns). The place of use of the water is being changed to all or portion(s) of Section 19, T15S, R6W, SLB&M; Section 30, T15S, R6W, SLB&M; Section 22, T15S, R7W, SLB&M; Section 23, T15S, R7W, SLB&M; Section 24, T15S, R7W, SLB&M; Section 25, T15S, R7W, SLB&M; Section 26, T15S, R7W, SLB&M; and Section 27, T15S, R7W, SLB&M.

1594 West North Temple, Suite 220, PO Box 146300, Salt Lake City, UT 84114-6300
telephone (801) 538-7240 • facsimile (801) 538-7467 • www.waterrights.utah.gov

ORDER OF THE STATE ENGINEER
Temporary Change Application Number
68-396 (t38640)
Page 2

Notice of this temporary change application was not published in a newspaper. It is the opinion of the State Engineer that it meets the criteria of Section 73-3-3 of the Utah Code for the approval of temporary change applications.

Review has been made of the proposed changes, the underlying right, and the protest. In order to approve this temporary change application without enlarging the underlying water rights the quantification limiting water right 68-2909 (a27062) to 172.43 acre-feet, as described in the approval memorandum for change application (a27062), must be continued. The quantified amounts for water right 68-396 is 0.893 cfs or 646.5 acre-feet and water right 68-2835 is 1.10 cfs or 179.56 acre-feet. Therefore, the total amount limited under these rights is: (172.43 acre-feet + 646.5 acre-feet + 179.56 acre-feet = 998.49 acre-feet).

In evaluating applications which propose to change the nature of use of a water right, the State Engineer believes it is appropriate to examine the rates and amounts of hydrologic depletion associated with the historical water use as compared to the proposed use to assure that there is no enlargement of the underlying water right. In this case, it is believed that the historical water uses would have incurred the following rates and amounts of hydrologic depletion:

<u>Prior Beneficial Use</u>	<u>Rate of Diversion</u>	<u>Amount of Diversion</u>	<u>*Rate of Depletion</u>	<u>Amount of Depletion</u>
Municipal	998.49 acre-feet	998.49 acre-feet	100 percent	998.49 acre-feet

The rate and amount of hydrologic depletion associated with the proposed use is as follows:

<u>Proposed Beneficial Use</u>	<u>Rate of Diversion</u>	<u>Amount of Diversion</u>	<u>*Rate of Depletion</u>	<u>Amount of Depletion</u>
Industrial Use	998.49 acre-feet	998.49 acre-feet	100 percent	998.49 acre-feet

**Consumptive Use of Irrigated Crops in Utah, Research Report 145, Utah Agricultural Experiment Station, Utah State University, Logan, Utah, October 1994, Delta Station.*

Based upon the above analysis, it appears that the proposed use will not exceed the hydrologic depletion limitations associated with the historical uses, thus causing an enlargement of the underlying water right.

It is the opinion of the State Engineer that this application can be approved without adversely affecting prior rights provided certain conditions are imposed. Therefore, the applicant is put on notice that diligence must be shown in pursuing the development of this application, which can be demonstrated by the completion of the project as approved in this order of the State Engineer.

It is, therefore, **ORDERED** and Permanent Change Application Number 68-396 (t38640) is hereby **APPROVED** subject to prior rights and with the following conditions:

ORDER OF THE STATE ENGINEER
Temporary Change Application Number
68-396 (t38640)
Page 3

- 1) The amount of water diverted by the applicant from the wells shall be limited to 2.6305 cfs or 998.49 acre-feet annually to be used for industrial use. The depletion shall be limited to the historical depletion of 998.49 acre-feet.
- 2) To accommodate the use approved under this application, the historic municipal use shall cease.
- 3) Section 73-5-4 of the Utah Code provides that "every person using water in this state shall construct or install and maintain ...controlling works...and measuring device at each point where water is diverted or turned out, for the purpose of regulating and measuring the quantity of water that may be used..." Adequate measuring and totalizing devices shall be installed on the heretofore and hereafter points of diversions. The applicant must maintain a record and prepare a report of the amount of water diverted from each diversion point. This annual report of water diverted shall be submitted to the State Engineer on or before December 31st of each operational year of the project. Failure to comply could result in an order to cease the use of water and/or the revocation of this approval.
- 4) **This application shall automatically expire one year from the date of this approval.**

If historical resources such as human remains (skeletons), prehistoric arrowheads/spear points, waste flakes from stone tool production, pottery, ancient fire pits, historical building foundations/remains, artifacts (glass, ceramic, metal, etc.) are found during construction, call the Utah Division of State History at 801-533-3555.

It is the applicant's responsibility to maintain a current address with this office and to update ownership of their water right. Please notify this office immediately of any change of address or for assistance in updating ownership.

Your contact with this office, should you need it, is with the Sevier River/Southern Regional Office. The telephone number is 435-896-4429.

This Order is subject to the provisions of Administrative Rule R655-6-17 of the Division of Water Rights and to Sections 63G-4-302, 63G-4-402, and 73-3-14 of the Utah Code which provide for filing either a Request for Reconsideration with the State Engineer or an appeal with the appropriate District Court. A Request for Reconsideration must be filed with the State Engineer within 20 days of the date of this Order. However, a Request for Reconsideration is not a prerequisite to filing a court appeal. A court appeal must be filed within 30 days after the date of this Order, or if a Request for Reconsideration has been filed, within 30 days after the

Application for Permit to Drill
Magnum Cavern Well 7

ORDER OF THE STATE ENGINEER
Temporary Change Application Number
68-396 (t38640)
Page 4

date the Request for Reconsideration is denied. A Request for Reconsideration is considered denied when no action is taken 20 days after the Request is filed.

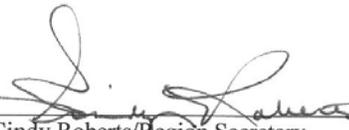
Dated this 10 day of January, 2013.


Kirk Forbush, P.E., Regional Engineer

Mailed a copy of the foregoing Order this 10th day of January, 2013 to:

Delta City Corporation
76 North 200 West
Delta UT 84624

Division of Water Rights
Water Use Program

BY: 
Cindy Roberts/Region Secretary

CONFIDENTIAL

Application for Permit to Drill Magnum Cavern Well 7

Blowout Preventer

01/18/2014

CONFIDENTIAL

Prepared by

Magnum

3165 E. Millrock Dr., Suite 330

Holladay, Utah 84121

Tel 801 993 7001 Fax 801 993 7025

www.westernenergyhub.com

RECEIVED: January 18, 2014

16-Inch Cavern Well Blowout Preventer Equipment

The geology of the area is well known from wells drilled by Magnum (CW-5, CW-6, MH-5, and MH-1) in the vicinity of CW-7 and the other wells drilled on adjacent lands (Delta Egg Far and IPA commercial and industrial water wells; Argonaut oil and gas exploration well). These wells demonstrate that the formations above the salt, and the salt itself, are gas-free. The Argonaut Well penetrated the entire sequence of salt to a depth of 11,266 feet bgs and the Magnum wells penetrated the salt to a depth of 6,420 feet bgs. This is deeper than the intended Cavern Well 7 depth of 4,820 bgs. Numerous other wells including CW-5, CW-6 and MH-5 (drilled by Magnum) in the immediate vicinity of CW-7 showed no gas in the aquifers overlying the salt structure. Additionally, the geophysical lines that run over the area show there are no structures present in the overlying formations that could trap gas. This is typical of the basin and range deposits that have been explored for hydrocarbon production.

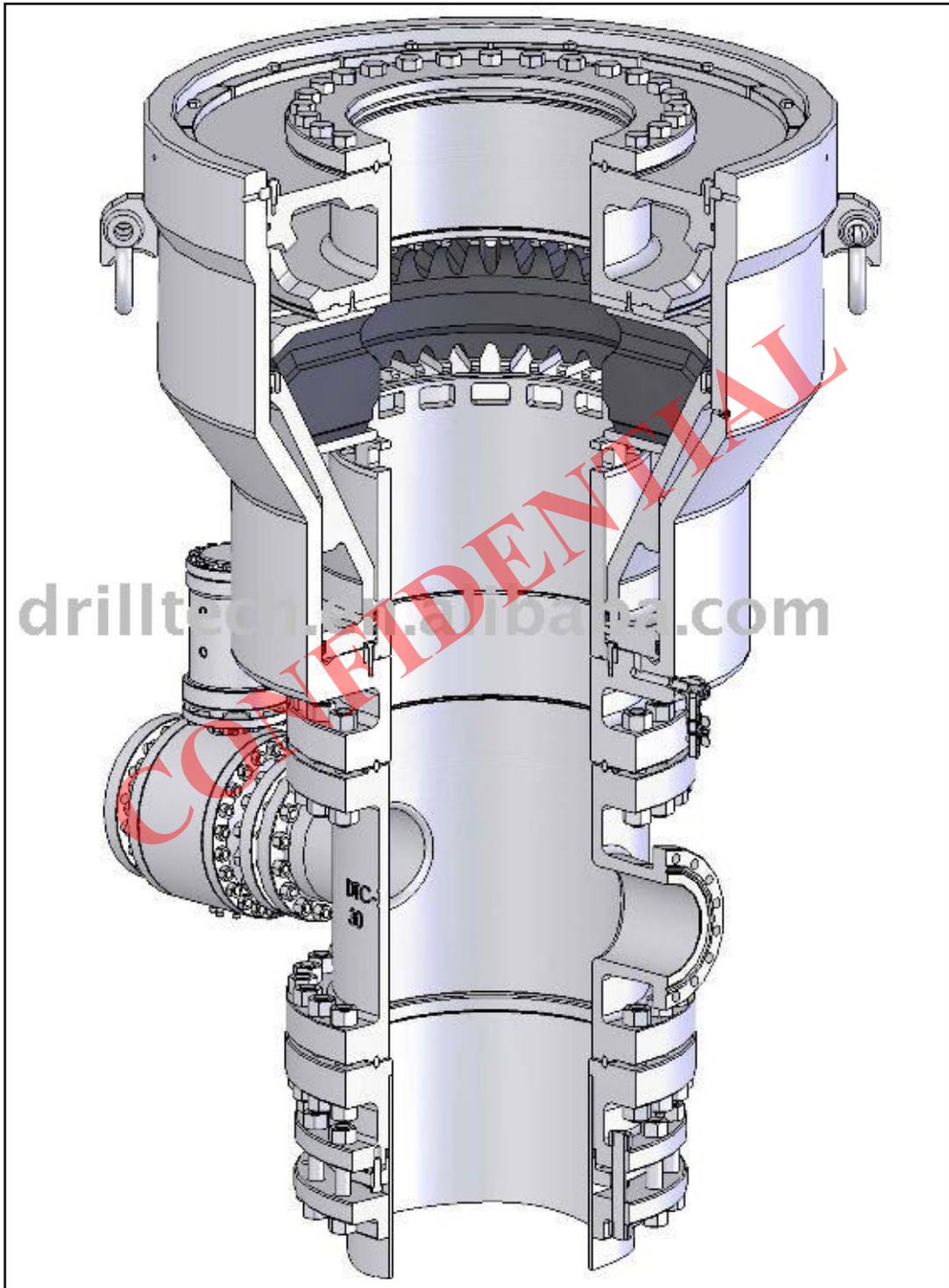
Wells drilled into salt generally utilize some kind of blowout control equipment. The blowout control equipment almost always includes an annular, bag-type blowout preventer. Magnum will follow industry practice and use an annular blowout preventer (BOP) when drilling Cavern Well 7 (see **Blowout Preventer**). Additional equipment used in deep oil and gas wells, such as shear and pipe rams, will not be used for drilling Magnum's cavern well.

Magnum intends to install BOP measures beginning with the 16-inch surface casing at a depth of 3,400 feet. The BOP will be installed on the 20-inch casing after the 16-inch casing is cemented in place in order to support the drilling of the 12-1/4-inch pilot hole below 3400 feet. The BOP will be installed on a temporary flange welded to the 20-inch casing. The exact size of the BOP to be used will be at least 13-5/8-inches in diameter and rated at 3,000 psi. Installation of the BOP measures are described in detail in Section 1.2 of the Drilling/Well Construction Plan and both the installation and testing process is summarized below.

Once the BOP is installed, testing of the equipment will follow oil and gas industry standards. Functionality testing of the equipment is conducted every time it is installed. The BOP will be connected to the closing unit by high-pressure hydraulic hoses. A joint of drill pipe will be picked up by the rig and run into the BOP. The BOP will then be closed from the control unit and checked that the bag has sealed around the drill pipe. If the closing is visually correct, the BOP will be opened, the drill pipe removed and rig activities will continue.

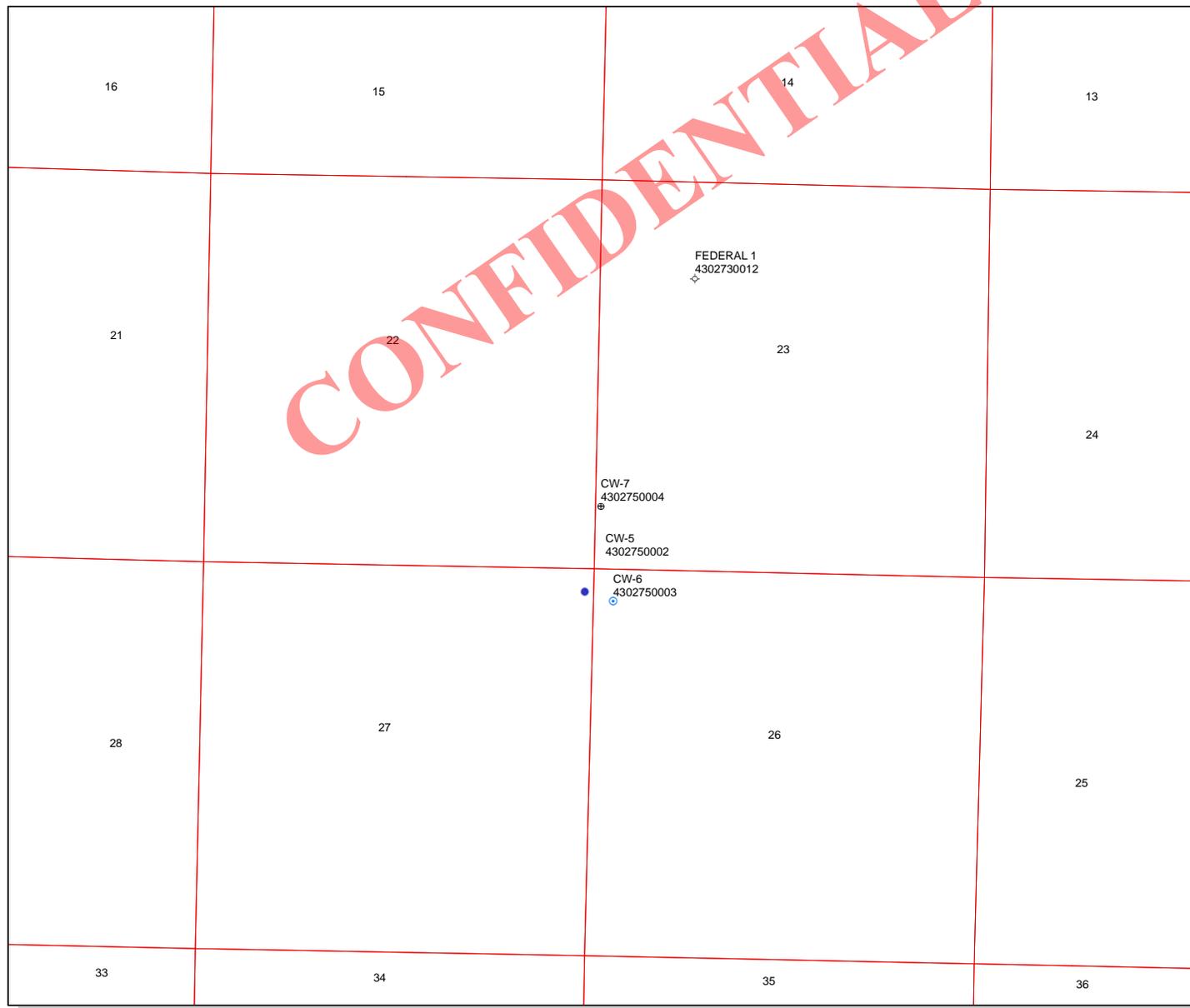
Sources

<https://www.drilltech.en.alibaba.com>



Magnum Cavern Well 7 Blowout Preventer

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API Number: 4302750004

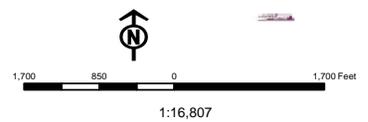
Well Name: CW-7

Township: T15.0S Range: R07.0W Section: 23 Meridian: S

Operator: MAGNUM NGLS SOLUTION MINING LLC

Map Prepared: 1/24/2014
Map Produced by Diana Mason

Wells Query		Units	
Status		STATUS	
◆ APD - Approved Permit		ACTIVE	
○ DRL - Spudded (Drilling Commenced)		EXPLORATORY	
↗ GW - Gas Injection		GAS STORAGE	
★ GS - Gas Storage		NF PP OIL	
⊕ LOC - New Location		NF SECONDARY	
⊖ OPS - Operation Suspended		PI OIL	
⊘ PA - Plugged Abandoned		PP GAS	
⊙ PGW - Producing Gas Well		PP GEOTHERML	
⊙ POW - Producing Oil Well		PP OIL	
⊙ SGW - Shut-in Gas Well		SECONDARY	
⊙ SOW - Shut-in Oil Well		TERMINATED	
⊙ TA - Temp. Abandoned			
○ TW - Test Well		Fields	
⊙ WDW - Water Disposal		STATUS	
⊙ WW - Water Injection Well		Unknown	
● WSW - Water Supply Well		ABANDONED	
		ACTIVE	
		COMBINED	
		INACTIVE	
		STORAGE	
		TERMINATED	



Well Name	MAGNUM NGLS SOLUTION MINING LLC CW-7 43027500040000			
String	SURF	I1	I2	PROD
Casing Size(")	30.000	24.000	20.000	16.000
Setting Depth (TVD)	750	2900	3300	3400
Previous Shoe Setting Depth (TVD)	150	750	2900	3300
Max Mud Weight (ppg)	9.5	10.2	10.2	10.4
BOPE Proposed (psi)	500	500	500	3000
Casing Internal Yield (psi)	2270	2843	3675	3675
Operators Max Anticipated Pressure (psi)	2341			13.2

Calculations	SURF String	30.000	"
Max BHP (psi)	.052*Setting Depth*MW=	371	
			BOPE Adequate For Drilling And Setting Casing at Depth?
MASP (Gas) (psi)	Max BHP-(0.12*Setting Depth)=	281	YES
MASP (Gas/Mud) (psi)	Max BHP-(0.22*Setting Depth)=	206	YES Divertor
			*Can Full Expected Pressure Be Held At Previous Shoe?
Pressure At Previous Shoe	Max BHP-.22*(Setting Depth - Previous Shoe Depth)=	239	NO OK
Required Casing/BOPE Test Pressure=		500	psi
*Max Pressure Allowed @ Previous Casing Shoe=		150	psi *Assumes 1psi/ft frac gradient

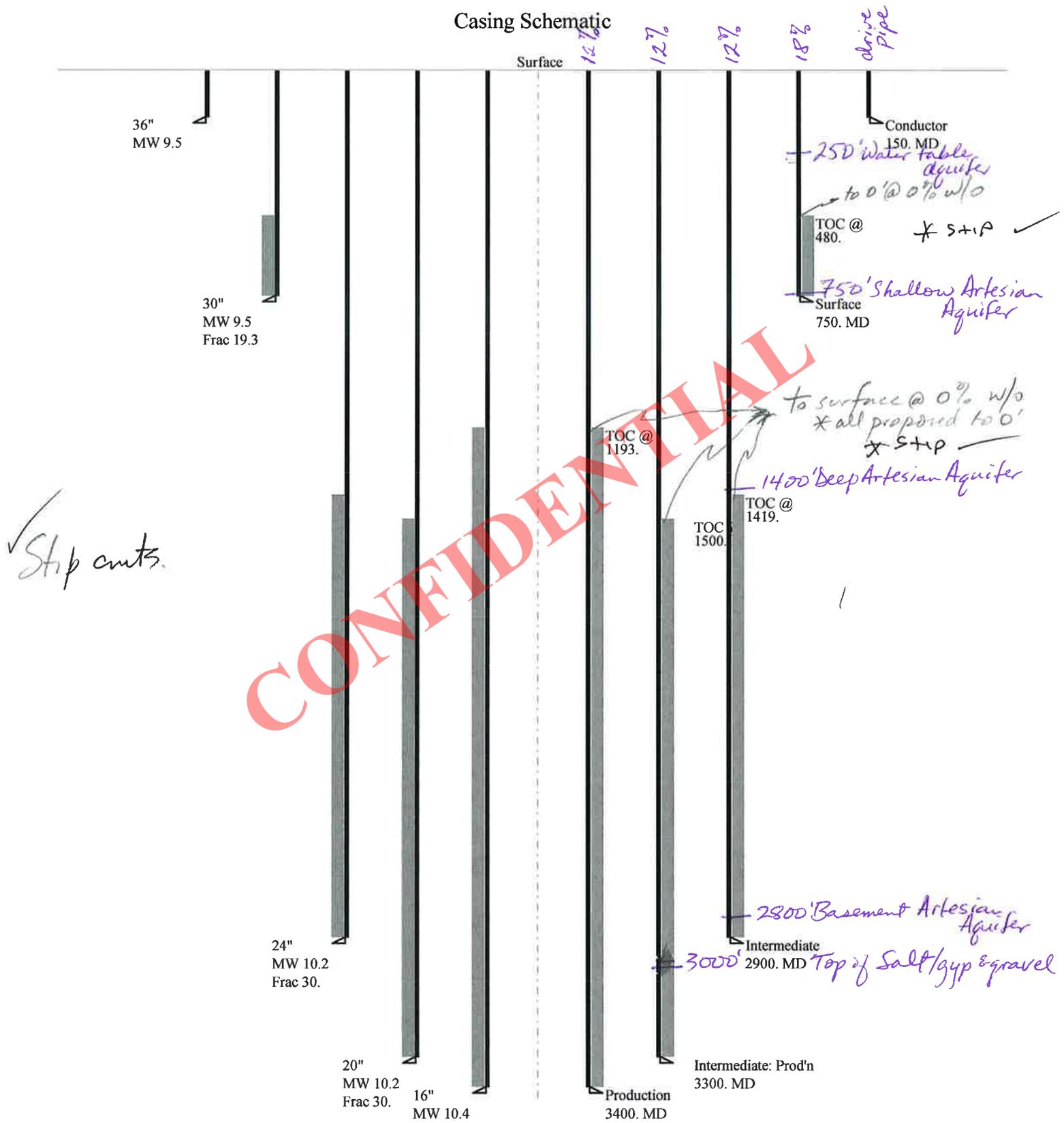
Calculations	I1 String	24.000	"
Max BHP (psi)	.052*Setting Depth*MW=	1588	
			BOPE Adequate For Drilling And Setting Casing at Depth?
MASP (Gas) (psi)	Max BHP-(0.12*Setting Depth)=	1190	NO
MASP (Gas/Mud) (psi)	Max BHP-(0.22*Setting Depth)=	900	NO Divertor
			*Can Full Expected Pressure Be Held At Previous Shoe?
Pressure At Previous Shoe	Max BHP-.22*(Setting Depth - Previous Shoe Depth)=	1065	NO OK
Required Casing/BOPE Test Pressure=		500	psi
*Max Pressure Allowed @ Previous Casing Shoe=		750	psi *Assumes 1psi/ft frac gradient

Calculations	I2 String	20.000	"
Max BHP (psi)	.052*Setting Depth*MW=	1750	
			BOPE Adequate For Drilling And Setting Casing at Depth?
MASP (Gas) (psi)	Max BHP-(0.12*Setting Depth)=	1354	NO
MASP (Gas/Mud) (psi)	Max BHP-(0.22*Setting Depth)=	1024	NO Divertor
			*Can Full Expected Pressure Be Held At Previous Shoe?
Pressure At Previous Shoe	Max BHP-.22*(Setting Depth - Previous Shoe Depth)=	1662	YES OK
Required Casing/BOPE Test Pressure=		2573	psi
*Max Pressure Allowed @ Previous Casing Shoe=		2843	psi *Assumes 1psi/ft frac gradient

Calculations	PROD String	16.000	"
Max BHP (psi)	.052*Setting Depth*MW=	1839	
			BOPE Adequate For Drilling And Setting Casing at Depth?
MASP (Gas) (psi)	Max BHP-(0.12*Setting Depth)=	1431	YES 3M BOPE will be mounted on this csg
MASP (Gas/Mud) (psi)	Max BHP-(0.22*Setting Depth)=	1091	YES OK
			*Can Full Expected Pressure Be Held At Previous Shoe?
Pressure At Previous Shoe	Max BHP-.22*(Setting Depth - Previous Shoe Depth)=	1817	YES OK
Required Casing/BOPE Test Pressure=		2573	psi
*Max Pressure Allowed @ Previous Casing Shoe=		3300	psi *Assumes 1psi/ft frac gradient

43027500040000 CW-7

Casing Schematic



Well name:	43027500040000 CW-7	
Operator:	Magnum Solution Mining, LLC	
String type:	Conductor	Project ID: 43-027-50004
Location:	MILLARD COUNTY	

Design parameters:

Collapse

Mud weight: 9.500 ppg
Design is based on evacuated pipe.

Minimum design factors:

Collapse:

Design factor 1.125

Burst:

Design factor 1.00

Environment:

H2S considered? No
Surface temperature: 74 °F
Bottom hole temperature: 76 °F
Temperature gradient: 1.40 °F/100ft
Minimum section length: 12 ft

Burst

Max anticipated surface pressure: 56 psi
Internal gradient: 0.120 psi/ft
Calculated BHP 74 psi

No backup mud specified.

Tension:

8 Round STC: 1.80 (J)
8 Round LTC: 1.70 (J)
Buttress: 1.60 (J)
Premium: 1.50 (J)
Body yield: 1.50 (B)

Tension is based on air weight.
Neutral point: 128 ft

Non-directional string.

Run Seq	Segment Length (ft)	Size (in)	Nominal Weight (lbs/ft)	Grade	End Finish	True Vert Depth (ft)	Measured Depth (ft)	Drift Diameter (in)	Est. Cost (\$)
1	150	36	282.39	A-53 B	Plain End	150	150	33	19800
Run Seq	Collapse Load (psi)	Collapse Strength (psi)	Collapse Design Factor	Burst Load (psi)	Burst Strength (psi)	Burst Design Factor	Tension Load (kips)	Tension Strength (kips)	Tension Design Factor
1	74	440	5.944	74	1280	17.29	42.4	2907	68.63 B

Prepared by: Helen Sadik-Macdonald
Div of Oil, Gas & Mining

Phone: 801 538-5357
FAX: 801-359-3940

Date: January 23, 2014
Salt Lake City, Utah

Remarks:

Collapse is based on a vertical depth of 150 ft, a mud weight of 9.5 ppg. The casing is considered to be evacuated for collapse purposes. Collapse strength is based on the Westcott, Dunlop & Kemler method of biaxial correction for tension.

Burst strength is not adjusted for tension.

Well name:	43027500040000 CW-7		Project ID:	
Operator:	Magnum Solution Mining, LLC		43-027-50004	
String type:	Surface			
Location:	MILLARD COUNTY			

Design parameters:

Collapse

Mud weight: 9.500 ppg
Design is based on evacuated pipe.

Burst

Max anticipated surface pressure: 660 psi
Internal gradient: 0.120 psi/ft
Calculated BHP: 750 psi

No backup mud specified.

Minimum design factors:

Collapse:

Design factor: 1.125

Burst:

Design factor: 1.00

Tension:

8 Round STC: 1.80 (J)
8 Round LTC: 1.70 (J)
Buttress: 1.60 (J)
Premium: 1.50 (J)
Body yield: 1.50 (B)

Tension is based on air weight.
Neutral point: 641 ft

Environment:

H2S considered? No
Surface temperature: 74 °F
Bottom hole temperature: 84 °F
Temperature gradient: 1.40 °F/100ft
Minimum section length: 12 ft

Cement top: 480 ft

Non-directional string.

Re subsequent strings:

Next setting depth: 2,900 ft
Next mud weight: 10.200 ppg
Next setting BHP: 1,537 psi
Fracture mud wt: 19.250 ppg
Fracture depth: 750 ft
Injection pressure: 750 psi

Run Seq	Segment Length (ft)	Size (in)	Nominal Weight (lbs/ft)	Grade	End Finish	True Vert Depth (ft)	Measured Depth (ft)	Drift Diameter (in)	Est. Cost (\$)
1	750	30	234.29	X-52	Plain End	750	750	28.1	69300
Run Seq	Collapse Load (psi)	Collapse Strength (psi)	Collapse Design Factor	Burst Load (psi)	Burst Strength (psi)	Burst Design Factor	Tension Load (kips)	Tension Strength (kips)	Tension Design Factor
1	370	770	2.080	750	2270	3.03	175.7	3583.8	20.40 B

Prepared by: Helen Sadik-Macdonald
Div of Oil, Gas & Mining

Phone: 801-538-5357
FAX: 801-359-3940

Date: January 23, 2014
Salt Lake City, Utah

Remarks:

Collapse is based on a vertical depth of 750 ft, a mud weight of 9.5 ppg. The casing is considered to be evacuated for collapse purposes. Collapse strength is based on the Westcott, Dunlop & Kemler method of biaxial correction for tension.

Burst strength is not adjusted for tension.

Well name:	43027500040000 CW-7	
Operator:	Magnum Solution Mining, LLC	
String type:	Intermediate	Project ID: 43-027-50004
Location:	MILLARD COUNTY	

Design parameters:

Collapse

Mud weight: 10.200 ppg
Design is based on evacuated pipe.

Minimum design factors:

Collapse:

Design factor 1.125

Burst:

Design factor 1.00

Environment:

H2S considered? No
Surface temperature: 74 °F
Bottom hole temperature: 115 °F
Temperature gradient: 1.40 °F/100ft
Minimum section length: 1,000 ft

Cement top: 1,419 ft

Burst

Max anticipated surface pressure: 1,023 psi
Internal gradient: 0.220 psi/ft
Calculated BHP 1,661 psi

No backup mud specified.

Tension:

8 Round STC: 1.80 (J)
8 Round LTC: 1.80 (J)
Buttress: 1.60 (J)
Premium: 1.50 (J)
Body yield: 1.60 (B)

Tension is based on air weight.
Neutral point: 2,508 ft

Estimated cost: 287,090 (\$)

Non-directional string.

Re subsequent strings:

Next setting depth: 3,300 ft
Next mud weight: 10.200 ppg
Next setting BHP: 1,749 psi
Fracture mud wt: 30.000 ppg
Fracture depth: 2,900 ft
Injection pressure: 4,519 psi

Run Seq	Segment Length (ft)	Size (in)	Nominal Weight (lbs/ft)	Grade	End Finish	True Vert Depth (ft)	Measured Depth (ft)	Drift Diameter (in)	Est. Cost (\$)
2	1600	24	186.23	X-56	Plain End	1600	1600	22.25	158400
1	1300	24	245.64	X-56	Plain End	2900	2900	22	128690

Run Seq	Collapse Load (psi)	Collapse Strength (psi)	Collapse Design Factor	Burst Load (psi)	Burst Strength (psi)	Burst Design Factor	Tension Load (kips)	Tension Strength (kips)	Tension Design Factor
2	848	1385	1.634	1375	2843	2.07	617.3	3068	4.97 J
1	1537	2612	1.700	1661	3791	2.28	319.3	3068	9.61 J

Prepared by: Helen Sadik-Macdonald
Div of Oil, Gas & Mining

Phone: 801 538-5357
FAX: 801-359-3940

Date: January 23, 2014
Salt Lake City, Utah

Remarks:

Collapse is based on a vertical depth of 2900 ft, a mud weight of 10.2 ppg. The casing is considered to be evacuated for collapse purposes. Collapse strength is based on the Westcott, Dunlop & Kemler method of biaxial correction for tension.

Burst strength is not adjusted for tension.

Engineering responsibility for use of this design will be that of the purchaser.

Well name:	43027500040000 CW-7	
Operator:	Magnum Solution Mining, LLC	
String type:	Intermediate: Prod'n	Project ID: 43-027-50004
Location:	MILLARD COUNTY	

Design parameters:

Collapse

Mud weight: 10.200 ppg
Design is based on evacuated pipe.

Burst

Max anticipated surface pressure: 1,089 psi
Internal gradient: 0.220 psi/ft
Calculated BHP 1,815 psi

No backup mud specified.

Minimum design factors:

Collapse:

Design factor 1.125

Burst:

Design factor 1.00

Tension:

8 Round STC: 1.80 (J)
8 Round LTC: 1.80 (J)
Buttress: 1.60 (J)
Premium: 1.50 (J)
Body yield: 1.60 (B)

Tension is based on air weight.
Neutral point: 2,870 ft

Estimated cost: 174,235 (\$)

Environment:

H2S considered? No
Surface temperature: 74 °F
Bottom hole temperature: 120 °F
Temperature gradient: 1.40 °F/100ft
Minimum section length: 1,000 ft

Cement top: 1,500 ft

Non-directional string.

Production liner info:

Liner setting depth: 3,400 ft
Pore pressure equivalent: 10,400 ppg
Assumed BHP at TD: 1,837 psi

Run Seq	Segment Length (ft)	Size (in)	Nominal Weight (lbs/ft)	Grade	End Finish	True Vert Depth (ft)	Measured Depth (ft)	Drift Diameter (in)	Est. Cost (\$)
2	1500	20	129.33	X-56	Plain End	1500	1500	18.45	79200
1	1800	20	202.92	X-56	Plain End	3300	3300	17.624	95035

Run Seq	Collapse Load (psi)	Collapse Strength (psi)	Collapse Design Factor	Burst Load (psi)	Burst Strength (psi)	Burst Design Factor	Tension Load (kips)	Tension Strength (kips)	Tension Design Factor
2	795	1391	1.751	1419	3675	2.59	559.2	2130	3.81 J
1	1749	4089	2.339	1815	4900	2.70	365.2	2130	5.83 J

Prepared by: Helen Sadik-Macdonald
Div of Oil, Gas & Mining

Phone: 801 538-5357
FAX: 801-359-3940

Date: January 23, 2014
Salt Lake City, Utah

Remarks:

Collapse is based on a vertical depth of 3300 ft, a mud weight of 10.2 ppg. The casing is considered to be evacuated for collapse purposes. Collapse strength is based on the Westcott, Dunlop & Kemler method of biaxial correction for tension.

Burst strength is not adjusted for tension.

Well name:	43027500040000 CW-7		Project ID:
Operator:	Magnum Solution Mining, LLC		43-027-50004
String type:	Production		
Location:	MILLARD COUNTY		

Design parameters:

Collapse

Mud weight: 10.400 ppg
Design is based on evacuated pipe.

Minimum design factors:

Collapse:

Design factor 1.125

Burst:

Design factor 1.00

Environment:

H2S considered? No
Surface temperature: 74 °F
Bottom hole temperature: 122 °F
Temperature gradient: 1.40 °F/100ft
Minimum section length: 100 ft
Cement top: 1,193 ft

Burst

Max anticipated surface pressure: 1,089 psi
Internal gradient: 0.220 psi/ft
Calculated BHP 1,837 psi

No backup mud specified.

Tension:

8 Round STC: 1.80 (J)
8 Round LTC: 1.80 (J)
Buttress: 1.60 (J)
Premium: 1.50 (J)
Body yield: 1.60 (B)

Non-directional string.

Tension is based on air weight.
Neutral point: 2,912 ft

Estimated cost: 124,415 (\$)

Run Seq	Segment Length (ft)	Size (in)	Nominal Weight (lbs/ft)	Grade	End Finish	True Vert Depth (ft)	Measured Depth (ft)	Drift Diameter (in)	Est. Cost (\$)
2	2400	16	97.00	N-80	Buttress	2400	2400	14.75	84459
1	1000	16	109.00	N-80	BOSS	3400	3400	14.5	39956

Run Seq	Collapse Load (psi)	Collapse Strength (psi)	Collapse Design Factor	Burst Load (psi)	Burst Strength (psi)	Burst Design Factor	Tension Load (kips)	Tension Strength (kips)	Tension Design Factor
2	1297	2239	1.727	1617	5030	3.11	341.8	2194	6.42 J
1	1837	3080	1.677	1837	5740	3.12	109	2529.8	23.21 B

Prepared by: Helen Sadik-Macdonald
Div of Oil, Gas & Mining

Phone: 801 538-5357
FAX: 801-359-3940

Date: January 23, 2014
Salt Lake City, Utah

Remarks:

Collapse is based on a vertical depth of 3400 ft, a mud weight of 10.4 ppg. The casing is considered to be evacuated for collapse purposes. Collapse strength is based on the Westcott, Dunlop & Kemler method of biaxial correction for tension.

Burst strength is not adjusted for tension.



3165 E. Millrock Dr., #330
Holladay, Utah 84121
520-429-6662

www.westernenergyhub.com

February 11, 2014

Division of Oil, Gas and Mining
1594 West North Temple
Suite 1210
Salt Lake City, Utah 84114-5801

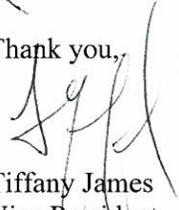
Re; Exception Location Request

Magnum is proposing to drill and solution mine a storage cavern well in a subsurface salt formation in Millard County, Utah. This storage cavern well is located on State Trust Lands leased to Magnum (Energy Storage and Development Lease 51537-OBA) by the School and Institutional Trust Lands Administration (SITLA) in the SW/4 of Section 23 in Township 15 South, Range 7 West (Figure 1). Additionally, Magnum is the sole working interest owner of both the surface and minerals within 2,500 feet of the well bore.

Magnum is requesting an exception to Utah Rule R649-3-2 due to the location of the well not being drilled within or in proximity to a hydrocarbon bearing formation as well as the intended purpose of the well is not for hydrocarbon production. The purpose of the well is to solution mine a storage cavern within the salt formation for the storage of hydrocarbons. The location of the well should therefore not have any impact on oil and gas correlative rights. SITLA, as the landowner, has approved the location of this well in an email correspondence to the Division of Oil, Gas and Mining dated February 6, 2014.

Please do not hesitate to contact me if there are any questions.

Thank you,


Tiffany James
Vice President
Project Development
and Government Affairs

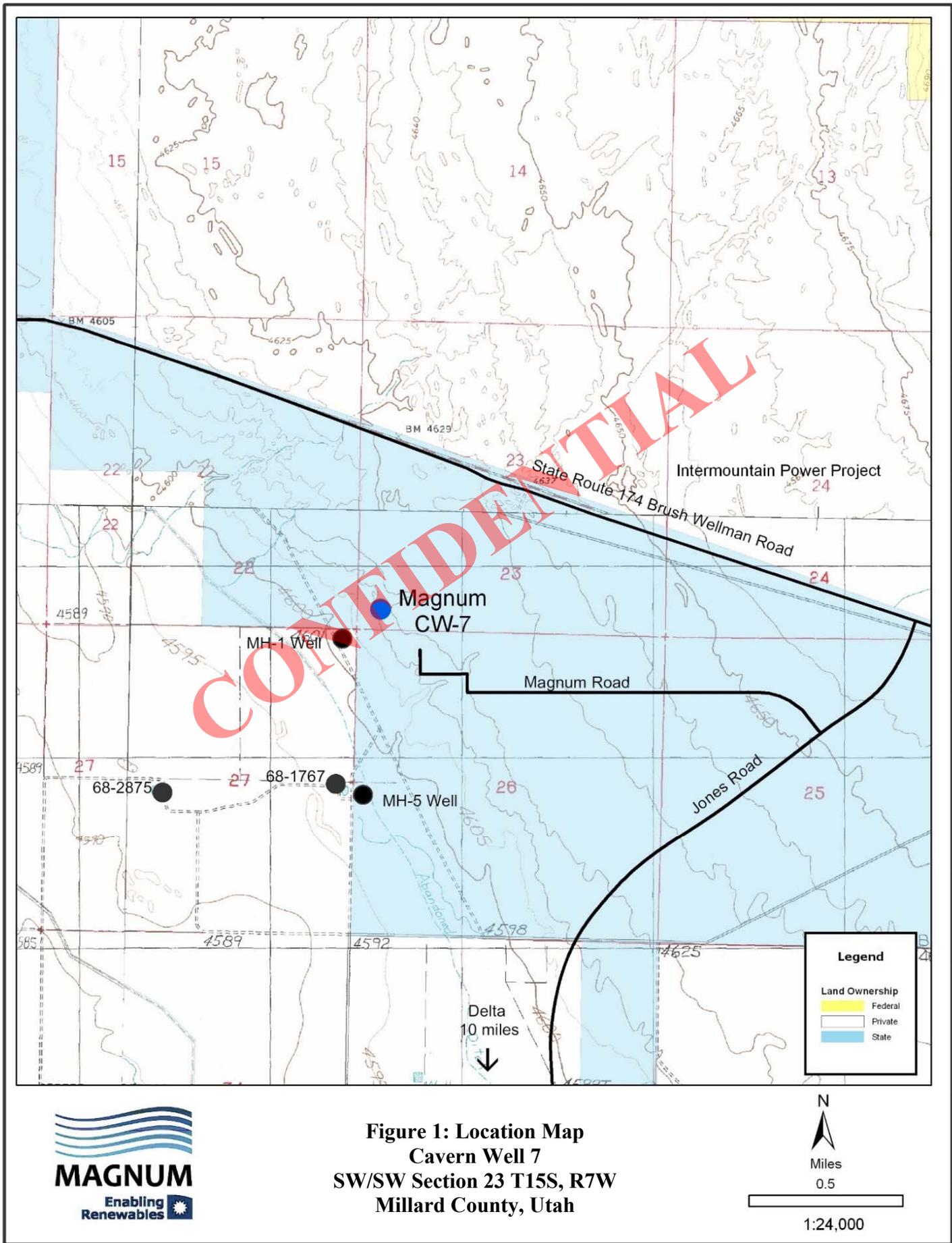


Figure 1: Location Map
Cavern Well 7
SW/SW Section 23 T15S, R7W
Millard County, Utah





Diana Mason <dianawhitney@utah.gov>

Magnum NGLS Solution Mining Approval

Jeff Conley <jconley@utah.gov>

Wed, Feb 5, 2014 at 11:57 AM

To: Diana Mason <dianawhitney@utah.gov>, Bradley Hill <bradhill@utah.gov>, james@westernenergyhub.com

Cc: Jim Davis <jimdavis1@utah.gov>

Hello,

The following well has been approved by SITLA:

[\(4302750004\)](#) CW-7

Thanks,

Jeff Conley
SITLA Resource Specialist
jconley@utah.gov
[801-538-5157](tel:801-538-5157)

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Site Stability Issues N**Drainage Diversion Required?** N

Small drainage present along the southeast edge of proposed pad.

Berm Required? N**Erosion Sedimentation Control Required?** N**Paleo Survey Run?** N **Paleo Potential Observed?** N **Cultural Survey Run?** Y **Cultural Resources?** N**Reserve Pit**

Site-Specific Factors	Site Ranking
Distance to Groundwater (feet) 25 to 75	15
Distance to Surface Water (feet) 300 to 1000	2
Dist. Nearest Municipal Well (ft) 1320 to 5280	5
Distance to Other Wells (feet) 300 to 1320	10
Native Soil Type Mod permeability	10
Fluid Type Fresh Water	5
Drill Cuttings Salt or Detrimental	10
Annual Precipitation (inches) 10 to 20	5
Affected Populations 10 to 30	10 to 30
Presence Nearby Utility Conduits Unknown	10
Final Score	78 3 Sensitivity Level

Characteristics / Requirements

Reserve pit will be constructed so as not to leak, break, or discharge. The reserve pit will be lined with a minimum of 20 mil plastic liner with felt placed between the ground and liner as requested from SITLA. The pit will be 100' x 150' x 12' in size. The reserve pit will be fenced once it has been lined.

Closed Loop Mud Required? N **Liner Required?** Y **Liner Thickness** 20 **Pit Underlayment Required?** Y**Other Observations / Comments**

Magnum Solutions Mining, LLC will use an open lined pit program. All pit fluids will be hauled to an approved disposal site for waste management once the well is completed. Fresh water source will be from Magnum's MH-1 well located approximately 400 feet southwest of the well location. Access to the site will be from State Highway # 174 to Millard County Road called Jones Road then continues on through SITLA property for approximately 0.07 mile on the new access road to API # 4302750003 & 4302750002. Millard County has issued Magnum a conditional use permit for use of their road. There are two large over head power lines located south of State Highway 174 and 0.5 mile to the north of the proposed location. There are two

occupied houses 0.75 mile southeast of the well location. There are 9 water wells within 1 mile of the well location, the closest being Magnum's MH-1 to the southwest. The Sevier River is located approximately 10 miles east. There is one PA well API #4302730012 within one mile of the proposed well site. The property is leased from SITLA using lease #51573-OBA. There currently is one grazing lease issued by SITLA for this area. There are no local disagreements by local landowners with this drilling program. Rig lights and noise may be seen and heard from the town of Delta. Photos are located in the well file.

Ammon McDonald
Evaluator

1/30/2014
Date / Time

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Application for Permit to Drill Statement of Basis

Utah Division of Oil, Gas and Mining

APD No	API WellNo	Status	Well Type	Surf Owner	CBM
9288	43027500040000	LOCKED	GS	S	No
Operator	MAGNUM NGLS SOLUTION MINING LLC		Surface Owner-APD		
Well Name	CW-7		Unit		
Field	WILDCAT		Type of Work	DRILL	
Location	SWSW 23 15S 7W S	852 FSL 91 FWL	GPS Coord		
	(UTM) 361417E	4373137N			

Geologic Statement of Basis

The proposed well location is in western Utah within the Basin & Range physiographic province. The mountains that bound the valley are composed of various sedimentary, metamorphic, and igneous rocks and the valley fill is composed of sands, silts, and gravels. These Tertiary and Quaternary aged valley deposits can be as thick as 7,000'. Oligocene and Miocene evaporite deposits have flowed over time to form a large salt dome, which is the drilling target. Magnum has proposed 150' of conductor pipe, 750' of surface casing, and 2,900' intermediate casing for this well. The holes for all three strings will be drilled with fresh water mud and the surface casing and intermediate casing will be cemented back to surface. A search of the Division of Water Rights database indicates that there are over 25 water wells within a 10,000' radius of the proposed location. These wells range in depth from 55' to 940'. Most of these wells are used for the source water for Magnum's project and the Intermountain Power Plant. Four wells near the outside radius and directly south are used for a combination of irrigation and/or stock watering. Magnum drilled several test wells during the initial phase of this project. These wells provided data to define the groundwater quality at depth for the proposed well. This data indicates that ground water quality begins to diminish below 2,500' and becomes saline at 3,000'. The proposed casing and cementing program should adequately protect usable groundwater in this area.

Ammon McDonald
APD Evaluator

2/3/2014
Date / Time

Surface Statement of Basis

A presite was conducted at 10:00am January 30, 2014. This area is easily accessed off State Highway 174. The proposed CW-7 pad runs in an east to west direction and is located in the Sevier Desert valley. The construction material needed for this location and access road will be obtained from a local gravel pit. The pad is located on a slight slope to the west. SITLA has requested that the reserve pit be lined with a 20 mil thick liner and that a subliner be placed between the ground and liner. The selected location for this well is suitable for drilling.

Ammon McDonald
Onsite Evaluator

1/30/2014
Date / Time

Conditions of Approval / Application for Permit to Drill

Category	Condition
Pits	A synthetic liner with a minimum thickness of 20 mils with a felt subliner shall be properly installed and maintained in the reserve pit.
Surface	The reserve pit shall be fenced upon completion of drilling operations.

Surface Drainages adjacent to the proposed pad shall be diverted around the location.

CONFIDENTIAL

WORKSHEET APPLICATION FOR PERMIT TO DRILL

APD RECEIVED: 1/18/2014

API NO. ASSIGNED: 43027500040000

WELL NAME: CW-7

OPERATOR: MAGNUM NGLS SOLUTION MINING LLC (N3995)

PHONE NUMBER: 801 993-7001

CONTACT: Tiffany A. James

PROPOSED LOCATION: SWSW 23 150S 070W

Permit Tech Review:

SURFACE: 0852 FSL 0091 FWL

Engineering Review:

BOTTOM: 0852 FSL 0091 FWL

Geology Review:

COUNTY: MILLARD

LATITUDE: 39.49669

LONGITUDE: -112.61170

UTM SURF EASTINGS: 361417.00

NORTHINGS: 4373137.00

FIELD NAME: WILDCAT

LEASE TYPE: 3 - State

LEASE NUMBER: 51573-OBA

PROPOSED PRODUCING FORMATION(S): SALT

SURFACE OWNER: 3 - State

COALBED METHANE: NO

RECEIVED AND/OR REVIEWED:

- PLAT
- Bond: STATE - BOO8497
- Potash
- Oil Shale 190-5
- Oil Shale 190-3
- Oil Shale 190-13
- Water Permit: 68-396
- RDCC Review: 2014-02-11 00:00:00.0
- Fee Surface Agreement
- Intent to Commingle

Commingle Approved

LOCATION AND SITING:

- R649-2-3.
- Unit:
- R649-3-2. General
- R649-3-3. Exception
- Drilling Unit
- Board Cause No: R649-3-3
- Effective Date:
- Siting:
- R649-3-11. Directional Drill

Comments: Presite Completed

Stipulations: 1 - Exception Location - dmason
 5 - Statement of Basis - bhll
 8 - Cement to Surface -- 2 strings - hmaconnald
 21 - RDCC - dmason
 23 - Spacing - dmason



GARY R. HERBERT
Governor

SPENCER J. COX
Lieutenant Governor

State of Utah

DEPARTMENT OF NATURAL RESOURCES

MICHAEL R. STYLER
Executive Director

Division of Oil, Gas and Mining

JOHN R. BAZA
Division Director

Permit To Drill

Well Name: CW-7

API Well Number: 43027500040000

Lease Number: 51573-OBA

Surface Owner: STATE

Approval Date: 2/11/2014

Issued to:

MAGNUM NGLS SOLUTION MINING LLC, 3165 East Millrock Drive Suite 330,
Holladay, UT 84121

Authority:

Pursuant to Utah Code Ann. 40-6-1 et seq., and Utah Administrative Code R649-3-1 et seq., the Utah Division of Oil, Gas and Mining issues conditions of approval, and permit to drill the listed well. This permit is issued in accordance with the requirements of R649-3-3. The expected producing formation or pool is the SALT Formation(s), completion into any other zones will require filing a Sundry Notice (Form 9). Completion and commingling of more than one pool will require approval in accordance with R649-3-22.

Duration:

This approval shall expire one year from the above date unless substantial and continuous operation is underway, or a request for extension is made prior to the expiration date

Exception Location:

Appropriate information has been submitted to DOGM and administrative approval of the requested exception location is hereby granted.

General:

Compliance with the requirements of Utah Admin. R. 649-1 et seq., the Oil and Gas Conservation General Rules, and the applicable terms and provisions of the approved Application for permit to drill.

Conditions of Approval:

The Application for Permit to Drill has been forwarded to the Resource Development Coordinating Committee for review of this action. The operator will be required to comply with any applicable recommendations resulting from this review. (See attached)

This proposed well is located in an area for which drilling units (well spacing patterns) have not been established through an order of the Board of Oil, Gas and Mining (the "Board"). In order to avoid the possibility of waste or injury to correlative rights, the operator is requested, once the well has been drilled, completed, and has produced, to analyze geological and engineering data generated

therefrom, as well as any similar data from surrounding areas if available. As soon as is practicable after completion of its analysis, and if the analysis suggests an area larger than the quarter-quarter section upon which the well is located is being drained, the operator is requested to seek an appropriate order from the Board establishing drilling and spacing units in conformance with such analysis by filing a Request for Agency Action with the Board.

Cement volumes for the 30", 24", 20" and 16" casing strings shall be determined from actual hole diameters in order to place cement from the pipe setting depths back to the surface, as stated in the submitted drill plan.

Compliance with the Conditions of Approval/Application for Permit to Drill outlined in the Statement of Basis (copy attached).

Additional Approvals:

The operator is required to obtain approval from the Division of Oil, Gas and mining before performing any of the following actions during the drilling of this well:

- Any changes to the approved drilling plan - contact Dustin Doucet
- Significant plug back of the well - contact Dustin Doucet
- Plug and abandonment of the well - contact Dustin Doucet

Notification Requirements:

The operator is required to notify the Division of Oil, Gas and Mining of the following actions during drilling of this well:

- Within 24 hours following the spudding of the well - contact Carol Daniels
OR
submit an electronic sundry notice (pre-registration required) via the Utah Oil & Gas website
at <http://oilgas.ogm.utah.gov>
- 24 hours prior to testing blowout prevention equipment - contact Dan Jarvis
- 24 hours prior to cementing or testing casing - contact Dan Jarvis
- Within 24 hours of making any emergency changes to the approved drilling program
- contact Dustin Doucet
- 24 hours prior to commencing operations to plug and abandon the well - contact Dan Jarvis

Contact Information:

The following are Division of Oil, Gas and Mining contacts and their telephone numbers (please leave a voicemail message if the person is not available to take the call):

- Carol Daniels 801-538-5284 - office
- Dustin Doucet 801-538-5281 - office
801-733-0983 - after office hours
- Dan Jarvis 801-538-5338 - office
801-231-8956 - after office hours

Reporting Requirements:

All reports, forms and submittals as required by the Utah Oil and Gas Conservation General Rules will be promptly filed with the Division of Oil, Gas and Mining, including but not limited to:

- Entity Action Form (Form 6) - due within 5 days of spudding the well
- Monthly Status Report (Form 9) - due by 5th day of the following calendar month
- Requests to Change Plans (Form 9) - due prior to implementation
- Written Notice of Emergency Changes (Form 9) - due within 5 days
- Notice of Operations Suspension or Resumption (Form 9) - due prior to implementation
- Report of Water Encountered (Form 7) - due within 30 days after completion
- Well Completion Report (Form 8) - due within 30 days after completion or plugging

Approved By:

A handwritten signature in black ink, appearing to read "John Rogers", written in a cursive style.

For John Rogers
Associate Director, Oil & Gas

STATE OF UTAH DEPARTMENT OF NATURAL RESOURCES DIVISION OF OIL, GAS, AND MINING		FORM 9																														
SUNDRY NOTICES AND REPORTS ON WELLS		5. LEASE DESIGNATION AND SERIAL NUMBER: 51573-OBA																														
Do not use this form for proposals to drill new wells, significantly deepen existing wells below current bottom-hole depth, reenter plugged wells, or to drill horizontal laterals. Use APPLICATION FOR PERMIT TO DRILL form for such proposals.		6. IF INDIAN, ALLOTTEE OR TRIBE NAME:																														
		7. UNIT or CA AGREEMENT NAME:																														
1. TYPE OF WELL Gas Storage Well		8. WELL NAME and NUMBER: CW-7																														
2. NAME OF OPERATOR: MAGNUM NGLS SOLUTION MINING LLC		9. API NUMBER: 43027500040000																														
3. ADDRESS OF OPERATOR: 3165 East Millrock Drive Suite 330 , Holladay, UT, 84121	PHONE NUMBER: 801 993-7001 Ext	9. FIELD and POOL or WILDCAT: WILDCAT																														
4. LOCATION OF WELL FOOTAGES AT SURFACE: 0852 FSL 0091 FWL QTR/QTR, SECTION, TOWNSHIP, RANGE, MERIDIAN: Qtr/Qtr: SWSW Section: 23 Township: 15.0S Range: 07.0W Meridian: S		COUNTY: MILLARD																														
		STATE: UTAH																														
11. CHECK APPROPRIATE BOXES TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA																																
TYPE OF SUBMISSION	TYPE OF ACTION																															
<input type="checkbox"/> NOTICE OF INTENT Approximate date work will start: <input checked="" type="checkbox"/> SUBSEQUENT REPORT Date of Work Completion: 8/14/2014 <input type="checkbox"/> SPUD REPORT Date of Spud: <input type="checkbox"/> DRILLING REPORT Report Date:	<table style="width: 100%; border: none;"> <tr> <td style="width: 33%;"><input type="checkbox"/> ACIDIZE</td> <td style="width: 33%;"><input type="checkbox"/> ALTER CASING</td> <td style="width: 33%;"><input type="checkbox"/> CASING REPAIR</td> </tr> <tr> <td><input type="checkbox"/> CHANGE TO PREVIOUS PLANS</td> <td><input type="checkbox"/> CHANGE TUBING</td> <td><input type="checkbox"/> CHANGE WELL NAME</td> </tr> <tr> <td><input type="checkbox"/> CHANGE WELL STATUS</td> <td><input type="checkbox"/> COMMINGLE PRODUCING FORMATIONS</td> <td><input type="checkbox"/> CONVERT WELL TYPE</td> </tr> <tr> <td><input type="checkbox"/> DEEPEN</td> <td><input type="checkbox"/> FRACTURE TREAT</td> <td><input type="checkbox"/> NEW CONSTRUCTION</td> </tr> <tr> <td><input type="checkbox"/> OPERATOR CHANGE</td> <td><input type="checkbox"/> PLUG AND ABANDON</td> <td><input type="checkbox"/> PLUG BACK</td> </tr> <tr> <td><input type="checkbox"/> PRODUCTION START OR RESUME</td> <td><input type="checkbox"/> RECLAMATION OF WELL SITE</td> <td><input type="checkbox"/> RECOMPLETE DIFFERENT FORMATION</td> </tr> <tr> <td><input type="checkbox"/> REPERFORATE CURRENT FORMATION</td> <td><input type="checkbox"/> SIDETRACK TO REPAIR WELL</td> <td><input type="checkbox"/> TEMPORARY ABANDON</td> </tr> <tr> <td><input type="checkbox"/> TUBING REPAIR</td> <td><input type="checkbox"/> VENT OR FLARE</td> <td><input type="checkbox"/> WATER DISPOSAL</td> </tr> <tr> <td><input type="checkbox"/> WATER SHUTOFF</td> <td><input type="checkbox"/> SI TA STATUS EXTENSION</td> <td><input type="checkbox"/> APD EXTENSION</td> </tr> <tr> <td><input type="checkbox"/> WILDCAT WELL DETERMINATION</td> <td><input checked="" type="checkbox"/> OTHER</td> <td>OTHER: <input style="width: 100px;" type="text" value="Cement 36-inch Conductor"/></td> </tr> </table>		<input type="checkbox"/> ACIDIZE	<input type="checkbox"/> ALTER CASING	<input type="checkbox"/> CASING REPAIR	<input type="checkbox"/> CHANGE TO PREVIOUS PLANS	<input type="checkbox"/> CHANGE TUBING	<input type="checkbox"/> CHANGE WELL NAME	<input type="checkbox"/> CHANGE WELL STATUS	<input type="checkbox"/> COMMINGLE PRODUCING FORMATIONS	<input type="checkbox"/> CONVERT WELL TYPE	<input type="checkbox"/> DEEPEN	<input type="checkbox"/> FRACTURE TREAT	<input type="checkbox"/> NEW CONSTRUCTION	<input type="checkbox"/> OPERATOR CHANGE	<input type="checkbox"/> PLUG AND ABANDON	<input type="checkbox"/> PLUG BACK	<input type="checkbox"/> PRODUCTION START OR RESUME	<input type="checkbox"/> RECLAMATION OF WELL SITE	<input type="checkbox"/> RECOMPLETE DIFFERENT FORMATION	<input type="checkbox"/> REPERFORATE CURRENT FORMATION	<input type="checkbox"/> SIDETRACK TO REPAIR WELL	<input type="checkbox"/> TEMPORARY ABANDON	<input type="checkbox"/> TUBING REPAIR	<input type="checkbox"/> VENT OR FLARE	<input type="checkbox"/> WATER DISPOSAL	<input type="checkbox"/> WATER SHUTOFF	<input type="checkbox"/> SI TA STATUS EXTENSION	<input type="checkbox"/> APD EXTENSION	<input type="checkbox"/> WILDCAT WELL DETERMINATION	<input checked="" type="checkbox"/> OTHER	OTHER: <input style="width: 100px;" type="text" value="Cement 36-inch Conductor"/>
<input type="checkbox"/> ACIDIZE	<input type="checkbox"/> ALTER CASING	<input type="checkbox"/> CASING REPAIR																														
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<input type="checkbox"/> WILDCAT WELL DETERMINATION	<input checked="" type="checkbox"/> OTHER	OTHER: <input style="width: 100px;" type="text" value="Cement 36-inch Conductor"/>																														
12. DESCRIBE PROPOSED OR COMPLETED OPERATIONS. Clearly show all pertinent details including dates, depths, volumes, etc.																																
Completed the cementing of the 36-inch O.D. x .750-inch conductor casing on August 14, 2014. The casing is comprised of four joints set to 158 bgs and 4,800 gallons/23.75 cy of cement was placed during the process.		Accepted by the Utah Division of Oil, Gas and Mining FOR RECORD ONLY August 27, 2014																														
NAME (PLEASE PRINT) Tiffany A. James	PHONE NUMBER 801 993-7001	TITLE Vice President Project Development																														
SIGNATURE N/A		DATE 8/17/2014																														

STATE OF UTAH DEPARTMENT OF NATURAL RESOURCES DIVISION OF OIL, GAS, AND MINING		FORM 9
SUNDRY NOTICES AND REPORTS ON WELLS Do not use this form for proposals to drill new wells, significantly deepen existing wells below current bottom-hole depth, reenter plugged wells, or to drill horizontal laterals. Use APPLICATION FOR PERMIT TO DRILL form for such proposals.		5. LEASE DESIGNATION AND SERIAL NUMBER: 51573-OBA
		6. IF INDIAN, ALLOTTEE OR TRIBE NAME:
1. TYPE OF WELL Gas Storage Well		7. UNIT or CA AGREEMENT NAME:
2. NAME OF OPERATOR: MAGNUM NGLS SOLUTION MINING LLC		8. WELL NAME and NUMBER: CW-7
3. ADDRESS OF OPERATOR: 3165 East Millrock Drive Suite 330 , Holladay, UT, 84121		9. API NUMBER: 43027500040000
PHONE NUMBER: 801 993-7001 Ext		9. FIELD and POOL or WILDCAT: WILDCAT
4. LOCATION OF WELL FOOTAGES AT SURFACE: 0852 FSL 0091 FWL QTR/QTR, SECTION, TOWNSHIP, RANGE, MERIDIAN: Qtr/Qtr: SWSW Section: 23 Township: 15.0S Range: 07.0W Meridian: S		COUNTY: MILLARD
		STATE: UTAH

11.

CHECK APPROPRIATE BOXES TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

TYPE OF SUBMISSION	TYPE OF ACTION		
<input type="checkbox"/> NOTICE OF INTENT Approximate date work will start:	<input type="checkbox"/> ACIDIZE	<input type="checkbox"/> ALTER CASING	<input type="checkbox"/> CASING REPAIR
<input checked="" type="checkbox"/> SUBSEQUENT REPORT Date of Work Completion: 8/24/2014	<input type="checkbox"/> CHANGE TO PREVIOUS PLANS	<input type="checkbox"/> CHANGE TUBING	<input type="checkbox"/> CHANGE WELL NAME
<input type="checkbox"/> SPUD REPORT Date of Spud:	<input type="checkbox"/> CHANGE WELL STATUS	<input type="checkbox"/> COMMINGLE PRODUCING FORMATIONS	<input type="checkbox"/> CONVERT WELL TYPE
<input type="checkbox"/> DRILLING REPORT Report Date:	<input type="checkbox"/> DEEPEN	<input type="checkbox"/> FRACTURE TREAT	<input type="checkbox"/> NEW CONSTRUCTION
	<input type="checkbox"/> OPERATOR CHANGE	<input type="checkbox"/> PLUG AND ABANDON	<input type="checkbox"/> PLUG BACK
	<input type="checkbox"/> PRODUCTION START OR RESUME	<input type="checkbox"/> RECLAMATION OF WELL SITE	<input type="checkbox"/> RECOMPLETE DIFFERENT FORMATION
	<input type="checkbox"/> REPERFORATE CURRENT FORMATION	<input type="checkbox"/> SIDETRACK TO REPAIR WELL	<input type="checkbox"/> TEMPORARY ABANDON
	<input type="checkbox"/> TUBING REPAIR	<input type="checkbox"/> VENT OR FLARE	<input type="checkbox"/> WATER DISPOSAL
	<input type="checkbox"/> WATER SHUTOFF	<input type="checkbox"/> SI TA STATUS EXTENSION	<input type="checkbox"/> APD EXTENSION
	<input type="checkbox"/> WILDCAT WELL DETERMINATION	<input checked="" type="checkbox"/> OTHER	OTHER: <input type="text" value="30-in Casing Pressure Test"/>

12. DESCRIBE PROPOSED OR COMPLETED OPERATIONS. Clearly show all pertinent details including dates, depths, volumes, etc.

Completed Pressure test of BOP and 30" diameter casing on 24 August 2014. Bottom of casing set at 750 feet bgs. Casing: 30" x 0.75" wall thickness. BOP: 21-1/4_2000 R73, CRA Serial No. 01337 Pressure Recorder: Barton, Instrument No. 118730, Calibration Date 11/8/13 Duration of test was 0.5 hrs with a starting pressure of 520psi. Pressure loss was 0 psi over the duration of the test (

**Accepted by the
Utah Division of
Oil, Gas and Mining
FOR RECORD ONLY
August 28, 2014**

NAME (PLEASE PRINT) Tiffany A. James	PHONE NUMBER 801 993-7001	TITLE Vice President Project Development
SIGNATURE N/A	DATE 8/27/2014	

STATE OF UTAH DEPARTMENT OF NATURAL RESOURCES DIVISION OF OIL, GAS, AND MINING		FORM 9
SUNDRY NOTICES AND REPORTS ON WELLS Do not use this form for proposals to drill new wells, significantly deepen existing wells below current bottom-hole depth, reenter plugged wells, or to drill horizontal laterals. Use APPLICATION FOR PERMIT TO DRILL form for such proposals.		5. LEASE DESIGNATION AND SERIAL NUMBER: 51573-OBA
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2. NAME OF OPERATOR: MAGNUM NGLS SOLUTION MINING LLC		8. WELL NAME and NUMBER: CW-7
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		STATE: UTAH

11.

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TYPE OF SUBMISSION	TYPE OF ACTION		
<input type="checkbox"/> NOTICE OF INTENT Approximate date work will start:	<input type="checkbox"/> ACIDIZE	<input type="checkbox"/> ALTER CASING	<input type="checkbox"/> CASING REPAIR
<input checked="" type="checkbox"/> SUBSEQUENT REPORT Date of Work Completion: 8/31/2014	<input type="checkbox"/> CHANGE TO PREVIOUS PLANS	<input type="checkbox"/> CHANGE TUBING	<input type="checkbox"/> CHANGE WELL NAME
<input type="checkbox"/> SPUD REPORT Date of Spud:	<input type="checkbox"/> CHANGE WELL STATUS	<input type="checkbox"/> COMMINGLE PRODUCING FORMATIONS	<input type="checkbox"/> CONVERT WELL TYPE
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	<input type="checkbox"/> TUBING REPAIR	<input type="checkbox"/> VENT OR FLARE	<input type="checkbox"/> WATER DISPOSAL
	<input type="checkbox"/> WATER SHUTOFF	<input type="checkbox"/> SI TA STATUS EXTENSION	<input type="checkbox"/> APD EXTENSION
	<input type="checkbox"/> WILDCAT WELL DETERMINATION	<input checked="" type="checkbox"/> OTHER	OTHER: <input type="text" value="Monthly Status Report"/>

12. DESCRIBE PROPOSED OR COMPLETED OPERATIONS. Clearly show all pertinent details including dates, depths, volumes, etc.

Magnum Cavern Well CW-7 Monthly Status Report for August, 2014 (API No. 4302750004): See Attached Summary Report. Drilling activities were in direct accordance with project specifications and Utah DOGM Application Permit to Drill requirements.

**Accepted by the
Utah Division of
Oil, Gas and Mining
FOR RECORD ONLY
September 09, 2014**

NAME (PLEASE PRINT) Tiffany A. James	PHONE NUMBER 801 993-7001	TITLE Vice President Project Development
SIGNATURE N/A	DATE 9/9/2014	

Magnum Cavern Well # CW-7 – August 2014 Monthly Status Report Summary

- 21 July, 2014:** Boart Longyear started mobilizing equipment to CW-7 well location in Delta UT.
- 22 July- 7 August, 2014:** Boart Longyear set up the drill rig.
- 08-11 August, 2014:** Tripped in and dilled with the 44" bit from 15ft to 160ft.
- 11-12 August, 2014:** Installed and cemented the 36" casing. Casing was landed at 158 bgs. and cemented with 23.75 cy.
- 12-16 August, 2014:** Tripped in and drilled with the 17.5" pilot bit from 160ft to 755ft.
- 16 August, 2014:** Conditioned the drilling mud and tripped out of the hole. Ran the wireline log on the drill hole, to a depth of 750ft.
- 17-20 August, 2014:** Trip in with the 34" bit and reamed the hole from 160ft to 770ft.
- 21 August, 2014:** Conditioned the drilling mud and tripped out of the hole. Ran wireline Volume Calibration and started installing the 30" casing.
- 22 August, 2014:** Landed the 30" casing at 750ft bgs., and cemented in the 30" with 1,539 ft³ of cement.
- 23 August, 2014:** Waiting on cement to cure.
- 24 August, 2014:** Assemble BOP and start pressure test of 30" casing. The surface pressure test was completed successfully, and was within Project & Permit Specifications.
- Test results: 30-minute duration test. Surface test pressure: 500 psi. Pressure Loss: 0 (0%)**
- 25-31 August, 2014:** Tripped in and drilled with the 17.5" pilot bit from 760ft to 1,975ft.

STATE OF UTAH DEPARTMENT OF NATURAL RESOURCES DIVISION OF OIL, GAS, AND MINING		FORM 9
SUNDRY NOTICES AND REPORTS ON WELLS		5. LEASE DESIGNATION AND SERIAL NUMBER: 51573-OBA
Do not use this form for proposals to drill new wells, significantly deepen existing wells below current bottom-hole depth, reenter plugged wells, or to drill horizontal laterals. Use APPLICATION FOR PERMIT TO DRILL form for such proposals.		6. IF INDIAN, ALLOTTEE OR TRIBE NAME:
		7. UNIT or CA AGREEMENT NAME:
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3. ADDRESS OF OPERATOR: 3165 East Millrock Drive Suite 330 , Holladay, UT, 84121	PHONE NUMBER: 801 993-7001 Ext	9. FIELD and POOL or WILDCAT: WILDCAT
4. LOCATION OF WELL FOOTAGES AT SURFACE: 0852 FSL 0091 FWL QTR/QTR, SECTION, TOWNSHIP, RANGE, MERIDIAN: Qtr/Qtr: SWSW Section: 23 Township: 15.0S Range: 07.0W Meridian: S		COUNTY: MILLARD
		STATE: UTAH
11. CHECK APPROPRIATE BOXES TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA		
TYPE OF SUBMISSION	TYPE OF ACTION	
<input type="checkbox"/> NOTICE OF INTENT Approximate date work will start:	<input type="checkbox"/> ACIDIZE <input type="checkbox"/> CHANGE TO PREVIOUS PLANS <input type="checkbox"/> CHANGE WELL STATUS <input type="checkbox"/> DEEPEN <input type="checkbox"/> OPERATOR CHANGE <input type="checkbox"/> PRODUCTION START OR RESUME <input type="checkbox"/> REPERFORATE CURRENT FORMATION <input type="checkbox"/> TUBING REPAIR <input type="checkbox"/> WATER SHUTOFF <input type="checkbox"/> WILDCAT WELL DETERMINATION	<input type="checkbox"/> ALTER CASING <input type="checkbox"/> CHANGE TUBING <input type="checkbox"/> COMMINGLE PRODUCING FORMATIONS <input type="checkbox"/> FRACTURE TREAT <input type="checkbox"/> PLUG AND ABANDON <input type="checkbox"/> RECLAMATION OF WELL SITE <input type="checkbox"/> SIDETRACK TO REPAIR WELL <input type="checkbox"/> VENT OR FLARE <input type="checkbox"/> SI TA STATUS EXTENSION <input checked="" type="checkbox"/> OTHER
<input checked="" type="checkbox"/> SUBSEQUENT REPORT Date of Work Completion: 9/27/2014		<input type="checkbox"/> CASING REPAIR <input type="checkbox"/> CHANGE WELL NAME <input type="checkbox"/> CONVERT WELL TYPE <input type="checkbox"/> NEW CONSTRUCTION <input type="checkbox"/> PLUG BACK <input type="checkbox"/> RECOMPLETE DIFFERENT FORMATION <input type="checkbox"/> TEMPORARY ABANDON <input type="checkbox"/> WATER DISPOSAL <input type="checkbox"/> APD EXTENSION
<input type="checkbox"/> SPUD REPORT Date of Spud:		OTHER: <input style="width: 100px;" type="text" value="Cement 24"/>
<input type="checkbox"/> DRILLING REPORT Report Date:		
12. DESCRIBE PROPOSED OR COMPLETED OPERATIONS. Clearly show all pertinent details including dates, depths, volumes, etc.		
<p>On 9/27/2014 Boart Longyear and Therma Source completed the cementing of 1262.36 feet of 24" O.D. x 1" wall thickness and 1576.83 feet of 24" O.D. x .750" wall thickness casing on well CW-7; the casing was set to 2839.19 feet bgs. Therma Source mixed 838 bbl. of cement and 506 bbl. of water, and was pumped into the annular space around the casing using the stab-in cementing method.</p>		<p>Accepted by the Utah Division of Oil, Gas and Mining FOR RECORD ONLY October 02, 2014</p>
NAME (PLEASE PRINT) Tiffany A. James	PHONE NUMBER 801 993-7001	TITLE Vice President Project Development
SIGNATURE N/A		DATE 10/2/2014

INSTRUCTIONS

This form shall be submitted by the operator to show the intention and/or completion of the following:

- miscellaneous work projects and actions for which other specific report forms do not exist;
- all other work and events as identified in section 11, Type of Action, or as required by the Utah Oil and Gas Conservation General Rules, including:
 - minor deepening of an existing well bore,
 - plugging back a well,
 - recompleting to a different producing formation within an existing well bore (intent only),
 - re-perforating the current producing formation,
 - drilling a sidetrack to repair a well,
 - reporting monthly the status of each drilling well.

This form is not to be used for proposals to

- drill new wells,
- reenter previously plugged and abandoned wells,
- significantly deepen existing wells below their current bottom-hole depth,
- drill horizontal laterals from an existing well bore,
- drill hydrocarbon exploratory holes such as core samples and stratigraphic tests.

Use Form 3, Application for Permit to Drill (APD) for such proposals.

NOTICE OF INTENT - A notice of intention to do work on a well or to change plans previously approved shall be submitted in duplicate and must be received and approved by the division before the work is commenced. The operator is responsible for receipt of the notice by the division in ample time for proper consideration and action. In cases of emergency, the operator may obtain verbal approval to commence work. Within five days after receiving verbal approval, the operator shall submit a Sundry Notice describing the work and acknowledging the verbal approval.

SUBSEQUENT REPORT - A subsequent report shall be submitted to the division within 30 days of the completion of the outlined work. Specific details of the work performed should be provided, including dates, well depths, placement of plugs, etc.

WELL ABANDONMENT - Proposals to abandon a well and subsequent reports of abandonment should include reasons for the abandonment; data on any former or present productive zones, or other zones with present significant fluid contents not sealed off by cement or otherwise; depths (top and bottom) and method of placement of cement plugs; mud or other material placed below, between and above plugs; amount, size, and method of parting of any casing, liner, or tubing pulled and the depth to top of any left in the hole; method of closing top of well; and date well site conditioned for final inspection looking to approval of the abandonment.

In addition to any Sundry Notice forms submitted, **Form 8, Well Completion or Recompletion Report and Log** must be submitted to the division to report the results of the following operations:

- completing or plugging a new well,
- reentering a previously plugged and abandoned well,
- significantly deepening an existing well bore below the current bottom-hole depth,
- drilling horizontal laterals from an existing well bore,
- drilling hydrocarbon exploratory holes such as core samples and stratigraphic tests,
- recompleting to a different producing formation.

Send to:

Utah Division of Oil, Gas and Mining
1594 West North Temple, Suite 1210
Box 145801
Salt Lake City, Utah 84114-5801

Phone: 801-538-5340

Fax: 801-359-3940

STATE OF UTAH DEPARTMENT OF NATURAL RESOURCES DIVISION OF OIL, GAS, AND MINING		FORM 9
SUNDRY NOTICES AND REPORTS ON WELLS Do not use this form for proposals to drill new wells, significantly deepen existing wells below current bottom-hole depth, reenter plugged wells, or to drill horizontal laterals. Use APPLICATION FOR PERMIT TO DRILL form for such proposals.		5. LEASE DESIGNATION AND SERIAL NUMBER: 51573-OBA
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3. ADDRESS OF OPERATOR: 3165 East Millrock Drive Suite 330 , Holladay, UT, 84121		9. API NUMBER: 43027500040000
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TYPE OF SUBMISSION	TYPE OF ACTION	
<input type="checkbox"/> NOTICE OF INTENT Approximate date work will start:	<input type="checkbox"/> ACIDIZE <input type="checkbox"/> ALTER CASING <input type="checkbox"/> CASING REPAIR <input type="checkbox"/> CHANGE TO PREVIOUS PLANS <input type="checkbox"/> CHANGE TUBING <input type="checkbox"/> CHANGE WELL NAME <input type="checkbox"/> CHANGE WELL STATUS <input type="checkbox"/> COMMINGLE PRODUCING FORMATIONS <input type="checkbox"/> CONVERT WELL TYPE <input type="checkbox"/> DEEPEN <input type="checkbox"/> FRACTURE TREAT <input type="checkbox"/> NEW CONSTRUCTION <input type="checkbox"/> OPERATOR CHANGE <input type="checkbox"/> PLUG AND ABANDON <input type="checkbox"/> PLUG BACK <input type="checkbox"/> PRODUCTION START OR RESUME <input type="checkbox"/> RECLAMATION OF WELL SITE <input type="checkbox"/> RECOMPLETE DIFFERENT FORMATION <input type="checkbox"/> REPERFORATE CURRENT FORMATION <input type="checkbox"/> SIDETRACK TO REPAIR WELL <input type="checkbox"/> TEMPORARY ABANDON <input type="checkbox"/> TUBING REPAIR <input type="checkbox"/> VENT OR FLARE <input type="checkbox"/> WATER DISPOSAL <input type="checkbox"/> WATER SHUTOFF <input type="checkbox"/> SI TA STATUS EXTENSION <input type="checkbox"/> WILDCAT WELL DETERMINATION <input checked="" type="checkbox"/> OTHER	
<input checked="" type="checkbox"/> SUBSEQUENT REPORT Date of Work Completion: 9/29/2014	<input type="checkbox"/> RECLAMATION OF WELL SITE <input type="checkbox"/> RECOMPLETE DIFFERENT FORMATION <input type="checkbox"/> TEMPORARY ABANDON <input type="checkbox"/> WATER DISPOSAL <input type="checkbox"/> APD EXTENSION OTHER: <input style="width: 50px;" type="text" value="24"/>	
<input type="checkbox"/> SPUD REPORT Date of Spud:	<input type="checkbox"/> RECLAMATION OF WELL SITE <input type="checkbox"/> RECOMPLETE DIFFERENT FORMATION <input type="checkbox"/> TEMPORARY ABANDON <input type="checkbox"/> WATER DISPOSAL <input type="checkbox"/> APD EXTENSION	
<input type="checkbox"/> DRILLING REPORT Report Date:	<input type="checkbox"/> RECLAMATION OF WELL SITE <input type="checkbox"/> RECOMPLETE DIFFERENT FORMATION <input type="checkbox"/> TEMPORARY ABANDON <input type="checkbox"/> WATER DISPOSAL <input type="checkbox"/> APD EXTENSION	
12. DESCRIBE PROPOSED OR COMPLETED OPERATIONS. Clearly show all pertinent details including dates, depths, volumes, etc. Completed Pressure test of BOP and 24" diameter casing on 29 September 2014. Bottom of casing set at 2839.03 feet bgs. Casing: 1262.36 ft of 24" x 1" and 1577.73 ft of 24" x 0.75" wall thickness. BOP: 21-1/4_2000 R73, CRA Serial No. 01337 Pressure Recorder: Barton, Instrument No. 118730, Calibration Date 11/8/13. Duration of test was 0.5 hrs with a starting pressure of 920 psi. Pressure loss was 70 psi over the duration of the test (
Accepted by the Utah Division of Oil, Gas and Mining FOR RECORD ONLY October 07, 2014		
NAME (PLEASE PRINT) Tiffany A. James	PHONE NUMBER 801 993-7001	TITLE Vice President Project Development
SIGNATURE N/A	DATE 10/2/2014	

CW-7 24" Casing Pressure Test	
Time	Pressure (psi)
8:14	920
8:19	910
8:24	900
8:29	885
8:34	870
8:39	860
8:44	850
8:49	840
8:54	830
8:59	825
9:04	815
9:09	810
9:14	800

STATE OF UTAH DEPARTMENT OF NATURAL RESOURCES DIVISION OF OIL, GAS, AND MINING		FORM 9
SUNDRY NOTICES AND REPORTS ON WELLS Do not use this form for proposals to drill new wells, significantly deepen existing wells below current bottom-hole depth, reenter plugged wells, or to drill horizontal laterals. Use APPLICATION FOR PERMIT TO DRILL form for such proposals.		5. LEASE DESIGNATION AND SERIAL NUMBER: 51573-OBA
		6. IF INDIAN, ALLOTTEE OR TRIBE NAME:
		7. UNIT or CA AGREEMENT NAME:
1. TYPE OF WELL Gas Storage Well		8. WELL NAME and NUMBER: CW-7
2. NAME OF OPERATOR: MAGNUM NGLS SOLUTION MINING LLC		9. API NUMBER: 43027500040000
3. ADDRESS OF OPERATOR: 3165 East Millrock Drive Suite 330 , Holladay, UT, 84121		9. FIELD and POOL or WILDCAT: WILDCAT
4. LOCATION OF WELL FOOTAGES AT SURFACE: 0852 FSL 0091 FWL QTR/QTR, SECTION, TOWNSHIP, RANGE, MERIDIAN: Qtr/Qtr: SWSW Section: 23 Township: 15.0S Range: 07.0W Meridian: S		COUNTY: MILLARD
		STATE: UTAH
11. CHECK APPROPRIATE BOXES TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA		
TYPE OF SUBMISSION	TYPE OF ACTION	
<input type="checkbox"/> NOTICE OF INTENT Approximate date work will start:	<input type="checkbox"/> ACIDIZE <input type="checkbox"/> ALTER CASING <input type="checkbox"/> CASING REPAIR <input type="checkbox"/> CHANGE TO PREVIOUS PLANS <input type="checkbox"/> CHANGE TUBING <input type="checkbox"/> CHANGE WELL NAME <input type="checkbox"/> CHANGE WELL STATUS <input type="checkbox"/> COMMINGLE PRODUCING FORMATIONS <input type="checkbox"/> CONVERT WELL TYPE <input type="checkbox"/> DEEPEN <input type="checkbox"/> FRACTURE TREAT <input type="checkbox"/> NEW CONSTRUCTION <input type="checkbox"/> OPERATOR CHANGE <input type="checkbox"/> PLUG AND ABANDON <input type="checkbox"/> PLUG BACK <input type="checkbox"/> PRODUCTION START OR RESUME <input type="checkbox"/> RECLAMATION OF WELL SITE <input type="checkbox"/> RECOMPLETE DIFFERENT FORMATION <input type="checkbox"/> REPERFORATE CURRENT FORMATION <input type="checkbox"/> SIDETRACK TO REPAIR WELL <input type="checkbox"/> TEMPORARY ABANDON <input type="checkbox"/> TUBING REPAIR <input type="checkbox"/> VENT OR FLARE <input type="checkbox"/> WATER DISPOSAL <input type="checkbox"/> WATER SHUTOFF <input type="checkbox"/> SI TA STATUS EXTENSION <input type="checkbox"/> WILDCAT WELL DETERMINATION <input checked="" type="checkbox"/> OTHER	
<input checked="" type="checkbox"/> SUBSEQUENT REPORT Date of Work Completion: 10/7/2014	<input type="checkbox"/> OTHER: <input type="text" value="Monthly Status Report Septe"/>	
<input type="checkbox"/> SPUD REPORT Date of Spud:	<input type="checkbox"/> DRILLING REPORT Report Date:	
12. DESCRIBE PROPOSED OR COMPLETED OPERATIONS. Clearly show all pertinent details including dates, depths, volumes, etc.		
Magnum Cavern Well CW-7 Monthly Status Report for September, 2014 (API No. 4302750004): See Attached Summary Report. Drilling activities were in direct accordance with project specifications and Utah DOGM Application Permit to Drill requirements.		
Accepted by the Utah Division of Oil, Gas and Mining FOR RECORD ONLY October 09, 2014		
NAME (PLEASE PRINT) Tiffany A. James	PHONE NUMBER 801 993-7001	TITLE Vice President Project Development
SIGNATURE N/A	DATE 10/9/2014	

Magnum Cavern Well # CW-7 – September 2014 Monthly Status Report Summary

- 01-07 September, 2014:** Continued drilling with the 17.5" pilot bit from 1975ft to 2850ft.
- 08 September, 2014:** Ran wireline logs on the hole.
- 08-24 September, 2014:** Tripped in with the 28" bit and opened the hole from 760ft to 2850ft.
- 25 September, 2014:** Conditioned the drilling mud and tripped out of the hole. Century ran the wireline Volume Calibration.
- 25-26 September, 2014:** Installed the 24 inch casing to a depth of 2839.19ft bgs.
- 26-27 September, 2014:** Cemented in the 24 inch casing with 838 BBL of cement.
- 28 September, 2014:** Waited on cement to cure.
- 29 September, 2014:** Assemble BOP and start pressure test of 34 inch casing. The surface pressure test was completed successfully, and was within Project & Permit Specifications.
- Test results: 30-minute duration test. Surface test pressure: 920 psi. Pressure Loss: 70 (<10%)**
- 30 September, 2014:** Tripped in and drilled with the 17.5" pilot bit from 2830ft to 2851ft. Flushed the old drilling mud out of hole and began drilling with the brine mud.

STATE OF UTAH DEPARTMENT OF NATURAL RESOURCES DIVISION OF OIL, GAS, AND MINING		FORM 9																														
		5. LEASE DESIGNATION AND SERIAL NUMBER: 51573-OBA																														
SUNDRY NOTICES AND REPORTS ON WELLS		6. IF INDIAN, ALLOTTEE OR TRIBE NAME:																														
Do not use this form for proposals to drill new wells, significantly deepen existing wells below current bottom-hole depth, reenter plugged wells, or to drill horizontal laterals. Use APPLICATION FOR PERMIT TO DRILL form for such proposals.		7. UNIT or CA AGREEMENT NAME:																														
1. TYPE OF WELL Gas Storage Well		8. WELL NAME and NUMBER: CW-7																														
2. NAME OF OPERATOR: MAGNUM NGLS SOLUTION MINING LLC		9. API NUMBER: 43027500040000																														
3. ADDRESS OF OPERATOR: 3165 East Millrock Drive Suite 330 , Holladay, UT, 84121	PHONE NUMBER: 801 993-7001 Ext	9. FIELD and POOL or WILDCAT: WILDCAT																														
4. LOCATION OF WELL FOOTAGES AT SURFACE: 0852 FSL 0091 FWL QTR/QTR, SECTION, TOWNSHIP, RANGE, MERIDIAN: Qtr/Qtr: SWSW Section: 23 Township: 15.0S Range: 07.0W Meridian: S		COUNTY: MILLARD																														
		STATE: UTAH																														
11. CHECK APPROPRIATE BOXES TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA																																
TYPE OF SUBMISSION	TYPE OF ACTION																															
<input type="checkbox"/> NOTICE OF INTENT Approximate date work will start: <input checked="" type="checkbox"/> SUBSEQUENT REPORT Date of Work Completion: 10/14/2014 <input type="checkbox"/> SPUD REPORT Date of Spud: <input type="checkbox"/> DRILLING REPORT Report Date:	<table style="width: 100%; border: none;"> <tr> <td style="width: 33%;"><input type="checkbox"/> ACIDIZE</td> <td style="width: 33%;"><input type="checkbox"/> ALTER CASING</td> <td style="width: 33%;"><input type="checkbox"/> CASING REPAIR</td> </tr> <tr> <td><input type="checkbox"/> CHANGE TO PREVIOUS PLANS</td> <td><input type="checkbox"/> CHANGE TUBING</td> <td><input type="checkbox"/> CHANGE WELL NAME</td> </tr> <tr> <td><input type="checkbox"/> CHANGE WELL STATUS</td> <td><input type="checkbox"/> COMMINGLE PRODUCING FORMATIONS</td> <td><input type="checkbox"/> CONVERT WELL TYPE</td> </tr> <tr> <td><input type="checkbox"/> DEEPEN</td> <td><input type="checkbox"/> FRACTURE TREAT</td> <td><input type="checkbox"/> NEW CONSTRUCTION</td> </tr> <tr> <td><input type="checkbox"/> OPERATOR CHANGE</td> <td><input type="checkbox"/> PLUG AND ABANDON</td> <td><input type="checkbox"/> PLUG BACK</td> </tr> <tr> <td><input type="checkbox"/> PRODUCTION START OR RESUME</td> <td><input type="checkbox"/> RECLAMATION OF WELL SITE</td> <td><input type="checkbox"/> RECOMPLETE DIFFERENT FORMATION</td> </tr> <tr> <td><input type="checkbox"/> REPERFORATE CURRENT FORMATION</td> <td><input type="checkbox"/> SIDETRACK TO REPAIR WELL</td> <td><input type="checkbox"/> TEMPORARY ABANDON</td> </tr> <tr> <td><input type="checkbox"/> TUBING REPAIR</td> <td><input type="checkbox"/> VENT OR FLARE</td> <td><input type="checkbox"/> WATER DISPOSAL</td> </tr> <tr> <td><input type="checkbox"/> WATER SHUTOFF</td> <td><input type="checkbox"/> SI TA STATUS EXTENSION</td> <td><input type="checkbox"/> APD EXTENSION</td> </tr> <tr> <td><input type="checkbox"/> WILDCAT WELL DETERMINATION</td> <td><input checked="" type="checkbox"/> OTHER</td> <td>OTHER: <input style="width: 100px;" type="text" value="Cement 20 inch casing"/></td> </tr> </table>		<input type="checkbox"/> ACIDIZE	<input type="checkbox"/> ALTER CASING	<input type="checkbox"/> CASING REPAIR	<input type="checkbox"/> CHANGE TO PREVIOUS PLANS	<input type="checkbox"/> CHANGE TUBING	<input type="checkbox"/> CHANGE WELL NAME	<input type="checkbox"/> CHANGE WELL STATUS	<input type="checkbox"/> COMMINGLE PRODUCING FORMATIONS	<input type="checkbox"/> CONVERT WELL TYPE	<input type="checkbox"/> DEEPEN	<input type="checkbox"/> FRACTURE TREAT	<input type="checkbox"/> NEW CONSTRUCTION	<input type="checkbox"/> OPERATOR CHANGE	<input type="checkbox"/> PLUG AND ABANDON	<input type="checkbox"/> PLUG BACK	<input type="checkbox"/> PRODUCTION START OR RESUME	<input type="checkbox"/> RECLAMATION OF WELL SITE	<input type="checkbox"/> RECOMPLETE DIFFERENT FORMATION	<input type="checkbox"/> REPERFORATE CURRENT FORMATION	<input type="checkbox"/> SIDETRACK TO REPAIR WELL	<input type="checkbox"/> TEMPORARY ABANDON	<input type="checkbox"/> TUBING REPAIR	<input type="checkbox"/> VENT OR FLARE	<input type="checkbox"/> WATER DISPOSAL	<input type="checkbox"/> WATER SHUTOFF	<input type="checkbox"/> SI TA STATUS EXTENSION	<input type="checkbox"/> APD EXTENSION	<input type="checkbox"/> WILDCAT WELL DETERMINATION	<input checked="" type="checkbox"/> OTHER	OTHER: <input style="width: 100px;" type="text" value="Cement 20 inch casing"/>
<input type="checkbox"/> ACIDIZE	<input type="checkbox"/> ALTER CASING	<input type="checkbox"/> CASING REPAIR																														
<input type="checkbox"/> CHANGE TO PREVIOUS PLANS	<input type="checkbox"/> CHANGE TUBING	<input type="checkbox"/> CHANGE WELL NAME																														
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12. DESCRIBE PROPOSED OR COMPLETED OPERATIONS. Clearly show all pertinent details including dates, depths, volumes, etc.																																
<p>On 10/14/2014 Boart Longyear and ThermaSource completed the cementing of 1,660.69 feet of 20" O.D. x 1.0" wall thickness and 1,525.31 feet of 20" O.D. x 0.625" wall thickness casing on well CW-7. The casing was set to 3,186 feet bgs. ThermaSource mixed 372 bbl. of cement was pumped into the annular space around the casing using the stab-in cementing method. Approximately 67 barrels of cement were returned to surface.</p>		<p>Accepted by the Utah Division of Oil, Gas and Mining FOR RECORD ONLY October 16, 2014</p>																														
NAME (PLEASE PRINT) Tiffany A. James	PHONE NUMBER 801 993-7001	TITLE Vice President Project Development																														
SIGNATURE N/A		DATE 10/16/2014																														

STATE OF UTAH DEPARTMENT OF NATURAL RESOURCES DIVISION OF OIL, GAS, AND MINING		FORM 9	
SUNDRY NOTICES AND REPORTS ON WELLS		5. LEASE DESIGNATION AND SERIAL NUMBER: 51573-OBA	
Do not use this form for proposals to drill new wells, significantly deepen existing wells below current bottom-hole depth, reenter plugged wells, or to drill horizontal laterals. Use APPLICATION FOR PERMIT TO DRILL form for such proposals.		6. IF INDIAN, ALLOTTEE OR TRIBE NAME:	
		7. UNIT or CA AGREEMENT NAME:	
1. TYPE OF WELL Gas Storage Well		8. WELL NAME and NUMBER: CW-7	
2. NAME OF OPERATOR: MAGNUM NGLS SOLUTION MINING LLC		9. API NUMBER: 43027500040000	
3. ADDRESS OF OPERATOR: 3165 East Millrock Drive Suite 330 , Holladay, UT, 84121	PHONE NUMBER: 801 993-7001 Ext	9. FIELD and POOL or WILDCAT: WILDCAT	
4. LOCATION OF WELL FOOTAGES AT SURFACE: 0852 FSL 0091 FWL QTR/QTR, SECTION, TOWNSHIP, RANGE, MERIDIAN: Qtr/Qtr: SWSW Section: 23 Township: 15.0S Range: 07.0W Meridian: S		COUNTY: MILLARD	
		STATE: UTAH	
11. CHECK APPROPRIATE BOXES TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA			
TYPE OF SUBMISSION	TYPE OF ACTION		
<input type="checkbox"/> NOTICE OF INTENT Approximate date work will start:	<input type="checkbox"/> ACIDIZE <input type="checkbox"/> CHANGE TO PREVIOUS PLANS <input type="checkbox"/> CHANGE WELL STATUS <input type="checkbox"/> DEEPEN <input type="checkbox"/> OPERATOR CHANGE <input type="checkbox"/> PRODUCTION START OR RESUME <input type="checkbox"/> REPERFORATE CURRENT FORMATION <input type="checkbox"/> TUBING REPAIR <input type="checkbox"/> WATER SHUTOFF <input type="checkbox"/> WILDCAT WELL DETERMINATION	<input type="checkbox"/> ALTER CASING <input type="checkbox"/> CHANGE TUBING <input type="checkbox"/> COMMINGLE PRODUCING FORMATIONS <input type="checkbox"/> FRACTURE TREAT <input type="checkbox"/> PLUG AND ABANDON <input type="checkbox"/> RECLAMATION OF WELL SITE <input type="checkbox"/> SIDETRACK TO REPAIR WELL <input type="checkbox"/> VENT OR FLARE <input type="checkbox"/> SI TA STATUS EXTENSION <input checked="" type="checkbox"/> OTHER	<input type="checkbox"/> CASING REPAIR <input type="checkbox"/> CHANGE WELL NAME <input type="checkbox"/> CONVERT WELL TYPE <input type="checkbox"/> NEW CONSTRUCTION <input type="checkbox"/> PLUG BACK <input type="checkbox"/> RECOMPLETE DIFFERENT FORMATION <input type="checkbox"/> TEMPORARY ABANDON <input type="checkbox"/> WATER DISPOSAL <input type="checkbox"/> APD EXTENSION OTHER: <input style="width: 100px;" type="text" value="20 casing pressure test"/>
<input checked="" type="checkbox"/> SUBSEQUENT REPORT Date of Work Completion: 10/18/2014			
<input type="checkbox"/> SPUD REPORT Date of Spud:			
<input type="checkbox"/> DRILLING REPORT Report Date:			
12. DESCRIBE PROPOSED OR COMPLETED OPERATIONS. Clearly show all pertinent details including dates, depths, volumes, etc.			
<p>Magnum Cavern Well #CW-7 (Sundry #57002 API #4302750004). Completed Pressure test of BOP and 20" diameter casing on 18 October 2014. Bottom of casing set at 3186 feet bgs. Casing: 1,660.69 feet of 20" O.D. x 1" wall thickness and 1525.31 feet of 20" O.D. x .625" wall thickness. BOP: 13861-10 CRA Serial No. 52992. Pressure Recorder: Barton, Instrument No. 118730. Duration of test was 1.0 hrs with a starting pressure of 940 psi. Pressure loss was 40 psi over the duration of the test (</p>			
			<p>Accepted by the Utah Division of Oil, Gas and Mining FOR RECORD ONLY October 24, 2014</p>
NAME (PLEASE PRINT) Tiffany A. James	PHONE NUMBER 801 993-7001	TITLE Vice President Project Development	
SIGNATURE N/A		DATE 10/23/2014	

STATE OF UTAH DEPARTMENT OF NATURAL RESOURCES DIVISION OF OIL, GAS, AND MINING		FORM 9
SUNDRY NOTICES AND REPORTS ON WELLS		5. LEASE DESIGNATION AND SERIAL NUMBER: 51573-OBA
Do not use this form for proposals to drill new wells, significantly deepen existing wells below current bottom-hole depth, reenter plugged wells, or to drill horizontal laterals. Use APPLICATION FOR PERMIT TO DRILL form for such proposals.		6. IF INDIAN, ALLOTTEE OR TRIBE NAME:
		7. UNIT or CA AGREEMENT NAME:
1. TYPE OF WELL Gas Storage Well	8. WELL NAME and NUMBER: CW-7	
2. NAME OF OPERATOR: MAGNUM NGLS SOLUTION MINING LLC	9. API NUMBER: 43027500040000	
3. ADDRESS OF OPERATOR: 3165 East Millrock Drive Suite 330 , Holladay, UT, 84121	PHONE NUMBER: 801 993-7001 Ext	9. FIELD and POOL or WILDCAT: WILDCAT
4. LOCATION OF WELL FOOTAGES AT SURFACE: 0852 FSL 0091 FWL QTR/QTR, SECTION, TOWNSHIP, RANGE, MERIDIAN: Qtr/Qtr: SWSW Section: 23 Township: 15.0S Range: 07.0W Meridian: S	COUNTY: MILLARD	
		STATE: UTAH
11. CHECK APPROPRIATE BOXES TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA		
TYPE OF SUBMISSION	TYPE OF ACTION	
<input type="checkbox"/> NOTICE OF INTENT Approximate date work will start: <input checked="" type="checkbox"/> SUBSEQUENT REPORT Date of Work Completion: 10/20/2014 <input type="checkbox"/> SPUD REPORT Date of Spud: <input type="checkbox"/> DRILLING REPORT Report Date:	<input type="checkbox"/> ACIDIZE <input type="checkbox"/> CHANGE TO PREVIOUS PLANS <input type="checkbox"/> CHANGE WELL STATUS <input type="checkbox"/> DEEPEN <input type="checkbox"/> OPERATOR CHANGE <input type="checkbox"/> PRODUCTION START OR RESUME <input type="checkbox"/> REPERFORATE CURRENT FORMATION <input type="checkbox"/> TUBING REPAIR <input type="checkbox"/> WATER SHUTOFF <input type="checkbox"/> WILDCAT WELL DETERMINATION	<input type="checkbox"/> ALTER CASING <input type="checkbox"/> CHANGE TUBING <input type="checkbox"/> COMMINGLE PRODUCING FORMATIONS <input type="checkbox"/> FRACTURE TREAT <input type="checkbox"/> PLUG AND ABANDON <input type="checkbox"/> RECLAMATION OF WELL SITE <input type="checkbox"/> SIDETRACK TO REPAIR WELL <input type="checkbox"/> VENT OR FLARE <input type="checkbox"/> SI TA STATUS EXTENSION <input checked="" type="checkbox"/> OTHER
		<input type="checkbox"/> CASING REPAIR <input type="checkbox"/> CHANGE WELL NAME <input type="checkbox"/> CONVERT WELL TYPE <input type="checkbox"/> NEW CONSTRUCTION <input type="checkbox"/> PLUG BACK <input type="checkbox"/> RECOMPLETE DIFFERENT FORMATION <input type="checkbox"/> TEMPORARY ABANDON <input type="checkbox"/> WATER DISPOSAL <input type="checkbox"/> APD EXTENSION OTHER: <input style="width: 100px;" type="text" value="20 Casing Pressure Test"/>
12. DESCRIBE PROPOSED OR COMPLETED OPERATIONS. Clearly show all pertinent details including dates, depths, volumes, etc.		
Magnum Cavern Well #CW-7 (Sundry 57004 API #4302750004) Completed Pressure test of BOP and 20" diameter casing seat on 20 October 2014. Bottom of casing set at 3186 feet bgs. Drill depth below shoe 3195 feet bgs. Casing: 1,660.69 feet of 20" O.D. x 1" wall thickness and 1,525.31 feet of 20" O.D. x .625" wall thickness. BOP: 13861-10 CRA Serial No. 52992 Pressure Recorder: Barton, Instrument No. 118730. Duration of test was 1.0 hrs with a starting pressure of 950 psi. Pressure loss was 40 psi over the duration of the test (Accepted by the Utah Division of Oil, Gas and Mining FOR RECORD ONLY October 24, 2014
NAME (PLEASE PRINT) Tiffany A. James	PHONE NUMBER 801 993-7001	TITLE Vice President Project Development
SIGNATURE N/A	DATE 10/23/2014	

STATE OF UTAH DEPARTMENT OF NATURAL RESOURCES DIVISION OF OIL, GAS, AND MINING		FORM 9
		5. LEASE DESIGNATION AND SERIAL NUMBER: 51573-OBA
SUNDRY NOTICES AND REPORTS ON WELLS		6. IF INDIAN, ALLOTTEE OR TRIBE NAME:
Do not use this form for proposals to drill new wells, significantly deepen existing wells below current bottom-hole depth, reenter plugged wells, or to drill horizontal laterals. Use APPLICATION FOR PERMIT TO DRILL form for such proposals.		7. UNIT or CA AGREEMENT NAME:
1. TYPE OF WELL Gas Storage Well		8. WELL NAME and NUMBER: CW-7
2. NAME OF OPERATOR: MAGNUM NGLS SOLUTION MINING LLC		9. API NUMBER: 43027500040000
3. ADDRESS OF OPERATOR: 3165 East Millrock Drive Suite 330 , Holladay, UT, 84121	PHONE NUMBER: 801 993-7001 Ext	9. FIELD and POOL or WILDCAT: WILDCAT
4. LOCATION OF WELL FOOTAGES AT SURFACE: 0852 FSL 0091 FWL QTR/QTR, SECTION, TOWNSHIP, RANGE, MERIDIAN: Qtr/Qtr: SWSW Section: 23 Township: 15.0S Range: 07.0W Meridian: S		COUNTY: MILLARD
		STATE: UTAH
11. CHECK APPROPRIATE BOXES TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA		
TYPE OF SUBMISSION	TYPE OF ACTION	
<input type="checkbox"/> NOTICE OF INTENT Approximate date work will start: <input checked="" type="checkbox"/> SUBSEQUENT REPORT Date of Work Completion: 10/27/2014 <input type="checkbox"/> SPUD REPORT Date of Spud: <input type="checkbox"/> DRILLING REPORT Report Date:	<input type="checkbox"/> ACIDIZE <input type="checkbox"/> ALTER CASING <input type="checkbox"/> CASING REPAIR <input type="checkbox"/> CHANGE TO PREVIOUS PLANS <input type="checkbox"/> CHANGE TUBING <input type="checkbox"/> CHANGE WELL NAME <input type="checkbox"/> CHANGE WELL STATUS <input type="checkbox"/> COMMINGLE PRODUCING FORMATIONS <input type="checkbox"/> CONVERT WELL TYPE <input type="checkbox"/> DEEPEN <input type="checkbox"/> FRACTURE TREAT <input type="checkbox"/> NEW CONSTRUCTION <input type="checkbox"/> OPERATOR CHANGE <input type="checkbox"/> PLUG AND ABANDON <input type="checkbox"/> PLUG BACK <input type="checkbox"/> PRODUCTION START OR RESUME <input type="checkbox"/> RECLAMATION OF WELL SITE <input type="checkbox"/> RECOMPLETE DIFFERENT FORMATION <input type="checkbox"/> REPERFORATE CURRENT FORMATION <input type="checkbox"/> SIDETRACK TO REPAIR WELL <input type="checkbox"/> TEMPORARY ABANDON <input type="checkbox"/> TUBING REPAIR <input type="checkbox"/> VENT OR FLARE <input type="checkbox"/> WATER DISPOSAL <input type="checkbox"/> WATER SHUTOFF <input type="checkbox"/> SI TA STATUS EXTENSION <input type="checkbox"/> WILDCAT WELL DETERMINATION <input checked="" type="checkbox"/> OTHER	
	OTHER: <input type="text" value="Cement 16"/>	
12. DESCRIBE PROPOSED OR COMPLETED OPERATIONS. Clearly show all pertinent details including dates, depths, volumes, etc.		
<p>Magnum Cavern Well #CW-7 (API #4302750004) Completed the cementing of 1,014.28 feet of 16" O.D. x .656" wall thickness and 2,403.72 feet of 16" O.D. x .575" wall thickness casing. The casing was set to 3,418 feet bgs. ThermaSource mixed 318 bbl. of cement that was pumped into the annular space around the casing using the stab-in cementing method.</p>		
<p>Accepted by the Utah Division of Oil, Gas and Mining FOR RECORD ONLY November 06, 2014</p>		
NAME (PLEASE PRINT) Tiffany A. James	PHONE NUMBER 801 993-7001	TITLE Vice President Project Development
SIGNATURE N/A		DATE 10/31/2014

STATE OF UTAH
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING

AMENDED REPORT FORM 8
(highlight changes)

WELL COMPLETION OR RECOMPLETION REPORT AND LOG

5. LEASE DESIGNATION AND SERIAL NUMBER:
51573-OBA

6. IF INDIAN, ALLOTTEE OR TRIBE NAME

7. UNIT or CA AGREEMENT NAME

8. WELL NAME and NUMBER:
Magnum Cavern Well #CW-7

1a. TYPE OF WELL: OIL WELL GAS WELL DRY OTHER Storage Well

b. TYPE OF WORK: NEW WELL HORIZ. LATS. DEEP-EN RE-ENTRY DIFF. RESVR. OTHER _____

2. NAME OF OPERATOR:
Magnum NGLs Solution Mining, LLC

9. API NUMBER:
4302750004

3. ADDRESS OF OPERATOR:
3165 E. Millrock Dr., St. CITY Holladay STATE UT ZIP 84121

PHONE NUMBER:
(801) 993-7001

10. FIELD AND POOL, OR WILDCAT
Undesignated

4. LOCATION OF WELL (FOOTAGES)
AT SURFACE: 852 FSL 91 FWL

AT TOP PRODUCING INTERVAL REPORTED BELOW: N/A

AT TOTAL DEPTH: 0540 FSL 0260FWL

11. QTR/QTR, SECTION, TOWNSHIP, RANGE, MERIDIAN:
SWSW 23 15S 7W S

12. COUNTY
Millard

13. STATE
UTAH

14. DATE SPUDDED: 8/8/2014

15. DATE T.D. REACHED: 11/10/2014

16. DATE COMPLETED: 11/25/2014

ABANDONED READY TO PRODUCE

17. ELEVATIONS (DF, RKB, RT, GL):
4,612ft. MSL - GL

18. TOTAL DEPTH: MD 5,000 TVD 4,960

19. PLUG BACK T.D.: MD TVD

20. IF MULTIPLE COMPLETIONS, HOW MANY? *
CSG Strings-8

21. DEPTH BRIDGE MD TVD
PLUG SET: TVD

22. TYPE ELECTRIC AND OTHER MECHANICAL LOGS RUN (Submit copy of each)
E-Logs, Caliper, CDL/CNL, MSI-QL Deviation, Gamm-Density Logs.
PDFs of logs are enclosed.

23. WAS WELL CORED? NO YES (Submit analysis)
WAS DST RUN? NO YES (Submit report)
DIRECTIONAL SURVEY? NO YES (Submit copy)

24. CASING AND LINER RECORD (Report all strings set in well)

HOLE SIZE	SIZE/GRADE	WEIGHT (#/ft.)	TOP (MD)	BOTTOM (MD)	STAGE CEMENTER DEPTH	CEMENT TYPE & NO. OF SACKS	SLURRY VOLUME (BBL)	CEMENT TOP **	AMOUNT PULLED
See Attached Summary									

25. TUBING RECORD

SIZE	DEPTH SET (MD)	PACKER SET (MD)	SIZE	DEPTH SET (MD)	PACKER SET (MD)	SIZE	DEPTH SET (MD)	PACKER SET (MD)

26. PRODUCING INTERVALS					27. PERFORATION RECORD			
FORMATION NAME	TOP (MD)	BOTTOM (MD)	TOP (TVD)	BOTTOM (TVD)	INTERVAL (Top/Bot - MD)	SIZE	NO. HOLES	PERFORATION STATUS
(A) N/A								Open <input type="checkbox"/> Squeezed <input type="checkbox"/>
(B)								Open <input type="checkbox"/> Squeezed <input type="checkbox"/>
(C)								Open <input type="checkbox"/> Squeezed <input type="checkbox"/>
(D)								Open <input type="checkbox"/> Squeezed <input type="checkbox"/>

28. ACID, FRACTURE, TREATMENT, CEMENT SQUEEZE, ETC.

WAS WELL HYDRAULICALLY FRACTURED? YES NO IF YES -- DATE FRACTURED: _____

DEPTH INTERVAL	AMOUNT AND TYPE OF MATERIAL
N/A	

29. ENCLOSED ATTACHMENTS:

ELECTRICAL/MECHANICAL LOGS GEOLOGIC REPORT DST REPORT DIRECTIONAL SURVEY

SUNDRY NOTICE FOR PLUGGING AND CEMENT VERIFICATION CORE ANALYSIS OTHER: _____

30. WELL STATUS:
Completed

31. INITIAL PRODUCTION

INTERVAL A (As shown in item #26)

DATE FIRST PRODUCED:		TEST DATE:		HOURS TESTED:		TEST PRODUCTION RATES: →	OIL – BBL:	GAS – MCF:	WATER – BBL:	PROD. METHOD:
CHOKE SIZE:	TBG. PRESS.	CSG. PRESS.	API GRAVITY	BTU – GAS	GAS/OIL RATIO	24 HR PRODUCTION RATES: →	OIL – BBL:	GAS – MCF:	WATER – BBL:	INTERVAL STATUS:

INTERVAL B (As shown in item #26)

DATE FIRST PRODUCED:		TEST DATE:		HOURS TESTED:		TEST PRODUCTION RATES: →	OIL – BBL:	GAS – MCF:	WATER – BBL:	PROD. METHOD:
CHOKE SIZE:	TBG. PRESS.	CSG. PRESS.	API GRAVITY	BTU – GAS	GAS/OIL RATIO	24 HR PRODUCTION RATES: →	OIL – BBL:	GAS – MCF:	WATER – BBL:	INTERVAL STATUS:

INTERVAL C (As shown in item #26)

DATE FIRST PRODUCED:		TEST DATE:		HOURS TESTED:		TEST PRODUCTION RATES: →	OIL – BBL:	GAS – MCF:	WATER – BBL:	PROD. METHOD:
CHOKE SIZE:	TBG. PRESS.	CSG. PRESS.	API GRAVITY	BTU – GAS	GAS/OIL RATIO	24 HR PRODUCTION RATES: →	OIL – BBL:	GAS – MCF:	WATER – BBL:	INTERVAL STATUS:

INTERVAL D (As shown in item #26)

DATE FIRST PRODUCED:		TEST DATE:		HOURS TESTED:		TEST PRODUCTION RATES: →	OIL – BBL:	GAS – MCF:	WATER – BBL:	PROD. METHOD:
CHOKE SIZE:	TBG. PRESS.	CSG. PRESS.	API GRAVITY	BTU – GAS	GAS/OIL RATIO	24 HR PRODUCTION RATES: →	OIL – BBL:	GAS – MCF:	WATER – BBL:	INTERVAL STATUS:

32. DISPOSITION OF GAS (Sold, Used for Fuel, Vented, Etc.)

33. SUMMARY OF POROUS ZONES (Include Aquifers):

Show all important zones of porosity and contents thereof: Cored intervals and all drill-stem tests, including depth interval tested, cushion used, time tool open, flowing and shut-in pressures and recoveries.

Formation	Top (MD)	Bottom (MD)	Descriptions, Contents, etc.	Name	Top (Measured Depth)
Unconfined Aquifer	0	250	sand, clay & occasional gravel layers	Quaternary Sediments	0
Shallow Artesian	250	750	sand, clay & occasional gravel layers	Miocene Evaporites & Salt	3,479
Deep Artesian	750	1,400	sand, clay & occasional gravel layers	Top of Salt Structure	3,479
Basement Artesian	1,400	3,400	sand, clay & occasional gravel layers		

34. FORMATION (Log) MARKERS:

35. ADDITIONAL REMARKS (Include plugging procedure)

Please see attached documents for: Well As-Built Diagram; Casing, Cementing & Pressure Testing Information; and, Geophysical Wireline Logging Summary. Also included are pdfs of the wireline logs.

36. I hereby certify that the foregoing and attached information is complete and correct as determined from all available records.

NAME (PLEASE PRINT) Samuel C Quigley TITLE General Manager
 SIGNATURE Samuel C Quigley DATE 12/24/14

This report must be submitted within 30 days of

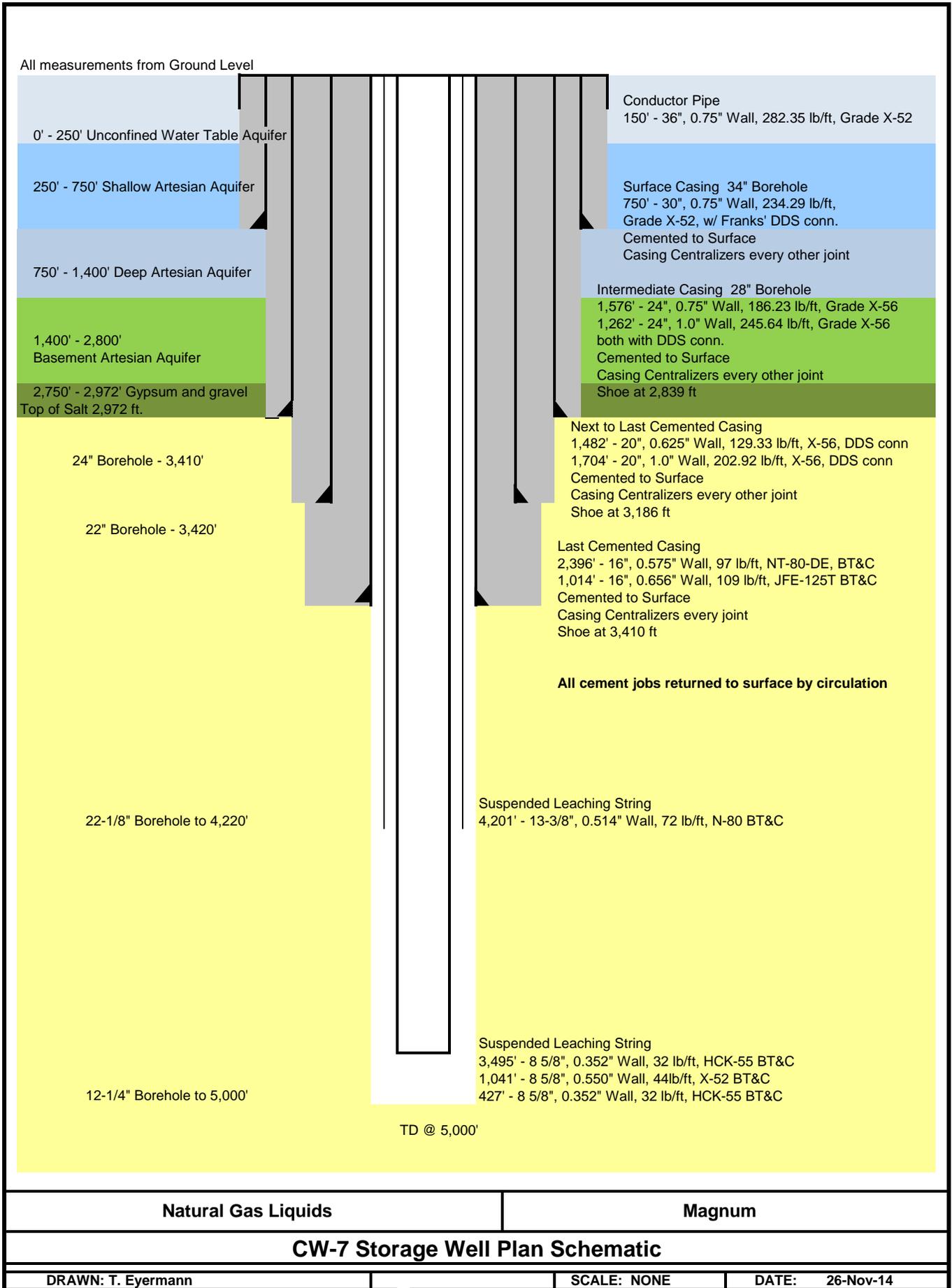
- completing or plugging a new well
- drilling horizontal laterals from an existing well bore
- recompleting to a different producing formation
- reentering a previously plugged and abandoned well
- significantly deepening an existing well bore below the previous bottom-hole depth
- drilling hydrocarbon exploratory holes, such as core samples and stratigraphic tests

* ITEM 20: Show the number of completions if production is measured separately from two or more formations.

** ITEM 24: Cement Top – Show how reported top(s) of cement were determined (circulated (CIR), calculated (CAL), cement bond log (CBL), temperature survey (TS)).

Send to: Utah Division of Oil, Gas and Mining
 1594 West North Temple, Suite 1210
 Box 145801
 Salt Lake City, Utah 84114-5801

Phone: 801-538-5340
 Fax: 801-359-3940



Magnum Cavern Well 7

API Well No. 4302750004

Summary of Casing Installations As-Built

Borehole Diameter (in) Depth Interval (ft. bgs)	CSG Size/Grade	CSG/Weight (lbs/ft)	Thread Connector Type	Cement Type/cubic ft.	BOP/Casing Pressure Test
44" diameter 0'-150'	36", 0.75" Wall, X-52	282.35 lb/ft	NA	NA	NA
34" diameter 0'-750'	30", 0.75" Wall, X-52	234.29 lb/ft	DDS	Portland Type I/II; 1,539 cu/ft	Shut-in @ 520 psi. Duration: 30 min. Pressure loss: 0 psi.
28" diameter 0'-1,576'	24", 0.75" Wall, X-56	186.23 lb/ft	DDS	Portland Type II/5; 2,761 cu/ft	Shut-in @ 920 psi. Duration: 60 min. Pressure loss: 70 psi or 7.6%.
28" diameter 1,576'-2,838'	24", 0.75" Wall, X-56	245.64 lb/ft	DDS	Portland Type II/5; 2,259 cu/ft	NA
24" diameter 0'-1,482'	20", 0.625" Wall, X-56	129.33 lb/ft	DDS	CalSeal Premium with 37.3% Salt 812 cu/ft	Shut-in @ 940 psi. Duration: 60 min. Pressure loss: 40 psi or 4.2%
24" diameter 1,482'-3,186'	20", 1.0" Wall, X-56	202.92 lb/ft	DDS	CalSeal Premium with 37.3% Salt 915 cu/ft	Casing Seat @ 950 psi. Duration: 60 min. Pressure loss: 45 psi or 4.7%.
22" diameter 0'-2,396'	16", 0.575" Wall, NT-80	97 lb/ft	BT&C	CalSeal Premium with 37.3% Salt 915 cu/ft	Shut-in @ 955 psi. Duration: 60 min. Pressure loss: 35 psi or 3.7%.
22" diameter 2,396'-3,410'	16", 0.656" Wall, JFE-125T	109 lb/ft	BT&C	CalSeal Premium with 37.3% Salt 512 cu/ft	Casing Seat @ 955 psi. Duration: 60 min. Pressure loss: 33 psi or 3.4%.

GEOCAL, INC.

Geosciences & Engineering

7290 S. Fraser Street
Centennial, Colorado 80112
PH: (303) 337-0338
FAX: (303) 337-0247**REPORT OF MORTAR/GROUT/MASONRY TEST RESULTS***Client:* Thermasource
600 Lone Tree Circle
Nunn, CO 80648
Attn: Matt Ryan*I.D. No.:* M 1
Sample Date: 9/22/2014
Technician: Cast By Client
Project No.: M14.1573.000
Project: On Call Testing

Type of Specimen: Dimensions: _____

Mortar 2 x 2 cubes Other _____

Mortar Type: Cast in block cells Cast as grout prism

Grout Cast in block cells Cast as grout prism

Masonry Prism Other (indicate type): Cement

Prism Data: Hollow Nominal Dimensions: _____ *Bedding:* Face Shell Other

Grout Filled Type of Masonry Unit: _____ Full Shell

Placement Location:
Slurry ID # 972-1027

Supplier: Not Provided by Client *Ambient Temp (°F):* Not Provided by Client

Time Mixed: Not Provided by Client *Time Sampled:* Not Provided by Client

Mix I.D.: Not Provided by Client *Flow/Slump (in):* NA *Temp (°F):* NA

Ticket No.: Not Provided by Client *Water Added (gal.):* NA

COMPRESSIVE STRENGTH DATA: *Total Yds. Of Pour:* Not Provided by Client

Specimen No.	1	2	3	4	5	6	
Age (days)	8	8	8	14	14	14	
Date Tested	09/30/14	09/30/14	09/30/14	10/06/14	10/06/14	10/6/14	
Maximum Load (lbs.)	10500	10050	10810	13810	13090	14470	
Gross Strength (psi)	2643.5	2516.0	2713.4	3408.2	3275.8	3601.3	
Net Strength (psi)	2640	2520	2710	3410	3280	3600	
Capped Height/Length (in.)	N/A	N/A	N/A	N/A	N/A	N/A	
Thickness/Diameter (in.)	1.986/2.000	1.995/2.002	1.990/2.002	2.017/2.009	1.992/2.006	1.998/2.011	
Gross Area (in. ²)	3.972	3.994	3.984	4.052	3.996	4.018	
Net Area (in. ²)	3.972	3.994	3.984	4.052	3.996	4.018	
H/D or L/D	N/A	N/A	N/A	N/A	N/A	N/A	
H/D or L/D Correction	N/A	N/A	N/A	N/A	N/A	N/A	

Design Strength: Not Specified psi @ 28 days

*Comments/Observations:**Copies:**Reviewed By:*

Ronald J. Vasquez, P.E.

GEOCAL, INC.

Geosciences & Engineering

7290 S. Fraser Street
Centennial, Colorado 80112
PH: (303) 337-0338
FAX: (303) 337-0247**REPORT OF MORTAR/GROUT/MASONRY TEST RESULTS***Client:* Thermasource
600 Lone Tree Circle
Nunn, CO 80648
Attn: Matt Ryan*I.D. No.:* M 1
Sample Date: 9/22/2014
Technician: Cast By Client
Project No.: M14.1573.000
Project: On Call Testing*Type of Specimen:*

Mortar X 2 x 2 cubes Other _____
Mortar Type:
 Grout Cast in block cells Cast as grout prism
 Masonry Prism x Other (indicate type): Cement

Dimensions: _____*Prism Data:*

Hollow Nominal Dimensions: _____ *Bedding:* Face Shell Other
 Grout Filled Type of Masonry Unit: _____ Full Shell

Placement Location:

Slurry ID # 972-1027

Supplier: Not Provided by Client
Time Mixed: Not Provided by Client
Mix I.D.: Not Provided by Client
Ticket No.: Not Provided by Client
COMPRESSIVE STRENGTH DATA:

Ambient Temp (°F): Not Provided by Client
Time Sampled: Not Provided by Client
Flow/Slump (in): NA *Temp (°F):* NA
Water Added (gal.): NA
Total Yds. Of Pour: Not Provided by Client

Specimen No.	7	8	9				
Age (days)	28	28	28				
Date Tested	10/20/14	10/20/14	10/20/14				
Maximum Load (lbs.)	12440	16380	15080				
Gross Strength (psi)	3118	4095	3694				
Net Strength (psi)	3120	4100	3690				
Capped Height/Length (in.)	N/A	N/A	N/A				
Thickness/Diameter (in.)	1.995/2.001	1.998/2.001	2.000/2.041				
Gross Area (in. ²)	3.990	4.000	4.082				
Net Area (in. ²)	3.990	4.000	4.082				
H/D or L/D	N/A	N/A	N/A				
H/D or L/D Correction	N/A	N/A	N/A				

Design Strength: Not Specified psi @ 28 days

*Comments/Observations:**Copies:**Reviewed By:*

Ronald J. Vasquez, P.E.

Magnum NGLs Cavern Well #CW-7 - Geophysical Wireline Log Summary
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#	Date Logging Completed	Log Type	Depth - Log Interval (ft bgs)	Logging Company	Purpose
1	16-Aug-14	Caliper-Gamma-E Log	0' - 750'	Century Wireline Services	30" CSG String
2	8-Sep-14	Dual Induction	654' - 2,840'	Century Wireline Services	20" CSG String
3	8-Sep-14	CDL/CNL Porosities	658' -2,844'	Century Wireline Services	20" CSG String
4	11-Nov-14	MSI-QL Deviation	0' - 750'	Jet West Geophysical Services	30" CSG String
	11-Nov-14	MSI-QL Deviation	750' - 2,850'	Jet West Geophysical Services	24" CSG String
	11-Nov-14	MSI-QL Deviation	2,850' - 3,410'	Jet West Geophysical Services	24" CSG String
	11-Nov-14	MSI-QL Deviation	3,410' - 5,000'	Jet West Geophysical Services	Pilot Hole
5	10/6 & 11/11/14	Gamma-Density-Neutron-Caliper	2800' - 5000'	Jet West Geophysical Services	16" CSG string & Open Hole

MIT

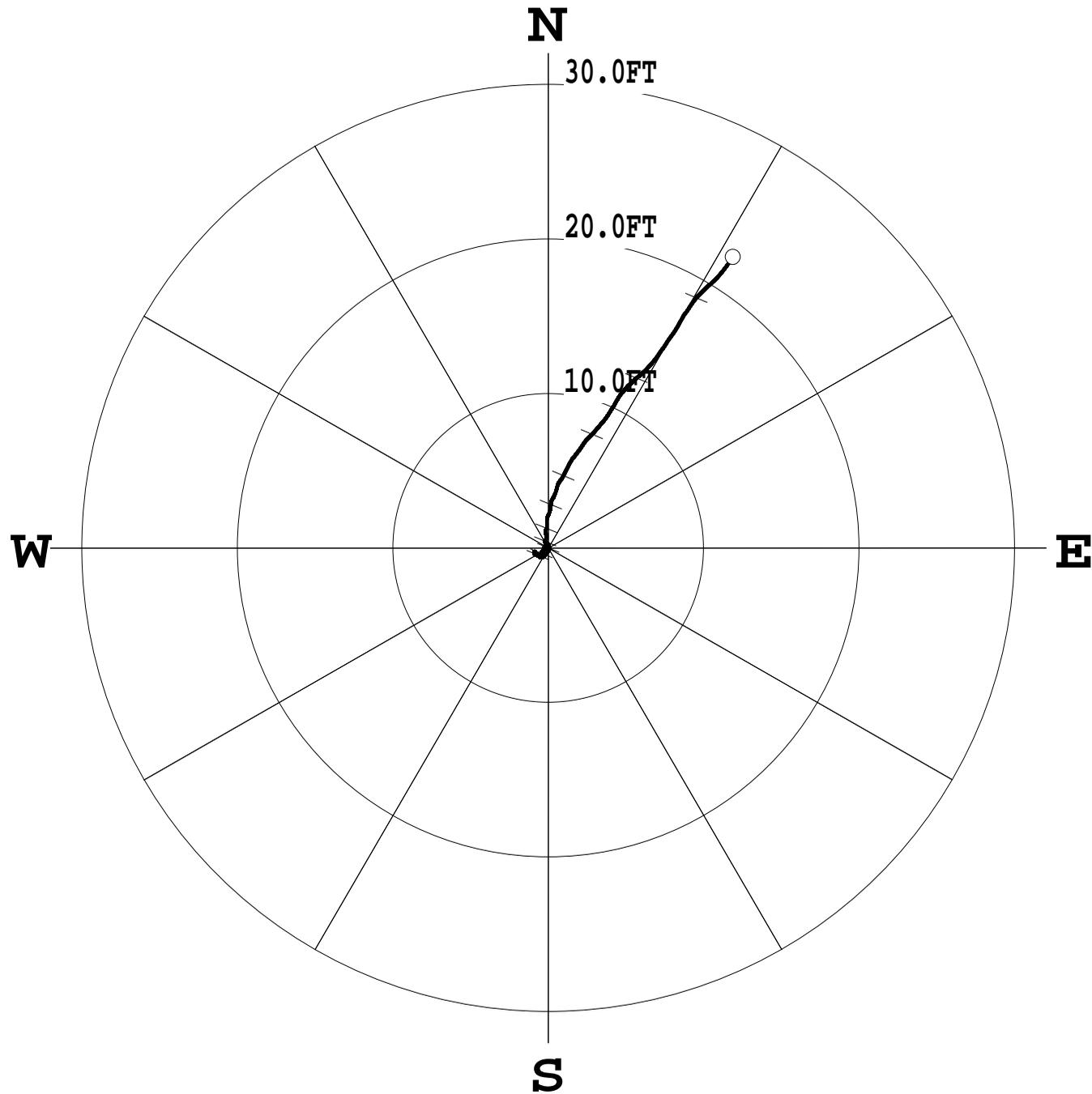
*Note: Mechanical Integrity Testing Data/Logs to be addressed under sperate cover.

PLAN VIEW COMPU-LOG DEVIATION

CLIENT: BOART/MAGNUM
LOCATION: N/A
HOLE ID: CW-7
DATE OF LOG: 08/16/14
PROBE: 9057C 4457



SCALE: 10 FT/IN
TRUE DEPTH: 2823.90 FT
AZIMUTH: 32.2
DISTANCE: 22.3 FT
+ = 300 FT INCR
○ = BOTTOM OF HOLE



Depth ft.	Tilt Deg.	Azimuth Deg.	Easting ft.	Northing ft.	TVD ft.	Close Dist. ft.	Closure Angle Deg.
0	0.3	223.9	0	0	0	0	223.9
25	0.1	245.9	-0.07	-0.03	25	0.1	173.8
50	0.2	251.5	-0.08	-0.03	50	0.1	259.7
75	0.3	295.3	-0.11	0.05	75	0.1	260.4
100	0.1	302.5	-0.16	0.1	100	0.2	328.7
125	0.1	301.2	-0.16	0.1	125	0.2	6.5
150	0.1	303.1	-0.18	0.12	150	0.2	303.7
175	0.2	290.2	-0.24	0.09	175	0.3	210
200	0.3	262.4	-0.28	-0.04	200	0.3	183.5
225	0.1	254.2	-0.29	-0.08	225	0.3	237.2
250	0.3	246.3	-0.36	-0.16	250	0.4	221.6
275	0.2	236.3	-0.43	-0.29	275	0.5	193.1
300	0	232.6	-0.44	-0.34	300	0.6	167.8
325	0.2	233.7	-0.5	-0.37	325	0.6	239.3
350	0.2	234.3	-0.59	-0.42	350	0.7	211.2
375	0.1	234.2	-0.6	-0.43	375	0.7	327.3
400	0.3	241	-0.67	-0.37	400	0.8	296.2
425	0.1	247.9	-0.79	-0.32	425	0.9	298.9
450	0	249.1	-0.84	-0.32	450	0.9	309.6
475	0.2	251.7	-0.84	-0.28	475	0.9	7.9
500	0.1	255.8	-0.86	-0.22	500	0.9	299
525	0.3	254.1	-0.92	-0.26	525	1	185.6
550	0.2	246.7	-0.85	-0.37	550	0.9	123.5
575	0.2	241.8	-0.77	-0.41	575	0.9	105.8
600	0.2	236.2	-0.68	-0.45	600	0.8	115.8
625	0.3	228.5	-0.58	-0.52	625	0.8	131.7
650	0.5	216.7	-0.43	-0.57	650	0.7	84.3
675	0.5	206.2	-0.23	-0.47	674.99	0.5	39.1
700	0.5	200.3	-0.12	-0.31	699.99	0.3	37.4
725	0.8	163.6	0.04	-0.13	724.99	0.1	23.7
750	0.1	56.7	0.07	0.04	749.99	0.1	0.9
775	0.2	33.7	0.06	0.08	774.99	0.1	336.3
800	0.3	4.8	0.02	0.18	799.99	0.2	340.2
825	0.2	354.2	-0.03	0.28	824.99	0.3	325.9
850	0.2	345.7	-0.09	0.35	849.99	0.4	307.5
875	0.2	338.8	-0.16	0.4	874.99	0.4	306.3
900	0.1	335.1	-0.2	0.43	899.99	0.5	296.6
925	0	334.3	-0.21	0.44	924.99	0.5	330.4
950	0.1	337.7	-0.19	0.47	949.99	0.5	34.1
975	0.2	344	-0.16	0.54	974.99	0.6	23.9
1000	0.3	349.5	-0.12	0.65	999.99	0.7	16.8
1025	0.3	352.4	-0.1	0.78	1024.99	0.8	0.4
1050	0.2	351.8	-0.13	0.89	1049.99	0.9	334.4
1075	0.2	350.3	-0.17	0.97	1074.99	1	336.9

1100	0.1	349.6	-0.19	1.04	1099.99	1.1	345.6
1125	0.1	349.8	-0.2	1.09	1124.99	1.1	0.6
1150	0.1	350.6	-0.19	1.13	1149.99	1.1	24.4
1175	0.2	352.3	-0.16	1.19	1174.99	1.2	32.5
1200	0.2	354.9	-0.11	1.27	1199.99	1.3	21.3
1225	0.3	356.5	-0.09	1.39	1224.99	1.4	5.7
1250	0.3	357	-0.08	1.53	1249.99	1.5	359.1
1275	0.3	357.2	-0.08	1.68	1274.99	1.7	359.7
1300	0.3	357.3	-0.08	1.81	1299.99	1.8	0.4
1325	0.2	357.6	-0.08	1.92	1324.99	1.9	8.2
1350	0.2	358.4	-0.06	2.01	1349.99	2	15.5
1375	0.2	359.2	-0.03	2.09	1374.99	2.1	27.9
1400	0.3	0.7	0.02	2.19	1399.99	2.2	23.6
1425	0.4	1.8	0.07	2.32	1424.99	2.3	16.8
1450	0.4	2.7	0.12	2.47	1449.99	2.5	15
1475	0.4	3.3	0.15	2.63	1474.98	2.6	7.7
1500	0.4	3.5	0.17	2.81	1499.98	2.8	6.9
1525	0.4	3.6	0.19	2.98	1524.98	3	10.8
1550	0.3	4.2	0.23	3.11	1549.98	3.1	23.6
1575	0.3	5.1	0.29	3.21	1574.98	3.2	38.4
1600	0.4	6.1	0.36	3.34	1599.98	3.4	21
1625	0.5	7.1	0.43	3.5	1624.98	3.5	20.5
1650	0.5	7.7	0.5	3.69	1649.98	3.7	17.9
1675	0.5	8.1	0.55	3.88	1674.98	3.9	15.4
1700	0.4	8.4	0.6	4.07	1699.98	4.1	16
1725	0.3	8.9	0.66	4.22	1724.98	4.3	28.4
1750	0.4	9.8	0.75	4.35	1749.98	4.4	39.4
1775	0.5	10.8	0.86	4.49	1774.98	4.6	35.7
1800	0.5	11.7	0.97	4.68	1799.98	4.8	28.7
1825	0.6	12.5	1.08	4.9	1824.98	5	25.7
1850	0.6	13.1	1.19	5.11	1849.97	5.3	26.2
1875	0.6	13.7	1.31	5.35	1874.97	5.5	26.3
1900	0.6	14.3	1.43	5.58	1899.97	5.8	28.9
1925	0.5	15	1.55	5.79	1924.97	6	35.8
1950	0.5	15.9	1.7	5.97	1949.97	6.2	36.9
1975	0.7	16.8	1.86	6.18	1974.97	6.5	39
2000	0.7	17.6	2.04	6.42	1999.97	6.7	35
2025	0.7	18.3	2.21	6.67	2024.96	7	33.4
2050	0.7	19	2.38	6.92	2049.96	7.3	41
2075	0.7	19.9	2.59	7.14	2074.96	7.6	49.2
2100	0.8	20.8	2.8	7.37	2099.96	7.9	44
2125	0.8	21.7	3.03	7.62	2124.96	8.2	41.6
2150	0.9	22.5	3.27	7.9	2149.95	8.6	39.2
2175	1	23.3	3.55	8.22	2174.95	9	40
2200	1	24	3.81	8.57	2199.95	9.4	34.2
2225	1	24.3	4.03	8.93	2224.94	9.8	31.9
2250	0.9	24.6	4.25	9.28	2249.94	10.2	29.7

2275	0.9	24.8	4.45	9.63	2274.94	10.6	30.7
2300	0.8	25	4.64	9.93	2299.93	11	36.2
2325	0.8	25.6	4.88	10.2	2324.93	11.3	40.1
2350	0.8	26	5.1	10.47	2349.93	11.6	44.2
2375	0.9	26.6	5.37	10.72	2374.93	12	45.7
2400	0.9	27.3	5.67	10.99	2399.92	12.4	46.3
2425	1	28	5.99	11.27	2424.92	12.8	48.8
2450	1.2	28.7	6.35	11.62	2449.91	13.2	42.8
2475	1.3	29.2	6.73	12.04	2474.91	13.8	40.2
2500	1.3	29.5	7.06	12.48	2499.9	14.3	33.3
2525	1.3	29.7	7.39	12.95	2524.89	14.9	37
2550	1.4	29.8	7.7	13.43	2549.89	15.5	34
2575	1.3	30	8.05	13.92	2574.88	16.1	34.3
2600	1.3	30.1	8.36	14.42	2599.87	16.7	29.2
2625	1.3	30.1	8.62	14.9	2624.87	17.2	29.4
2650	1.2	30.2	8.93	15.35	2649.86	17.8	36.3
2675	1.2	30.3	9.2	15.76	2674.86	18.3	34.3
2700	1.3	30.4	9.51	16.18	2699.85	18.8	40.2
2725	1.3	30.8	9.91	16.6	2724.85	19.3	43.1
2750	1.3	31.3	10.35	17.02	2749.84	19.9	55.8
2775	1.5	31.8	10.81	17.47	2774.83	20.5	43.9
2800	1.9	32.1	11.31	18.04	2799.82	21.3	39.3
2824.1	2.4	32.2	11.87	18.83	2823.9	22.3	41.5
3420	1.9	33.0	22.63	35.40	3419.47	42.0	
3420.7	2.5	32.5	22.73	35.72	3420.77	42.3	
3445.7	2.2	32.1	23.06	36.70	3445.71	43.3	
3470.7	2.3	31.8	23.32	37.63	3470.66	44.3	
3495.7	2.2	31.4	23.57	38.54	3495.61	45.2	
3520.7	2.4	31.0	23.69	39.47	3520.56	46.0	
3545.7	2.2	30.9	23.70	39.65	3545.51	46.2	
3570.7	2.3	30.3	23.79	40.64	3570.66	47.1	
3595.7	2.3	29.8	23.89	41.63	3595.61	48.0	
3620.7	2.4	29.3	23.95	42.64	3620.56	48.9	
3645.7	2.3	28.8	24.00	43.64	3645.50	49.8	
3670.7	2.3	28.3	24.03	44.66	3670.45	50.7	
3695.7	2.3	27.8	24.05	45.67	3695.40	51.6	
3720.7	2.4	27.2	24.03	46.71	3720.55	52.5	
3745.7	2.4	26.7	24.00	47.72	3745.50	53.4	
3770.7	2.3	26.2	23.95	48.76	3770.44	54.3	
3795.7	2.4	25.6	23.87	49.78	3795.39	55.2	
3820.7	2.3	25.1	23.79	50.81	3820.34	56.1	
3845.7	2.4	24.6	23.70	51.85	3845.28	57.0	
3870.7	2.3	24.0	23.58	52.87	3870.23	57.9	
3895.7	2.4	23.5	23.45	53.92	3895.38	58.8	
3920.7	2.4	23.0	23.31	54.94	3920.32	59.7	
3945.7	2.4	22.5	23.16	55.99	3945.27	60.6	
3970.7	2.5	22.0	22.98	57.01	3970.22	61.5	

3995.7	2.3	21.4	22.80	58.05	3995.16	62.4
4020.7	2.5	20.9	22.60	59.08	4020.11	63.3
4045.7	2.3	20.4	22.38	60.14	4045.26	64.2
4070.7	2.6	19.9	22.15	61.18	4070.20	65.1
4095.7	2.4	19.4	21.91	62.22	4095.15	66.0
4120.7	2.5	18.9	21.66	63.29	4120.09	66.9
4145.7	2.6	18.4	21.39	64.31	4145.04	67.8
4170.7	2.4	17.9	21.11	65.40	4169.98	68.7
4195.7	2.6	17.4	20.81	66.42	4194.93	69.6
4220.7	2.4	16.9	20.51	67.47	4220.07	70.5
4245.7	2.6	16.4	20.18	68.49	4245.02	71.4
4270.7	2.4	15.9	19.86	69.51	4269.96	72.3
4295.7	2.5	15.5	19.52	70.55	4294.91	73.2
4320.7	2.5	15.0	19.17	71.55	4319.85	74.1
4345.7	2.5	14.5	18.81	72.60	4344.80	75.0
4370.7	2.6	14.1	18.44	73.61	4369.94	75.9
4395.7	2.4	13.6	18.06	74.65	4394.89	76.8
4420.7	2.6	13.1	17.68	75.68	4419.83	77.7
4445.7	2.3	12.7	17.29	76.68	4444.78	78.6
4470.7	2.5	12.3	16.89	77.70	4469.72	79.5
4495.7	2.5	11.8	16.48	78.66	4494.67	80.4
4520.7	2.4	11.4	16.05	79.67	4519.81	81.3
4545.7	2.6	11.0	15.62	80.63	4544.76	82.1
4570.7	2.3	10.5	15.18	81.62	4569.70	83.0
4595.7	2.6	10.1	14.74	82.59	4594.65	83.9
4620.7	2.5	9.7	14.29	83.55	4619.60	84.8
4645.7	2.5	9.3	13.81	84.55	4644.54	85.7
4670.7	2.5	8.9	13.35	85.49	4669.49	86.5
4695.7	2.5	8.5	12.86	86.49	4694.63	87.4
4720.7	2.5	8.1	12.37	87.43	4719.58	88.3
4745.7	2.4	7.6	11.87	88.42	4744.52	89.2
4770.7	2.7	7.2	11.36	89.39	4769.46	90.1
4795.7	2.4	6.9	10.86	90.35	4794.41	91.0
4820.7	2.6	6.5	10.34	91.31	4819.35	91.9
4845.7	2.2	6.1	9.83	92.24	4844.50	92.8
4870.7	2.5	5.7	9.28	93.20	4869.44	93.7
4895.7	2.4	5.3	8.74	94.06	4894.39	94.5
4920.7	2.3	4.9	8.18	95.00	4919.34	95.4
4945.7	2.5	4.5	7.63	95.87	4944.28	96.2
4970.7	2.1	4.1	7.02	96.82	4969.23	97.1
4995.7	2.8	3.8	6.46	97.66	4994.37	97.9

97.87 feet total displacement

0.000342 degree, heading

1.12 degree inclination



CALIPER
GAMMA E-LOG
CW-7
N/A

COMPANY BOART/MAGNUM
WELL CW-7
WELL EXT N/A
FIELD N/A
COUNTY MILLARD
STATE TX
COUNTRY USA
API NO. N/A
UNIQ ID N/A
LOCATION N/A

COMPANY : BOART/MAGNUM
WELL : CW-7
WELL EXT : N/A
FIELD : N/A
COUNTY : MILLARD
STATE : TX
COUNTRY : USA
API NO. : N/A
UNIQ ID : N/A
LOCATION : N/A

LAT GPS UTM N/A
LON GPS UTM N/A

SECTION: N/A TOWNSHIP: N/A RANGE: N/A

Version 3.65 JK7

PERMANENT DATUM G/L
DRL MEASURED FROM G/L
LOG MEASURED FROM G/L
ELEV. PERM. DATUM FT

DATE	DEPTH DRILLER	DEPTH LOGGER	FIRST READING	LAST READING	BIT SIZE	CASING -- DRILLER	CASING -- LOGGER	CASING O.D.	CASING TYPE	FLUID TYPE	FLUID DENSITY	FLUID VISCOSITY	FLUID PH	MUD SOURCE	RM @ MEAS TEMP	RMF @ MEAS TEMP	RMG @ MEAS TEMP	CIRC STOPPED	RECORDED BY	WITNESSED BY	REMARKS 1	REMARKS 2	REMARKS 3
08/16/14 17:42:	750	749.75			17.5	150	150	36	STEEL	MUD				0	0 @ 0 F	0 @ F	0 @ F		HOLT	JESSE	N/A	N/A	N/A

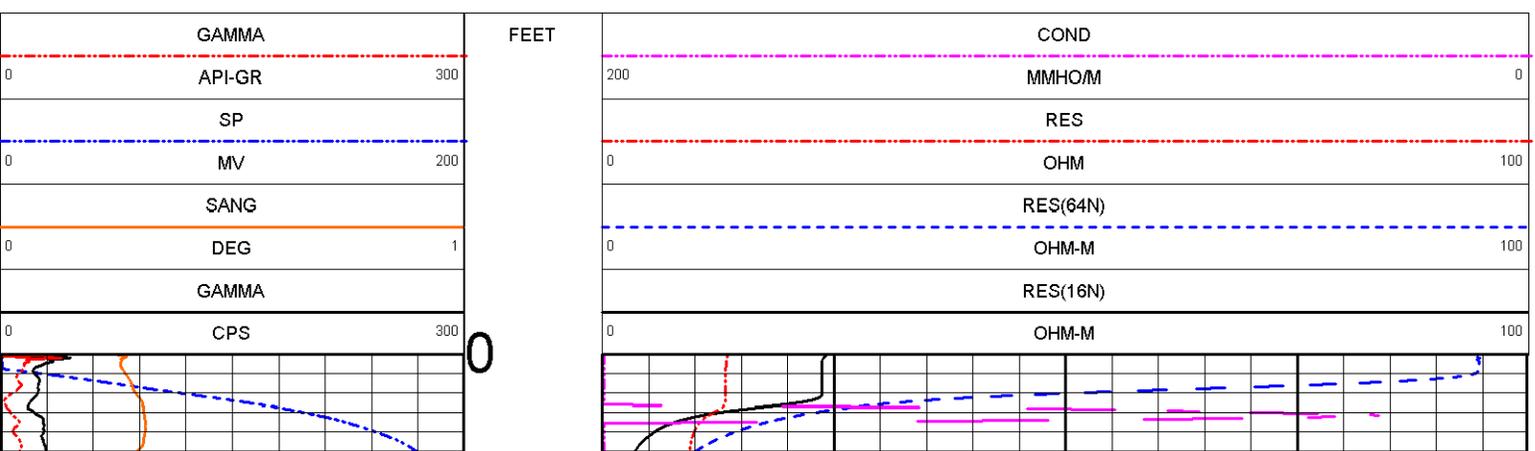
ALL SERVICES PROVIDED SUBJECT TO STANDARD TERMS AND CONDITIONS

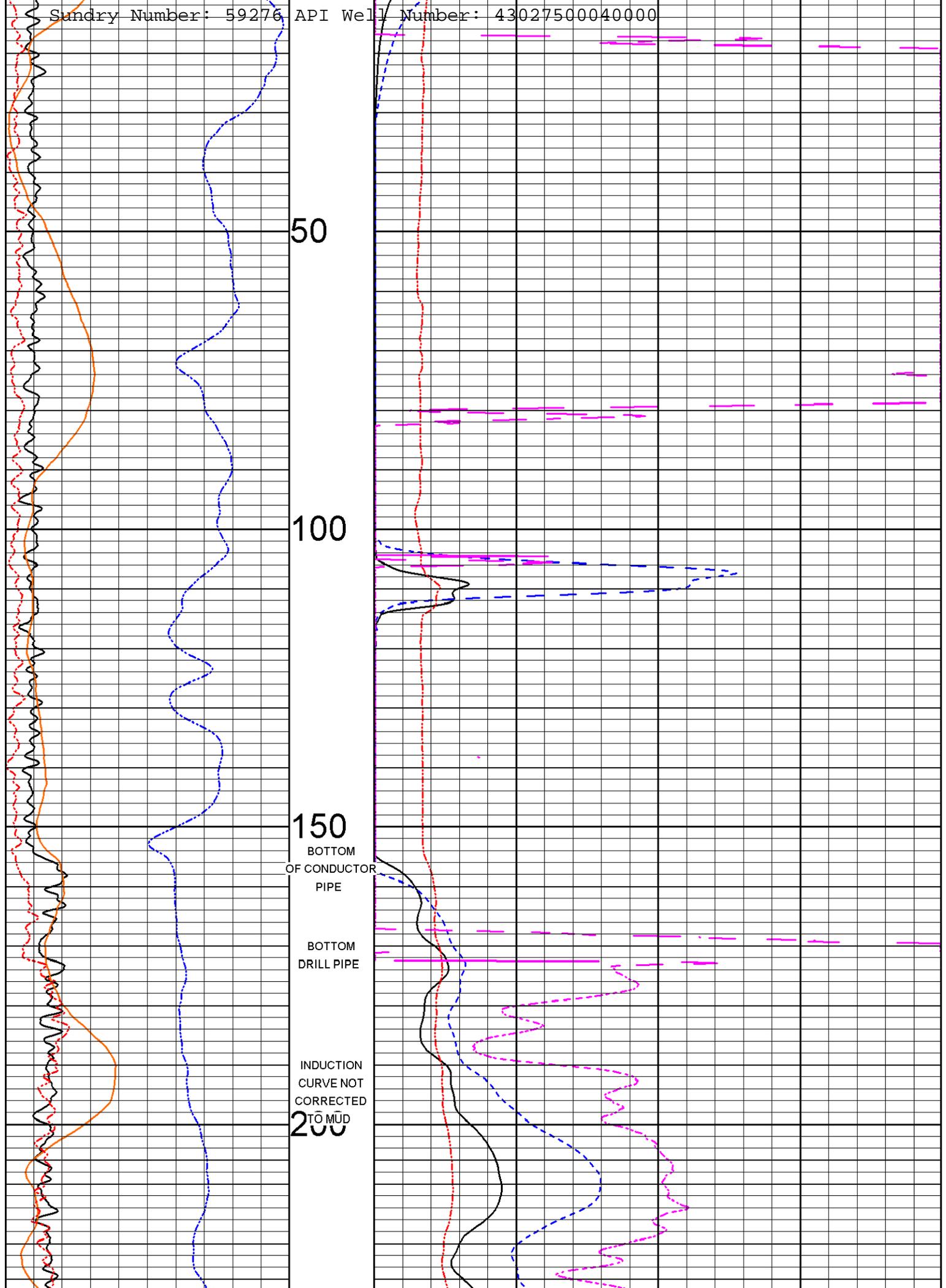
5 INCH DNEL CPS GAMMA, API GAMMA IND CW-7 08/16/14

N/A

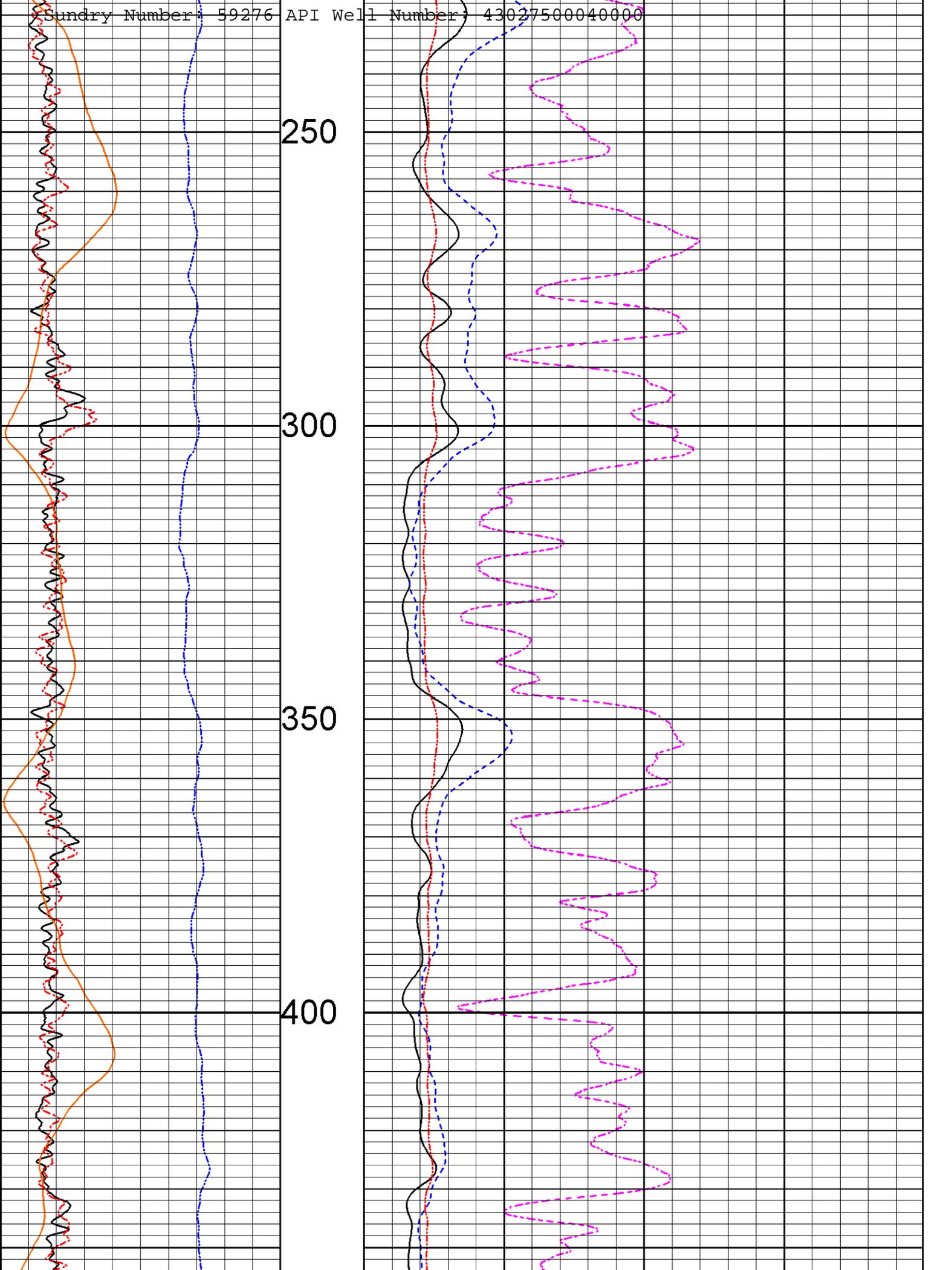
LOG PARAMETERS

MATRIX DENSITY : 2.65 NEUTRON MATRIX : SANDSTONE MATRIX DELTA T : 54
 MAGNETIC DECL : 0 ELECT. CUTOFF : 75000 BIT SIZE : 17.5 IN
 PRESENTATION NAME/DATE = 9057 RBOART MAGNUM CW-7 08 16 14.0 08/16/2014 Version 3.65 JK7





Sundry Number: 59276 API Well Number: 43027500040000



Sundry Number: 59276

API Well Number: 43027500040000

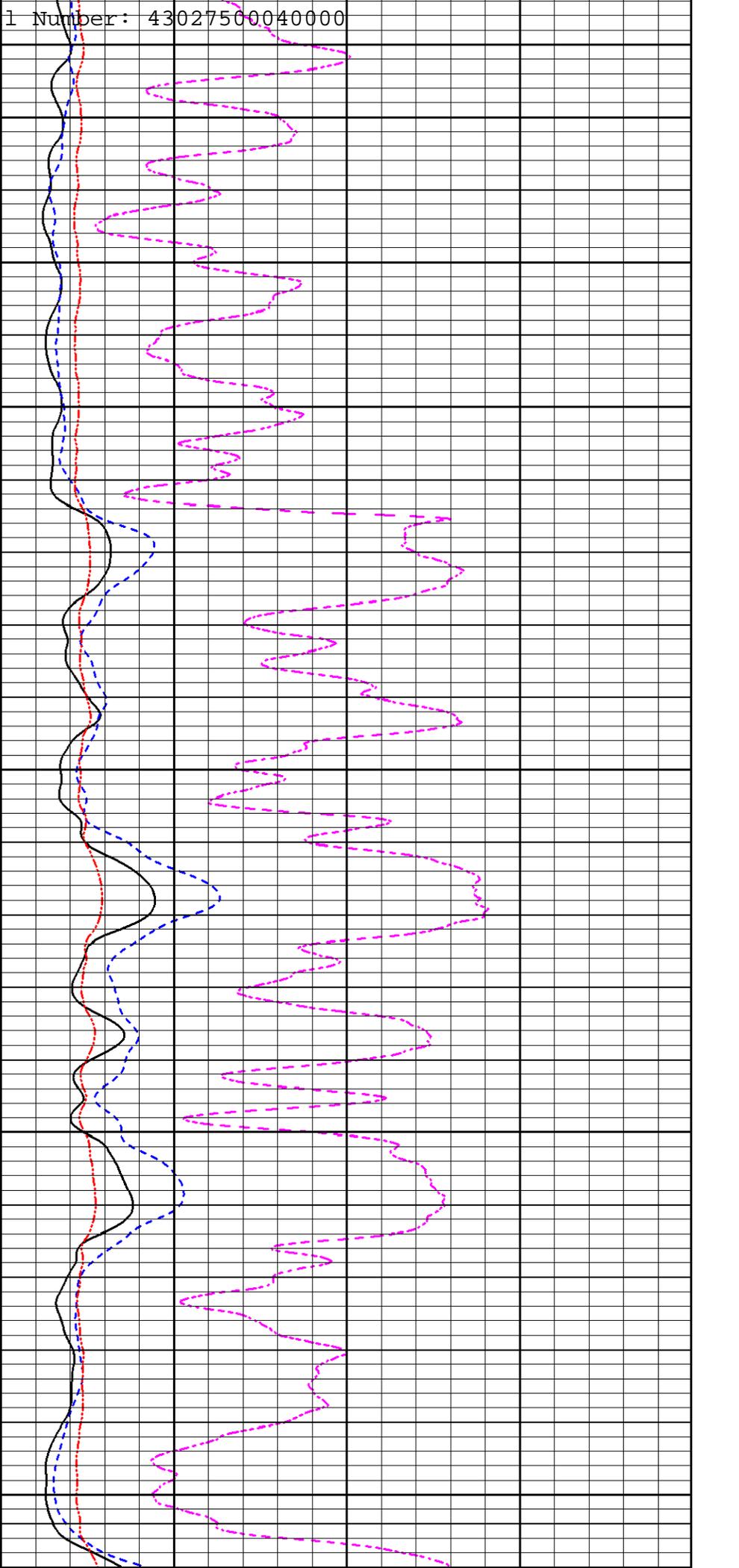
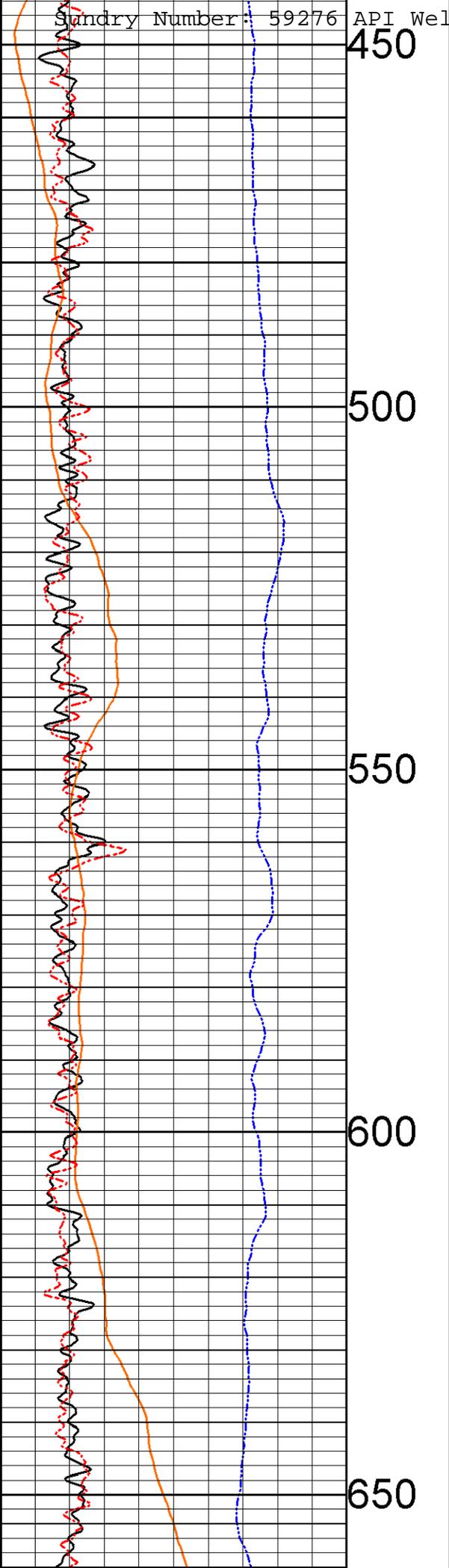
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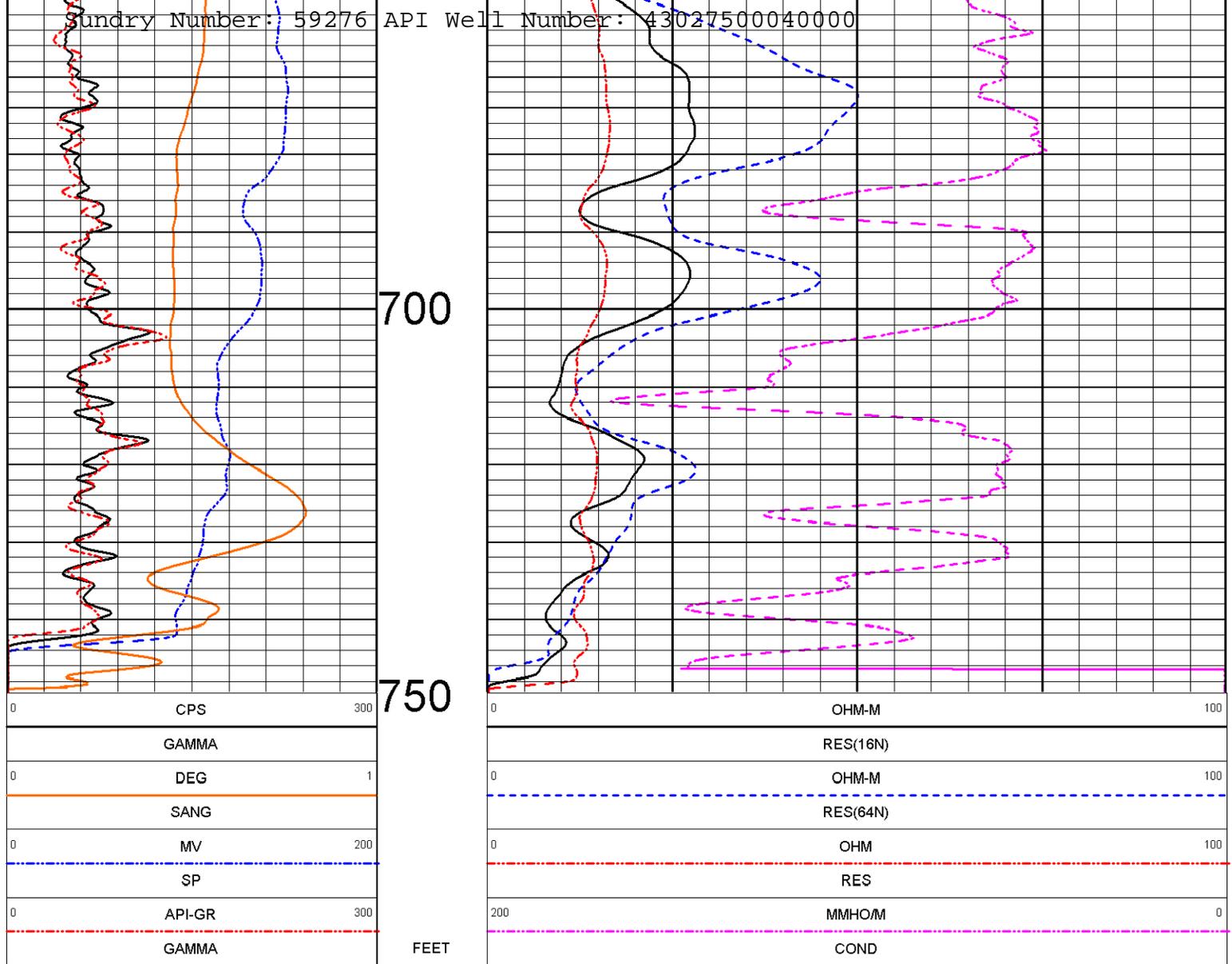
500

550

600

650





▲
5 INCH DNEL CPS GAMMA, API GAMMA IND CW-7 08/16/14
▲

N/A

LOG PARAMETERS

MATRIX DENSITY : 2.65	NEUTRON MATRIX : SANDSTONE	MATRIX DELTA T : 54
MAGNETIC DECL : 0	ELECT. CUTOFF : 75000	BIT SIZE : 17.5 IN
PRESENTATION NAME/DATE = 9057 RBOART MAGNUM CW-7 08 16 14.0 08/16/2011 Version 3.65 JK7		

***** COMPU-LOG - VERTICAL DEVIATION *****

CLIENT : BOART/MAGNUM	HOLE ID. : CW-7
FIELD OFFICE : MAST	DATE OF LOG : 08/16/14
DATA FROM : N/A	PROBE : 9057C , 4457
MAG. DECL. : 0.000	DEPTH UNITS : FEET

LOG: CW-7 17.5 PILOT FOR 36 IN CSG.log

CABLE DEPTH	TRUE DEPTH	NORTH DEV.	EAST DEV.	DISTANCE	AZIMUTH	SANG	SANGB
-6.20	-6.20	0.00	0.00	0.0	0.0	0.0	0.0
13.60	13.60	-0.04	-0.05	0.1	231.5	0.2	303.0
22.60	22.60	0.04	0.06	0.1	232.0	0.2	303.0

33.60	33.60	-0.04	-0.06	0.1	232.8	0.0	283.8
53.60	53.60	-0.05	-0.08	0.1	241.3	0.2	280.1
73.60	73.60	0.03	-0.12	0.1	284.8	0.3	282.4
93.60	93.60	0.06	-0.18	0.2	287.8	0.1	353.0
113.60	113.60	0.06	-0.19	0.2	286.5	0.1	108.4
133.60	133.60	0.07	-0.18	0.2	292.4	0.1	333.1
153.60	153.60	0.08	-0.21	0.2	290.5	0.1	244.5
173.60	173.60	0.04	-0.26	0.3	279.3	0.2	200.4
193.60	193.60	-0.05	-0.27	0.3	258.7	0.4	172.6
213.60	213.60	-0.12	-0.27	0.3	245.4	0.1	168.0
233.60	233.60	-0.16	-0.28	0.3	241.1	0.2	215.5
253.60	253.60	-0.25	-0.33	0.4	233.3	0.4	209.6
273.60	273.60	-0.37	-0.36	0.5	224.9	0.2	180.9
293.60	293.60	-0.42	-0.37	0.6	221.4	0.1	162.3
313.60	313.60	-0.43	-0.39	0.6	221.7	0.2	232.1
333.60	333.60	-0.48	-0.44	0.7	222.6	0.2	239.4
353.60	353.60	-0.54	-0.49	0.7	222.1	0.2	186.9
373.60	373.60	-0.55	-0.49	0.7	222.1	0.1	322.7
393.60	393.60	-0.51	-0.55	0.7	226.9	0.3	290.6
413.60	413.60	-0.49	-0.67	0.8	233.8	0.3	277.8
433.60	433.60	-0.48	-0.73	0.9	236.9	0.2	253.5
453.60	453.60	-0.48	-0.76	0.9	237.5	0.1	330.6
473.60	473.60	-0.45	-0.76	0.9	239.6	0.2	357.4
493.60	493.60	-0.40	-0.78	0.9	243.2	0.1	309.4
513.60	513.60	-0.40	-0.83	0.9	244.6	0.2	225.6
533.60	533.60	-0.49	-0.83	1.0	239.5	0.3	144.9
553.60	553.60	-0.54	-0.75	0.9	234.2	0.2	113.7
573.60	573.60	-0.56	-0.67	0.9	230.3	0.2	94.8
593.60	593.60	-0.58	-0.59	0.8	225.9	0.2	106.6
613.60	613.60	-0.60	-0.52	0.8	220.8	0.3	114.5
633.60	633.60	-0.65	-0.42	0.8	213.2	0.4	110.5
653.60	653.59	-0.64	-0.27	0.7	203.2	0.5	66.5
673.60	673.59	-0.52	-0.14	0.5	194.7	0.5	29.3
693.60	693.59	-0.38	-0.07	0.4	190.6	0.4	23.5
713.60	713.59	-0.24	0.00	0.2	179.4	0.5	35.5
733.60	733.59	-0.02	0.06	0.1	110.3	0.4	0.1
749.20	749.19	0.07	0.05	0.1	37.0	0.0	0.0

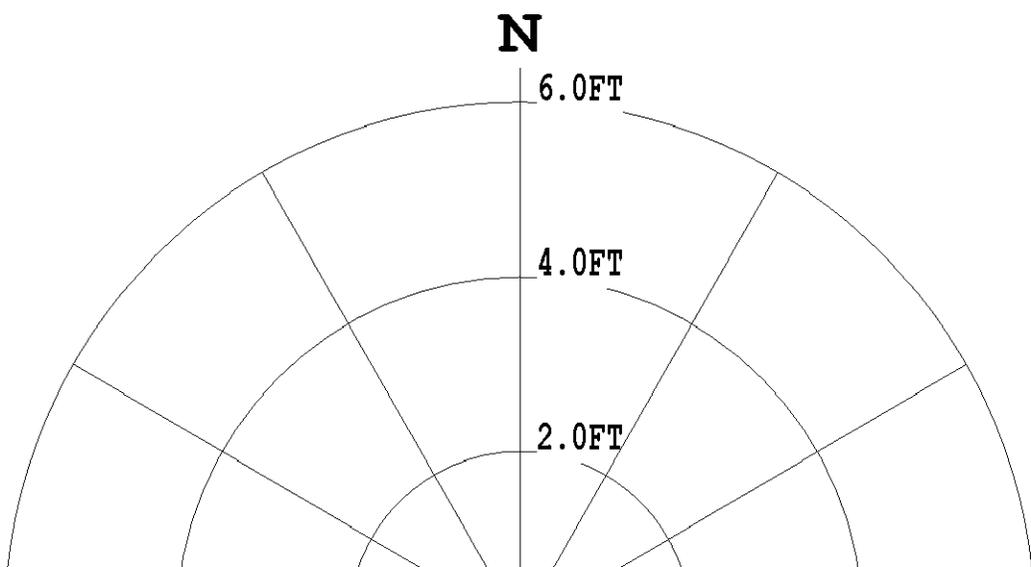
PLAN VIEW COMPU-LOG DEVIATION

CLIENT: BOART/MAGNUM
 LOCATION: N/A
 HOLE ID: CW-7
 DATE OF LOG: 08/16/14
 PROBE: 9057C 4457



MAG DECL: 0.0

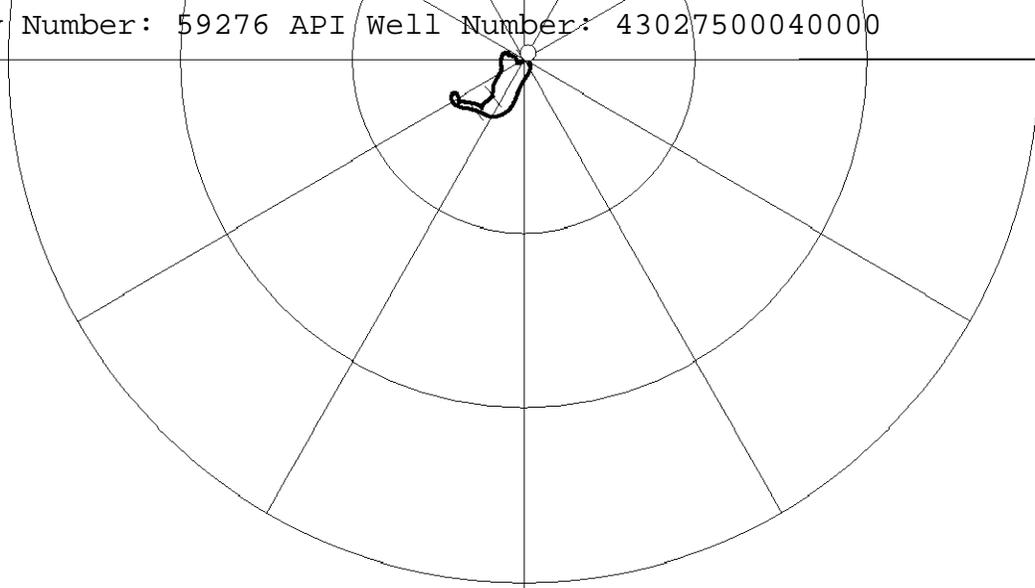
SCALE: 2 FT/IN
 TRUE DEPTH: 748.69 FT
 AZIMUTH: 37.0
 DISTANCE: 0.1 FT
 + = 300 FT INCR
 ○ = BOTTOM OF HOLE



Sundry Number: 59276 API Well Number: 43027500040000

W

E



S

Sundry Number: 59276 API Well Number: 43027500040000

RECEIVED: Dec. 24, 2014

Sundry Number: 59276 API Well Number: 43027500040000

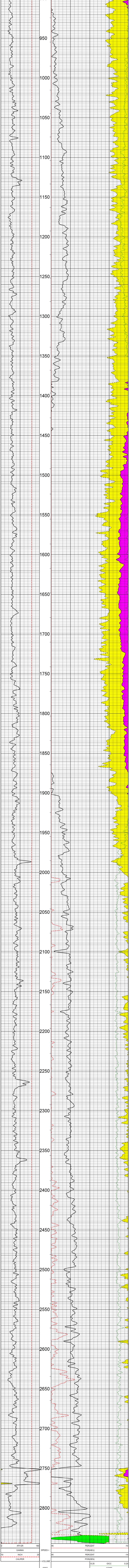
RECEIVED: Dec. 24, 2014

COMPANY	SONART MANAGEMENT	OTHER SERVICES	LOG
WELL	CW-7	LOG	N/A
COUNTY	HILLIARD	LOG	N/A
STATE	OH	LOG	N/A
LOCATION	3629 BL P/HAL SEC 23	LOG	N/A
SECTION	23	LOG	N/A
TOWNSHIP	158	LOG	N/A
RANGE	7W	LOG	N/A
SECTION	7W	LOG	N/A
WELL ID	N/A	ELEVATION K3	N/A
PERMANENT DATUM	CEL	ELEVATION OF	N/A
PRE MEASURED FROM	CEL	ELEVATION OF	4818
RISER NUMBER	2845	RISER NUMBER	2845
DATE	09/08/14	ARRIVAL TIME	17:23
DEPTH - FEET	2880	DEPARTURE TIME	18:00
BIT SIZE	86280	CNC STOPPED	3000
LOG TOP	20		
LOG BOTTOM	20		
CASING CO	20		
CASING SIZE	20		
CASING WEIGHT	20		
CASING TENSILE STRENGTH	20		
CASING GRADE	20		
CASING MANUFACTURER	20		
CASING WEIGHT	20		
CASING TENSILE STRENGTH	20		
CASING GRADE	20		
CASING MANUFACTURER	20		
CASING WEIGHT	20		
CASING TENSILE STRENGTH	20		
CASING GRADE	20		
CASING MANUFACTURER	20		

RECORDED BY: HQT
 CHECKED BY: HQT
 LOG NUMBER: 5443137
 ALL SERVICES PROVIDED SUBJECT TO STANDARD TERMS AND CONDITIONS

5 INCH GAMMA NEUTRON DENSITY CW-7 09/08/14

MATRIX DENSITY : 2.65	NEUTRON MATRIX : SANDSTONE	MATRIX DELTA : 54
MAGNETIC DECL : 11.76	ELECT. CUTOFF : 75000	BIT SIZE : 17.5
PRESENTATION NAMEDATE = 4000.0 10/31/2011		VERSION = 3.64KF

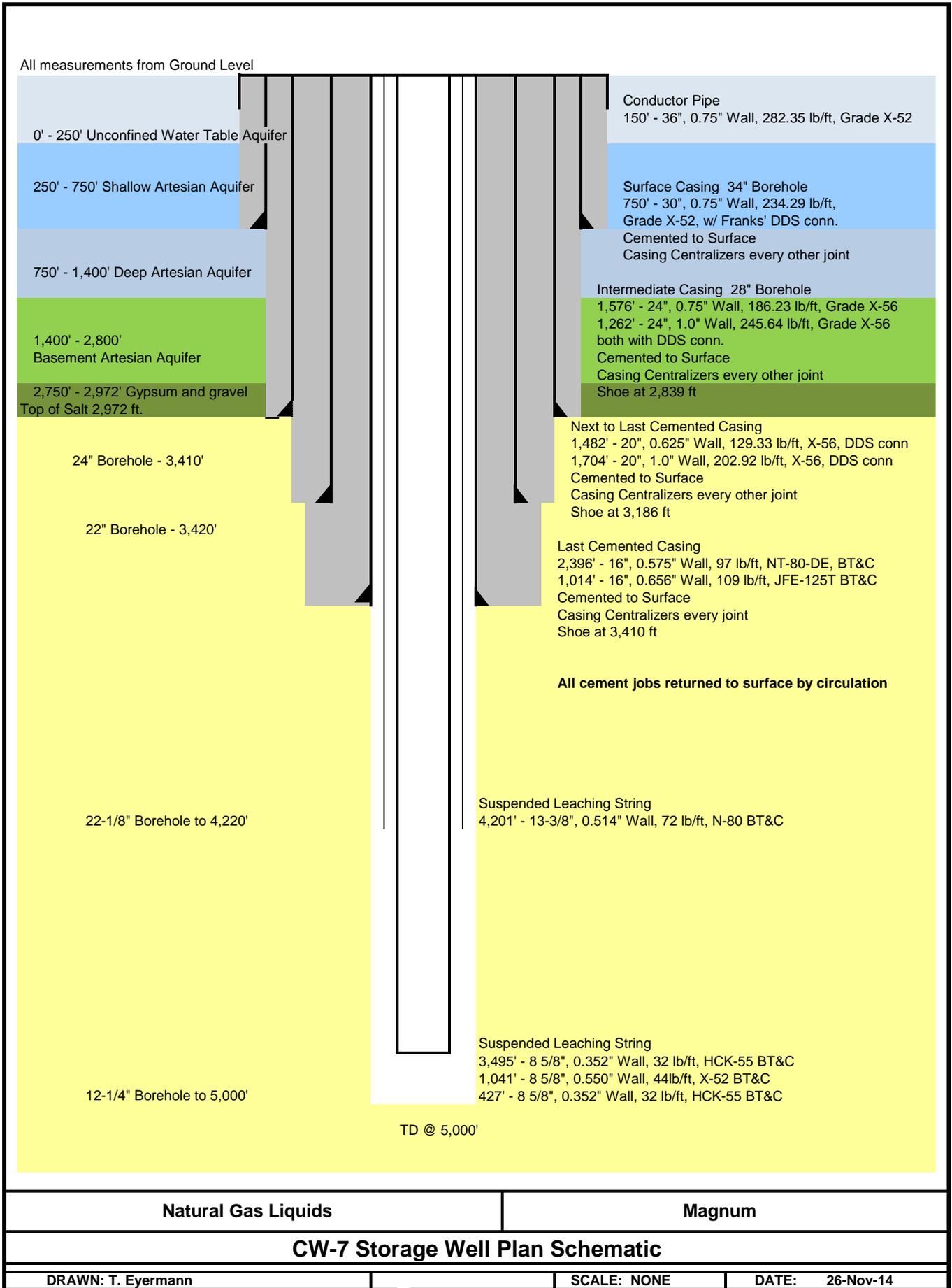


5 INCH GAMMA NEUTRON DENSITY CW-7 09/08/14

MATRIX DENSITY : 2.65	NEUTRON MATRIX : SANDSTONE	MATRIX DELTA : 54
MAGNETIC DECL : 11.76	ELECT. CUTOFF : 75000	BIT SIZE : 17.5
PRESENTATION NAMEDATE = 4000.0 10/31/2011		VERSION = 3.64KF

TOOL CALIBRATION CW-7 09/08/14 14:25		
TOOL 4000	TM VERSION 23	
SERIAL NUMBER	2816	
1	DATE	TIME
2	DATE	TIME
	SENSOR	STANDARD
	GAMMA	1.000 [API-GR]
	GAMMA	340.000 [API-GR]
	TEMP	50.000 [DEG_F]
	TEMP	100.000 [DEG_F]
	RESPONSE	0.000 [CPS]
		291.000 [CPS]
		302203.000 [CPS]
		340409.000 [CPS]

STATE OF UTAH DEPARTMENT OF NATURAL RESOURCES DIVISION OF OIL, GAS, AND MINING		FORM 9
SUNDRY NOTICES AND REPORTS ON WELLS Do not use this form for proposals to drill new wells, significantly deepen existing wells below current bottom-hole depth, reenter plugged wells, or to drill horizontal laterals. Use APPLICATION FOR PERMIT TO DRILL form for such proposals.		5. LEASE DESIGNATION AND SERIAL NUMBER: 51573-OBA
1. TYPE OF WELL Gas Storage Well		6. IF INDIAN, ALLOTTEE OR TRIBE NAME:
2. NAME OF OPERATOR: MAGNUM NGLS SOLUTION MINING LLC		7. UNIT or CA AGREEMENT NAME:
3. ADDRESS OF OPERATOR: 3165 East Millrock Drive Suite 330 , Holladay, UT, 84121		8. WELL NAME and NUMBER: CW-7
4. LOCATION OF WELL FOOTAGES AT SURFACE: 0852 FSL 0091 FWL QTR/QTR, SECTION, TOWNSHIP, RANGE, MERIDIAN: Qtr/Qtr: SWSW Section: 23 Township: 15.0S Range: 07.0W Meridian: S		9. API NUMBER: 43027500040000
PHONE NUMBER: 801 993-7001 Ext		9. FIELD and POOL or WILDCAT: WILDCAT
		COUNTY: MILLARD
		STATE: UTAH
11. CHECK APPROPRIATE BOXES TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA		
TYPE OF SUBMISSION	TYPE OF ACTION	
<input type="checkbox"/> NOTICE OF INTENT Approximate date work will start:	<input type="checkbox"/> ACIDIZE <input type="checkbox"/> ALTER CASING <input type="checkbox"/> CASING REPAIR <input type="checkbox"/> CHANGE TO PREVIOUS PLANS <input type="checkbox"/> CHANGE TUBING <input type="checkbox"/> CHANGE WELL NAME <input type="checkbox"/> CHANGE WELL STATUS <input type="checkbox"/> COMMINGLE PRODUCING FORMATIONS <input type="checkbox"/> CONVERT WELL TYPE <input type="checkbox"/> DEEPEN <input type="checkbox"/> FRACTURE TREAT <input type="checkbox"/> NEW CONSTRUCTION <input type="checkbox"/> OPERATOR CHANGE <input type="checkbox"/> PLUG AND ABANDON <input type="checkbox"/> PLUG BACK <input type="checkbox"/> PRODUCTION START OR RESUME <input type="checkbox"/> RECLAMATION OF WELL SITE <input type="checkbox"/> RECOMPLETE DIFFERENT FORMATION <input type="checkbox"/> REPERFORATE CURRENT FORMATION <input type="checkbox"/> SIDETRACK TO REPAIR WELL <input type="checkbox"/> TEMPORARY ABANDON <input type="checkbox"/> TUBING REPAIR <input type="checkbox"/> VENT OR FLARE <input type="checkbox"/> WATER DISPOSAL <input type="checkbox"/> WATER SHUTOFF <input type="checkbox"/> SI TA STATUS EXTENSION <input type="checkbox"/> WILDCAT WELL DETERMINATION <input checked="" type="checkbox"/> OTHER	
<input checked="" type="checkbox"/> SUBSEQUENT REPORT Date of Work Completion: 11/26/2014	<input type="checkbox"/> APD EXTENSION OTHER: CW-7 As-Built Casing Design	
<input type="checkbox"/> SPUD REPORT Date of Spud:		
<input type="checkbox"/> DRILLING REPORT Report Date:		
12. DESCRIBE PROPOSED OR COMPLETED OPERATIONS. Clearly show all pertinent details including dates, depths, volumes, etc. Magnum NGLS Cavern Well #CW-7 As-Built Casing Design Dated November 26, 2014 API No. 43027500040000 APD No. 9288		
Accepted by the Utah Division of Oil, Gas and Mining FOR RECORD ONLY February 11, 2015		
NAME (PLEASE PRINT) Tiffany A. James	PHONE NUMBER 801 993-7001	TITLE Vice President Project Development
SIGNATURE N/A	DATE 2/2/2015	



STATE OF UTAH DEPARTMENT OF NATURAL RESOURCES DIVISION OF OIL, GAS, AND MINING		FORM 9	
SUNDRY NOTICES AND REPORTS ON WELLS Do not use this form for proposals to drill new wells, significantly deepen existing wells below current bottom-hole depth, reenter plugged wells, or to drill horizontal laterals. Use APPLICATION FOR PERMIT TO DRILL form for such proposals.		5. LEASE DESIGNATION AND SERIAL NUMBER: 51573-OBA	
		6. IF INDIAN, ALLOTTEE OR TRIBE NAME:	
1. TYPE OF WELL Gas Storage Well		7. UNIT or CA AGREEMENT NAME:	
2. NAME OF OPERATOR: MAGNUM NGLS SOLUTION MINING LLC		8. WELL NAME and NUMBER: CW-7	
3. ADDRESS OF OPERATOR: 3165 East Millrock Drive Suite 330 , Holladay, UT, 84121		9. API NUMBER: 43027500040000	
4. LOCATION OF WELL FOOTAGES AT SURFACE: 0852 FSL 0091 FWL QTR/QTR, SECTION, TOWNSHIP, RANGE, MERIDIAN: Qtr/Qtr: SWSW Section: 23 Township: 15.0S Range: 07.0W Meridian: S		9. FIELD and POOL or WILDCAT: DELTA SALT CAVERN STORAGE	
		COUNTY: MILLARD	
		STATE: UTAH	
11. CHECK APPROPRIATE BOXES TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA			
TYPE OF SUBMISSION	TYPE OF ACTION		
<input type="checkbox"/> NOTICE OF INTENT Approximate date work will start: <input checked="" type="checkbox"/> SUBSEQUENT REPORT Date of Work Completion: 12/7/2014 <input type="checkbox"/> SPUD REPORT Date of Spud: <input type="checkbox"/> DRILLING REPORT Report Date:	<input type="checkbox"/> ACIDIZE <input type="checkbox"/> CHANGE TO PREVIOUS PLANS <input type="checkbox"/> CHANGE WELL STATUS <input type="checkbox"/> DEEPEN <input type="checkbox"/> OPERATOR CHANGE <input type="checkbox"/> PRODUCTION START OR RESUME <input type="checkbox"/> REPERFORATE CURRENT FORMATION <input type="checkbox"/> TUBING REPAIR <input type="checkbox"/> WATER SHUTOFF <input type="checkbox"/> WILDCAT WELL DETERMINATION	<input type="checkbox"/> ALTER CASING <input type="checkbox"/> CHANGE TUBING <input type="checkbox"/> COMMINGLE PRODUCING FORMATIONS <input type="checkbox"/> FRACTURE TREAT <input type="checkbox"/> PLUG AND ABANDON <input type="checkbox"/> RECLAMATION OF WELL SITE <input type="checkbox"/> SIDETRACK TO REPAIR WELL <input type="checkbox"/> VENT OR FLARE <input type="checkbox"/> SI TA STATUS EXTENSION <input checked="" type="checkbox"/> OTHER	<input type="checkbox"/> CASING REPAIR <input type="checkbox"/> CHANGE WELL NAME <input type="checkbox"/> CONVERT WELL TYPE <input type="checkbox"/> NEW CONSTRUCTION <input type="checkbox"/> PLUG BACK <input type="checkbox"/> RECOMPLETE DIFFERENT FORMATION <input type="checkbox"/> TEMPORARY ABANDON <input type="checkbox"/> WATER DISPOSAL <input type="checkbox"/> APD EXTENSION OTHER: Monthly Status Report Oct, N
12. DESCRIBE PROPOSED OR COMPLETED OPERATIONS. Clearly show all pertinent details including dates, depths, volumes, etc.			
Magnum Cavern Well CW-7 Monthly Status Reports for October 2014, November 2014 (API No. 4302750004); See Attached Summary Reports. Drilling activities were in direct accordance with project specifications and Utah DOGM Application Permit to Drill requirements.			
Accepted by the Utah Division of Oil, Gas and Mining FOR RECORD ONLY March 13, 2015			
NAME (PLEASE PRINT) Adam Richins		PHONE NUMBER 801 993-7001	TITLE Compliance Manager
SIGNATURE N/A		DATE 3/13/2015	

Magnum CW-7 October 2014 Monthly Status Report Summary

10/1-2/2014 Drilled 12-1/4" pilot hole below shoe at 2803' bgs.

10/2/2014 Encountered top of salt at 2975' bgs.

10/5/2014 Completed 12-1/4" pilot hole to a depth of 3450' bgs.

10/6/2014 Jet West performed open hole gamma, neutron, density, and sonic wireline logging.

10/7-12/2014 Reamed hole to 24 inches from 2860' bgs to 3200' bgs.

10/12/2014 Jest West performed open hole caliper and deviation wireline logging.

10/12-13/2014 B & L installed 1660.69 feet of 20x1" and 1525.31 feet of 20x.625" casing to a depth of 3186' bgs.

10/14/2014 ThermaSource completed the cementing of the 20" casing using 2079 ft³ of cement.

10/15-17/2014 Allowed cement to cure.

10/18/2014 Assembled BOP and pressure tested 20" casing. The surface pressure test was completed successfully and was within project and permit specifications.
20" Casing Test Results: 60-minute test. Surface pressure 940 psi. Pressure loss: 40 psi (<5%).

10/18-20/2014 Drilled out cement and shoe with 17-1/2" tooling.

10/20/2014 Assembled BOP and pressure tested 20" casing seat. The surface pressure test was completed successfully and was within project and permit specifications.
20" Casing Seat Test Results: 60-minute test. Surface pressure 940 psi. Pressure loss: 40 psi (<5%).

10/21-25/2014 Reamed the hole to 22 inches and to a depth of 3418' bgs.

10/26/2014 B&L installed 1014.28 feet of 16x.656" and 2403.72 feet of 16x.575" casing to a depth of 3418' bgs.

10/27/2014 ThermaSource completed the cementing of the 16" casing using 1785 ft³ of cement.

10/27-30/2014 Allowed cement to cure.

10/30/2014 Assembled BOP and pressure tested 16" casing. The surface pressure test was completed successfully and was within project and permit specifications.

**16" Casing Test Results: 60-minute test. Surface pressure 955 psi.
Pressure loss: 35 psi (<5%).**

10/30-31/2014

Drilled out cement and shoe with 14-3/4" bit.

10/31/2014

Assembled BOP and pressure tested 16" casing seat. The surface pressure test was completed successfully and was within project and permit specifications.

16" Casing Seat Test Results: 60-minute test. Surface pressure 955 psi. Pressure loss: 33 psi (<5%).

Magnum CW-7 November 2014 Monthly Status Report Summary

11/1-11/2014	Drilled 12-1/4" pilot hole through salt to a depth of 5000' bgs.
11/11/2014	Jet West performed open hole caliper, neutron, density, and gamma wireline logging.
11/12/2014	Haliburton performed open hole SP and deviation wireline logging.
11/13-19/2014	Reamed hole to 16 inches from 3432' bgs to 4220' bgs.
11/20-22/2014	Reamed hole to 22 inches from 3431' bgs to 3750' bgs.
11/24/2014	B & L installed 4201.74 feet of 13-3/8" hanging casing to a depth of 4202' bgs.
11/25/2014	B & L installed 1041 feet of 8-5/8x.550" and 3923 feet of 8-5/8x.352" hanging casing to a depth of 4960' bgs. The well head was installed and completed.
11/26-30/2014	Boart Longyear began rig-down and equipment transport to the CW-8 well pad.

STATE OF UTAH DEPARTMENT OF NATURAL RESOURCES DIVISION OF OIL, GAS, AND MINING		FORM 9
SUNDRY NOTICES AND REPORTS ON WELLS		5. LEASE DESIGNATION AND SERIAL NUMBER: 51573-OBA
Do not use this form for proposals to drill new wells, significantly deepen existing wells below current bottom-hole depth, reenter plugged wells, or to drill horizontal laterals. Use APPLICATION FOR PERMIT TO DRILL form for such proposals.		6. IF INDIAN, ALLOTTEE OR TRIBE NAME:
		7. UNIT or CA AGREEMENT NAME:
1. TYPE OF WELL Gas Storage Well	8. WELL NAME and NUMBER: CW-7	
2. NAME OF OPERATOR: MAGNUM NGLS SOLUTION MINING LLC	9. API NUMBER: 43027500040000	
3. ADDRESS OF OPERATOR: 3165 East Millrock Drive Suite 330 , Holladay, UT, 84121	PHONE NUMBER: 801 993-7001 Ext	9. FIELD and POOL or WILDCAT: DELTA SALT CAVERN STORAGE
4. LOCATION OF WELL FOOTAGES AT SURFACE: 0852 FSL 0091 FWL QTR/QTR, SECTION, TOWNSHIP, RANGE, MERIDIAN: Qtr/Qtr: SWSW Section: 23 Township: 15.0S Range: 07.0W Meridian: S	COUNTY: MILLARD	
	STATE: UTAH	
11. CHECK APPROPRIATE BOXES TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA		
TYPE OF SUBMISSION	TYPE OF ACTION	
<input type="checkbox"/> NOTICE OF INTENT Approximate date work will start: <input checked="" type="checkbox"/> SUBSEQUENT REPORT Date of Work Completion: 2/20/2015 <input type="checkbox"/> SPUD REPORT Date of Spud: <input type="checkbox"/> DRILLING REPORT Report Date:	<input type="checkbox"/> ACIDIZE <input type="checkbox"/> ALTER CASING <input type="checkbox"/> CASING REPAIR <input type="checkbox"/> CHANGE TO PREVIOUS PLANS <input type="checkbox"/> CHANGE TUBING <input type="checkbox"/> CHANGE WELL NAME <input type="checkbox"/> CHANGE WELL STATUS <input type="checkbox"/> COMMINGLE PRODUCING FORMATIONS <input type="checkbox"/> CONVERT WELL TYPE <input type="checkbox"/> DEEPEN <input type="checkbox"/> FRACTURE TREAT <input type="checkbox"/> NEW CONSTRUCTION <input type="checkbox"/> OPERATOR CHANGE <input type="checkbox"/> PLUG AND ABANDON <input type="checkbox"/> PLUG BACK <input type="checkbox"/> PRODUCTION START OR RESUME <input type="checkbox"/> RECLAMATION OF WELL SITE <input type="checkbox"/> RECOMPLETE DIFFERENT FORMATION <input type="checkbox"/> REPERFORATE CURRENT FORMATION <input type="checkbox"/> SIDETRACK TO REPAIR WELL <input type="checkbox"/> TEMPORARY ABANDON <input type="checkbox"/> TUBING REPAIR <input type="checkbox"/> VENT OR FLARE <input type="checkbox"/> WATER DISPOSAL <input type="checkbox"/> WATER SHUTOFF <input type="checkbox"/> SI TA STATUS EXTENSION <input type="checkbox"/> WILDCAT WELL DETERMINATION <input checked="" type="checkbox"/> OTHER	
12. DESCRIBE PROPOSED OR COMPLETED OPERATIONS. Clearly show all pertinent details including dates, depths, volumes, etc. Sonar Survey of CW-7 (API No. 4302750004) conducted by Sonarwire Global February 20, 2015 in direct accordance with project specifications and Utah DOGM Application Permit to Drill requirements.		
Accepted by the Utah Division of Oil, Gas and Mining FOR RECORD ONLY March 13, 2015		OTHER: <input style="width: 100px;" type="text" value="CW-7 Sonar Survey"/>
NAME (PLEASE PRINT) Adam Richins	PHONE NUMBER 801 993-7001	TITLE Compliance Manager
SIGNATURE N/A	DATE 3/13/2015	

SONARWIRE GLOBAL, LLC

P.O. BOX 576
ABITA SPRINGS, LA 70420
Office: 985-893-9221
Toll Free: 888-211-6037
Fax: 985-893-4798
Email: sean@sonarwire.com

Survey conducted by: Ricky Lawrence

MAGNUM NGLS
DELTA, UT
CAVERN WELL NO. CW-7
FEBRUARY 20, 2015

Survey from 3747 ft. to 4955 ft.
Sonar TD at 4955 ft.
Nitrogen at 3747 ft.
13 3/8 inch casing at 4204 ft.
8 5/8 inch tubing at 4964 ft.
Zero sonar tool at B.H.F.
Site personnel: Mr. Thomas Eyerman

SONARWIRE GLOBAL, LLC
Depth versus VolumeMAGNUM NGLS
CAVERN NO. CW-7DELTA, UT
Fri, Feb 20, 2015

Depth	Cubic ft. per ft.	Cubic ft. total	Barrels per ft.	Barrels total
3750	294.0	882.0	52.4	157.1
3755	300.3	2383.3	53.5	424.5
3760	311.3	3940.0	55.5	701.7
3765	321.2	5546.1	57.2	987.8
3770	329.0	7191.1	58.6	1280.8
3775	337.4	8878.2	60.1	1581.3
3780	346.6	10611.3	61.7	1890.0
3785	357.5	12398.8	63.7	2208.3
3790	370.8	14252.8	66.0	2538.5
3795	399.6	16250.8	71.2	2894.4
3800	454.2	18521.9	80.9	3298.9
3805	504.9	21046.3	89.9	3748.5
3810	544.9	23770.8	97.0	4233.8
3815	572.5	26633.4	102.0	4743.6
3820	579.5	29530.9	103.2	5259.7
3825	600.0	32530.7	106.9	5794.0
3830	642.6	35743.7	114.5	6366.2
3835	672.9	39108.0	119.8	6965.4
3840	681.0	42513.1	121.3	7571.9
3845	691.1	45968.5	123.1	8187.3
3850	703.8	49487.4	125.3	8814.1
3855	720.4	53089.3	128.3	9455.6
3860	742.9	56804.0	132.3	10117.2
3865	761.9	60613.7	135.7	10795.8
3870	774.7	64487.0	138.0	11485.6
3875	784.7	68410.5	139.8	12184.4
3880	790.4	72362.4	140.8	12888.3
3885	793.8	76331.3	141.4	13595.2
3890	793.8	80300.1	141.4	14302.1
3895	804.4	84322.2	143.3	15018.4
3900	830.5	88474.7	147.9	15758.0
3905	858.7	92768.0	152.9	16522.7
3910	889.9	97217.6	158.5	17315.2
3915	920.1	101818.2	163.9	18134.6
3920	948.1	106558.5	168.9	18978.9
3925	979.9	111458.0	174.5	19851.5
3930	1017.3	116544.5	181.2	20757.5
3935	1047.5	121782.0	186.6	21690.3
3940	1066.1	127112.4	189.9	22639.7
3945	1078.3	132503.9	192.1	23600.0
3950	1080.9	137908.2	192.5	24562.5
3955	1074.1	143278.7	191.3	25519.0
3960	1054.1	148549.0	187.7	26457.7
3965	1035.7	153727.4	184.5	27380.0
3970	1018.7	158820.8	181.4	28287.2
3975	1026.1	163951.3	182.8	29201.0
3980	1069.2	169297.3	190.4	30153.1
3985	1115.9	174877.0	198.8	31146.9
3990	1167.9	180716.3	208.0	32187.0
3995	1208.9	186760.9	215.3	33263.6
4000	1231.9	192920.2	219.4	34360.6
4005	1257.7	199208.8	224.0	35480.6

MAGNUM NGLS
CAVERN NO. CW-7DELTA, UT
Fri, Feb 20, 2015

Depth	Cubic ft. per ft.	Cubic ft. total	Barrels per ft.	Barrels total
4010	1288.1	205649.1	229.4	36627.7
4015	1325.5	212276.5	236.1	37808.1
4020	1372.0	219136.7	244.4	39029.9
4025	1405.4	226163.9	250.3	40281.5
4030	1417.9	233253.3	252.5	41544.2
4035	1427.9	240392.6	254.3	42815.8
4040	1433.4	247559.9	255.3	44092.3
4045	1431.2	254716.1	254.9	45366.9
4050	1417.3	261802.8	252.4	46629.1
4055	1414.1	268873.3	251.9	47888.4
4060	1425.5	276000.8	253.9	49157.9
4065	1451.9	283260.3	258.6	50450.8
4070	1501.3	290766.9	267.4	51787.8
4075	1544.9	298491.6	275.2	53163.7
4080	1578.1	306382.3	281.1	54569.0
4085	1614.8	314456.4	287.6	56007.1
4090	1656.3	322738.0	295.0	57482.1
4095	1689.6	331186.2	300.9	58986.8
4100	1710.2	339737.1	304.6	60509.8
4105	1729.5	348384.8	308.0	62050.0
4110	1747.0	357119.9	311.2	63605.8
4115	1771.2	365976.1	315.5	65183.2
4120	1805.1	375001.4	321.5	66790.6
4125	1849.3	384247.8	329.4	68437.5
4130	1909.1	393793.4	340.0	70137.6
4135	1963.8	403612.6	349.8	71886.5
4140	2009.9	413662.2	358.0	73676.4
4145	2044.7	423885.7	364.2	75497.3
4150	2061.9	434195.3	367.2	77333.5
4155	2080.6	444598.4	370.6	79186.4
4160	2100.6	455101.5	374.1	81057.1
4165	2111.7	465660.0	376.1	82937.6
4170	2108.8	476204.0	375.6	84815.6
4175	2103.8	486723.0	374.7	86689.1
4180	2095.5	497200.7	373.2	88555.3
4185	2093.7	507669.1	372.9	90419.8
4190	2101.4	518176.0	374.3	92291.1
4195	2119.8	528775.0	377.6	94178.9
4200	2153.7	539543.8	383.6	96096.9
4205	2177.6	550431.9	387.8	98036.2
4210	2184.8	561356.1	389.1	99981.8
4215	2198.7	572349.4	391.6	101939.8
4220	2222.1	583459.8	395.8	103918.7
4225	2260.7	594763.1	402.6	105931.9
4230	2323.1	606378.6	413.8	108000.7
4235	2373.2	618244.8	422.7	110114.2
4240	2401.8	630254.1	427.8	112253.1
4245	2410.9	642308.7	429.4	114400.1
4250	2390.1	654259.2	425.7	116528.6
4255	2375.7	666137.8	423.1	118644.3
4260	2370.9	677992.2	422.3	120755.6
4265	2358.1	689782.9	420.0	122855.7
4270	2334.0	701453.0	415.7	124934.2
4275	2322.3	713064.3	413.6	127002.2

MAGNUM NGLS
CAVERN NO. CW-7DELTA, UT
Fri, Feb 20, 2015

Depth	Cubic ft. per ft.	Cubic ft. total	Barrels per ft.	Barrels total
4280	2328.3	724705.9	414.7	129075.7
4285	2335.6	736383.7	416.0	131155.6
4290	2341.9	748093.3	417.1	133241.2
4295	2358.2	759884.1	420.0	135341.2
4300	2389.3	771830.6	425.6	137469.0
4305	2413.2	783896.7	429.8	139618.0
4310	2425.7	796025.2	432.0	141778.2
4315	2424.6	808148.4	431.8	143937.5
4320	2403.4	820165.4	428.1	146077.8
4325	2383.8	832084.3	424.6	148200.6
4330	2366.1	843914.8	421.4	150307.7
4335	2339.0	855609.8	416.6	152390.7
4340	2297.9	867099.5	409.3	154437.1
4345	2271.4	878456.4	404.5	156459.9
4350	2265.4	889783.4	403.5	158477.3
4355	2299.1	901279.1	409.5	160524.8
4360	2393.4	913246.1	426.3	162656.2
4365	2477.3	925632.5	441.2	164862.3
4370	2543.0	938347.4	452.9	167126.9
4375	2585.6	951275.3	460.5	169429.5
4380	2592.7	964238.8	461.8	171738.4
4385	2591.4	977195.8	461.5	174046.1
4390	2576.7	990079.4	458.9	176340.8
4395	2585.4	1003006.5	460.5	178643.2
4400	2628.7	1016149.9	468.2	180984.1
4405	2673.3	1029516.4	476.1	183364.8
4410	2719.4	1043113.2	484.3	185786.5
4415	2741.5	1056820.6	488.3	188227.9
4420	2726.8	1070454.9	485.7	190656.3
4425	2705.9	1083984.4	481.9	193066.0
4430	2676.2	1097365.3	476.6	195449.2
4435	2666.7	1110698.6	475.0	197824.0
4440	2685.7	1124127.2	478.3	200215.7
4445	2714.3	1137698.7	483.4	202632.9
4450	2757.3	1151485.2	491.1	205088.4
4455	2810.1	1165535.7	500.5	207590.9
4460	2877.6	1179923.7	512.5	210153.5
4465	2939.2	1194619.6	523.5	212771.0
4470	2990.7	1209573.3	532.7	215434.3
4475	3054.7	1224846.8	544.1	218154.7
4480	3137.3	1240533.4	558.8	220948.6
4485	3221.8	1256642.2	573.8	223817.7
4490	3307.6	1273180.0	589.1	226763.2
4495	3381.0	1290085.2	602.2	229774.1
4500	3433.4	1307252.2	611.5	232831.7
4505	3482.7	1324665.8	620.3	235933.2
4510	3525.4	1342292.8	627.9	239072.7
4515	3490.4	1359744.8	621.7	242181.0
4520	3340.5	1376447.2	595.0	245155.9
4525	3224.6	1392570.4	574.3	248027.5
4530	3153.2	1408336.5	561.6	250835.6
4535	3091.4	1423793.3	550.6	253588.6
4540	3043.3	1439010.1	542.0	256298.8
4545	2995.8	1453988.9	533.6	258966.6

MAGNUM NGLS
CAVERN NO. CW-7DELTA, UT
Fri, Feb 20, 2015

Depth	Cubic ft. per ft.	Cubic ft. total	Barrels per ft.	Barrels total
4550	2947.3	1468725.2	524.9	261591.3
4555	2899.3	1483221.7	516.4	264173.2
4560	2851.1	1497477.3	507.8	266712.3
4565	2810.5	1511529.6	500.6	269215.1
4570	2780.9	1525434.1	495.3	271691.6
4575	2771.5	1539291.6	493.6	274159.7
4580	2791.5	1553249.1	497.2	276645.7
4585	2821.4	1567356.2	502.5	279158.2
4590	2866.0	1581686.4	510.5	281710.5
4595	2914.6	1596259.5	519.1	284306.1
4600	2968.9	1611104.2	528.8	286950.1
4605	3012.0	1626164.2	536.5	289632.4
4610	3037.2	1641350.2	541.0	292337.1
4615	3067.7	1656688.6	546.4	295069.0
4620	3105.3	1672215.2	553.1	297834.4
4625	3130.2	1687866.0	557.5	300621.9
4630	3134.7	1703539.5	558.3	303413.5
4635	3121.8	1719148.4	556.0	306193.6
4640	3082.6	1734561.5	549.0	308938.8
4645	3053.1	1749826.9	543.8	311657.7
4650	3038.3	1765018.1	541.1	314363.3
4655	3031.8	1780177.1	540.0	317063.3
4660	3036.3	1795358.6	540.8	319767.2
4665	3038.7	1810551.9	541.2	322473.3
4670	3034.5	1825724.4	540.5	325175.6
4675	3025.2	1840850.4	538.8	327869.6
4680	3007.9	1855890.1	535.7	330548.3
4685	3018.1	1870980.4	537.5	333236.0
4690	3069.1	1886326.0	546.6	335969.2
4695	3131.9	1901985.3	557.8	338758.3
4700	3211.5	1918042.9	572.0	341618.2
4705	3266.0	1934373.0	581.7	344526.8
4710	3281.0	1950778.1	584.4	347448.6
4715	3283.3	1967194.4	584.8	350372.5
4720	3266.5	1983527.0	581.8	353281.5
4725	3268.6	1999870.3	582.2	356192.3
4730	3297.9	2016359.7	587.4	359129.2
4735	3332.3	2033021.2	593.5	362096.8
4740	3374.0	2049891.2	600.9	365101.4
4745	3408.8	2066935.2	607.1	368137.1
4750	3432.9	2084099.6	611.4	371194.2
4755	3431.7	2101257.9	611.2	374250.2
4760	3392.1	2118218.3	604.2	377271.0
4765	3383.8	2135137.0	602.7	380284.4
4770	3422.2	2152247.9	609.5	383332.0
4775	3447.8	2169486.8	614.1	386402.3
4780	3453.0	2186751.9	615.0	389477.4
4785	3933.9	2206421.4	700.7	392980.7
4790	5240.4	2232623.4	933.4	397647.4
4795	6113.6	2263191.4	1088.9	403091.9
4800	6130.8	2293845.6	1091.9	408551.6
4805	5924.1	2323466.4	1055.1	413827.3
4810	5404.2	2350487.2	962.5	418639.9
4815	4847.0	2374722.4	863.3	422956.4

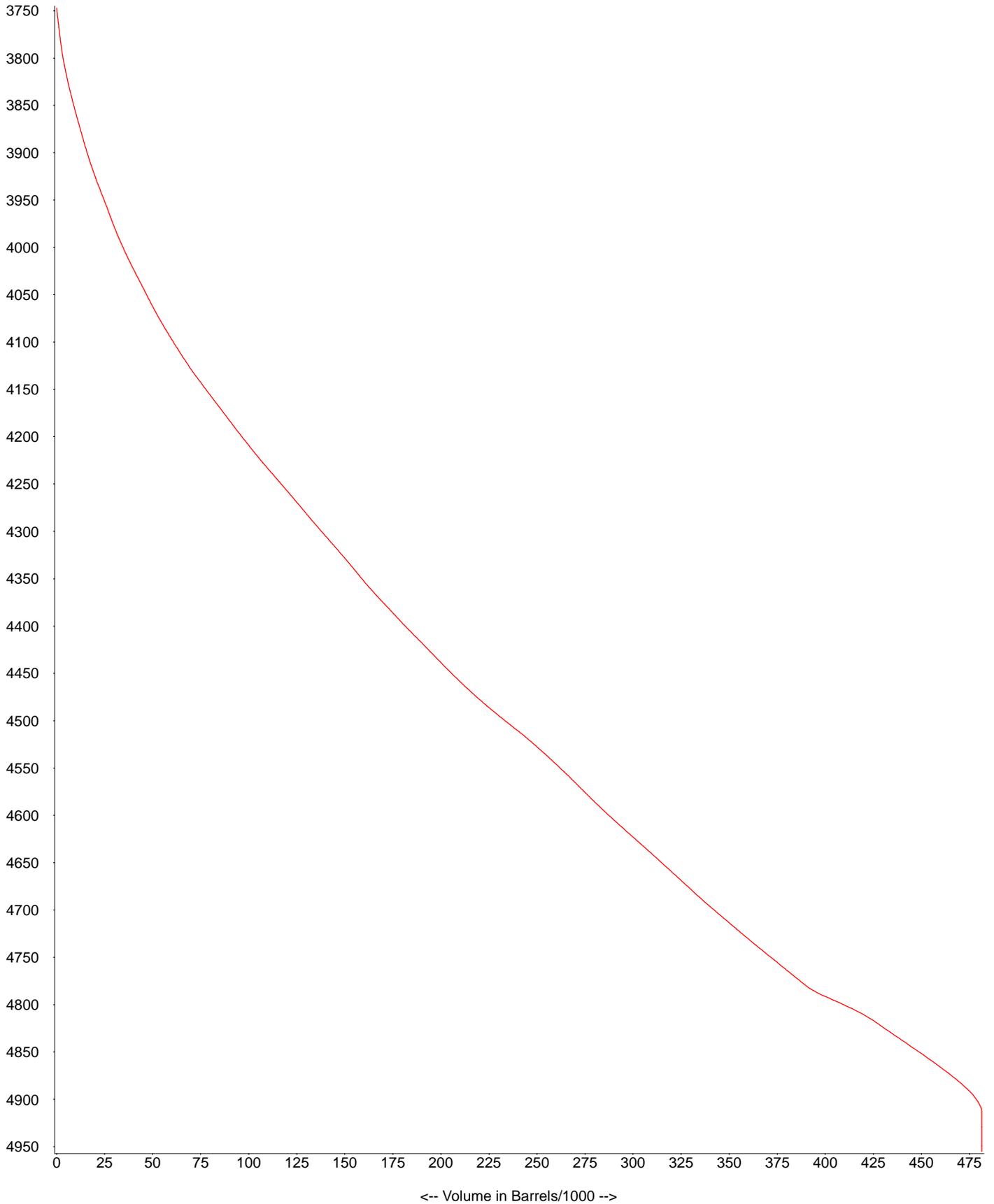
MAGNUM NGLS
CAVERN NO. CW-7DELTA, UT
Fri, Feb 20, 2015

Depth	Cubic ft. per ft.	Cubic ft. total	Barrels per ft.	Barrels total
4820	4228.4	2395864.1	753.1	426721.9
4825	3928.5	2415506.5	699.7	430220.3
4830	4037.4	2435693.3	719.1	433815.8
4835	4086.5	2456125.8	727.8	437454.9
4840	4044.3	2476347.0	720.3	441056.5
4845	4016.6	2496430.2	715.4	444633.5
4850	4008.2	2516471.0	713.9	448202.9
4855	3971.4	2536328.2	707.3	451739.6
4860	3893.5	2555795.9	693.5	455207.0
4865	3826.7	2574929.3	681.6	458614.8
4870	3771.3	2593785.6	671.7	461973.2
4875	3656.4	2612067.6	651.2	465229.4
4880	3462.7	2629381.0	616.7	468313.0
4885	3257.7	2645669.4	580.2	471214.1
4890	3025.4	2660796.2	538.8	473908.3
4895	2695.2	2674272.4	480.0	476308.5
4900	2231.7	2685431.1	397.5	478296.0
4905	1779.8	2694330.0	317.0	479881.0
4910	1315.4	2700907.0	234.3	481052.4
4915	488.5	2703349.3	87.0	481487.4
4920	2.0	2703359.3	0.4	481489.1
4925	2.0	2703369.2	0.4	481490.9
4930	2.0	2703379.1	0.4	481492.7
4935	2.0	2703388.9	0.4	481494.4
4940	2.0	2703398.8	0.4	481496.2
4945	2.0	2703408.6	0.3	481497.9
4950	1.9	2703418.3	0.3	481499.6
4955	1.9	2703427.7	0.3	481501.3

MAGNUM NGLS
CAVERN NO. CW-7

SONARWIRE GLOBAL, LLC
Depth -vs- Volume

DELTA, UT
Fri, Feb 20, 2015



SONARWIRE GLOBAL, LLC
Max Radius & Depth vs BearingMAGNUM NGLS
CAVERN NO. CW-7DELTA, UT
Fri, Feb 20, 2015

This table lists the maximum radius (in feet) found at each of the 128 bearings at which soundings were taken. Also listed after each radius, (separated by ':'), is the depth (in feet) at which that maximum radius was found. Bearings are shown, (in degrees), for each row of four 'radius : depth' pairs.

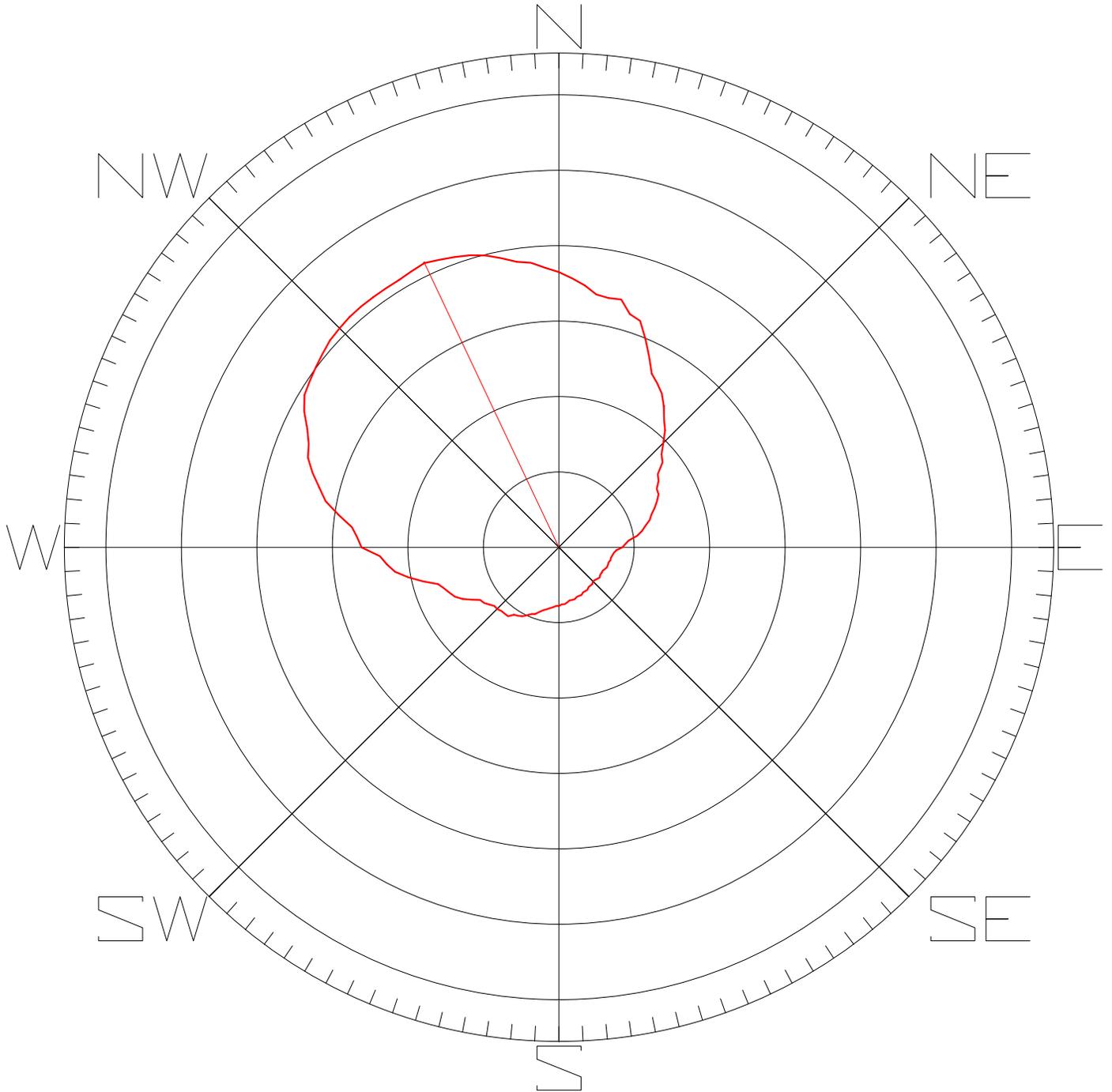
Bearing	+0.0	+2.8	+5.6	+8.4
0.0	73.0: 4800	71.4: 4800	69.8: 4800	67.8: 4800
11.3	67.4: 4870	67.8: 4870	64.6: 4850	63.8: 4860
22.5	59.8: 4870	55.9: 4870	52.3: 4850	50.7: 4880
33.8	49.1: 4880	46.7: 4880	43.9: 4890	41.9: 4890
45.0	39.1: 4890	36.7: 4890	35.5: 4890	32.6: 4510
56.3	31.7: 4510	30.2: 4510	29.9: 4510	28.7: 4510
67.5	27.5: 4510	26.0: 4510	25.1: 4510	23.6: 4510
78.8	22.4: 4510	21.0: 4510	18.6: 4510	17.7: 4510
90.0	16.8: 4510	15.3: 4510	14.7: 4510	14.4: 4160
101.3	14.1: 4160	14.1: 4160	13.8: 4160	13.8: 4160
112.5	13.8: 4160	13.5: 4160	13.2: 4160	13.2: 4160
123.8	13.2: 4160	13.5: 4160	13.2: 4160	12.9: 4160
135.0	12.8: 4890	13.2: 4890	13.2: 4890	13.2: 4890
146.3	13.6: 4890	13.6: 4890	13.6: 4890	14.0: 4890
157.5	14.0: 4890	14.0: 4890	14.4: 4890	14.4: 4900
168.8	14.4: 4900	14.8: 4900	15.2: 4890	15.2: 4890
180.0	15.6: 4890	15.6: 4890	16.0: 4890	16.4: 4890
191.3	16.8: 4890	17.2: 4890	18.0: 4890	18.8: 4890
202.5	19.2: 4890	19.9: 4890	20.7: 4890	21.1: 4890
213.8	21.5: 4890	22.7: 4890	22.7: 4890	22.7: 4890
225.0	23.1: 4890	23.1: 4900	23.9: 4510	24.7: 4900
236.3	25.1: 4240	26.9: 4490	29.0: 4490	30.5: 4490
247.5	31.4: 4490	32.3: 4480	33.5: 4480	37.1: 4790
258.8	40.7: 4790	43.9: 4790	45.9: 4790	47.5: 4790
270.0	52.3: 4790	53.5: 4790	55.1: 4790	59.1: 4790
281.3	63.1: 4790	65.5: 4790	68.2: 4790	70.6: 4790
292.5	71.8: 4800	73.8: 4800	76.6: 4800	78.6: 4800
303.8	79.4: 4800	80.2: 4800	81.0: 4790	81.8: 4800
315.0	82.2: 4790	82.6: 4800	82.6: 4790	82.6: 4790
326.3	82.6: 4790	82.6: 4790	83.0: 4790	83.4: 4790
337.5	82.6: 4800	81.8: 4790	81.0: 4800	79.8: 4800
348.8	78.2: 4790	76.6: 4790	75.8: 4790	74.2: 4790

Between 3747 and 4955 foot depths, maximum radius was 83.4 feet at bearing 334.7 at 4790.0 foot depth

MAGNUM NGLS
DELTA, UT
CAVERN NO. CW-7

SONARWIRE GLOBAL, LLC
Max Range vs Bearing

Max Radius= 83.4 ft @ 334.7 deg
Depth= 4790 ft. Fri, Feb 20, 2015



1 inch = 40.0 ft.

120 100 80 60 40 20 0 20 40 60 80 100 120

SONARWIRE GLOBAL, LLC
Average Wall Range versus Depth (ft.)MAGNUM NGLS
CAVERN NO. CW-7DELTA, UT
Fri, Feb 20, 2015

Depth	Avg Rad ft.	Min Rad ft @ Az	Max Rad ft @ Az	Min Dia ft @ Az	Max Dia ft @ Az
3747	10	8 @ 90.0	13 @ 337.6	19 @ 33.8-213.8	21 @ 157.6-337.6
3750	10	8 @ 129.4	13 @ 337.6	18 @ 11.3-191.3	21 @ 157.6-337.6
3760	10	8 @ 132.2	13 @ 303.8	19 @ 25.4-205.4	21 @ 87.2-267.2
3770	11	8 @ 118.2	14 @ 295.4	20 @ 39.4-219.4	22 @ 160.4-340.4
3780	11	8 @ 121.0	14 @ 270.1	20 @ 53.5-233.5	23 @ 157.6-337.6
3790	11	8 @ 129.4	15 @ 309.4	21 @ 50.7-230.7	24 @ 151.9-331.9
3800	13	8 @ 129.4	17 @ 309.4	23 @ 16.9-196.9	26 @ 73.2-253.2
3810	13	8 @ 140.7	18 @ 292.6	25 @ 16.9-196.9	28 @ 73.2-253.2
3820	14	8 @ 160.4	19 @ 284.1	25 @ 28.2-208.2	29 @ 81.6-261.6
3830	15	11 @ 146.3	20 @ 312.2	27 @ 39.4-219.4	31 @ 132.2-312.2
3840	15	11 @ 199.7	20 @ 306.6	27 @ 36.6-216.6	32 @ 132.2-312.2
3850	15	11 @ 90.0	21 @ 295.4	28 @ 47.9-227.9	32 @ 118.2-298.2
3860	16	11 @ 146.3	21 @ 320.7	29 @ 28.2-208.2	32 @ 112.6-292.6
3870	16	11 @ 132.2	22 @ 306.6	29 @ 50.7-230.7	33 @ 126.6-306.6
3880	16	11 @ 126.6	23 @ 331.9	28 @ 56.3-236.3	34 @ 157.6-337.6
3890	16	10 @ 104.1	24 @ 334.7	28 @ 53.5-233.5	34 @ 137.9-317.9
3900	16	11 @ 112.6	24 @ 301.0	29 @ 50.7-230.7	35 @ 121.0-301.0
3910	17	11 @ 157.6	24 @ 320.7	30 @ 64.7-244.7	35 @ 140.7-320.7
3920	17	11 @ 115.4	26 @ 306.6	31 @ 61.9-241.9	37 @ 143.5-323.5
3930	18	12 @ 115.4	26 @ 301.0	33 @ 39.4-219.4	38 @ 132.2-312.2
3940	18	12 @ 106.9	27 @ 303.8	33 @ 39.4-219.4	39 @ 126.6-306.6
3950	18	12 @ 106.9	27 @ 303.8	33 @ 36.6-216.6	39 @ 149.1-329.1
3960	18	11 @ 106.9	27 @ 312.2	32 @ 36.6-216.6	38 @ 132.2-312.2
3970	17	9 @ 129.4	27 @ 315.1	31 @ 39.4-219.4	36 @ 135.1-315.1
3980	18	9 @ 151.9	29 @ 320.7	30 @ 36.6-216.6	38 @ 112.6-292.6
3990	19	10 @ 118.2	29 @ 301.0	32 @ 36.6-216.6	39 @ 101.3-281.3
4000	19	10 @ 135.1	30 @ 320.7	34 @ 45.0-225.1	40 @ 140.7-320.7
4010	20	11 @ 123.8	31 @ 309.4	34 @ 33.8-213.8	42 @ 137.9-317.9
4020	20	12 @ 112.6	32 @ 323.5	36 @ 50.7-230.7	44 @ 143.5-323.5
4030	20	12 @ 135.1	32 @ 320.7	36 @ 50.7-230.7	44 @ 109.7-289.7
4040	20	10 @ 123.8	33 @ 317.9	35 @ 45.0-225.1	44 @ 163.2-343.2
4050	20	10 @ 180.1	33 @ 315.1	35 @ 33.8-213.8	43 @ 135.1-315.1
4060	20	11 @ 121.0	34 @ 312.2	34 @ 47.9-227.9	44 @ 132.2-312.2
4070	21	11 @ 129.4	34 @ 309.4	37 @ 33.8-213.8	45 @ 151.9-331.9
4080	21	11 @ 143.5	35 @ 323.5	38 @ 47.9-227.9	46 @ 174.4-354.4
4090	22	11 @ 126.6	36 @ 326.3	39 @ 36.6-216.6	47 @ 160.4-340.4
4100	22	11 @ 123.8	36 @ 320.7	39 @ 36.6-216.6	47 @ 149.1-329.1
4110	22	11 @ 154.7	37 @ 326.3	38 @ 56.3-236.3	48 @ 146.3-326.3
4120	22	11 @ 126.6	38 @ 323.5	37 @ 53.5-233.5	49 @ 137.9-317.9
4130	23	11 @ 123.8	39 @ 315.1	39 @ 45.0-225.1	50 @ 135.1-315.1
4140	24	11 @ 149.1	40 @ 315.1	41 @ 47.9-227.9	51 @ 135.1-315.1
4150	24	12 @ 115.4	41 @ 337.6	41 @ 45.0-225.1	53 @ 157.6-337.6
4160	24	12 @ 140.7	40 @ 334.7	41 @ 56.3-236.3	53 @ 126.6-306.6
4170	24	12 @ 140.7	41 @ 320.7	41 @ 53.5-233.5	53 @ 174.4-354.4
4180	24	12 @ 143.5	41 @ 315.1	40 @ 53.5-233.5	53 @ 121.0-301.0
4190	24	10 @ 146.3	42 @ 329.1	39 @ 47.9-227.9	53 @ 151.9-331.9
4200	24	10 @ 126.6	44 @ 309.4	38 @ 50.7-230.7	53 @ 129.4-309.4
4210	24	9 @ 132.2	45 @ 320.7	38 @ 50.7-230.7	54 @ 140.7-320.7
4220	24	10 @ 149.1	44 @ 320.7	40 @ 47.9-227.9	54 @ 137.9-317.9
4230	25	11 @ 135.1	45 @ 317.9	45 @ 56.3-236.3	55 @ 137.9-317.9
4240	26	12 @ 151.9	45 @ 320.7	46 @ 45.0-225.1	56 @ 135.1-315.1
4250	26	12 @ 140.7	44 @ 329.1	45 @ 56.3-236.3	56 @ 149.1-329.1
4260	25	12 @ 137.9	44 @ 320.7	44 @ 50.7-230.7	56 @ 146.3-326.3

MAGNUM NGLS
CAVERN NO. CW-7DELTA, UT
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Depth	Avg Rad ft.	Min Rad ft @ Az	Max Rad ft @ Az	Min Dia ft @ Az	Max Dia ft @ Az
4270	25	11 @ 143.5	45 @ 329.1	41 @ 61.9-241.9	56 @ 149.1-329.1
4280	24	9 @ 140.7	45 @ 326.3	40 @ 53.5-233.5	54 @ 146.3-326.3
4290	24	9 @ 123.8	45 @ 326.3	40 @ 56.3-236.3	54 @ 146.3-326.3
4300	25	9 @ 121.0	47 @ 320.7	41 @ 59.1-239.1	55 @ 140.7-320.7
4310	25	9 @ 123.8	47 @ 326.3	42 @ 59.1-239.1	56 @ 146.3-326.3
4320	25	10 @ 143.5	47 @ 326.3	40 @ 53.5-233.5	56 @ 146.3-326.3
4330	24	9 @ 123.8	47 @ 326.3	39 @ 53.5-233.5	56 @ 146.3-326.3
4340	24	9 @ 112.6	46 @ 329.1	36 @ 47.9-227.9	55 @ 154.7-334.7
4350	23	8 @ 137.9	47 @ 317.9	36 @ 53.5-233.5	54 @ 137.9-317.9
4360	24	8 @ 137.9	50 @ 326.3	36 @ 61.9-241.9	58 @ 146.3-326.3
4370	25	8 @ 140.7	50 @ 334.7	37 @ 56.3-236.3	59 @ 166.0-346.0
4380	25	7 @ 140.7	50 @ 320.7	37 @ 56.3-236.3	58 @ 146.3-326.3
4390	25	8 @ 126.6	50 @ 323.5	38 @ 61.9-241.9	58 @ 157.6-337.6
4400	25	8 @ 132.2	50 @ 334.7	40 @ 61.9-241.9	58 @ 154.7-334.7
4410	26	9 @ 132.2	50 @ 317.9	42 @ 59.1-239.1	59 @ 146.3-326.3
4420	26	8 @ 146.3	50 @ 334.7	41 @ 64.7-244.7	59 @ 154.7-334.7
4430	25	7 @ 129.4	49 @ 317.9	40 @ 47.9-227.9	56 @ 154.7-334.7
4440	25	6 @ 126.6	50 @ 317.9	41 @ 50.7-230.7	56 @ 137.9-317.9
4450	25	6 @ 135.1	51 @ 329.1	41 @ 53.5-233.5	57 @ 143.5-323.5
4460	26	7 @ 163.2	53 @ 329.1	42 @ 33.8-213.8	59 @ 149.1-329.1
4470	26	1 @ 140.7	54 @ 331.9	43 @ 47.9-227.9	60 @ 151.9-331.9
4480	27	6 @ 135.1	54 @ 334.7	45 @ 45.0-225.1	60 @ 160.4-340.4
4490	28	7 @ 146.3	55 @ 334.7	51 @ 33.8-213.8	62 @ 163.2-343.2
4500	29	8 @ 154.7	54 @ 337.6	53 @ 53.5-233.5	63 @ 146.3-326.3
4510	30	9 @ 143.5	54 @ 331.9	56 @ 25.4-205.4	63 @ 151.9-331.9
4520	28	9 @ 126.6	53 @ 329.1	49 @ 39.4-219.4	62 @ 143.5-323.5
4530	28	8 @ 146.3	52 @ 323.5	48 @ 50.7-230.7	60 @ 143.5-323.5
4540	27	7 @ 137.9	52 @ 323.5	46 @ 59.1-239.1	59 @ 146.3-326.3
4550	26	7 @ 149.1	52 @ 320.7	44 @ 56.3-236.3	59 @ 143.5-323.5
4560	26	7 @ 149.1	51 @ 334.7	42 @ 50.7-230.7	58 @ 154.7-334.7
4570	25	6 @ 149.1	51 @ 334.7	40 @ 67.5-247.6	57 @ 140.7-320.7
4580	25	6 @ 149.1	52 @ 331.9	39 @ 67.5-247.6	57 @ 151.9-331.9
4590	25	6 @ 166.0	53 @ 326.3	39 @ 61.9-241.9	59 @ 146.3-326.3
4600	26	6 @ 174.4	55 @ 329.1	40 @ 67.5-247.6	61 @ 154.7-334.7
4610	26	5 @ 166.0	56 @ 334.7	38 @ 59.1-239.1	62 @ 154.7-334.7
4620	26	5 @ 168.8	56 @ 346.0	37 @ 53.5-233.5	61 @ 166.0-346.0
4630	26	5 @ 151.9	56 @ 323.5	35 @ 59.1-239.1	62 @ 143.5-323.5
4640	25	6 @ 177.2	56 @ 320.7	33 @ 59.1-239.1	62 @ 140.7-320.7
4650	25	4 @ 157.6	57 @ 320.7	31 @ 50.7-230.7	61 @ 140.7-320.7
4660	24	4 @ 135.1	58 @ 320.7	29 @ 59.1-239.1	62 @ 137.9-317.9
4670	24	4 @ 146.3	58 @ 317.9	29 @ 59.1-239.1	62 @ 137.9-317.9
4680	24	4 @ 143.5	57 @ 317.9	27 @ 56.3-236.3	61 @ 137.9-317.9
4690	25	5 @ 123.8	58 @ 315.1	29 @ 56.3-236.3	62 @ 135.1-315.1
4700	25	4 @ 135.1	59 @ 312.2	32 @ 64.7-244.7	64 @ 132.2-312.2
4710	25	4 @ 132.2	59 @ 317.9	31 @ 61.9-241.9	63 @ 137.9-317.9
4720	25	4 @ 132.2	60 @ 309.4	28 @ 64.7-244.7	64 @ 129.4-309.4
4730	25	4 @ 126.6	62 @ 317.9	27 @ 59.1-239.1	66 @ 143.5-323.5
4740	25	3 @ 137.9	62 @ 326.3	29 @ 70.4-250.4	66 @ 146.3-326.3
4750	26	5 @ 123.8	63 @ 323.5	28 @ 56.3-236.3	68 @ 143.5-323.5
4760	25	4 @ 126.6	62 @ 323.5	28 @ 61.9-241.9	66 @ 143.5-323.5
4770	25	4 @ 126.6	63 @ 312.2	28 @ 56.3-236.3	67 @ 132.2-312.2
4780	26	4 @ 143.5	63 @ 312.2	29 @ 59.1-239.1	68 @ 132.2-312.2
4790	34	6 @ 137.9	84 @ 334.7	36 @ 50.7-230.7	89 @ 154.7-334.7
4800	34	5 @ 137.9	83 @ 334.7	37 @ 53.5-233.5	89 @ 154.7-334.7
4810	32	6 @ 126.6	74 @ 348.8	38 @ 59.1-239.1	79 @ 168.8-348.8
4820	29	7 @ 146.3	67 @ 357.2	38 @ 56.3-236.3	75 @ 177.2-357.2

MAGNUM NGLS
CAVERN NO. CW-7DELTA, UT
Fri, Feb 20, 2015

Depth	Avg Rad ft.	Min Rad ft @ Az	Max Rad ft @ Az	Min Dia ft @ Az	Max Dia ft @ Az
4830	30	7 @ 143.5	68 @ 354.4	38 @ 61.9-241.9	77 @ 177.2-357.2
4840	29	7 @ 146.3	69 @ 2.9	37 @ 64.7-244.7	78 @ 2.9-182.9
4850	30	9 @ 137.9	70 @ 0.1	39 @ 59.1-239.1	79 @ 0.1-180.1
4860	29	1 @ 129.4	70 @ 2.9	39 @ 61.9-241.9	81 @ 2.9-182.9
4870	29	10 @ 118.2	68 @ 14.1	41 @ 53.5-233.5	80 @ 5.7-185.7
4880	29	12 @ 143.5	61 @ 14.1	44 @ 61.9-241.9	76 @ 16.9-196.9
4890	28	12 @ 106.9	56 @ 340.4	41 @ 106.9-286.9	71 @ 163.2-343.2
4900	24	12 @ 135.1	38 @ 343.2	40 @ 115.4-295.4	57 @ 42.2-222.2
4910	18	10 @ 118.2	25 @ 239.1	32 @ 118.2-298.2	43 @ 59.1-239.1
4915	1	1 @ 315.1	1 @ 0.1	1 @ 135.1-315.1	2 @ 0.1-180.1
4920	1	1 @ 180.1	1 @ 0.1	2 @ 0.1-180.1	2 @ 0.1-180.1
4930	1	1 @ 261.6	1 @ 0.1	1 @ 81.6-261.6	2 @ 0.1-180.1
4940	1	1 @ 315.1	1 @ 0.1	1 @ 135.1-315.1	2 @ 0.1-180.1
4950	1	1 @ 261.6	1 @ 0.1	1 @ 81.6-261.6	2 @ 0.1-180.1
4955	1	1 @ 199.7	1 @ 0.1	1 @ 19.7-199.7	2 @ 0.1-180.1

SONARWIRE GLOBAL, LLC
Wall Ranges versus Depth (ft.)MAGNUM NGLS
CAVERN NO. CW-7DELTA, UT
Fri, Feb 20, 2015

Depth	Tilt	N	NE	E	SE	S	SW	W	NW
3747	0	11.4	8.4	7.8	7.8	8.7	9.9	10.8	11.4
3750	0	10.8	9.0	8.4	7.5	8.1	9.9	11.1	12.3
3760	0	11.4	9.0	8.4	7.8	8.7	9.6	12.0	12.9
3770	0	12.0	9.0	8.1	7.8	8.7	10.5	12.0	12.9
3780	0	12.3	9.6	7.8	7.5	8.7	10.8	13.5	12.9
3790	0	12.9	9.9	8.4	8.1	9.9	10.8	12.9	13.8
3800	0	14.4	12.9	9.9	8.1	9.0	11.4	15.3	16.8
3810	0	16.5	13.5	10.2	8.1	8.7	11.4	17.1	17.9
3820	0	17.1	13.8	10.2	8.1	8.1	11.7	17.4	17.9
3830	0	17.9	13.8	11.7	10.8	10.8	12.3	17.9	19.1
3840	0	17.9	14.4	11.1	11.4	11.1	12.9	17.9	19.4
3850	0	17.9	14.4	10.5	11.4	11.7	13.2	19.1	19.7
3860	0	18.8	14.7	12.3	10.8	10.8	14.1	18.5	20.3
3870	0	20.3	14.4	12.0	11.1	11.1	14.1	18.5	20.9
3880	0	20.9	14.1	11.7	10.8	12.0	13.8	19.1	21.2
3890	0	20.6	14.4	11.1	10.5	10.5	13.8	18.5	22.4
3900	0	21.2	15.6	10.8	10.8	11.4	14.4	19.7	23.3
3910	0	21.5	16.5	11.4	10.8	11.4	15.3	21.5	23.6
3920	0	22.7	17.1	11.4	11.4	11.4	15.0	21.5	24.5
3930	0	22.7	16.8	11.7	11.7	12.0	16.2	23.0	25.4
3940	0	23.9	17.1	12.3	11.7	12.9	16.5	22.7	26.0
3950	0	23.9	16.8	12.6	12.3	13.2	16.8	21.8	25.4
3960	0	23.9	15.9	11.4	10.8	11.4	15.9	23.0	26.3
3970	0	23.9	15.9	10.8	8.7	10.2	14.4	23.0	26.9
3980	0	25.1	15.9	10.5	9.0	10.5	14.1	24.2	28.1
3990	0	27.2	16.8	11.4	9.9	10.2	14.7	25.7	28.4
4000	0	27.5	17.7	11.7	9.3	9.9	16.2	26.0	29.0
4010	0	27.8	18.9	12.9	10.8	11.7	17.1	23.9	30.2
4020	0	30.5	19.2	12.9	11.4	12.9	17.1	25.1	30.8
4030	0	29.9	19.8	13.8	11.1	12.3	15.6	25.1	31.4
4040	0	30.2	19.2	12.6	10.8	12.6	15.6	26.0	31.7
4050	0	30.8	19.2	12.6	9.9	9.6	15.3	26.3	32.6
4060	0	31.4	18.3	12.0	10.2	10.8	15.6	26.0	32.9
4070	0	30.8	20.4	13.2	10.8	12.0	16.5	27.8	32.6
4080	0	32.3	20.6	13.5	10.8	12.0	17.1	27.5	33.8
4090	0	32.9	22.4	14.4	10.8	12.0	17.1	29.0	34.1
4100	0	32.9	22.4	14.1	10.5	12.6	17.4	29.9	35.3
4110	0	32.9	21.6	13.5	10.8	12.0	17.1	30.5	35.9
4120	0	33.2	21.0	12.6	10.5	11.7	17.7	31.4	37.4
4130	0	35.0	20.7	12.6	10.8	12.3	18.0	32.6	38.9
4140	0	35.9	23.0	13.2	11.4	12.9	18.6	32.3	39.5
4150	0	37.1	22.1	13.8	12.0	13.5	18.6	32.3	39.2
4160	0	38.3	22.4	14.7	12.3	13.5	19.5	32.0	39.2
4170	0	38.3	23.0	14.4	12.3	12.9	19.2	31.4	39.5
4180	0	37.4	22.4	13.8	11.7	12.9	18.3	32.0	40.1
4190	0	37.4	21.0	12.6	10.2	12.3	18.0	32.3	41.6
4200	0	37.4	21.3	11.7	9.6	11.4	17.4	34.4	43.1
4210	0	37.7	21.0	11.1	9.0	10.2	17.4	34.1	43.4
4220	0	38.6	22.1	10.8	10.2	10.8	18.6	34.7	43.1
4230	0	38.0	23.9	13.8	10.8	12.0	20.4	35.0	43.7
4240	0	38.6	23.9	14.1	12.0	12.9	21.3	35.0	43.7
4250	0	38.6	24.2	14.7	12.0	12.6	21.0	34.1	42.5
4260	0	39.2	23.9	13.5	11.4	12.6	20.4	34.4	43.1

MAGNUM NGLS
CAVERN NO. CW-7DELTA, UT
Fri, Feb 20, 2015

Depth	Tilt	N	NE	E	SE	S	SW	W	NW
4270	0	39.8	22.7	12.3	10.5	11.1	18.9	34.1	44.0
4280	0	41.0	22.7	11.4	9.0	9.6	18.0	33.8	44.3
4290	0	41.3	24.2	10.8	8.7	9.3	18.0	34.1	44.6
4300	0	41.9	24.8	11.7	8.7	10.2	18.6	34.4	45.2
4310	0	41.9	24.8	12.3	9.3	10.5	19.1	33.8	45.5
4320	0	43.4	22.7	12.0	9.6	10.8	17.4	33.8	44.9
4330	0	43.4	22.1	11.4	9.6	9.9	16.5	32.6	45.2
4340	0	42.5	20.9	9.3	8.7	9.9	15.9	32.6	44.0
4350	0	41.6	20.9	9.9	8.1	8.7	16.2	32.3	44.9
4360	0	44.6	21.8	10.5	8.1	8.7	15.9	31.7	47.9
4370	0	46.4	22.1	11.4	8.1	9.6	15.9	32.6	49.1
4380	0	46.7	22.1	9.6	7.2	8.7	16.8	33.2	49.1
4390	0	45.5	22.7	9.6	7.2	9.0	17.4	35.0	48.8
4400	0	45.5	23.9	10.8	7.8	9.3	17.7	35.9	48.8
4410	0	44.9	24.2	11.4	8.7	9.6	18.3	37.4	49.1
4420	0	45.5	24.5	11.1	8.4	9.3	17.7	37.7	49.1
4430	0	44.3	24.2	11.1	6.6	7.8	16.2	37.4	48.5
4440	0	44.9	25.1	12.0	6.0	7.5	16.2	37.7	49.1
4450	0	44.9	26.6	11.4	6.0	7.2	15.6	38.3	50.3
4460	0	47.3	26.0	11.1	6.9	6.9	15.6	39.2	49.7
4470	0	48.5	26.3	11.1	6.0	7.2	16.2	40.1	52.4
4480	0	47.9	28.1	11.7	5.4	7.2	16.5	41.0	52.1
4490	0	49.4	32.0	14.4	6.9	7.8	19.5	42.2	51.8
4500	0	50.6	33.5	15.9	8.4	9.0	19.8	41.9	52.7
4510	0	50.6	36.5	16.8	8.7	9.9	20.1	41.9	52.7
4520	0	50.0	31.1	14.7	10.2	9.3	19.2	40.1	50.3
4530	0	49.4	30.5	14.4	7.8	8.7	18.3	38.6	49.7
4540	0	48.5	31.1	12.3	7.2	8.1	16.5	37.1	50.0
4550	0	48.2	29.3	10.8	6.9	7.5	15.0	36.8	50.3
4560	0	47.9	28.7	10.8	6.9	7.2	13.8	36.5	49.1
4570	0	46.7	28.1	9.9	7.2	6.9	12.9	36.5	48.8
4580	0	46.4	28.1	9.6	5.7	6.0	13.8	38.0	49.4
4590	0	48.5	28.7	9.9	6.0	6.0	13.2	37.4	50.3
4600	0	50.6	29.9	9.9	5.4	6.0	13.2	36.8	51.8
4610	0	52.1	28.1	10.2	5.7	5.1	11.7	37.1	51.5
4620	0	52.1	26.6	9.9	5.7	5.4	11.1	37.7	52.7
4630	0	51.8	27.2	9.9	5.7	5.4	11.4	37.1	54.2
4640	0	51.2	25.1	9.0	5.7	5.7	11.4	37.1	55.0
4650	0	51.5	24.2	8.7	4.5	4.2	10.8	36.2	55.6
4660	0	50.9	21.5	6.0	3.6	4.2	9.6	36.8	57.1
4670	0	50.6	22.1	6.0	4.2	4.5	9.3	36.8	56.2
4680	0	50.6	23.0	5.7	3.9	4.5	9.6	37.1	55.6
4690	0	51.2	23.3	6.3	4.5	5.4	10.2	38.3	57.1
4700	0	50.9	23.3	5.7	3.9	5.1	10.8	40.4	58.9
4710	0	51.2	22.7	5.7	3.6	5.1	12.0	40.1	58.4
4720	0	51.8	21.8	5.4	3.9	4.8	12.0	38.0	59.2
4730	0	52.1	22.1	5.4	3.9	4.5	11.1	39.2	60.7
4740	0	52.1	22.1	5.4	3.9	4.8	11.7	40.4	61.6
4750	0	52.4	20.6	5.7	4.2	5.4	11.1	41.0	62.2
4760	0	52.7	20.3	6.3	3.9	4.8	10.8	41.3	61.0
4770	0	54.2	19.7	6.0	3.9	5.1	10.5	39.8	62.5
4780	0	54.2	19.5	6.3	4.2	4.8	11.1	38.3	61.9
4790	0	72.2	24.7	8.8	6.0	6.4	14.0	52.3	82.2
4800	0	73.0	27.9	9.2	5.2	6.0	13.2	51.1	82.2
4810	0	71.4	31.1	8.8	5.2	6.4	12.4	49.9	68.6
4820	0	65.8	30.7	10.0	7.2	7.6	13.2	39.1	54.3

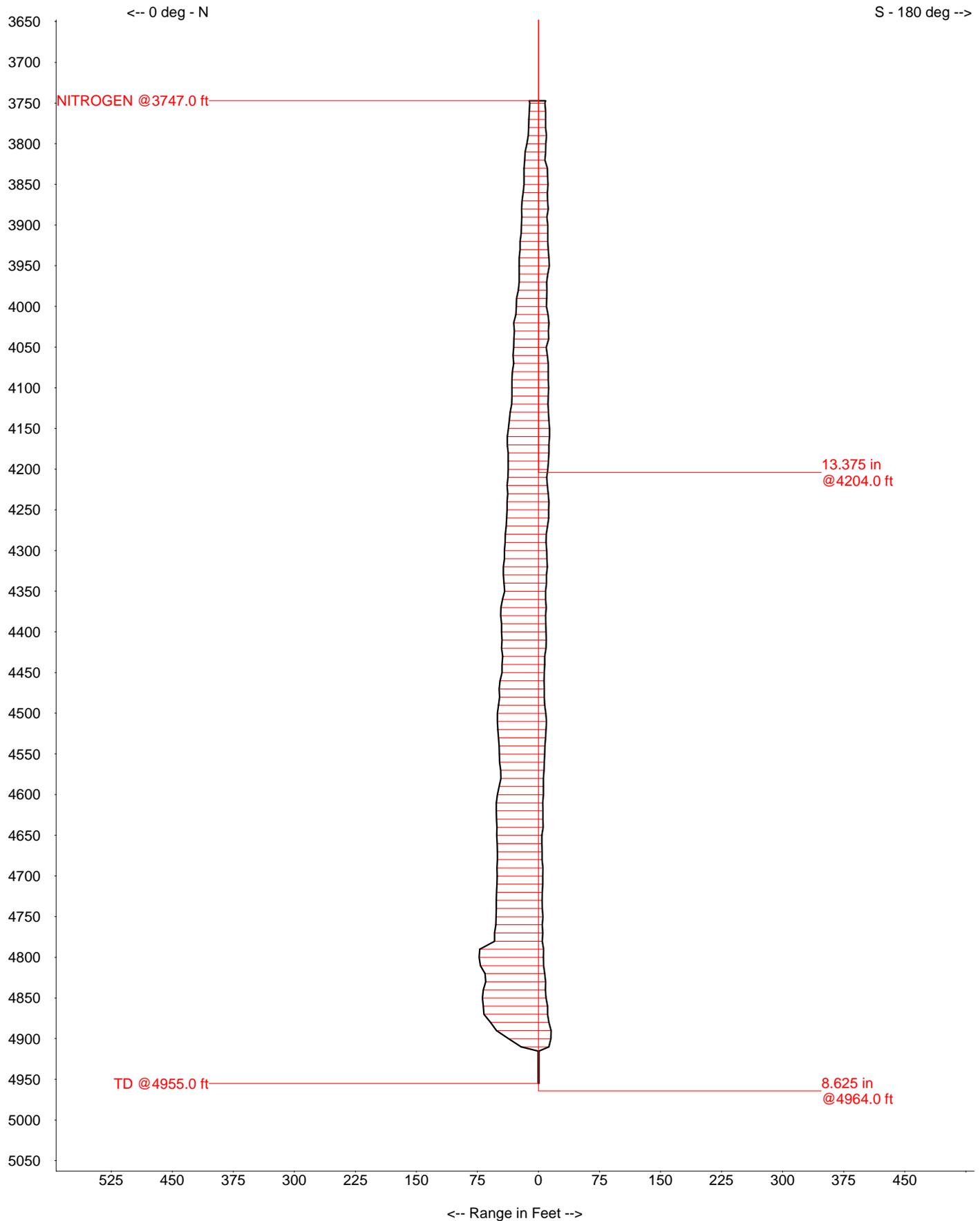
MAGNUM NGLS
CAVERN NO. CW-7DELTA, UT
Fri, Feb 20, 2015

Depth	Tilt	N	NE	E	SE	S	SW	W	NW
4830	0	65.0	33.1	10.0	7.2	8.8	14.0	39.9	56.3
4840	0	67.8	33.1	10.8	7.2	8.4	15.2	37.1	53.9
4850	0	69.0	32.3	11.2	8.8	9.2	14.4	37.9	52.7
4860	0	67.8	34.3	12.0	0.0	11.2	15.6	35.9	49.1
4870	0	67.0	34.3	11.6	9.6	11.2	16.0	33.9	48.7
4880	0	59.1	37.1	15.2	11.6	12.8	20.3	31.1	41.1
4890	0	51.9	39.1	12.8	12.8	15.6	23.1	28.3	30.3
4900	0	36.7	33.5	14.0	11.6	15.2	22.7	28.3	31.9
4910	0	21.5	19.2	12.0	9.6	12.8	22.3	23.9	23.1
4915	0	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.0
4920	0	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
4930	0	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
4940	0	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.0
4950	0	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.0
4955	0	0.8	0.8	0.8	0.0	0.8	0.8	0.8	0.8

MAGNUM NGLS
CAVERN NO. CW-7

SONARWIRE GLOBAL, LLC
Vertical Cross Section

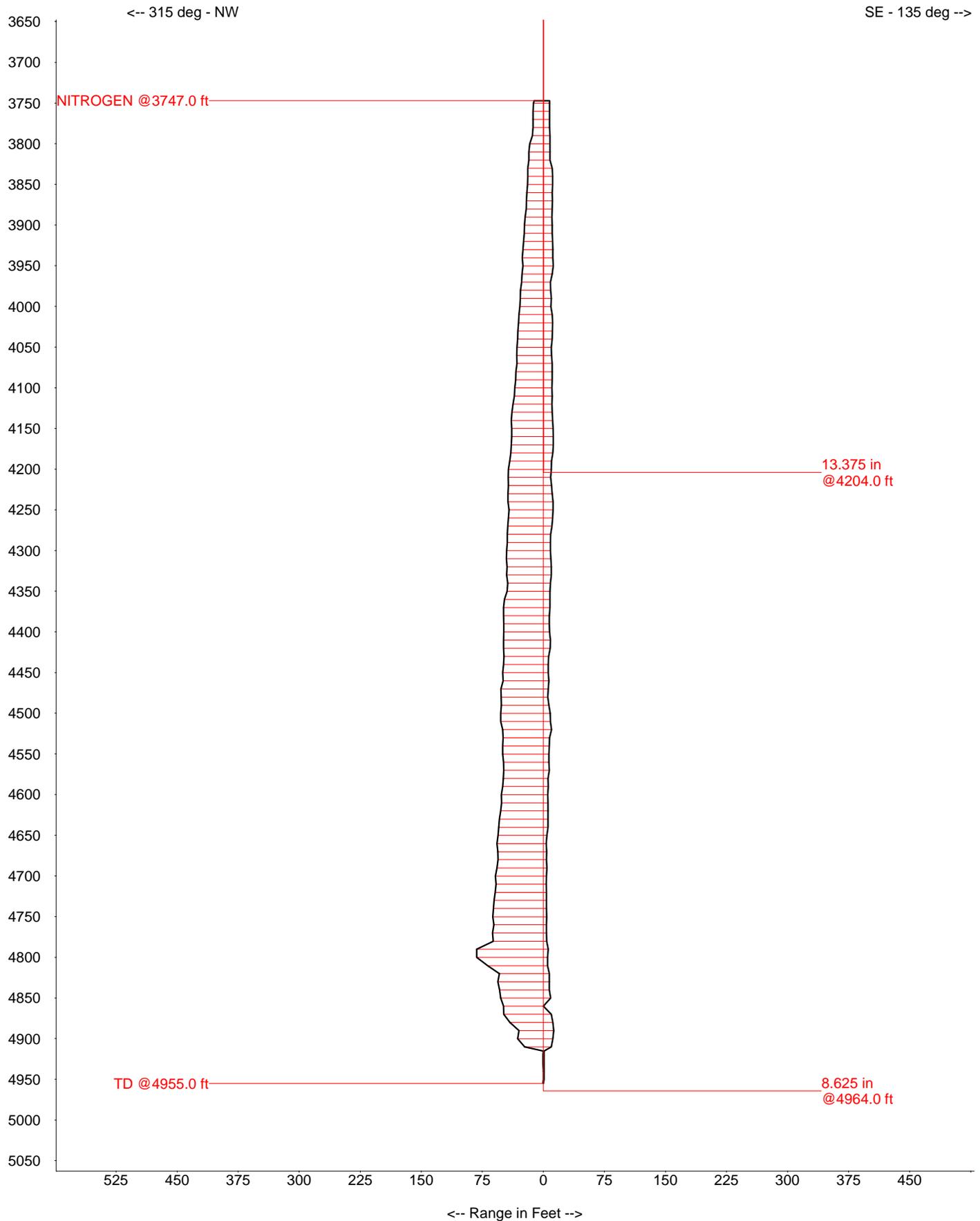
DELTA, UT
Fri, Feb 20, 2015



MAGNUM NGLS
CAVERN NO. CW-7

SONARWIRE GLOBAL, LLC
Vertical Cross Section

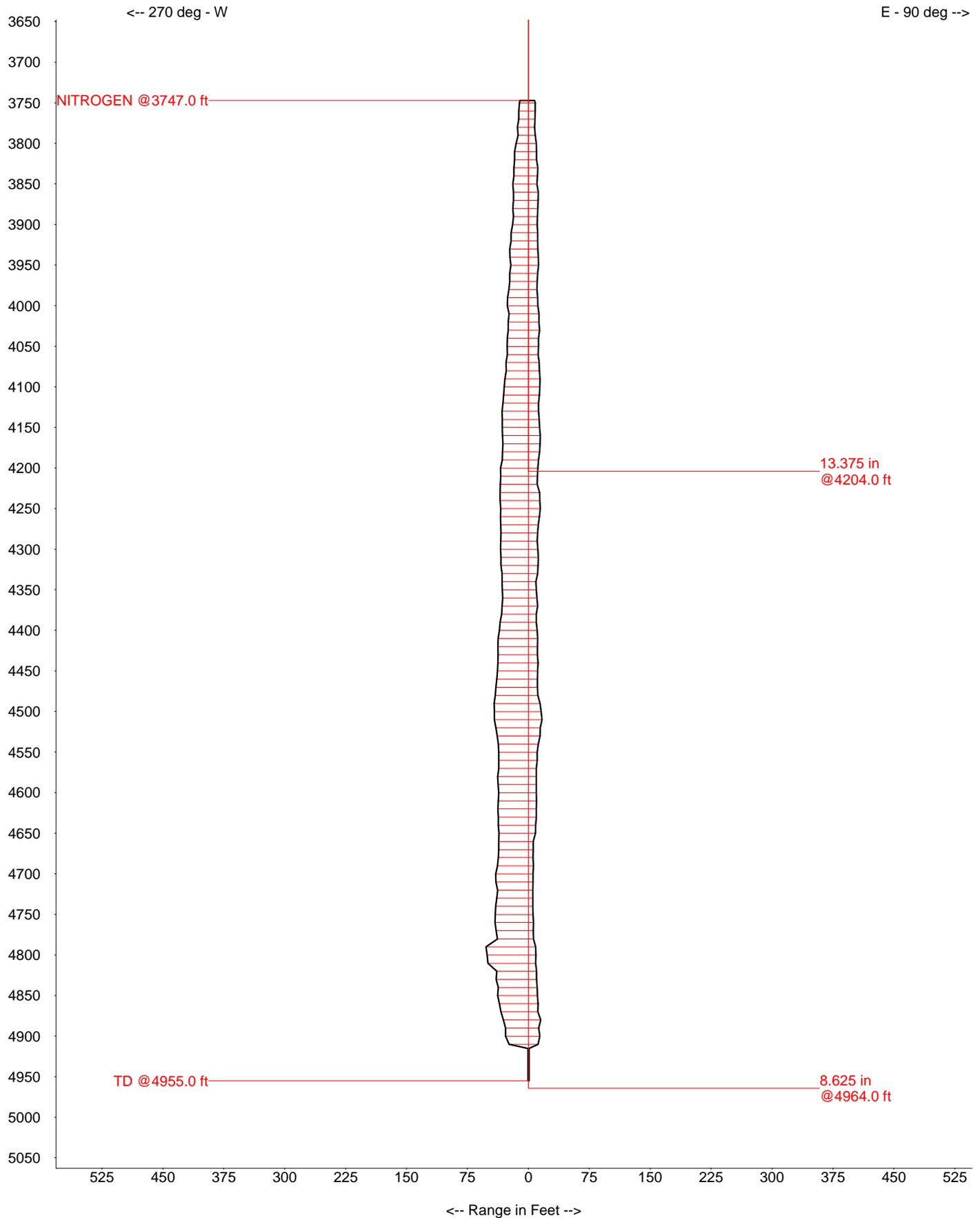
DELTA, UT
Fri, Feb 20, 2015



MAGNUM NGLS
CAVERN NO. CW-7

SONARWIRE GLOBAL, LLC
Vertical Cross Section

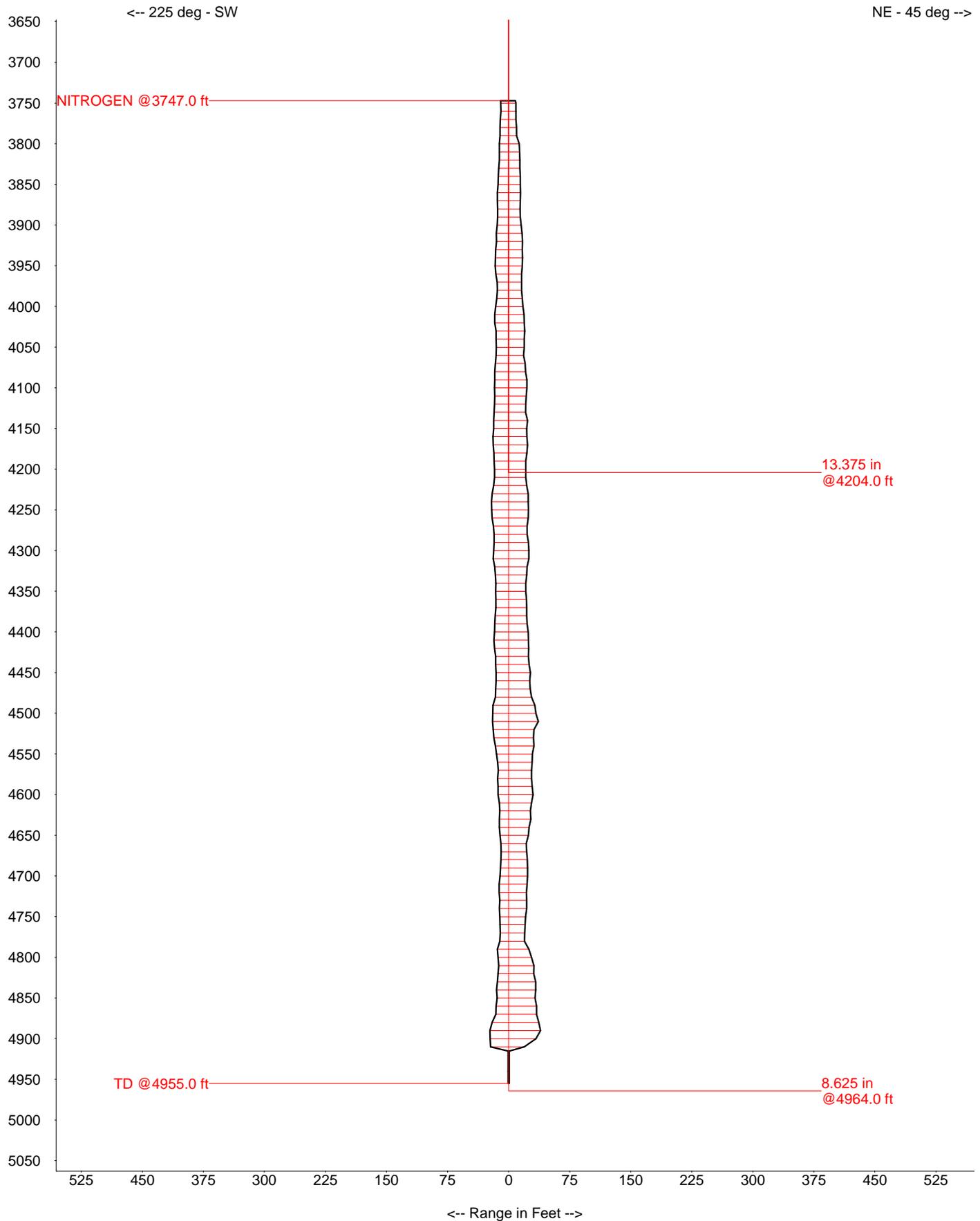
DELTA, UT
Fri, Feb 20, 2015



MAGNUM NGLS
CAVERN NO. CW-7

SONARWIRE GLOBAL, LLC
Vertical Cross Section

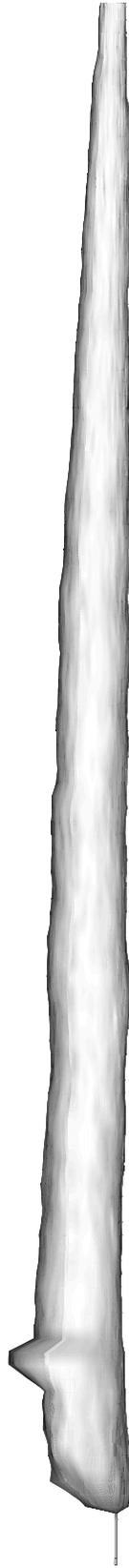
DELTA, UT
Fri, Feb 20, 2015



**SONARWIRE GLOBAL, LLC
3D SHADE PLOT**

**MAGNUM NGL
DELTA, UT
CAVERN NO. CW-7
FEBRUARY 20, 2015**

**VIEWING AZIMUTH: 45
AXIS TILT: -2 DEGS**



**SONARWIRE GLOBAL, LLC
3D SHADE PLOT**

**MAGNUM NGL
DELTA, UT
CAVERN NO. CW-7
FEBRUARY 20, 2015**

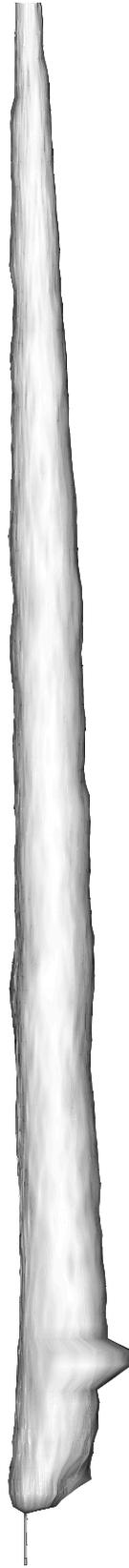
**VIEWING AZIMUTH: 135
AXIS TILT: -2 DEGS**



**SONARWIRE GLOBAL, LLC
3D SHADE PLOT**

**MAGNUM NGL
DELTA, UT
CAVERN NO. CW-7
FEBRUARY 20, 2015**

**VIEWING AZIMUTH: 225
AXIS TILT: -2 DEGS**



**SONARWIRE GLOBAL, LLC
3D SHADE PLOT**

**MAGNUM NGL
DELTA, UT
CAVERN NO. CW-7
FEBRUARY 20, 2015**

**VIEWING AZIMUTH: 315
AXIS TILT: -2 DEGS**



SONARWIRE GLOBAL, LLC
 Wall Ranges versus Depth (ft.)

MAGNUM NGLS
 CAVERN NO. CW-7

DELTA, UT
 Fri, Feb 20, 2015

DEPTH:	3747	TILT:	0	RANGE:	70.9	VOS:	5667		
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7	
0.0	11.4	11.4	11.1	10.8	10.5	10.5	10.5	10.2	
22.5	10.2	9.9	9.9	9.6	9.3	9.3	9.0	8.7	
45.0	8.4	8.4	8.4	8.4	8.4	8.1	8.1	8.4	
67.5	8.4	8.4	8.4	8.4	8.1	8.1	8.4	8.4	
90.0	7.8	8.1	8.1	8.1	8.1	8.1	8.1	8.1	
112.5	8.1	7.8	7.8	7.8	8.1	7.8	8.1	8.1	
135.0	7.8	8.1	8.1	7.8	7.8	8.1	7.8	8.1	
157.5	8.4	8.1	8.4	8.1	8.1	8.4	8.4	8.4	
180.0	8.7	8.7	8.7	8.7	8.4	8.4	8.4	8.7	
202.5	9.0	9.0	9.0	9.0	9.0	9.0	9.3	9.6	
225.0	9.9	10.2	10.5	10.5	10.5	10.5	11.1	10.8	
247.5	10.8	10.8	10.8	10.5	10.5	11.1	11.1	10.8	
270.0	10.8	10.8	10.8	10.8	10.8	10.8	10.8	10.8	
292.5	10.8	10.8	10.8	11.1	11.1	11.4	11.4	11.4	
315.0	11.4	11.7	11.4	11.4	11.4	11.1	11.1	11.1	
337.5	12.3	12.3	12.3	12.0	11.7	11.7	11.7	11.4	

DEPTH:	3750	TILT:	0	RANGE:	70.9	VOS:	5667		
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7	
0.0	10.8	10.8	10.5	10.5	9.6	9.6	9.6	9.6	
22.5	9.6	9.6	9.6	9.6	9.6	9.3	9.0	9.0	
45.0	9.0	8.7	8.7	8.7	8.4	8.4	8.4	8.4	
67.5	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	
90.0	8.4	8.1	8.1	8.1	8.1	8.1	8.1	8.1	
112.5	8.1	8.1	7.8	7.8	7.8	7.8	7.5	7.5	
135.0	7.5	7.5	7.5	7.5	7.5	7.8	7.8	7.8	
157.5	7.8	7.8	7.8	8.1	8.1	8.1	8.1	8.1	
180.0	8.1	8.1	8.1	8.1	8.1	8.4	8.4	8.4	
202.5	8.7	8.7	9.0	9.0	9.3	9.3	9.6	9.6	
225.0	9.9	9.9	9.9	9.9	10.2	10.2	10.2	10.5	
247.5	10.5	10.5	10.8	11.1	11.1	11.4	11.4	11.1	
270.0	11.1	11.1	11.1	11.1	10.8	10.8	11.1	11.1	
292.5	11.4	11.4	11.7	12.0	12.0	12.0	12.0	12.3	
315.0	12.3	12.3	12.3	12.3	12.3	12.3	12.3	12.3	
337.5	12.6	12.3	12.0	12.0	11.7	11.7	12.0	11.1	

DEPTH:	3760	TILT:	0	RANGE:	70.9	VOS:	5667		
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7	
0.0	11.4	11.4	11.1	10.8	10.5	10.2	10.2	9.9	
22.5	9.9	9.6	9.6	9.3	9.3	9.3	9.3	9.0	
45.0	9.0	9.0	9.0	9.0	9.0	9.0	8.7	8.7	
67.5	8.7	8.7	8.4	8.4	8.4	8.4	8.4	8.4	
90.0	8.4	8.4	8.1	8.1	8.1	7.8	7.8	7.8	
112.5	7.8	7.8	7.8	7.8	7.8	7.8	7.8	7.5	
135.0	7.8	7.8	7.8	7.8	7.5	7.8	7.8	7.8	
157.5	7.8	7.8	8.1	7.8	8.1	8.1	8.1	8.4	
180.0	8.7	8.7	8.4	8.4	8.7	8.4	8.4	8.7	
202.5	8.7	8.7	8.7	9.0	9.0	9.3	9.3	9.3	
225.0	9.6	9.6	9.6	9.9	10.2	10.5	10.5	10.8	
247.5	10.8	10.8	11.1	11.4	11.7	11.7	12.0	12.3	
270.0	12.0	12.3	12.3	12.3	12.6	12.6	12.6	12.6	
292.5	12.6	12.6	12.6	12.6	12.9	12.9	12.9	12.9	
315.0	12.9	12.9	12.6	12.9	12.9	12.9	12.9	12.9	
337.5	12.6	12.6	12.6	12.6	12.6	12.3	12.0	11.7	

DEPTH:	3770	TILT:	0	RANGE:	70.9	VOS:	5667		
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7	
0.0	12.0	12.0	11.4	11.7	11.4	11.4	10.8	10.5	
22.5	10.5	10.2	10.2	9.9	9.9	9.3	9.0	9.0	
45.0	9.0	8.7	9.3	9.0	8.7	8.7	8.4	8.1	
67.5	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	
90.0	8.1	8.1	8.4	8.1	8.1	7.8	7.8	7.8	
112.5	7.8	7.8	7.5	7.5	7.5	7.5	7.5	7.5	
135.0	7.8	7.8	8.1	8.1	8.1	8.1	8.1	8.1	
157.5	8.1	8.4	8.4	8.4	8.7	8.7	8.7	8.4	
180.0	8.7	8.7	8.7	8.7	9.0	9.0	9.0	9.0	
202.5	9.0	9.3	9.6	9.6	10.2	10.2	10.2	10.2	
225.0	10.5	10.5	10.8	10.8	10.8	10.8	11.1	11.1	
247.5	11.4	11.7	11.7	11.7	11.7	11.7	11.7	11.7	
270.0	12.0	12.0	12.3	12.3	12.6	12.9	12.6	12.9	
292.5	12.9	13.2	12.9	12.9	13.2	12.9	12.9	13.2	
315.0	12.9	12.9	12.9	12.9	12.9	12.9	12.6	13.2	
337.5	13.2	13.2	13.2	12.9	12.9	12.6	12.3	12.3	

DEPTH:	3780	TILT:	0	RANGE:	70.9	VOS:	5667		
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7	
0.0	12.3	12.3	12.0	11.7	11.7	11.4	11.4	11.1	
22.5	10.8	10.8	10.8	10.8	10.5	10.2	10.2	9.9	
45.0	9.6	9.6	9.3	8.7	8.7	8.4	8.4	8.1	
67.5	8.1	8.4	8.1	8.1	8.4	8.1	8.1	7.8	
90.0	7.8	7.8	7.8	7.8	7.8	7.8	7.8	7.8	
112.5	7.8	7.8	7.8	7.5	7.8	7.8	7.8	7.8	
135.0	7.5	8.1	7.8	8.1	8.1	8.4	8.4	7.8	
157.5	9.0	7.8	7.8	8.1	8.1	8.4	8.4	8.4	
180.0	8.7	8.7	8.7	8.7	9.0	9.0	9.3	9.6	
202.5	9.9	9.9	10.2	10.2	10.5	10.5	10.5	10.5	
225.0	10.8	10.8	11.1	11.1	11.4	11.7	11.7	12.0	
247.5	12.0	12.0	12.0	12.3	12.6	12.9	13.2	13.2	
270.0	13.5	13.5	13.5	13.5	13.2	13.2	13.2	13.2	
292.5	12.9	12.9	12.9	12.9	13.2	12.9	12.9	12.9	
315.0	12.9	12.9	12.9	13.2	13.2	13.2	13.2	13.2	
337.5	13.2	13.2	13.2	12.9	12.9	12.9	12.6	12.6	

DEPTH:	3790	TILT:	0	RANGE:	70.9	VOS:	5667		
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7	
0.0	12.9	12.9	12.6	12.0	12.0	12.0	12.3	12.0	
22.5	12.0	12.0	11.7	11.7	11.1	10.8	10.5	10.2	
45.0	9.9	9.9	9.6	9.3	9.3	9.3	9.0	9.0	
67.5	8.7	9.0	9.0	9.0	8.7	8.4	8.4	8.4	
90.0	8.4	8.4	8.1	8.1	8.1	8.1	8.1	8.1	
112.5	8.1	8.1	8.1	8.1	8.1	8.1	7.8	8.1	
135.0	8.1	8.1	8.4	8.1	8.1	8.1	8.4	8.4	
157.5	8.4	8.4	8.7	9.0	9.3	9.3	9.3	9.6	
180.0	9.9	9.0	9.3	9.3	9.3	9.6	9.9	10.2	
202.5	10.5	10.5	10.8	10.8	10.8	10.8	10.8	10.8	
225.0	10.8	10.8	10.8	11.1	11.1	11.4	11.7	11.7	
247.5	11.7	12.0	12.0	12.0	12.3	12.3	12.6	12.6	
270.0	12.9	12.9	12.9	12.9	12.9	12.9	13.2	13.5	
292.5	13.2	13.5	13.8	13.8	13.8	13.5	14.7	14.1	
315.0	13.8	14.1	14.1	13.5	13.5	13.8	14.7	14.4	
337.5	14.1	13.5	13.5	13.2	13.2	13.2	13.2	13.2	

DEPTH:	3800	TILT:	0	RANGE:	70.9	VOS:	5668		
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7	
0.0	14.4	14.1	14.1	14.1	14.1	14.1	13.8	14.1	
22.5	14.1	14.1	14.1	14.1	13.8	13.5	13.8	13.5	
45.0	12.9	12.3	12.0	11.4	11.1	12.3	11.1	11.1	
67.5	10.8	10.5	10.5	10.2	9.9	9.9	9.9	9.6	
90.0	9.9	9.6	9.3	9.3	9.3	9.0	8.7	8.7	
112.5	8.4	8.4	8.4	8.4	8.1	8.1	7.8	7.8	
135.0	8.1	8.1	7.8	7.8	7.8	7.8	7.8	7.8	
157.5	8.1	8.1	8.1	8.1	8.1	8.4	8.4	9.0	
180.0	9.0	9.0	9.0	9.0	9.3	9.3	9.0	9.0	
202.5	9.0	9.3	9.9	9.9	10.2	10.8	11.1	11.4	
225.0	11.4	11.4	11.7	13.5	12.3	12.9	13.2	13.2	
247.5	13.8	14.7	15.0	15.0	15.3	15.3	15.3	15.3	
270.0	15.3	15.3	15.3	15.6	15.9	15.9	15.9	16.2	
292.5	16.2	16.5	16.5	16.5	16.5	16.5	16.8	16.8	
315.0	16.8	16.8	16.5	16.5	16.5	16.5	16.2	16.2	
337.5	16.2	15.9	15.9	14.7	14.7	14.7	14.7	14.7	

DEPTH:	3810	TILT:	0	RANGE:	70.9	VOS:	5668		
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7	
0.0	16.5	16.5	16.5	16.2	16.2	15.9	15.6	15.3	
22.5	15.3	15.0	14.7	14.7	14.7	14.4	14.1	13.8	
45.0	13.5	13.5	13.2	12.9	12.9	12.9	12.3	11.7	
67.5	11.4	11.4	12.0	10.8	10.2	10.5	10.2	10.2	
90.0	10.2	9.9	9.6	9.6	9.3	9.0	9.0	9.0	
112.5	8.7	8.7	8.7	8.7	8.4	8.4	8.4	8.4	
135.0	8.1	8.1	7.8	7.8	7.8	8.1	8.1	7.8	
157.5	8.1	7.8	8.1	8.1	8.4	8.7	8.7	9.0	
180.0	8.7	9.0	8.7	9.0	9.0	9.6	9.3	9.6	
202.5	9.6	9.9	10.2	10.2	10.5	11.1	11.1	11.4	
225.0	11.4	12.3	12.3	12.9	12.9	14.1	14.1	14.7	
247.5	15.3	15.3	15.6	15.9	16.5	16.8	16.8	16.8	
270.0	17.1	17.1	17.4	17.4	17.4	17.7	17.7	17.7	
292.5	17.9	17.7	17.7	17.7	17.7	17.7	17.7	17.9	
315.0	17.9	17.9	17.9	17.9	17.7	17.4	17.4	17.7	
337.5	17.4	17.4	17.4	17.7	17.7	17.4	17.4	17.1	

DEPTH:	3820	TILT:	0	RANGE:	70.9	VOS:	5668		
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7	
0.0	17.1	17.1	16.8	16.5	16.5	16.5	16.5	15.9	
22.5	15.9	15.9	15.0	15.0	14.7	14.4	14.4	13.8	
45.0	13.8	13.5	13.2	12.9	12.6	12.3	12.3	12.0	
67.5	11.7	11.7	11.4	11.1	11.1	11.1	10.8	10.5	
90.0	10.2	9.9	9.6	9.6	9.3	9.3	9.0	8.7	
112.5	8.7	8.7	8.4	8.4	8.4	8.7	8.4	8.4	
135.0	8.1	8.1	8.1	8.1	8.1	7.8	7.8	7.8	
157.5	7.8	7.5	7.5	7.8	8.1	7.8	8.1	8.1	
180.0	8.1	8.4	8.4	8.4	8.7	8.7	9.0	9.0	
202.5	9.3	9.3	9.6	10.2	10.8	10.8	11.1	11.4	
225.0	11.7	12.0	12.6	12.9	13.2	14.1	14.4	14.4	
247.5	14.7	15.3	15.6	16.2	16.5	17.1	17.1	17.1	
270.0	17.4	17.4	17.7	17.9	17.9	18.2	18.2	18.2	
292.5	17.9	17.9	18.2	18.2	17.9	17.9	17.9	17.9	
315.0	17.9	17.9	17.9	17.9	18.2	18.2	17.9	17.9	
337.5	18.2	17.9	17.9	17.9	17.9	17.7	17.9	17.4	

DEPTH:	3830	TILT:	0	RANGE:	70.9	VOS:	5668		
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7	
0.0	17.9	18.2	17.9	17.7	17.4	17.1	16.8	16.5	
22.5	15.9	15.9	15.6	15.3	15.0	15.0	14.4	14.4	
45.0	13.8	13.5	13.2	12.6	12.6	12.6	12.3	12.3	
67.5	12.3	12.3	12.6	12.0	12.0	12.0	12.0	11.7	
90.0	11.7	11.7	11.4	11.4	11.1	11.1	11.1	10.8	
112.5	11.1	10.8	10.8	11.1	10.8	10.8	11.1	11.1	
135.0	10.8	10.8	10.8	10.8	10.2	10.2	10.2	10.2	
157.5	10.2	10.2	10.5	10.2	10.5	10.8	10.8	10.8	
180.0	10.8	10.8	11.4	11.4	11.4	11.4	11.4	11.4	
202.5	11.4	11.4	11.4	11.7	11.7	11.7	11.7	12.3	
225.0	12.3	12.6	13.2	13.5	14.1	14.4	15.0	15.0	
247.5	15.6	15.9	16.5	16.8	17.1	17.7	17.9	17.9	
270.0	17.9	17.9	18.2	18.2	18.2	18.2	18.2	18.2	
292.5	18.5	18.5	18.5	18.8	18.8	18.5	18.8	19.1	
315.0	19.1	18.5	18.5	18.5	18.5	18.5	18.5	18.8	
337.5	17.9	18.2	18.2	18.2	18.2	18.5	18.5	18.2	

DEPTH:	3840	TILT:	0	RANGE:	70.9	VOS:	5668		
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7	
0.0	17.9	17.7	17.1	16.8	16.8	16.5	16.2	15.6	
22.5	15.9	15.6	15.3	15.0	14.7	14.1	14.1	14.1	
45.0	14.4	14.1	13.5	12.9	12.9	12.9	12.3	12.0	
67.5	12.3	12.0	12.0	11.7	11.7	11.4	11.4	11.4	
90.0	11.1	11.1	11.1	10.8	10.8	10.8	10.8	10.8	
112.5	10.8	10.8	11.4	11.4	11.4	11.4	11.4	11.7	
135.0	11.4	11.7	12.0	11.7	11.4	11.4	11.7	11.7	
157.5	12.0	12.0	12.0	12.0	12.0	12.3	12.0	11.1	
180.0	11.1	11.1	11.1	11.1	11.1	11.1	11.1	10.8	
202.5	11.1	11.1	11.4	11.4	11.7	12.0	12.3	12.6	
225.0	12.9	13.2	13.5	14.4	14.7	15.0	15.0	15.6	
247.5	15.9	16.5	16.8	17.1	17.4	17.4	17.7	17.9	
270.0	17.9	18.2	18.2	18.5	18.5	18.8	18.5	18.8	
292.5	18.5	18.8	19.1	19.1	19.1	19.7	19.7	19.7	
315.0	19.4	19.4	19.4	18.8	18.5	18.8	18.8	18.5	
337.5	18.5	18.5	18.5	18.2	18.2	18.2	18.2	17.9	

DEPTH:	3850	TILT:	0	RANGE:	70.9	VOS:	5668		
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7	
0.0	17.9	17.7	17.1	16.8	16.2	16.2	15.6	15.3	
22.5	15.0	15.0	15.0	15.0	14.7	14.7	14.7	14.4	
45.0	14.4	14.1	14.1	13.5	13.5	12.9	12.9	12.3	
67.5	12.3	12.0	11.7	11.7	11.4	11.1	10.8	10.8	
90.0	10.5	10.5	10.5	10.5	10.5	10.8	10.8	10.8	
112.5	11.1	11.1	11.4	11.4	11.1	11.4	11.4	11.4	
135.0	11.4	11.4	11.4	11.1	11.1	11.1	11.1	11.1	
157.5	11.1	11.4	11.4	11.4	11.4	11.4	11.4	11.7	
180.0	11.7	12.0	12.0	12.3	12.3	12.0	12.0	12.3	
202.5	12.6	12.6	12.9	12.9	13.2	12.9	12.9	13.2	
225.0	13.2	13.2	14.1	14.1	14.7	15.3	15.6	15.6	
247.5	15.9	16.5	16.8	17.9	18.2	18.5	18.5	19.1	
270.0	19.1	19.4	18.5	18.5	18.8	19.1	19.7	19.7	
292.5	20.0	20.3	20.3	20.3	20.0	20.0	19.7	19.4	
315.0	19.7	19.4	19.4	19.4	19.4	19.1	19.4	19.1	
337.5	19.1	18.8	18.8	18.8	18.8	18.5	17.9	17.9	

DEPTH:	3860	TILT:	0	RANGE:	70.9	VOS:	5668		
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7	
0.0	18.8	18.5	18.2	17.9	17.7	17.7	17.1	17.1	
22.5	16.8	16.5	16.2	15.9	15.6	15.3	15.3	15.0	
45.0	14.7	14.4	14.1	14.1	14.1	13.8	13.8	13.5	
67.5	13.2	12.9	12.9	12.6	12.6	12.6	12.3	12.6	
90.0	12.3	12.0	10.8	11.7	11.4	11.4	11.1	11.1	
112.5	11.1	10.8	10.8	10.8	10.8	11.1	10.8	10.8	
135.0	10.8	10.8	10.8	10.8	10.5	11.4	11.4	11.1	
157.5	11.1	10.8	10.8	10.8	10.8	10.8	10.8	10.8	
180.0	10.8	10.8	11.1	11.1	11.1	11.1	11.4	11.7	
202.5	11.7	11.7	12.0	12.3	12.6	12.9	13.5	13.8	
225.0	14.1	14.7	15.0	15.3	15.6	16.2	16.5	17.4	
247.5	17.7	17.7	17.9	18.2	18.2	18.5	18.5	18.5	
270.0	18.5	18.8	18.8	19.1	19.1	19.4	19.7	19.7	
292.5	20.6	20.6	20.6	20.6	20.3	20.0	20.3	20.3	
315.0	20.3	20.6	20.9	20.6	20.0	20.0	20.3	20.0	
337.5	20.0	20.3	20.6	19.7	19.4	19.1	19.1	18.8	

DEPTH:	3870	TILT:	0	RANGE:	70.9	VOS:	5668		
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7	
0.0	20.3	20.3	20.0	19.4	19.1	18.8	18.5	18.2	
22.5	17.7	17.4	17.1	16.5	15.9	15.6	15.3	15.0	
45.0	14.4	13.8	13.5	13.2	13.2	12.9	12.9	12.9	
67.5	12.6	12.6	12.6	12.3	12.3	12.0	12.0	11.7	
90.0	12.0	12.0	12.0	12.0	11.7	11.7	11.4	11.4	
112.5	11.4	11.1	11.4	11.4	11.1	11.1	11.1	10.8	
135.0	11.1	11.1	11.1	11.1	11.1	10.8	10.8	10.8	
157.5	10.8	10.8	11.1	10.8	10.8	10.8	10.8	11.1	
180.0	11.1	11.1	11.1	11.4	11.1	11.1	11.4	11.7	
202.5	12.0	12.3	12.3	12.6	12.9	13.2	13.5	13.8	
225.0	14.1	14.7	14.7	15.3	15.9	16.2	16.5	16.8	
247.5	17.1	17.4	17.4	17.7	17.9	18.2	18.5	18.5	
270.0	18.5	18.8	18.8	19.1	19.1	19.4	19.4	19.7	
292.5	20.0	20.3	20.6	20.9	20.9	21.5	20.9	20.9	
315.0	20.9	20.6	20.9	20.9	20.9	20.9	20.9	21.2	
337.5	20.9	20.9	20.9	20.6	20.6	20.6	20.6	20.6	

DEPTH:	3880	TILT:	0	RANGE:	70.9	VOS:	5668		
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7	
0.0	20.9	20.0	19.1	18.8	18.5	17.7	18.5	17.9	
22.5	17.7	17.1	17.1	16.5	15.9	15.6	15.0	14.4	
45.0	14.1	14.1	13.5	13.5	12.9	12.6	12.9	12.9	
67.5	12.9	12.9	12.6	12.6	12.3	12.0	12.0	11.7	
90.0	11.7	11.7	11.4	11.4	11.4	11.1	11.1	11.1	
112.5	11.4	11.1	11.1	10.8	10.8	10.5	10.8	10.8	
135.0	10.8	11.1	11.1	11.1	10.8	10.8	10.8	10.8	
157.5	11.1	11.1	11.1	11.1	11.4	11.4	12.0	12.0	
180.0	12.0	12.0	12.0	12.0	12.0	12.3	12.0	12.3	
202.5	12.6	12.9	12.9	12.9	12.9	13.2	13.5	13.5	
225.0	13.8	14.1	14.4	14.7	14.7	15.0	15.3	15.6	
247.5	15.9	16.2	16.5	17.1	17.7	17.9	18.2	18.5	
270.0	19.1	19.4	19.7	20.0	19.7	20.0	20.0	20.3	
292.5	20.3	20.9	21.2	21.5	21.5	21.5	21.5	21.2	
315.0	21.2	21.2	21.5	21.5	21.5	21.5	22.1	22.1	
337.5	22.1	22.1	21.5	21.5	21.2	20.9	20.9	20.9	

DEPTH:	3890	TILT:	0	RANGE:	70.9	VOS:	5668		
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7	
0.0	20.6	20.0	19.4	19.1	18.5	18.2	17.7	17.9	
22.5	17.7	17.1	16.8	16.2	15.9	15.3	15.0	14.7	
45.0	14.4	14.1	13.8	13.5	13.2	12.9	12.9	12.6	
67.5	12.3	12.3	12.0	12.0	11.7	11.4	11.1	11.1	
90.0	11.1	10.8	10.5	10.5	10.2	9.9	9.9	9.9	
112.5	9.9	9.9	9.9	9.9	9.9	9.9	10.2	10.2	
135.0	10.5	10.5	10.2	10.5	10.5	10.5	10.5	9.9	
157.5	10.2	9.9	10.2	10.2	10.2	10.2	10.2	10.2	
180.0	10.5	10.5	10.5	11.1	11.1	11.1	11.4	11.7	
202.5	11.7	12.6	12.9	13.2	13.2	13.2	13.5	13.8	
225.0	13.8	14.1	14.4	14.4	14.7	15.3	15.3	15.9	
247.5	15.9	16.5	16.2	17.1	17.4	17.9	18.5	18.5	
270.0	18.5	19.1	19.7	20.0	20.6	20.9	20.9	21.5	
292.5	21.8	21.8	21.8	22.1	22.4	22.4	22.1	22.1	
315.0	22.4	22.7	22.7	22.7	22.4	22.7	22.7	23.0	
337.5	22.7	22.4	22.1	21.8	21.8	21.5	21.2	20.9	

DEPTH:	3900	TILT:	0	RANGE:	70.9	VOS:	5669		
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7	
0.0	21.2	20.6	19.7	19.4	19.4	18.6	17.7	17.7	
22.5	17.4	17.1	16.8	16.5	16.2	15.9	15.6	15.6	
45.0	15.6	14.7	14.1	14.1	13.8	13.2	12.9	12.6	
67.5	12.6	12.3	12.0	11.7	11.4	11.1	11.1	11.1	
90.0	10.8	10.8	10.8	10.5	10.5	10.5	10.5	10.5	
112.5	10.2	10.8	10.2	10.5	10.2	10.8	10.5	10.8	
135.0	10.8	10.8	10.2	10.5	10.5	10.5	10.5	10.2	
157.5	10.5	10.8	10.8	10.8	10.8	11.1	11.1	11.4	
180.0	11.4	11.7	11.7	11.7	11.7	12.0	12.6	12.6	
202.5	12.3	12.3	12.9	13.2	13.5	13.5	13.8	14.1	
225.0	14.4	14.7	14.7	14.7	15.3	15.6	15.9	16.5	
247.5	17.1	17.1	17.4	18.0	18.3	18.9	19.4	19.7	
270.0	19.7	20.0	20.3	20.3	21.5	21.8	22.1	22.1	
292.5	22.4	22.7	23.0	23.6	23.0	23.3	23.3	23.3	
315.0	23.3	22.7	23.0	23.0	23.0	23.3	23.3	23.3	
337.5	23.3	23.0	22.7	22.4	22.1	21.8	21.5	21.5	

DEPTH:	3910	TILT:	0	RANGE:	70.9	VOS:	5669		
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7	
0.0	21.5	21.2	20.9	20.3	19.7	19.7	18.9	18.9	
22.5	18.6	18.3	18.0	18.0	18.0	17.4	17.1	16.8	
45.0	16.5	16.2	15.6	15.6	14.7	13.8	13.5	12.9	
67.5	12.6	12.6	12.3	12.3	12.0	11.7	11.7	11.7	
90.0	11.4	11.4	11.4	11.7	11.7	11.7	11.4	11.4	
112.5	11.4	11.1	11.1	11.1	11.1	11.1	11.1	11.1	
135.0	10.8	10.8	10.8	10.8	10.8	10.8	10.8	10.8	
157.5	10.5	10.8	10.8	10.8	10.8	11.1	11.1	11.4	
180.0	11.4	11.7	11.7	11.7	12.0	12.0	11.7	12.3	
202.5	12.3	12.6	12.9	13.2	13.5	13.8	14.4	14.7	
225.0	15.3	15.6	15.9	15.9	16.5	16.8	17.1	17.1	
247.5	18.0	18.3	18.6	19.1	19.1	19.4	20.0	20.3	
270.0	21.5	21.8	21.8	21.8	22.4	22.7	23.3	22.7	
292.5	23.0	23.3	23.3	23.3	23.3	23.3	23.3	23.3	
315.0	23.6	23.6	23.9	23.9	23.9	23.3	23.3	23.0	
337.5	22.7	22.4	22.7	22.4	22.4	22.4	22.4	22.1	

DEPTH:	3920	TILT:	0	RANGE:	70.9	VOS:	5669		
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7	
0.0	22.7	22.4	22.1	21.2	20.6	20.0	19.7	19.4	
22.5	18.9	18.9	18.9	18.6	17.7	17.1	17.1	17.1	
45.0	17.1	16.2	15.9	15.6	15.0	14.4	13.8	13.5	
67.5	13.2	13.2	12.9	12.3	12.0	12.0	11.7	11.7	
90.0	11.4	11.4	11.1	11.1	11.1	11.4	11.1	11.1	
112.5	11.1	10.8	10.8	11.1	11.1	11.1	11.1	11.4	
135.0	11.4	11.1	11.4	11.4	11.4	11.4	11.1	10.8	
157.5	11.1	11.4	11.4	11.7	10.8	11.1	11.1	11.1	
180.0	11.4	11.4	11.7	12.0	12.3	12.3	12.6	12.6	
202.5	12.9	12.9	13.2	13.5	13.8	14.1	14.1	14.4	
225.0	15.0	15.6	15.6	16.5	16.8	17.1	17.1	17.7	
247.5	18.6	18.9	19.1	19.7	19.7	20.3	20.9	21.5	
270.0	21.5	21.5	22.1	22.1	22.4	23.0	23.3	23.9	
292.5	24.2	24.5	24.8	24.8	24.8	25.1	24.8	24.8	
315.0	24.5	24.8	24.8	25.1	24.8	24.5	24.2	24.2	
337.5	23.9	23.6	23.6	23.3	23.3	23.0	22.7	22.7	

DEPTH:	3930	TILT:	0	RANGE:	70.9	VOS:	5669		
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7	
0.0	22.7	23.0	23.0	22.7	22.4	21.8	21.5	20.9	
22.5	20.6	20.0	19.4	18.9	18.3	18.3	17.4	17.4	
45.0	16.8	16.2	15.9	15.6	15.0	14.7	14.4	14.1	
67.5	13.8	13.8	13.2	12.9	12.9	12.6	12.3	12.0	
90.0	11.7	11.7	11.7	11.7	11.4	11.4	11.4	11.4	
112.5	11.4	11.1	11.4	11.4	11.4	11.4	11.4	11.7	
135.0	11.7	11.7	11.7	11.4	11.4	11.4	11.4	11.7	
157.5	12.0	11.7	11.7	11.7	12.0	12.0	12.0	12.0	
180.0	12.0	12.3	12.3	12.9	12.9	13.2	13.2	13.5	
202.5	13.8	13.8	13.5	13.8	14.1	14.4	14.7	16.2	
225.0	16.2	16.5	17.1	17.1	17.4	17.7	17.7	18.6	
247.5	19.1	19.4	19.7	20.0	20.9	21.5	21.8	22.4	
270.0	23.0	23.3	23.3	23.3	23.6	23.9	24.2	24.2	
292.5	25.4	25.1	25.4	25.7	25.7	25.7	25.7	25.7	
315.0	25.4	25.4	25.4	25.1	24.8	25.1	25.1	25.1	
337.5	25.1	24.5	24.5	24.2	23.3	23.3	22.7	22.7	

DEPTH:	3940	TILT:	0	RANGE:	70.9	VOS:	5669		
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7	
0.0	23.9	23.6	23.6	23.0	22.7	22.4	21.8	21.2	
22.5	20.6	20.0	19.4	18.9	18.3	18.3	17.4	17.4	
45.0	17.1	16.5	16.5	15.9	15.6	15.3	15.0	14.7	
67.5	14.4	14.1	13.8	13.5	13.2	12.9	12.6	12.3	
90.0	12.3	12.3	12.3	12.0	12.0	12.0	11.7	11.7	
112.5	11.7	11.7	11.7	11.7	11.7	12.0	12.0	11.7	
135.0	11.7	12.0	11.7	11.7	11.7	11.7	11.7	11.7	
157.5	11.7	12.0	12.0	12.0	12.0	12.3	12.3	12.6	
180.0	12.9	12.6	12.6	12.6	12.9	13.2	13.2	13.5	
202.5	13.8	13.8	14.1	14.4	15.0	15.0	15.6	15.9	
225.0	16.5	16.5	17.4	17.7	18.0	18.6	18.6	18.9	
247.5	19.4	19.7	20.3	20.9	20.9	21.5	21.8	22.4	
270.0	22.7	23.0	23.0	23.3	23.9	23.9	23.9	24.8	
292.5	25.1	25.4	25.4	25.7	26.3	26.3	26.3	26.0	
315.0	26.0	25.7	25.7	25.7	25.1	25.4	25.4	25.1	
337.5	24.8	24.8	24.8	24.8	24.5	24.5	24.2	24.2	

DEPTH:	3950	TILT:	0	RANGE:	70.9	VOS:	5669		
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7	
0.0	23.9	23.6	23.0	22.7	22.1	21.8	21.5	20.9	
22.5	20.6	20.3	19.7	18.9	18.0	17.4	17.4	17.1	
45.0	16.8	16.8	16.5	16.2	15.9	15.0	14.7	14.4	
67.5	14.1	13.8	13.8	13.5	13.2	13.2	12.9	12.9	
90.0	12.6	12.6	12.6	12.0	12.0	12.0	11.7	11.7	
112.5	11.7	11.7	11.7	11.7	12.0	12.0	12.0	12.0	
135.0	12.3	12.3	12.6	12.6	12.6	12.9	12.9	12.9	
157.5	13.2	13.2	12.9	12.9	12.9	12.6	12.9	12.9	
180.0	13.2	13.2	13.2	13.2	13.2	13.5	13.8	14.1	
202.5	14.1	14.7	14.7	15.0	15.3	15.6	15.9	16.5	
225.0	16.8	16.8	17.1	17.4	17.7	18.3	18.6	19.1	
247.5	19.7	19.7	19.7	20.3	20.6	20.6	21.2	21.5	
270.0	21.8	22.4	23.0	23.3	23.6	24.2	23.9	24.2	
292.5	24.2	25.7	25.7	25.7	26.0	25.7	25.7	25.4	
315.0	25.4	25.1	25.4	25.7	25.7	25.7	25.7	25.7	
337.5	25.4	25.4	25.4	25.1	25.1	24.5	23.9	24.2	

DEPTH:	3960	TILT:	0	RANGE:	70.9	VOS:	5669		
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7	
0.0	23.9	23.3	23.0	22.4	21.8	21.2	20.9	20.9	
22.5	20.3	19.7	19.1	18.9	17.4	17.1	16.5	16.2	
45.0	15.9	15.0	15.0	14.4	13.8	13.8	13.5	13.2	
67.5	12.9	12.6	12.3	12.3	12.0	11.7	11.7	11.4	
90.0	11.4	11.4	11.4	11.1	11.1	11.1	10.8	10.8	
112.5	10.8	10.8	10.8	11.1	11.1	11.1	10.8	10.8	
135.0	10.8	10.8	10.8	10.8	11.1	11.1	11.1	11.4	
157.5	11.4	11.1	10.8	11.1	10.8	11.1	11.1	11.4	
180.0	11.4	11.7	11.7	12.0	12.3	12.0	12.3	12.3	
202.5	12.9	12.9	13.2	13.5	14.1	14.4	15.3	15.3	
225.0	15.9	16.5	17.1	17.4	18.0	18.9	19.1	19.4	
247.5	19.4	20.0	20.3	20.6	21.2	21.2	22.1	22.1	
270.0	23.0	23.6	23.6	23.6	23.9	23.9	24.5	25.1	
292.5	24.8	25.1	25.7	26.0	26.3	26.3	26.3	26.9	
315.0	26.3	26.6	26.6	26.6	26.3	25.7	25.4	25.4	
337.5	25.1	25.1	25.7	25.1	24.8	24.8	24.8	24.5	

DEPTH:	3970	TILT:	0	RANGE:	70.9	VOS:	5669		
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7	
0.0	23.9	23.6	23.3	22.4	22.1	21.5	21.2	20.9	
22.5	20.0	19.4	18.9	18.9	17.4	17.1	16.5	16.2	
45.0	15.9	15.9	15.6	15.0	14.4	14.1	13.8	13.5	
67.5	13.2	12.6	12.6	12.3	12.0	11.7	11.1	11.1	
90.0	10.8	10.5	10.5	10.2	10.2	9.9	9.9	9.6	
112.5	9.6	9.3	9.3	9.3	9.0	9.0	8.7	8.7	
135.0	8.7	9.0	8.7	8.7	8.7	8.7	8.7	9.0	
157.5	9.0	9.0	9.0	9.3	9.3	9.6	9.6	9.9	
180.0	10.2	10.5	10.5	10.8	11.1	11.1	11.4	11.7	
202.5	12.0	12.0	12.3	12.6	13.2	13.5	13.8	14.4	
225.0	14.4	15.3	15.9	16.2	17.1	17.7	18.3	18.9	
247.5	19.4	20.0	20.6	20.9	21.5	21.8	22.1	22.4	
270.0	23.0	23.3	23.9	23.9	24.2	24.2	24.5	24.8	
292.5	25.4	25.7	26.0	26.0	26.0	26.6	26.6	26.6	
315.0	26.9	26.6	26.6	26.3	26.3	25.7	25.7	25.7	
337.5	25.4	25.4	25.4	25.4	25.1	24.8	24.8	24.5	

DEPTH:	3980	TILT:	0	RANGE:	70.9	VOS:	5669		
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7	
0.0	25.1	25.1	24.8	24.2	23.6	23.0	21.8	20.9	
22.5	20.6	20.0	19.4	18.6	17.7	16.8	16.8	16.2	
45.0	15.9	15.6	15.9	15.3	14.4	13.8	13.5	13.5	
67.5	13.2	12.9	12.6	12.0	11.7	11.4	11.1	10.8	
90.0	10.5	10.5	10.5	10.2	9.9	9.9	9.9	9.9	
112.5	9.9	9.3	9.3	9.3	9.3	9.3	9.3	9.0	
135.0	9.0	9.0	9.0	9.0	9.0	9.0	8.7	9.0	
157.5	9.0	9.0	9.0	9.3	9.6	9.9	9.9	10.2	
180.0	10.5	10.8	10.8	11.1	11.4	11.4	11.4	12.0	
202.5	12.3	11.4	12.0	12.3	12.6	12.6	13.2	13.8	
225.0	14.1	16.2	16.5	17.1	17.4	17.7	18.3	19.1	
247.5	19.7	20.0	20.9	20.6	21.8	22.1	22.7	23.0	
270.0	24.2	24.5	24.8	25.1	25.1	25.4	26.6	27.2	
292.5	27.5	27.5	27.5	27.8	27.5	27.5	27.5	28.1	
315.0	28.1	28.1	28.4	28.4	28.1	28.1	28.1	27.5	
337.5	27.5	27.5	27.5	27.2	27.2	27.2	26.6	25.7	

DEPTH:	3990	TILT:	0	RANGE:	70.9	VOS:	5669		
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7	
0.0	27.2	26.9	26.9	26.6	26.0	26.0	25.4	23.9	
22.5	22.7	21.2	20.3	19.4	18.9	18.3	18.0	17.4	
45.0	16.8	16.2	15.6	15.3	14.4	14.1	13.8	13.5	
67.5	13.2	12.9	12.6	12.3	12.3	12.0	11.7	11.4	
90.0	11.4	10.8	10.8	10.8	10.8	10.2	10.5	9.9	
112.5	9.9	9.9	9.6	9.6	9.6	9.6	9.9	10.2	
135.0	9.9	9.9	9.6	9.6	9.6	9.6	9.6	9.6	
157.5	9.6	9.9	9.6	9.6	9.9	9.9	9.9	9.9	
180.0	10.2	10.2	10.5	10.5	10.8	11.1	11.1	11.1	
202.5	11.4	11.7	12.3	12.3	12.9	13.2	13.8	14.4	
225.0	14.7	15.3	15.9	16.5	17.7	18.3	19.4	20.9	
247.5	21.5	22.4	23.0	23.3	23.9	24.2	24.8	25.4	
270.0	25.7	26.3	26.9	27.2	27.8	28.1	27.8	27.8	
292.5	27.8	28.1	28.4	28.7	28.7	28.4	28.1	28.1	
315.0	28.4	28.4	28.4	28.1	28.4	28.4	28.4	28.4	
337.5	28.1	28.1	28.1	28.4	28.1	27.8	27.5	27.5	

DEPTH:	4000	TILT:	0	RANGE:	70.9	VOS:	5670		
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7	
0.0	27.5	27.2	26.3	26.3	26.3	25.1	24.5	23.9	
22.5	23.0	22.4	21.8	21.5	20.6	20.1	19.5	18.6	
45.0	17.7	17.1	16.5	15.9	15.6	15.3	15.0	14.4	
67.5	14.1	13.8	13.5	13.2	12.9	12.6	12.3	12.0	
90.0	11.7	11.7	11.4	11.1	10.8	10.5	10.5	10.5	
112.5	10.2	9.9	9.9	9.6	9.6	9.6	9.6	9.6	
135.0	9.3	9.3	9.3	9.3	9.3	9.3	9.3	9.3	
157.5	9.3	9.3	9.3	9.3	9.6	9.6	9.6	9.9	
180.0	9.9	10.2	10.5	10.5	10.5	10.8	11.1	11.4	
202.5	11.7	12.3	12.9	13.2	13.8	15.0	15.3	15.6	
225.0	16.2	17.1	17.7	18.3	18.6	19.5	20.1	20.9	
247.5	21.2	21.5	22.1	22.1	23.3	23.9	24.5	25.1	
270.0	26.0	26.3	26.6	27.5	27.5	28.1	28.1	28.1	
292.5	28.4	28.1	28.1	28.1	28.4	28.4	28.7	28.7	
315.0	29.0	29.3	29.9	29.9	29.9	29.6	29.3	29.0	
337.5	29.0	28.7	29.0	28.7	28.4	28.4	28.1	27.8	

DEPTH:	4010	TILT:	0	RANGE:	70.9	VOS:	5670		
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7	
0.0	27.8	27.2	26.9	26.3	26.0	25.1	24.2	23.9	
22.5	22.7	22.1	21.2	20.6	20.1	19.8	19.5	19.2	
45.0	18.9	18.3	18.0	17.7	17.1	16.5	16.5	15.9	
67.5	15.6	15.3	15.0	14.7	14.1	13.5	12.9	12.6	
90.0	12.9	12.3	12.0	11.7	11.7	11.4	11.7	11.4	
112.5	11.1	10.8	10.8	10.8	10.5	10.8	10.8	10.8	
135.0	10.8	11.1	11.1	11.1	11.1	11.1	11.1	11.1	
157.5	11.1	11.1	11.1	10.8	11.1	11.7	11.7	11.7	
180.0	11.7	11.7	11.7	12.0	12.3	12.3	12.6	12.3	
202.5	13.2	13.5	13.2	13.5	13.8	15.6	15.9	16.8	
225.0	17.1	17.4	17.7	18.0	18.3	18.9	19.2	19.8	
247.5	20.1	20.4	20.6	21.5	21.8	22.1	23.0	23.6	
270.0	23.9	25.1	25.7	26.6	26.9	27.5	28.4	28.7	
292.5	28.7	29.3	29.3	29.3	29.0	29.3	30.5	30.5	
315.0	30.2	30.5	30.5	30.5	30.2	30.2	30.2	30.2	
337.5	30.5	30.5	30.2	29.9	29.6	29.3	29.0	28.4	

DEPTH:	4020	TILT:	0	RANGE:	70.9	VOS:	5670		
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7	
0.0	30.5	29.9	29.6	29.0	27.2	26.6	26.0	24.5	
22.5	24.2	23.6	22.7	22.4	22.1	22.1	20.4	19.5	
45.0	19.2	18.3	17.7	17.4	17.1	16.8	16.5	15.9	
67.5	15.6	15.0	14.4	14.1	13.8	13.5	13.5	12.9	
90.0	12.9	12.6	12.3	12.0	12.0	11.7	11.4	11.4	
112.5	11.1	11.1	11.1	11.1	11.1	11.1	11.7	11.7	
135.0	11.4	11.4	11.7	12.0	12.0	11.4	11.4	11.7	
157.5	11.7	11.7	12.0	12.0	12.3	12.6	12.6	12.9	
180.0	12.9	13.5	13.8	13.5	13.8	14.1	14.4	14.7	
202.5	14.7	15.0	15.3	15.3	15.6	15.9	16.5	16.5	
225.0	17.1	17.4	17.4	18.3	18.9	19.2	19.5	20.1	
247.5	20.4	20.9	21.5	21.8	22.4	22.7	23.6	24.5	
270.0	25.1	25.4	26.0	26.6	27.5	27.8	28.1	28.4	
292.5	28.7	29.0	29.3	29.6	29.9	30.5	30.8	30.8	
315.0	30.8	31.1	31.4	31.7	31.4	31.7	31.4	31.4	
337.5	31.1	30.8	30.5	30.5	30.2	30.2	30.2	30.2	

DEPTH:	4030	TILT:	0	RANGE:	70.9	VOS:	5670		
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7	
0.0	29.9	29.3	29.0	28.7	26.9	26.0	26.0	26.0	
22.5	25.1	24.2	23.3	22.4	22.1	21.2	20.6	20.4	
45.0	19.8	19.2	18.3	17.7	17.4	16.8	16.8	15.3	
67.5	15.9	14.7	14.1	14.1	14.1	13.8	13.8	13.8	
90.0	13.8	13.2	13.2	12.9	12.9	12.9	12.9	12.9	
112.5	12.6	12.3	12.0	12.0	11.7	11.4	11.4	11.7	
135.0	11.1	11.1	11.4	11.4	11.7	11.7	12.0	12.0	
157.5	11.7	12.0	12.0	12.0	12.0	12.0	12.0	12.3	
180.0	12.3	12.6	12.6	12.6	12.6	12.6	12.9	12.9	
202.5	13.2	13.2	13.8	13.8	14.4	14.7	15.0	15.3	
225.0	15.6	16.2	16.8	17.7	18.3	18.9	19.8	20.4	
247.5	20.6	21.2	21.5	22.1	22.7	23.3	23.6	24.2	
270.0	25.1	26.0	26.6	27.5	28.1	29.0	29.9	30.5	
292.5	30.8	30.8	30.8	31.1	31.4	31.1	31.1	31.4	
315.0	31.4	31.4	31.7	31.4	31.4	31.1	31.1	30.8	
337.5	30.8	31.1	31.4	31.4	31.4	31.4	30.5	30.2	

DEPTH:	4040	TILT:	0	RANGE:	70.9	VOS:	5670		
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7	
0.0	30.2	29.3	29.0	28.1	27.8	27.5	26.6	25.7	
22.5	24.8	24.2	23.6	22.7	21.5	20.9	20.1	19.8	
45.0	19.2	18.9	18.6	18.0	17.4	16.5	16.2	15.9	
67.5	15.0	15.0	14.7	14.4	13.8	13.5	13.2	12.9	
90.0	12.6	12.6	12.0	12.3	11.4	11.1	10.8	10.5	
112.5	10.5	10.2	10.2	10.2	9.9	9.9	10.8	10.8	
135.0	10.8	10.8	10.8	10.8	10.8	10.8	11.1	11.4	
157.5	11.4	11.4	11.7	11.7	11.7	12.0	12.3	12.3	
180.0	12.6	12.3	12.6	12.6	12.9	12.9	13.2	13.2	
202.5	13.5	13.5	13.8	14.1	14.7	14.7	15.3	15.3	
225.0	15.6	16.5	17.4	17.4	18.3	18.6	19.2	20.1	
247.5	20.4	21.5	21.8	22.4	22.7	23.6	24.2	25.4	
270.0	26.0	26.9	27.5	27.8	28.4	28.7	29.3	30.5	
292.5	30.8	31.1	31.4	31.4	31.7	31.4	31.7	31.7	
315.0	31.7	32.3	32.3	32.3	32.0	31.7	31.7	31.7	
337.5	32.0	32.0	32.3	32.3	32.3	31.7	31.1	30.5	

DEPTH:	4050	TILT:	0	RANGE:	70.9	VOS:	5670		
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7	
0.0	30.8	30.2	29.6	29.3	28.4	27.8	26.9	25.4	
22.5	23.9	23.0	22.1	22.1	20.9	20.6	20.4	19.8	
45.0	19.2	18.3	18.3	17.7	17.4	16.2	15.9	15.3	
67.5	15.0	14.7	14.7	14.1	13.5	12.0	12.6	12.6	
90.0	12.6	11.7	11.4	11.4	11.1	10.8	10.5	10.5	
112.5	10.5	10.5	10.2	10.2	10.2	10.2	9.9	9.9	
135.0	9.9	9.6	9.6	9.6	9.6	9.6	9.6	9.6	
157.5	9.6	9.6	9.6	9.6	9.6	9.9	9.9	9.6	
180.0	9.6	10.2	10.2	10.5	10.8	11.1	11.4	11.7	
202.5	12.0	12.3	12.6	12.9	13.2	13.8	14.1	14.4	
225.0	15.3	17.1	17.1	17.4	17.7	18.3	18.6	20.4	
247.5	20.4	20.9	21.8	22.7	23.3	23.9	24.8	25.4	
270.0	26.3	27.2	27.8	28.4	29.0	29.3	29.6	29.9	
292.5	30.2	30.2	30.8	31.1	31.4	31.7	32.3	32.3	
315.0	32.6	32.3	32.3	32.6	32.3	32.3	32.0	31.7	
337.5	32.0	32.0	32.0	32.3	32.6	32.6	31.4	31.1	

DEPTH:	4060	TILT:	0	RANGE:	70.9	VOS:	5670		
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7	
0.0	31.4	31.1	29.6	28.7	27.5	27.2	26.6	25.1	
22.5	24.2	22.7	22.1	21.8	20.9	20.1	19.8	19.2	
45.0	18.3	18.0	17.7	17.4	16.8	16.5	15.9	15.3	
67.5	15.6	15.6	15.0	15.0	14.4	12.6	12.3	12.3	
90.0	12.0	11.7	11.4	11.7	11.4	11.1	11.1	10.8	
112.5	10.8	10.5	10.5	10.2	10.5	10.5	10.5	10.5	
135.0	10.2	10.5	10.5	10.5	10.8	11.1	11.1	10.2	
157.5	10.2	10.2	10.2	10.2	10.2	10.5	10.5	10.8	
180.0	10.8	10.8	11.1	11.1	11.4	11.7	12.0	12.0	
202.5	12.9	13.2	13.2	13.8	14.1	14.7	14.7	15.3	
225.0	15.6	15.9	16.5	17.1	17.7	18.9	18.9	20.1	
247.5	20.4	21.2	21.8	22.7	23.3	23.6	24.8	25.4	
270.0	26.0	27.2	27.8	28.7	29.9	29.3	29.6	29.6	
292.5	29.9	30.2	30.8	31.4	32.3	32.6	32.6	33.2	
315.0	32.9	33.2	32.6	32.6	32.3	32.3	32.0	32.0	
337.5	32.0	32.3	32.6	32.9	32.6	32.3	31.7	31.4	

DEPTH:	4070	TILT:	0	RANGE:	70.9	VOS:	5670		
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7	
0.0	30.8	30.5	30.2	29.3	28.7	28.4	27.5	26.0	
22.5	25.4	24.8	23.9	23.3	21.8	21.5	20.9	20.6	
45.0	20.4	19.8	19.2	18.9	18.6	18.3	18.0	17.4	
67.5	17.1	16.5	15.9	15.0	14.7	14.7	14.4	13.5	
90.0	13.2	12.6	12.6	12.6	12.6	12.3	12.3	12.0	
112.5	11.7	11.4	11.1	11.1	11.1	11.1	10.8	10.8	
135.0	10.8	10.8	11.1	11.1	11.1	11.4	11.4	11.4	
157.5	11.7	11.4	11.4	11.4	11.4	11.7	11.7	12.0	
180.0	12.0	12.3	12.3	12.6	12.9	12.9	13.2	13.8	
202.5	13.8	14.1	13.8	14.1	14.7	15.3	15.6	16.2	
225.0	16.5	17.1	18.0	18.6	18.9	20.1	20.6	21.2	
247.5	21.5	22.1	22.7	23.3	25.1	26.0	26.3	26.6	
270.0	27.8	28.1	28.7	29.0	29.3	29.3	29.9	30.2	
292.5	30.8	31.1	31.7	31.7	32.3	32.6	33.2	32.6	
315.0	32.6	32.6	32.6	32.6	32.6	32.9	33.2	33.2	
337.5	32.9	32.6	32.9	32.6	32.0	32.0	31.7	31.1	

DEPTH:	4080	TILT:	0	RANGE:	70.9	VOS:	5670		
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7	
0.0	32.3	31.7	30.5	29.6	29.9	29.0	28.1	27.5	
22.5	26.3	25.4	24.8	24.2	23.6	22.7	22.1	21.5	
45.0	20.6	20.1	20.1	19.5	18.9	18.3	18.0	17.7	
67.5	17.4	17.1	16.5	15.9	15.3	15.0	14.7	14.4	
90.0	13.5	13.2	12.9	12.6	12.0	11.7	11.7	11.7	
112.5	11.4	11.4	11.4	11.1	10.8	10.8	10.8	10.8	
135.0	10.8	10.8	10.8	10.5	10.5	10.5	10.5	10.8	
157.5	11.1	11.1	11.1	11.4	11.4	11.4	11.7	11.7	
180.0	12.0	12.3	12.3	12.6	12.6	12.6	12.9	12.9	
202.5	13.2	13.5	13.8	14.1	14.7	15.3	16.2	16.5	
225.0	17.1	17.4	18.6	18.9	19.8	20.1	20.4	20.9	
247.5	21.8	22.4	23.0	23.6	24.8	26.0	26.6	27.2	
270.0	27.5	28.7	29.0	29.6	29.9	30.5	30.8	30.8	
292.5	31.1	31.4	31.7	32.0	32.6	32.6	32.9	33.2	
315.0	33.8	33.8	33.8	34.1	33.8	33.5	33.5	34.1	
337.5	34.1	34.1	33.8	33.8	33.5	33.8	33.8	33.2	

DEPTH:	4090	TILT:	0	RANGE:	70.9	VOS:	5670		
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7	
0.0	32.9	32.3	31.7	31.1	30.5	29.6	29.3	28.1	
22.5	27.2	26.9	25.4	24.8	24.2	23.6	23.3	22.7	
45.0	22.4	22.1	20.9	20.1	19.5	18.9	18.3	18.0	
67.5	17.4	16.8	16.8	16.2	15.9	15.6	15.0	14.7	
90.0	14.4	14.1	13.8	13.5	12.9	12.6	12.0	11.7	
112.5	11.4	11.4	11.1	11.1	11.1	10.8	10.8	10.8	
135.0	10.8	10.8	10.8	11.1	10.8	11.1	11.1	11.1	
157.5	11.1	11.4	11.4	11.4	11.4	11.7	12.0	12.0	
180.0	12.0	12.0	12.6	12.6	12.9	12.9	12.9	13.5	
202.5	13.8	14.4	14.7	15.0	15.3	15.3	15.9	16.5	
225.0	17.1	17.4	18.0	19.2	20.1	20.6	21.5	21.5	
247.5	22.1	23.0	23.6	24.2	25.1	26.9	27.8	28.4	
270.0	29.0	29.3	29.6	29.9	30.5	30.8	31.1	31.4	
292.5	32.0	32.3	32.6	33.2	32.9	33.5	33.5	33.8	
315.0	34.1	34.4	34.7	34.7	35.0	35.0	35.0	35.0	
337.5	35.0	35.0	34.4	34.7	34.4	33.8	33.5	33.5	

DEPTH:	4100	TILT:	0	RANGE:	70.9	VOS:	5671		
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7	
0.0	32.9	32.6	32.0	31.4	30.5	29.9	28.7	28.1	
22.5	27.5	26.9	26.3	25.7	24.8	23.9	23.3	23.0	
45.0	22.4	21.9	21.0	20.1	19.5	19.2	18.6	17.7	
67.5	17.1	16.5	15.9	15.3	15.3	15.0	14.4	14.4	
90.0	14.1	13.8	13.2	12.9	12.6	12.3	12.0	11.7	
112.5	11.4	11.1	10.8	10.8	10.5	10.5	10.5	10.5	
135.0	10.5	10.5	10.8	10.8	10.8	11.1	11.1	11.1	
157.5	11.1	11.1	11.4	11.4	11.7	12.0	12.3	12.6	
180.0	12.6	12.6	13.2	13.2	12.6	12.6	12.9	13.2	
202.5	13.2	13.5	13.8	14.4	14.7	15.0	15.9	16.2	
225.0	17.4	17.7	18.3	19.2	19.5	19.8	20.7	21.6	
247.5	22.4	23.0	24.5	24.2	26.3	28.1	29.0	29.6	
270.0	29.9	30.2	30.8	31.1	31.4	32.0	32.3	32.3	
292.5	32.6	32.9	33.2	33.8	34.1	34.4	34.7	35.0	
315.0	35.3	35.3	35.6	35.6	35.6	35.6	35.6	35.6	
337.5	35.6	35.0	34.7	34.7	34.4	34.1	33.8	33.5	

DEPTH:	4110	TILT:	0	RANGE:	70.9	VOS:	5671		
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7	
0.0	32.9	32.3	32.0	31.4	30.8	30.5	29.9	29.0	
22.5	28.1	27.8	26.6	25.7	25.1	23.6	23.0	22.1	
45.0	21.6	20.7	19.8	18.9	18.0	17.7	16.8	16.2	
67.5	15.9	15.3	15.0	14.7	14.4	14.1	13.8	13.8	
90.0	13.5	13.2	12.9	12.6	12.0	12.0	11.7	11.4	
112.5	11.4	11.1	11.1	10.8	10.8	10.8	10.8	10.8	
135.0	10.8	10.8	10.8	10.8	10.8	11.1	11.1	10.2	
157.5	10.2	11.1	11.1	11.1	11.4	11.4	11.7	12.0	
180.0	12.0	12.0	12.3	12.3	12.3	12.6	12.6	12.6	
202.5	13.2	14.1	14.4	14.4	15.0	15.6	15.9	16.8	
225.0	17.1	17.4	18.0	18.6	19.2	19.8	20.7	21.3	
247.5	23.0	24.2	24.8	26.0	27.8	28.4	29.3	30.2	
270.0	30.5	31.1	32.0	32.3	32.3	32.6	33.2	33.2	
292.5	33.8	34.1	34.7	35.0	35.3	35.3	35.6	35.9	
315.0	35.9	36.2	36.5	36.5	36.8	36.5	36.2	36.2	
337.5	35.9	35.6	35.3	35.0	35.0	34.7	34.1	33.2	

DEPTH:	4120	TILT:	0	RANGE:	70.9	VOS:	5671		
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7	
0.0	33.2	33.2	32.9	32.9	31.7	30.8	29.6	29.0	
22.5	28.4	27.8	26.9	25.4	24.5	23.6	22.7	21.9	
45.0	21.0	20.1	18.9	18.3	17.7	17.1	16.8	15.9	
67.5	15.6	15.0	14.7	14.4	14.1	13.8	13.5	12.9	
90.0	12.6	12.6	12.3	12.0	11.7	11.7	11.4	11.4	
112.5	11.1	11.1	11.1	10.8	10.8	10.5	10.5	10.8	
135.0	10.5	11.1	10.8	10.8	10.8	10.8	10.8	10.8	
157.5	10.8	11.1	11.1	11.4	11.4	11.7	11.7	11.7	
180.0	11.7	12.0	12.3	12.3	12.6	12.6	13.2	13.5	
202.5	13.8	14.4	15.0	15.6	15.6	16.2	16.5	17.1	
225.0	17.7	18.0	18.3	18.6	19.2	19.8	21.0	22.1	
247.5	23.0	24.5	26.6	26.9	27.8	28.4	29.6	30.5	
270.0	31.4	32.0	32.6	32.9	33.8	34.1	34.7	35.0	
292.5	35.3	35.9	36.2	36.5	36.8	36.5	36.8	37.1	
315.0	37.4	37.4	37.4	37.7	37.7	37.1	36.8	36.2	
337.5	36.2	36.2	36.5	36.5	36.2	34.7	34.7	33.8	

DEPTH:	4130	TILT:	0	RANGE:	70.9	VOS:	5671		
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7	
0.0	35.0	33.5	33.2	33.2	33.2	32.6	32.3	32.0	
22.5	31.1	30.2	29.6	28.1	27.2	25.1	23.3	22.4	
45.0	20.7	20.1	19.8	18.6	18.6	17.7	18.0	17.1	
67.5	16.8	16.2	15.9	15.3	14.7	14.1	13.5	13.2	
90.0	12.6	12.3	12.3	12.3	12.0	11.7	11.7	11.4	
112.5	11.1	11.1	11.1	11.1	10.8	10.8	10.8	10.8	
135.0	10.8	10.8	11.1	11.1	11.1	10.8	10.8	11.4	
157.5	10.8	10.8	11.1	11.1	11.1	11.4	11.7	12.0	
180.0	12.3	12.3	12.3	12.9	13.2	13.5	13.8	14.1	
202.5	14.4	14.7	14.7	15.3	15.9	15.9	16.8	17.4	
225.0	18.0	18.6	19.5	20.1	20.4	21.0	22.1	23.0	
247.5	24.5	25.1	26.6	27.5	29.0	29.9	31.1	31.4	
270.0	32.6	32.6	33.5	33.8	34.4	35.0	35.6	36.2	
292.5	36.5	36.8	37.4	37.4	37.4	37.7	37.7	38.3	
315.0	38.9	38.6	38.3	38.0	37.7	37.4	37.4	36.8	
337.5	37.1	36.8	36.8	37.1	36.8	35.9	35.9	35.6	

DEPTH:	4140	TILT:	0	RANGE:	70.9	VOS:	5671		
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7	
0.0	35.9	35.0	34.4	34.4	34.1	32.6	32.3	31.4	
22.5	30.5	29.3	29.3	28.4	27.2	26.3	24.5	23.9	
45.0	23.0	21.6	21.3	20.4	19.8	19.5	18.9	18.3	
67.5	17.1	16.5	16.2	15.6	15.3	14.7	13.8	13.5	
90.0	13.2	12.9	12.6	12.3	12.6	12.3	12.0	12.0	
112.5	12.0	11.7	11.4	11.4	11.4	11.1	11.4	11.4	
135.0	11.4	11.4	11.4	11.7	11.7	10.8	11.1	10.8	
157.5	10.8	11.1	11.1	11.1	11.4	11.7	12.0	12.9	
180.0	12.9	12.9	13.2	13.2	13.5	13.8	14.4	15.0	
202.5	15.6	15.9	16.2	16.5	17.1	17.4	18.0	18.0	
225.0	18.6	19.2	20.1	21.0	21.9	22.4	23.3	24.8	
247.5	24.8	26.3	27.2	27.8	28.7	30.2	30.5	31.4	
270.0	32.3	32.9	33.2	33.8	34.7	35.0	35.6	35.9	
292.5	36.5	37.1	37.4	37.7	37.7	38.3	38.3	38.6	
315.0	39.5	39.2	39.2	38.9	38.9	38.9	39.2	38.9	
337.5	38.9	38.6	37.7	37.7	37.7	37.4	36.5	36.5	

DEPTH:	4150	TILT:	0	RANGE:	70.9	VOS:	5671		
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7	
0.0	37.1	37.1	36.5	35.6	34.4	33.5	32.3	30.5	
22.5	28.7	28.1	26.9	25.7	24.8	23.9	23.6	23.3	
45.0	22.1	21.6	21.3	20.4	19.8	19.5	18.9	18.3	
67.5	17.7	17.1	16.5	15.6	15.0	14.7	14.4	13.8	
90.0	13.8	13.2	12.9	13.5	13.5	12.9	12.9	12.6	
112.5	12.3	11.7	12.0	12.0	12.0	12.0	12.0	12.0	
135.0	12.0	12.0	11.7	12.0	11.7	11.7	11.7	12.0	
157.5	12.0	12.3	12.6	12.6	12.9	12.9	13.2	13.2	
180.0	13.5	13.5	13.8	14.1	14.1	14.1	14.7	16.2	
202.5	16.2	16.2	16.5	16.8	17.1	17.4	17.7	18.3	
225.0	18.6	19.5	20.4	21.3	22.1	23.0	23.6	24.2	
247.5	24.5	26.3	26.9	28.4	28.7	29.3	30.2	31.7	
270.0	32.3	32.9	33.5	33.8	34.4	35.3	35.9	36.2	
292.5	36.5	36.8	37.1	37.4	37.4	37.7	38.3	38.9	
315.0	39.2	38.9	38.9	38.9	39.5	39.5	39.5	39.8	
337.5	40.1	39.5	39.5	39.5	38.6	38.6	38.3	37.7	

DEPTH:	4160	TILT:	0	RANGE:	70.9	VOS:	5671		
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7	
0.0	38.3	37.7	37.1	35.3	34.7	33.2	31.7	30.5	
22.5	29.3	28.4	27.2	26.3	25.1	24.5	23.6	23.0	
45.0	22.4	21.9	21.0	20.1	19.2	18.6	18.3	18.3	
67.5	17.7	17.4	16.8	16.5	15.9	15.6	15.3	14.7	
90.0	14.7	15.0	14.4	14.4	14.1	14.1	13.8	13.8	
112.5	13.8	13.5	13.2	13.2	13.2	13.5	13.2	12.9	
135.0	12.3	12.9	12.0	12.0	12.0	12.6	12.3	12.3	
157.5	12.3	12.3	12.3	12.6	12.6	12.9	12.9	13.2	
180.0	13.5	13.5	13.5	13.5	13.8	14.1	15.6	15.3	
202.5	15.9	16.2	16.8	17.1	17.4	18.0	18.6	19.2	
225.0	19.5	19.8	20.4	20.7	21.3	22.7	23.0	23.6	
247.5	24.5	25.1	27.2	28.7	29.0	29.0	30.5	31.4	
270.0	32.0	32.6	33.5	34.4	35.0	35.6	35.9	36.5	
292.5	36.8	37.4	38.3	38.6	38.6	38.6	38.9	39.2	
315.0	39.2	38.9	38.9	39.2	39.2	39.5	39.5	39.8	
337.5	39.5	39.5	39.5	39.5	39.5	38.9	39.2	38.9	

DEPTH:	4170	TILT:	0	RANGE:	70.9	VOS:	5671		
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7	
0.0	38.3	37.1	36.5	35.3	35.0	33.5	32.0	30.2	
22.5	29.6	27.8	26.6	26.3	26.0	24.8	23.9	23.6	
45.0	23.0	21.6	21.3	20.4	19.8	19.2	18.6	18.3	
67.5	17.7	17.1	16.8	16.2	15.9	15.6	14.7	14.4	
90.0	14.4	14.1	14.1	14.1	13.5	13.5	12.9	12.9	
112.5	12.6	12.6	12.3	12.6	12.3	12.3	12.0	12.0	
135.0	12.3	12.0	11.7	12.0	11.7	11.7	11.7	12.3	
157.5	12.3	12.3	12.3	12.6	12.6	12.6	12.9	12.6	
180.0	12.9	13.2	13.5	13.8	14.1	14.4	14.7	15.0	
202.5	15.6	16.2	16.8	16.8	17.7	18.0	18.3	18.9	
225.0	19.2	20.1	20.4	20.4	21.3	22.1	23.3	23.9	
247.5	24.5	25.4	26.3	26.9	28.4	28.4	29.0	30.2	
270.0	31.4	32.0	33.2	34.7	35.6	36.2	37.1	37.1	
292.5	37.4	38.6	38.3	38.6	38.6	38.9	39.2	39.5	
315.0	39.5	39.5	40.1	39.5	39.8	39.5	39.5	39.5	
337.5	39.2	39.5	39.5	39.5	39.5	39.2	39.5	38.9	

DEPTH:	4180	TILT:	0	RANGE:	70.9	VOS:	5671		
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7	
0.0	37.4	36.8	35.9	34.7	34.1	33.5	32.3	30.8	
22.5	29.6	28.1	27.2	26.0	24.8	24.2	23.9	23.0	
45.0	22.4	21.3	20.1	19.2	18.3	17.7	17.1	16.2	
67.5	15.9	15.6	15.3	15.3	15.0	14.7	14.4	14.1	
90.0	13.8	13.8	13.2	13.2	12.9	12.6	12.6	12.3	
112.5	12.9	12.6	12.3	12.3	12.0	12.0	12.0	11.7	
135.0	11.7	11.4	11.4	11.1	11.1	11.1	11.1	11.1	
157.5	11.1	11.4	11.4	11.7	12.0	12.0	12.3	12.6	
180.0	12.9	12.9	13.5	13.8	14.1	14.1	14.7	15.0	
202.5	15.3	15.3	15.9	16.5	17.1	17.4	17.7	18.3	
225.0	18.3	18.9	19.5	20.1	21.3	22.1	23.3	23.9	
247.5	24.8	25.7	26.3	26.9	27.5	28.4	30.2	31.1	
270.0	32.0	32.9	34.1	35.0	35.9	36.5	37.4	38.0	
292.5	38.6	39.2	39.5	39.8	39.8	39.8	39.8	39.8	
315.0	40.1	39.8	40.1	40.1	40.1	40.1	39.5	39.5	
337.5	39.5	39.8	39.2	39.2	38.9	38.9	38.6	38.0	

DEPTH:	4190	TILT:	0	RANGE:	70.9	VOS:	5671		
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7	
0.0	37.4	37.4	36.2	35.0	34.7	33.8	32.3	30.8	
22.5	29.9	28.1	26.6	25.7	24.2	23.0	22.7	21.6	
45.0	21.0	19.5	18.9	17.7	17.4	16.5	16.2	16.2	
67.5	15.6	15.0	14.7	14.1	13.8	13.2	12.9	12.6	
90.0	12.6	12.3	12.0	12.0	11.7	12.3	12.0	12.0	
112.5	11.7	11.4	11.1	11.1	10.8	10.8	10.5	10.5	
135.0	10.2	10.2	10.2	10.2	9.9	10.2	10.8	10.2	
157.5	10.5	10.5	10.5	10.8	11.7	11.7	12.0	12.0	
180.0	12.3	12.6	12.6	12.9	12.9	13.5	13.8	14.1	
202.5	14.4	14.4	15.0	15.3	15.9	16.2	16.8	17.1	
225.0	18.0	18.6	19.5	20.4	21.3	22.1	23.3	24.5	
247.5	25.1	26.3	27.2	27.8	29.3	29.9	30.5	32.0	
270.0	32.3	34.7	35.0	36.2	36.5	37.1	37.7	38.0	
292.5	38.9	39.2	40.4	41.0	41.3	41.0	41.3	41.6	
315.0	41.6	41.3	41.0	40.7	40.7	41.9	41.6	41.3	
337.5	40.4	39.5	38.9	39.8	39.2	38.9	38.6	37.7	

DEPTH:	4200	TILT:	0	RANGE:	70.9	VOS:	5671		
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7	
0.0	37.4	36.8	36.8	35.9	35.3	34.1	32.3	31.4	
22.5	30.2	29.0	27.2	25.7	25.1	23.6	22.4	21.9	
45.0	21.3	20.1	18.9	18.0	17.1	17.1	16.2	15.3	
67.5	14.7	14.4	14.1	13.8	13.5	13.5	12.6	12.0	
90.0	11.7	11.4	11.4	11.1	11.1	10.5	10.2	10.2	
112.5	10.2	9.9	9.6	9.9	9.6	9.3	9.6	9.6	
135.0	9.6	9.3	9.3	9.3	9.3	9.3	9.3	9.3	
157.5	9.3	9.3	9.6	9.9	10.2	10.5	10.8	11.1	
180.0	11.4	11.7	12.0	12.3	12.9	13.2	13.2	13.2	
202.5	13.5	14.1	14.4	14.7	15.3	15.6	16.5	16.8	
225.0	17.4	18.6	18.9	20.1	21.3	22.1	23.9	24.8	
247.5	26.6	27.8	29.6	29.9	30.8	31.4	32.3	33.2	
270.0	34.4	34.4	35.3	36.2	37.1	37.4	38.0	38.6	
292.5	38.9	39.8	40.4	41.3	42.2	42.8	43.4	43.4	
315.0	43.1	42.8	42.8	42.5	43.4	43.1	42.8	42.2	
337.5	42.2	41.9	41.0	41.3	40.1	40.1	38.3	37.7	

DEPTH:	4210	TILT:	0	RANGE:	70.9	VOS:	5671		
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7	
0.0	37.7	36.8	36.2	36.2	34.7	34.4	33.8	32.0	
22.5	31.1	29.3	29.0	27.5	26.0	24.5	24.2	21.9	
45.0	21.0	20.1	18.9	18.0	17.4	16.8	15.9	15.0	
67.5	14.7	14.1	13.8	13.5	13.2	12.3	11.7	11.4	
90.0	11.1	10.8	10.5	10.2	10.2	9.9	9.9	9.9	
112.5	9.6	9.6	9.3	9.3	9.3	9.3	9.3	9.0	
135.0	9.0	9.3	9.3	9.3	9.3	9.3	9.6	9.6	
157.5	9.6	9.6	9.6	9.9	9.9	10.2	9.9	9.9	
180.0	10.2	10.5	10.8	11.1	11.1	11.7	12.3	12.9	
202.5	13.5	13.5	14.4	14.7	15.0	15.3	16.2	17.1	
225.0	17.4	18.0	18.6	20.1	21.3	22.7	24.5	24.8	
247.5	26.9	27.8	29.6	30.5	31.4	31.7	32.6	33.5	
270.0	34.1	34.4	35.0	35.6	36.5	37.4	38.0	38.6	
292.5	38.9	39.2	40.1	41.3	41.9	42.5	43.1	43.4	
315.0	43.4	43.4	44.0	43.4	43.7	43.4	43.4	43.1	
337.5	43.4	42.5	41.9	41.3	40.7	39.5	38.9	38.0	

DEPTH:	4220	TILT:	0	RANGE:	70.9	VOS:	5671		
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7	
0.0	38.6	38.0	36.5	36.2	35.3	34.1	34.1	32.3	
22.5	31.1	29.6	28.4	27.2	26.0	25.1	23.9	23.6	
45.0	22.1	20.7	20.4	19.8	18.9	18.0	17.4	16.5	
67.5	15.6	15.0	14.7	14.1	12.3	12.3	11.7	11.4	
90.0	10.8	10.8	10.5	10.5	10.5	10.5	10.2	10.2	
112.5	10.2	9.9	9.9	9.9	9.9	9.9	9.9	10.2	
135.0	10.2	10.2	9.9	9.9	9.9	9.6	9.6	9.9	
157.5	9.9	9.6	9.9	9.9	10.2	10.2	10.2	10.5	
180.0	10.8	10.5	11.1	11.7	12.0	12.3	12.6	13.2	
202.5	13.5	14.1	15.0	15.6	16.2	16.5	17.1	17.7	
225.0	18.6	18.9	19.8	21.0	21.6	22.7	24.2	25.4	
247.5	26.9	28.1	29.3	30.8	31.4	32.3	33.5	34.1	
270.0	34.7	35.3	35.6	36.5	37.1	37.7	37.7	38.3	
292.5	38.9	39.5	40.4	41.3	41.9	42.2	43.1	42.8	
315.0	43.1	43.4	43.7	43.4	43.4	43.4	43.1	42.5	
337.5	42.8	42.8	41.6	41.3	41.0	40.4	40.1	39.2	

DEPTH:	4230	TILT:	0	RANGE:	70.9	VOS:	5671		
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7	
0.0	38.0	38.0	36.8	35.6	35.3	35.0	34.4	33.8	
22.5	32.3	31.7	30.2	29.0	28.1	26.0	25.1	24.5	
45.0	23.9	23.0	22.1	21.3	20.4	19.5	18.9	18.3	
67.5	17.7	17.4	17.1	16.2	15.9	15.0	14.7	14.1	
90.0	13.8	13.2	12.9	12.3	12.0	12.0	12.0	11.7	
112.5	11.4	11.4	11.4	11.1	11.1	11.1	11.1	11.1	
135.0	10.8	10.8	10.8	10.8	10.8	10.8	11.1	11.1	
157.5	11.1	11.1	11.1	11.4	11.4	11.7	11.7	12.0	
180.0	12.0	12.3	12.6	12.6	13.2	14.4	14.4	15.0	
202.5	15.3	15.6	15.9	16.5	17.4	18.6	19.2	20.1	
225.0	20.4	21.3	22.4	23.0	23.6	24.8	25.7	27.2	
247.5	27.5	28.4	29.6	30.8	31.7	32.0	33.2	33.8	
270.0	35.0	35.9	36.8	36.8	37.4	37.7	38.3	39.2	
292.5	39.8	40.1	40.7	41.9	42.2	42.2	42.2	43.1	
315.0	43.7	44.0	43.7	43.7	43.7	43.1	43.4	43.1	
337.5	42.8	42.5	41.9	41.3	41.0	40.4	40.1	39.2	

DEPTH:	4240	TILT:	0	RANGE:	70.9	VOS:	5671		
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7	
0.0	38.6	37.4	36.8	36.5	36.2	35.6	34.4	33.8	
22.5	32.0	31.7	30.8	29.6	28.7	27.5	26.0	25.1	
45.0	23.9	23.3	22.4	21.9	21.3	20.4	19.8	18.9	
67.5	18.6	18.0	17.4	16.5	15.9	15.3	15.0	14.7	
90.0	14.1	13.8	13.8	13.5	12.9	12.9	12.9	12.6	
112.5	12.3	12.0	12.3	12.0	12.0	12.0	12.0	12.0	
135.0	12.0	11.7	11.7	12.0	11.7	11.7	11.4	11.7	
157.5	12.0	12.0	12.0	12.3	12.3	12.6	12.6	12.6	
180.0	12.9	12.9	13.2	13.5	14.4	14.7	15.0	15.3	
202.5	15.9	16.2	16.5	17.7	18.3	18.9	19.5	20.4	
225.0	21.3	22.1	23.0	23.9	25.1	25.7	26.6	26.9	
247.5	27.8	28.7	29.9	31.4	31.7	32.6	33.2	34.1	
270.0	35.0	36.2	36.8	38.0	38.3	38.6	39.2	39.5	
292.5	40.7	41.0	41.0	41.0	41.6	41.9	42.2	43.4	
315.0	43.7	43.7	44.0	43.7	43.4	43.4	42.8	42.8	
337.5	42.5	41.9	41.6	41.3	41.0	40.7	40.4	38.9	

DEPTH:	4250	TILT:	0	RANGE:	70.9	VOS:	5671		
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7	
0.0	38.6	38.0	37.4	36.2	36.2	35.3	34.1	33.5	
22.5	32.3	31.4	30.2	29.3	28.4	27.5	26.3	25.1	
45.0	24.2	22.7	22.1	21.6	20.7	20.1	19.5	18.9	
67.5	18.3	17.7	17.1	16.5	15.9	15.9	15.3	15.0	
90.0	14.7	14.1	14.1	13.8	13.5	13.2	12.9	12.9	
112.5	12.9	12.6	12.6	12.3	12.3	12.3	12.0	12.0	
135.0	12.0	12.0	11.7	11.7	12.0	12.0	12.0	12.0	
157.5	12.0	12.0	12.3	12.3	12.3	12.6	12.6	12.6	
180.0	12.6	12.6	13.2	13.8	13.8	14.4	14.7	15.3	
202.5	15.9	16.5	17.1	17.7	18.6	18.9	19.2	20.4	
225.0	21.0	22.1	22.7	23.3	23.9	24.5	25.7	26.3	
247.5	27.8	28.4	29.0	30.2	31.1	32.3	33.5	33.8	
270.0	34.1	35.0	35.9	36.5	37.4	38.3	38.9	38.9	
292.5	39.5	40.1	40.4	40.7	41.9	41.9	42.5	42.5	
315.0	42.5	42.5	42.5	42.8	42.8	43.1	43.1	42.8	
337.5	42.5	41.9	41.6	41.9	40.7	40.1	39.8	39.2	

DEPTH:	4260	TILT:	0	RANGE:	70.9	VOS:	5671		
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7	
0.0	39.2	38.3	37.4	36.2	36.2	35.3	33.8	32.6	
22.5	31.4	30.8	29.6	28.7	27.8	26.9	25.7	24.8	
45.0	23.9	23.3	22.1	21.3	20.4	19.5	18.6	17.7	
67.5	17.1	16.8	15.9	15.6	15.0	14.7	14.4	13.8	
90.0	13.5	13.2	12.6	12.6	12.6	12.3	12.3	12.0	
112.5	12.0	12.0	11.4	11.4	11.4	11.4	11.4	11.4	
135.0	11.4	11.1	11.1	11.1	11.4	11.4	11.4	11.4	
157.5	11.4	11.4	11.4	11.7	11.7	12.0	12.0	12.6	
180.0	12.6	12.9	12.9	13.5	13.8	14.4	15.0	15.3	
202.5	16.2	16.8	17.1	17.7	18.3	18.9	19.5	20.1	
225.0	20.4	21.0	21.6	22.4	23.3	24.5	25.7	27.2	
247.5	27.8	28.7	29.6	30.2	31.7	31.7	32.3	33.5	
270.0	34.4	35.0	35.6	36.5	37.1	38.0	38.6	39.2	
292.5	39.8	40.4	41.0	41.3	41.6	42.2	42.5	43.1	
315.0	43.1	43.4	43.7	43.7	43.7	43.7	43.4	43.7	
337.5	43.7	42.2	41.9	42.2	41.3	40.7	40.4	39.8	

DEPTH:	4270	TILT:	0	RANGE:	70.9	VOS:	5671		
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7	
0.0	39.8	38.9	38.3	37.4	36.2	35.3	33.8	32.6	
22.5	31.4	30.5	29.0	28.1	27.2	26.3	25.1	23.9	
45.0	22.7	22.1	20.7	20.1	19.2	18.3	16.8	16.5	
67.5	16.2	15.3	15.0	14.4	14.1	13.8	13.5	12.6	
90.0	12.3	12.3	12.0	11.7	11.4	11.4	11.1	11.1	
112.5	11.1	10.8	10.5	10.8	10.8	10.8	10.5	10.5	
135.0	10.5	10.5	10.5	10.2	10.5	10.5	10.5	10.5	
157.5	10.5	10.5	10.5	10.5	10.5	10.8	10.8	11.1	
180.0	11.1	11.4	11.7	12.3	12.6	12.9	13.5	13.8	
202.5	14.4	15.0	15.3	15.6	15.9	16.5	17.1	18.0	
225.0	18.9	19.2	20.1	20.7	21.6	22.7	23.3	24.5	
247.5	26.0	27.2	28.1	29.3	30.5	31.4	31.7	32.6	
270.0	34.1	34.4	35.6	36.5	37.1	38.0	38.9	39.8	
292.5	40.4	40.7	41.3	41.6	41.9	42.5	42.8	43.7	
315.0	44.0	44.0	44.3	44.3	44.3	44.6	44.6	44.6	
337.5	44.6	43.7	43.7	42.8	42.5	41.6	40.4	40.4	

DEPTH:	4280	TILT:	0	RANGE:	70.9	VOS:	5671		
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7	
0.0	41.0	41.0	39.5	38.9	38.6	37.7	36.2	35.3	
22.5	33.8	32.3	31.1	29.9	28.7	26.9	25.4	23.9	
45.0	22.7	21.9	20.1	19.2	18.9	17.4	16.8	15.9	
67.5	15.3	15.0	14.4	13.8	13.5	12.6	12.0	11.7	
90.0	11.4	11.1	10.8	10.5	10.5	9.9	9.6	9.6	
112.5	9.3	9.3	9.3	9.0	9.0	9.0	9.0	9.0	
135.0	9.0	9.0	8.7	9.0	9.0	8.7	9.0	9.0	
157.5	9.0	9.0	9.0	9.3	9.3	9.3	9.3	9.6	
180.0	9.6	9.9	9.9	10.2	10.2	10.5	10.8	11.4	
202.5	11.7	12.3	13.2	14.1	15.3	16.2	17.1	17.7	
225.0	18.0	18.9	19.8	20.4	21.6	22.7	23.6	24.2	
247.5	25.4	26.3	27.5	28.7	29.3	30.8	31.4	32.9	
270.0	33.8	34.4	35.3	36.5	37.1	37.7	38.9	39.5	
292.5	40.4	41.0	41.9	42.8	42.5	43.1	43.4	43.7	
315.0	44.3	44.3	44.3	44.3	44.6	44.6	44.3	44.6	
337.5	44.6	44.6	44.0	43.7	43.7	43.1	42.2	41.6	

DEPTH:	4290	TILT:	0	RANGE:	70.9	VOS:	5671		
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7	
0.0	41.3	41.0	40.4	39.5	37.7	36.8	35.6	34.7	
22.5	34.4	32.3	31.7	30.2	29.0	28.7	27.2	25.1	
45.0	24.2	23.0	21.3	19.8	18.3	17.4	16.5	15.9	
67.5	15.0	14.4	13.5	13.5	12.9	12.0	11.7	11.4	
90.0	10.8	10.5	10.2	9.9	9.6	9.6	9.6	9.3	
112.5	9.3	9.3	9.0	9.0	8.7	8.7	8.7	9.0	
135.0	8.7	8.7	8.7	8.7	8.7	8.7	9.0	9.0	
157.5	9.0	9.0	9.0	9.0	9.0	9.3	9.3	9.3	
180.0	9.3	9.6	9.9	9.9	10.2	10.5	10.8	11.4	
202.5	11.7	12.3	13.5	14.4	15.6	15.9	16.5	17.4	
225.0	18.0	18.9	19.8	20.4	21.0	21.9	23.0	24.5	
247.5	25.7	26.3	28.4	28.7	30.2	30.5	31.7	33.2	
270.0	34.1	34.4	35.6	36.2	36.8	38.0	38.9	39.5	
292.5	40.7	41.0	41.6	42.5	42.8	43.1	43.4	44.0	
315.0	44.6	44.6	44.6	44.6	44.9	44.6	44.6	44.6	
337.5	44.3	44.3	44.3	43.7	44.0	43.4	42.5	41.9	

DEPTH:	4300	TILT:	0	RANGE:	70.9	VOS:	5672		
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7	
0.0	41.9	41.0	40.4	39.2	38.3	37.1	35.9	35.0	
22.5	34.1	32.6	31.4	29.9	29.3	28.4	27.5	26.0	
45.0	24.8	23.9	21.8	20.9	19.4	18.3	18.0	16.5	
67.5	15.9	15.3	15.0	14.4	13.5	13.2	12.6	12.0	
90.0	11.7	11.1	10.8	10.5	10.2	9.9	9.6	9.3	
112.5	9.3	9.0	9.0	8.7	8.7	8.7	8.7	8.7	
135.0	8.7	8.7	8.7	8.7	8.7	8.7	8.7	8.7	
157.5	9.0	9.0	9.0	9.0	9.3	9.6	9.6	9.9	
180.0	10.2	10.5	10.8	11.1	11.1	11.4	12.3	12.6	
202.5	13.5	13.8	14.1	14.7	15.9	16.8	17.7	18.0	
225.0	18.6	19.1	20.0	20.6	21.8	22.7	23.9	24.5	
247.5	25.4	26.3	27.5	29.0	29.6	30.5	32.0	33.5	
270.0	34.4	35.0	35.9	36.8	37.1	37.7	38.6	39.8	
292.5	39.8	41.0	41.6	42.5	43.1	43.4	44.0	44.9	
315.0	45.2	45.5	46.1	46.1	46.1	45.8	45.5	45.8	
337.5	45.2	44.6	44.3	44.0	44.0	44.0	43.4	42.5	

DEPTH:	4310	TILT:	0	RANGE:	70.9	VOS:	5672		
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7	
0.0	41.9	41.0	40.1	38.9	37.7	36.8	35.6	34.7	
22.5	33.2	32.6	31.4	30.5	29.6	28.1	26.9	26.0	
45.0	24.8	23.3	22.4	21.2	20.6	18.3	17.7	16.8	
67.5	16.2	15.3	15.0	14.4	14.1	13.5	12.9	12.6	
90.0	12.3	12.0	11.4	11.1	10.8	10.5	10.5	9.9	
112.5	9.9	9.6	9.3	9.3	9.0	9.0	9.0	9.0	
135.0	9.3	9.3	9.3	9.3	9.3	9.3	9.6	9.0	
157.5	9.3	9.3	9.6	9.6	9.9	9.9	10.2	10.2	
180.0	10.5	10.5	10.8	10.8	11.1	11.4	12.0	12.3	
202.5	12.6	13.8	14.1	14.4	15.6	15.9	17.7	18.3	
225.0	19.1	19.4	20.3	21.5	21.8	23.0	23.6	24.8	
247.5	25.4	26.6	27.8	28.7	29.9	30.8	31.7	32.9	
270.0	33.8	35.3	35.9	36.8	37.7	38.3	38.9	39.5	
292.5	40.7	41.3	42.2	42.8	43.1	43.7	44.6	44.9	
315.0	45.5	45.5	45.8	46.1	46.4	46.1	45.8	46.1	
337.5	44.9	45.2	45.2	44.9	44.9	44.3	43.4	43.1	

DEPTH:	4320	TILT:	0	RANGE:	70.9	VOS:	5672		
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7	
0.0	43.4	42.2	41.6	40.1	38.0	36.8	35.3	34.7	
22.5	33.8	32.3	31.4	29.9	28.7	26.9	26.0	24.2	
45.0	22.7	21.5	20.3	19.1	18.3	17.7	17.1	16.5	
67.5	15.6	15.0	14.4	14.1	13.5	12.9	12.6	12.3	
90.0	12.0	11.7	11.4	11.1	11.1	10.8	10.8	10.5	
112.5	10.5	10.2	10.2	9.9	9.9	9.9	9.6	9.6	
135.0	9.6	9.6	9.6	9.3	9.6	9.3	9.6	9.6	
157.5	10.2	9.9	9.9	9.9	10.2	10.2	10.2	10.8	
180.0	10.8	11.1	11.4	11.4	11.7	11.7	12.3	12.3	
202.5	12.9	13.5	14.1	14.7	15.0	15.6	16.2	16.8	
225.0	17.4	18.3	19.4	20.0	21.5	22.1	22.4	23.6	
247.5	24.5	25.4	27.2	28.1	29.0	29.3	31.1	32.3	
270.0	33.8	34.4	35.6	36.5	37.1	38.0	38.9	39.5	
292.5	40.4	41.0	41.9	42.5	42.5	43.1	43.7	44.6	
315.0	44.9	45.2	45.5	45.8	46.1	45.8	45.8	45.2	
337.5	45.2	44.9	44.6	45.5	44.9	44.0	43.7	43.7	

DEPTH:	4330	TILT:	0	RANGE:	70.9	VOS:	5672		
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7	
0.0	43.4	42.8	41.0	39.5	37.7	36.2	36.2	35.0	
22.5	34.7	32.9	31.4	29.3	28.1	26.9	24.8	23.0	
45.0	22.1	20.9	19.7	18.6	17.7	16.8	16.2	15.6	
67.5	14.7	14.1	13.8	13.2	12.9	12.3	12.3	12.0	
90.0	11.4	11.4	11.1	11.1	10.8	10.8	10.2	10.2	
112.5	9.9	9.6	9.3	9.3	9.0	9.0	9.0	9.0	
135.0	9.6	9.3	9.3	9.3	9.3	9.3	9.0	9.0	
157.5	9.3	9.3	9.3	9.6	9.6	9.6	9.6	9.6	
180.0	9.9	9.9	10.5	10.5	10.2	10.5	11.1	11.4	
202.5	11.7	12.3	12.3	12.9	13.5	14.1	15.3	15.9	
225.0	16.5	18.3	19.1	19.7	20.9	21.8	22.7	23.6	
247.5	24.2	25.1	26.0	27.2	28.4	29.6	30.8	31.7	
270.0	32.6	34.1	35.0	35.9	36.5	38.0	38.6	39.5	
292.5	40.4	41.3	42.2	41.9	42.5	43.7	44.0	44.6	
315.0	45.2	45.5	45.5	45.8	46.4	46.4	45.8	45.8	
337.5	45.2	45.2	44.9	45.2	44.6	44.6	44.3	43.7	

DEPTH:	4340	TILT:	0	RANGE:	70.9	VOS:	5672		
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7	
0.0	42.5	41.0	40.1	38.3	37.4	36.5	35.0	34.4	
22.5	33.8	33.2	31.7	30.2	27.8	25.7	24.2	22.1	
45.0	20.9	19.1	18.3	17.4	16.5	15.9	15.3	14.4	
67.5	13.8	12.9	12.6	12.3	10.5	9.9	9.9	9.6	
90.0	9.3	9.3	9.0	9.9	8.7	8.7	8.7	9.0	
112.5	8.4	8.4	8.4	9.0	8.7	9.0	8.7	8.7	
135.0	8.7	8.7	8.4	8.4	8.4	8.4	8.4	8.7	
157.5	8.7	8.7	8.7	9.0	9.0	9.3	9.6	9.9	
180.0	9.9	10.2	10.2	10.5	10.8	11.1	11.4	11.4	
202.5	11.4	11.7	12.3	12.6	12.9	13.8	14.1	15.6	
225.0	15.9	16.5	17.7	18.8	19.7	20.9	21.5	22.1	
247.5	23.6	24.2	25.7	27.2	27.8	29.3	30.2	31.1	
270.0	32.6	34.1	35.3	35.9	37.1	38.3	39.5	40.1	
292.5	40.7	41.6	41.9	42.8	43.1	43.1	43.1	43.4	
315.0	44.0	44.6	44.9	45.2	45.2	45.5	45.5	45.5	
337.5	44.6	44.6	44.3	44.3	44.6	44.3	43.4	43.1	

DEPTH:	4350	TILT:	0	RANGE:	70.9	VOS:	5672		
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7	
0.0	41.6	40.7	39.5	38.6	37.7	36.5	35.6	34.4	
22.5	32.6	32.0	30.5	28.7	27.2	25.1	23.3	21.8	
45.0	20.9	19.4	18.6	17.7	16.5	15.9	15.3	14.1	
67.5	13.5	12.9	12.6	12.0	11.7	10.8	10.5	10.2	
90.0	9.9	9.6	9.6	9.3	9.0	9.0	9.0	8.7	
112.5	8.7	8.7	8.7	9.0	9.0	9.0	8.7	8.1	
135.0	8.1	7.8	7.8	7.8	7.8	7.8	7.8	7.8	
157.5	7.8	7.8	7.8	7.8	8.1	8.1	8.4	8.4	
180.0	8.7	8.7	9.3	9.3	9.6	9.9	10.2	10.2	
202.5	10.8	11.4	11.4	12.0	12.3	12.9	13.8	15.3	
225.0	16.2	16.8	17.7	18.3	19.7	20.9	21.8	22.4	
247.5	23.3	24.5	24.8	26.9	28.1	29.3	30.5	31.4	
270.0	32.3	33.2	34.1	35.3	35.9	37.1	38.0	39.2	
292.5	40.4	41.3	42.5	42.5	43.1	43.4	43.7	44.9	
315.0	44.9	46.1	46.1	45.8	45.8	46.1	45.8	45.8	
337.5	45.8	45.8	45.2	44.6	44.6	44.0	43.4	42.8	

DEPTH:	4360	TILT:	0	RANGE:	70.9	VOS:	5672		
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7	
0.0	44.6	43.7	43.1	41.3	40.7	38.6	37.7	36.2	
22.5	34.1	33.2	31.4	29.3	27.8	26.9	24.8	23.0	
45.0	21.8	20.3	19.7	18.3	17.1	16.5	15.3	14.4	
67.5	14.1	13.2	12.9	12.3	11.7	11.7	11.1	10.8	
90.0	10.5	10.2	9.9	9.9	9.6	9.6	9.3	9.0	
112.5	8.7	8.7	8.4	8.4	8.4	8.1	8.1	8.1	
135.0	8.1	7.8	7.8	8.1	8.1	8.1	8.1	8.1	
157.5	8.1	8.1	8.1	8.1	8.1	8.1	8.4	8.7	
180.0	8.7	9.0	9.3	9.6	9.6	10.2	10.5	10.5	
202.5	11.1	12.0	12.3	12.6	13.2	13.8	14.4	15.0	
225.0	15.9	16.5	17.4	18.3	18.8	20.0	20.3	21.5	
247.5	22.7	24.2	25.1	26.6	28.1	28.7	29.6	30.5	
270.0	31.7	33.2	34.1	35.3	36.8	37.4	38.9	39.8	
292.5	41.0	42.2	43.1	43.7	44.0	44.9	45.8	47.0	
315.0	47.9	48.8	49.1	49.4	49.7	49.7	49.4	49.4	
337.5	48.8	48.2	47.6	47.3	46.7	46.1	45.8	45.5	

DEPTH:	4370	TILT:	0	RANGE:	70.9	VOS:	5672		
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7	
0.0	46.4	45.8	45.2	44.0	42.5	40.7	38.9	37.1	
22.5	34.7	33.5	31.7	29.6	27.8	27.2	24.5	23.3	
45.0	22.1	21.2	19.7	18.6	17.7	17.1	15.9	15.3	
67.5	14.7	14.1	13.5	13.2	12.9	12.3	12.3	12.0	
90.0	11.4	11.1	10.8	10.8	10.5	10.2	9.9	9.6	
112.5	9.3	9.3	8.7	8.7	8.4	8.4	8.4	8.1	
135.0	8.1	7.8	7.5	7.5	7.5	7.8	8.1	8.1	
157.5	7.8	8.1	8.1	8.7	8.4	8.4	8.4	8.7	
180.0	9.6	9.0	9.3	9.6	9.6	9.9	10.8	11.1	
202.5	12.0	12.3	12.6	12.9	13.2	14.1	14.4	15.3	
225.0	15.9	16.8	18.0	18.8	18.8	20.3	20.9	22.4	
247.5	23.0	24.8	26.0	27.5	28.1	29.3	30.5	31.4	
270.0	32.6	33.8	35.3	36.2	37.1	38.9	40.1	41.3	
292.5	42.5	43.7	44.3	45.8	46.1	46.7	47.6	48.8	
315.0	49.1	48.8	49.1	49.1	49.1	49.1	49.4	49.7	
337.5	49.7	49.1	49.1	49.4	48.5	48.2	47.3	47.3	

DEPTH:	4380	TILT:	0	RANGE:	70.9	VOS:	5672		
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7	
0.0	46.7	45.2	45.2	44.3	41.3	40.4	38.9	38.6	
22.5	36.2	33.2	32.0	30.2	28.7	26.9	25.1	23.9	
45.0	22.1	20.6	19.1	18.0	17.4	16.2	15.3	14.4	
67.5	13.8	13.2	12.6	12.0	11.4	11.1	10.5	10.2	
90.0	9.6	9.6	9.3	8.7	8.7	8.4	8.4	8.1	
112.5	7.8	7.8	7.8	7.5	7.5	7.2	7.5	7.2	
135.0	7.2	7.5	6.9	7.2	7.5	7.5	6.9	7.5	
157.5	7.5	7.8	7.8	8.1	8.1	8.1	8.4	8.7	
180.0	8.7	9.0	9.0	9.3	9.6	9.9	9.9	10.5	
202.5	11.1	11.4	11.7	12.3	13.2	13.8	15.0	15.6	
225.0	16.8	17.4	18.0	18.8	19.1	20.6	22.1	23.3	
247.5	24.8	26.3	27.5	28.1	29.3	30.2	31.1	32.3	
270.0	33.2	34.7	36.5	37.4	38.3	39.2	39.8	41.0	
292.5	42.2	43.4	44.3	45.2	46.1	46.7	47.6	48.5	
315.0	49.1	49.7	50.0	50.0	50.0	49.7	50.0	50.0	
337.5	50.0	49.1	48.8	49.1	48.5	48.2	47.3	47.9	

DEPTH:	4390	TILT:	0	RANGE:	70.9	VOS:	5672		
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7	
0.0	45.5	44.6	41.9	40.7	39.8	38.6	38.6	37.1	
22.5	34.7	33.2	31.7	30.2	29.0	28.4	24.8	23.6	
45.0	22.7	21.2	20.0	19.1	18.0	17.1	15.6	15.0	
67.5	13.5	12.9	12.3	11.7	11.1	10.5	10.2	9.9	
90.0	9.6	9.3	8.7	8.7	8.4	8.1	8.1	7.8	
112.5	7.8	7.5	7.8	7.5	7.5	7.2	7.2	7.2	
135.0	7.2	7.8	7.5	7.2	7.5	7.5	7.5	7.5	
157.5	7.8	7.8	7.8	8.1	8.4	8.4	8.4	8.7	
180.0	9.0	9.0	9.6	9.9	9.9	10.5	10.8	11.4	
202.5	11.7	12.3	13.2	13.8	14.4	14.7	15.6	16.2	
225.0	17.4	17.7	18.6	19.4	20.3	21.5	22.1	23.0	
247.5	24.2	25.4	26.9	27.8	29.0	29.9	31.4	33.8	
270.0	35.0	35.9	37.1	38.0	38.9	40.1	40.7	41.9	
292.5	42.8	43.4	44.3	44.9	45.8	46.7	47.6	48.2	
315.0	48.8	49.4	49.4	49.7	49.7	49.7	49.7	49.7	
337.5	49.7	48.8	47.9	47.6	47.6	46.7	46.1	46.1	

DEPTH:	4400	TILT:	0	RANGE:	70.9	VOS:	5673		
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7	
0.0	45.5	43.4	43.4	41.6	40.1	39.2	38.6	36.8	
22.5	35.6	33.5	32.0	30.8	29.6	28.7	26.9	25.7	
45.0	23.9	23.0	21.8	20.3	19.2	18.3	16.5	15.9	
67.5	15.0	14.1	13.2	12.6	12.0	11.7	11.4	11.1	
90.0	10.8	10.2	10.2	9.9	9.6	9.3	9.0	8.7	
112.5	8.7	8.4	8.4	8.4	8.1	8.1	8.1	7.8	
135.0	7.8	7.8	7.8	7.8	7.8	7.8	7.8	7.8	
157.5	8.1	8.1	8.1	8.4	8.4	8.7	8.7	9.0	
180.0	9.3	9.6	9.9	10.2	10.5	10.8	11.1	12.3	
202.5	12.3	13.2	13.8	14.4	15.0	15.6	15.9	16.8	
225.0	17.7	18.3	19.2	20.0	21.2	22.1	23.3	24.2	
247.5	25.1	26.0	28.1	28.1	29.9	31.7	32.9	34.7	
270.0	35.9	37.1	38.0	39.8	39.5	40.7	41.6	43.1	
292.5	44.0	44.9	45.5	46.1	46.4	47.6	48.2	48.2	
315.0	48.8	48.8	49.4	49.4	49.4	49.4	49.1	49.7	
337.5	49.4	48.5	47.9	47.9	47.6	47.3	45.8	45.8	

DEPTH:	4410	TILT:	0	RANGE:	70.9	VOS:	5673		
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7	
0.0	44.9	44.3	43.1	41.6	40.1	38.6	37.4	36.5	
22.5	35.9	33.2	32.6	30.5	29.3	28.1	26.9	25.4	
45.0	24.2	23.0	22.7	21.2	20.3	18.3	17.4	16.2	
67.5	15.6	14.7	13.5	13.8	12.9	12.6	12.3	11.7	
90.0	11.4	11.1	10.8	10.5	9.9	9.6	9.6	9.3	
112.5	9.3	9.0	9.0	9.0	8.7	9.0	8.7	8.4	
135.0	8.7	8.4	8.4	8.4	8.7	8.7	8.7	8.7	
157.5	8.7	8.7	9.0	9.0	9.0	9.0	9.3	9.6	
180.0	9.6	9.9	10.2	10.2	10.5	10.8	11.1	12.0	
202.5	12.6	13.2	13.8	15.0	15.3	15.9	16.5	17.4	
225.0	18.3	18.9	19.8	20.6	21.8	23.0	23.9	25.4	
247.5	26.3	27.8	28.7	30.5	32.0	33.2	35.0	36.2	
270.0	37.4	38.6	39.8	41.0	41.9	42.5	43.4	44.0	
292.5	44.6	45.2	45.8	46.7	47.3	47.9	48.5	49.1	
315.0	49.1	49.7	49.4	49.7	49.7	49.7	49.7	49.7	
337.5	49.7	49.7	49.4	48.2	47.6	47.3	46.7	46.1	

DEPTH:	4420	TILT:	0	RANGE:	70.9	VOS:	5673		
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7	
0.0	45.5	43.7	43.4	42.2	40.1	39.8	37.7	36.8	
22.5	35.9	33.8	32.6	31.1	29.3	27.8	26.3	25.4	
45.0	24.5	23.3	22.4	21.2	20.3	19.5	17.1	15.9	
67.5	15.6	15.0	14.1	13.2	12.3	12.0	11.4	11.7	
90.0	11.1	10.8	10.5	9.9	9.6	9.6	9.0	9.0	
112.5	8.7	8.4	8.7	8.1	8.4	8.4	8.4	8.1	
135.0	8.4	8.1	8.1	8.1	7.8	8.1	8.1	8.1	
157.5	7.8	8.1	8.1	8.1	8.4	8.7	9.0	9.0	
180.0	9.3	9.6	9.6	9.9	9.9	10.2	10.8	11.1	
202.5	11.7	12.0	13.2	14.1	15.0	15.6	16.2	17.1	
225.0	17.7	18.6	19.8	20.3	21.5	22.4	23.9	24.5	
247.5	26.3	27.2	29.3	30.5	32.9	33.8	34.7	36.2	
270.0	37.7	38.6	39.2	40.1	40.7	41.9	42.8	43.4	
292.5	44.3	44.9	45.5	46.1	46.7	47.3	47.9	48.5	
315.0	49.1	49.7	49.7	49.4	49.1	48.8	49.1	50.0	
337.5	50.0	49.1	49.1	48.5	47.9	47.3	46.7	46.1	

DEPTH:	4430	TILT:	0	RANGE:	70.9	VOS:	5673		
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7	
0.0	44.3	44.0	43.1	41.6	41.3	39.5	38.3	36.8	
22.5	35.0	33.2	31.4	30.5	29.3	28.1	26.6	25.4	
45.0	24.2	22.7	21.8	20.9	20.0	18.9	18.0	17.7	
67.5	17.1	15.6	14.7	13.8	12.9	12.6	12.0	11.7	
90.0	11.1	10.8	9.3	9.0	8.7	8.4	8.1	7.8	
112.5	7.8	7.5	7.5	7.2	7.2	6.9	6.3	6.3	
135.0	6.6	6.3	6.6	6.3	6.3	6.6	6.3	6.9	
157.5	6.3	6.6	6.6	6.9	6.9	7.2	7.5	7.5	
180.0	7.8	8.1	8.4	9.0	9.6	9.9	10.2	9.9	
202.5	10.2	10.5	11.1	11.7	12.3	13.5	14.1	15.3	
225.0	16.2	16.5	17.4	18.3	20.6	21.8	23.6	25.1	
247.5	26.3	28.1	30.5	31.4	33.2	34.4	35.3	36.5	
270.0	37.4	38.0	38.9	40.1	40.7	41.6	42.8	43.7	
292.5	44.0	44.9	45.2	46.1	46.1	47.3	47.9	48.5	
315.0	48.5	48.8	48.5	48.8	48.5	48.5	48.5	48.5	
337.5	48.8	48.8	48.5	48.2	47.6	47.9	47.0	45.5	

DEPTH:	4440	TILT:	0	RANGE:	70.9	VOS:	5673		
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7	
0.0	44.9	44.0	42.5	41.6	41.0	40.4	38.9	36.8	
22.5	36.5	33.5	32.0	30.5	29.9	28.7	27.5	26.3	
45.0	25.1	23.6	22.1	20.6	19.8	19.2	17.7	16.8	
67.5	15.9	15.0	14.4	13.8	13.5	13.2	12.9	12.6	
90.0	12.0	9.6	9.3	8.4	8.4	8.1	7.2	7.8	
112.5	7.5	7.2	6.6	6.9	6.6	6.0	6.0	6.0	
135.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	
157.5	6.3	6.6	6.6	6.6	6.6	6.9	7.2	7.2	
180.0	7.5	7.8	8.1	8.1	8.4	9.3	9.6	9.9	
202.5	10.2	10.8	11.4	12.0	12.6	13.5	14.4	15.3	
225.0	16.2	16.8	18.0	19.5	20.6	22.1	22.7	25.1	
247.5	26.0	28.7	29.9	31.7	33.8	34.7	35.6	36.8	
270.0	37.7	38.6	39.5	40.7	41.9	42.2	43.1	44.0	
292.5	44.9	45.5	46.1	46.4	47.6	48.2	48.8	48.8	
315.0	49.1	49.4	48.5	48.8	49.1	48.2	48.5	48.8	
337.5	48.8	48.8	48.5	48.2	47.9	47.6	46.4	46.1	

DEPTH:	4450	TILT:	0	RANGE:	70.9	VOS:	5673		
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7	
0.0	44.9	43.4	42.2	41.3	41.3	40.4	39.5	37.7	
22.5	35.3	34.7	32.9	32.0	30.5	29.6	29.0	27.5	
45.0	26.6	25.4	23.6	22.4	21.5	20.0	18.6	18.0	
67.5	17.4	16.5	15.6	14.7	13.8	13.2	12.6	12.0	
90.0	11.4	10.8	9.9	9.6	8.4	8.1	7.8	7.5	
112.5	7.2	6.9	6.9	6.6	6.3	6.3	6.3	6.3	
135.0	6.0	6.0	6.3	6.3	6.3	6.0	6.3	6.3	
157.5	6.3	6.3	6.3	6.6	6.6	6.9	6.9	7.2	
180.0	7.2	7.5	7.8	7.8	8.4	8.7	9.3	9.9	
202.5	10.2	10.8	11.1	11.7	12.3	13.2	13.8	14.7	
225.0	15.6	16.8	17.4	18.0	19.5	22.1	23.0	24.5	
247.5	26.3	27.8	29.6	30.8	33.2	35.0	36.2	37.4	
270.0	38.3	38.9	40.1	40.7	41.9	43.4	43.7	44.3	
292.5	44.9	46.4	47.3	47.9	48.2	48.8	49.7	49.7	
315.0	50.3	50.3	50.3	50.6	50.6	50.9	50.6	50.6	
337.5	50.3	49.7	49.1	48.8	48.2	47.3	47.0	46.1	

DEPTH:	4460	TILT:	0	RANGE:	70.9	VOS:	5673		
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7	
0.0	47.3	46.1	45.8	43.7	42.5	41.0	39.5	37.7	
22.5	36.2	34.4	32.6	31.4	30.5	29.6	28.1	27.2	
45.0	26.0	24.8	23.6	22.4	21.2	19.8	18.6	17.4	
67.5	16.2	15.6	15.0	14.4	13.5	12.6	12.3	11.4	
90.0	11.1	10.5	10.2	9.6	9.3	8.7	8.4	7.8	
112.5	7.8	7.5	7.5	7.2	7.2	6.9	6.9	6.6	
135.0	6.9	6.9	6.9	6.6	6.6	6.6	6.6	6.6	
157.5	6.6	6.6	6.3	6.6	6.3	6.6	6.9	6.9	
180.0	6.9	7.2	7.2	7.5	7.8	8.1	8.4	7.5	
202.5	9.0	9.3	9.9	10.2	10.8	11.7	13.2	14.4	
225.0	15.6	16.5	17.7	19.2	21.2	23.0	24.5	26.0	
247.5	27.5	29.3	31.1	32.6	34.1	35.6	36.2	38.3	
270.0	39.2	40.7	41.6	42.8	44.6	45.2	45.5	46.4	
292.5	47.0	47.9	48.8	48.5	49.1	49.7	49.7	50.0	
315.0	49.7	50.3	50.9	51.2	51.2	52.1	52.1	51.5	
337.5	51.5	51.8	51.2	50.9	50.3	49.7	49.1	47.9	

DEPTH:	4470	TILT:	0	RANGE:	70.9	VOS:	5673		
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7	
0.0	48.5	47.3	46.1	44.6	43.1	41.6	40.1	37.7	
22.5	36.5	34.7	33.2	33.2	31.7	30.5	29.0	27.8	
45.0	26.3	25.1	23.9	23.0	21.8	20.6	19.5	18.6	
67.5	18.0	16.5	15.0	14.1	13.5	12.6	12.0	11.7	
90.0	11.1	10.5	9.9	9.6	9.3	8.7	8.7	8.1	
112.5	8.1	7.2	6.9	6.6	6.6	6.3	6.3	6.0	
135.0	6.0	6.0	0.0	6.0	6.0	6.0	6.0	6.0	
157.5	6.0	6.0	6.3	6.3	6.3	6.6	6.9	6.9	
180.0	7.2	7.2	7.5	7.8	8.1	8.4	8.4	9.0	
202.5	9.6	10.2	10.8	11.7	12.6	14.1	15.3	15.3	
225.0	16.2	17.1	18.3	19.5	20.6	23.0	24.2	25.1	
247.5	26.9	28.1	30.2	32.0	33.2	35.3	37.4	38.9	
270.0	40.1	41.6	43.1	44.0	44.6	45.2	45.8	46.4	
292.5	47.0	47.6	48.5	48.8	49.7	50.9	51.2	51.8	
315.0	52.4	53.0	53.0	53.0	52.4	52.4	53.3	53.3	
337.5	52.7	52.7	52.4	51.5	50.6	50.3	50.0	49.4	

DEPTH:	4480		TILT:	0		RANGE:	70.9		VOS:	5673	
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7			
0.0	47.9	47.3	47.3	46.1	45.2	43.7	42.5	40.1			
22.5	38.3	37.1	37.1	35.6	34.1	32.9	31.7	29.9			
45.0	28.1	27.2	26.6	25.4	24.2	23.0	22.1	20.9			
67.5	18.6	17.7	16.5	15.3	14.4	13.5	12.9	12.3			
90.0	11.7	11.4	10.8	10.5	9.9	9.9	7.8	7.5			
112.5	7.5	7.8	7.2	6.9	6.3	6.3	6.3	6.0			
135.0	5.4	5.4	6.0	6.0	6.0	6.0	6.3	5.7			
157.5	6.3	6.3	6.3	6.3	6.3	6.6	6.3	6.9			
180.0	7.2	6.9	7.2	7.5	7.8	8.4	8.7	9.0			
202.5	9.6	10.2	11.7	12.3	13.2	13.8	14.7	15.3			
225.0	16.5	17.7	18.3	19.8	21.5	23.6	25.4	29.3			
247.5	30.8	32.3	33.5	35.3	36.2	37.7	38.6	40.4			
270.0	41.0	42.2	43.7	44.9	45.5	45.8	46.4	47.0			
292.5	47.6	47.9	48.8	49.4	50.0	51.2	51.5	52.1			
315.0	52.1	52.1	52.1	52.7	53.0	53.3	53.3	53.6			
337.5	53.3	53.6	53.6	53.0	51.8	50.9	50.3	49.1			

DEPTH:	4490		TILT:	0		RANGE:	70.9		VOS:	5673	
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7			
0.0	49.4	48.8	47.9	46.1	45.5	44.6	43.1	41.9			
22.5	41.3	40.4	39.2	38.0	36.2	35.6	34.7	33.8			
45.0	32.0	30.5	29.3	27.2	26.0	25.1	24.2	22.7			
67.5	21.2	20.0	19.8	18.0	17.1	16.5	15.6	14.7			
90.0	14.4	12.6	11.7	11.1	10.2	9.6	9.3	8.7			
112.5	8.4	8.1	7.8	8.1	7.5	7.2	7.2	6.9			
135.0	6.9	6.9	6.9	6.9	6.6	6.6	6.9	6.6			
157.5	6.6	6.9	7.2	7.2	7.2	7.5	7.5	7.5			
180.0	7.8	8.1	8.4	8.7	9.3	9.6	10.2	10.2			
202.5	10.8	11.4	12.0	12.9	14.1	15.3	16.5	17.4			
225.0	19.5	20.0	21.8	23.0	24.5	26.9	29.0	30.5			
247.5	31.4	32.0	33.2	34.4	35.6	37.4	38.6	40.7			
270.0	42.2	42.8	44.0	45.2	45.8	46.4	47.0	47.6			
292.5	47.6	47.9	48.8	49.4	50.0	50.3	51.5	51.5			
315.0	51.8	52.4	52.4	53.6	53.6	53.6	53.3	54.2			
337.5	54.2	53.9	53.9	52.7	52.4	52.1	51.8	50.9			

DEPTH:	4500		TILT:	0		RANGE:	70.9		VOS:	5673	
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7			
0.0	50.6	50.3	49.4	47.6	45.8	45.2	44.3	43.7			
22.5	43.1	42.2	41.3	40.1	39.2	37.7	36.5	35.0			
45.0	33.5	32.3	31.1	29.3	28.1	27.5	26.6	24.8			
67.5	23.6	22.7	21.5	20.6	19.8	18.9	17.7	16.8			
90.0	15.9	14.4	13.8	12.9	12.0	11.4	11.1	10.8			
112.5	9.9	9.6	9.6	9.6	9.3	9.3	9.0	8.7			
135.0	8.4	8.4	8.1	8.1	9.0	8.1	9.0	7.8			
157.5	8.1	8.7	8.1	8.1	9.3	8.4	8.7	9.0			
180.0	9.0	9.3	9.3	9.9	10.2	10.5	11.1	11.7			
202.5	12.3	12.9	12.9	14.1	14.4	15.9	17.4	19.2			
225.0	19.8	21.8	22.4	23.6	25.1	26.0	27.8	29.0			
247.5	30.2	30.8	32.0	33.2	34.4	35.9	37.4	41.0			
270.0	41.9	42.5	43.1	44.6	45.5	46.4	46.7	47.3			
292.5	47.9	48.8	49.1	50.0	50.3	50.9	50.9	51.5			
315.0	52.7	53.0	53.3	53.3	53.6	53.6	53.6	53.6			
337.5	53.9	53.6	53.0	52.7	51.8	51.5	51.2	50.9			

DEPTH:	4510	TILT:	0	RANGE:	70.9	VOS:	5674		
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7	
0.0	50.6	49.4	49.4	48.2	45.5	45.2	44.3	44.3	
22.5	43.4	42.5	41.6	41.0	40.1	39.2	38.6	38.0	
45.0	36.5	35.0	33.2	32.6	31.7	30.2	29.9	28.7	
67.5	27.5	26.0	25.1	23.6	22.4	21.0	18.6	17.7	
90.0	16.8	15.3	14.7	13.5	12.9	12.0	11.4	10.8	
112.5	10.5	9.9	9.6	9.6	9.3	9.3	9.0	8.7	
135.0	8.7	8.7	8.7	8.4	8.7	8.4	8.7	8.4	
157.5	8.7	8.7	8.7	9.0	9.0	9.0	9.3	9.6	
180.0	9.9	9.9	10.5	10.5	10.8	11.4	12.0	12.0	
202.5	12.6	13.2	14.4	15.0	15.9	16.8	17.7	18.3	
225.0	20.1	21.3	23.9	24.2	24.8	26.0	27.8	29.0	
247.5	29.9	30.8	31.4	32.6	34.1	35.6	37.7	40.7	
270.0	41.9	43.1	44.3	44.6	45.5	46.1	46.7	47.0	
292.5	47.9	48.2	48.8	49.1	49.7	50.9	50.9	51.8	
315.0	52.7	52.7	53.0	53.0	53.0	53.3	53.9	53.9	
337.5	53.6	53.3	52.7	52.7	52.4	52.1	51.8	51.2	

DEPTH:	4520	TILT:	0	RANGE:	70.9	VOS:	5674		
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7	
0.0	50.0	50.0	49.4	48.2	46.4	45.2	44.3	41.9	
22.5	40.1	39.2	37.4	36.5	34.7	34.4	32.0	31.4	
45.0	31.1	30.5	28.7	28.1	26.9	26.0	25.4	24.8	
67.5	24.2	23.3	22.1	21.3	20.4	20.1	17.4	15.6	
90.0	14.7	13.2	12.6	13.5	12.6	11.1	10.5	10.5	
112.5	9.9	9.9	9.3	9.3	9.0	8.7	8.7	8.7	
135.0	10.2	8.7	8.7	9.6	8.7	8.7	9.0	9.0	
157.5	9.0	9.0	9.0	9.0	9.3	9.6	8.7	9.0	
180.0	9.3	9.6	9.9	10.2	10.5	10.5	11.1	11.7	
202.5	12.6	13.5	14.1	15.0	15.3	16.2	16.8	18.3	
225.0	19.2	19.5	20.4	21.3	23.6	25.1	24.8	26.0	
247.5	27.8	29.0	30.2	31.7	32.6	34.7	35.9	38.9	
270.0	40.1	41.3	42.2	43.4	44.0	44.9	45.5	45.8	
292.5	46.4	46.7	47.9	47.6	48.5	49.1	50.0	50.9	
315.0	50.3	51.2	51.5	52.1	52.1	52.4	52.4	51.5	
337.5	51.5	52.4	51.5	51.5	51.8	51.5	50.9	50.3	

DEPTH:	4530	TILT:	0	RANGE:	70.9	VOS:	5674		
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7	
0.0	49.4	49.4	48.8	47.3	45.2	44.0	42.8	41.0	
22.5	40.1	38.9	37.4	36.5	34.4	33.8	31.7	30.5	
45.0	30.5	29.9	28.1	27.2	26.6	25.4	24.8	23.3	
67.5	22.4	21.8	20.4	19.8	18.9	17.4	15.9	15.6	
90.0	14.4	13.2	12.3	11.7	11.4	10.2	9.9	9.3	
112.5	9.0	9.0	8.4	8.1	8.1	8.1	8.1	7.8	
135.0	7.8	7.8	7.8	7.8	7.5	7.5	7.8	7.8	
157.5	7.8	7.8	8.1	8.1	8.1	8.1	8.4	8.7	
180.0	8.7	9.0	9.0	9.3	9.9	10.2	10.8	11.1	
202.5	11.4	12.9	13.5	14.1	15.3	15.9	17.1	17.7	
225.0	18.3	18.9	19.8	21.3	21.5	22.4	23.3	24.5	
247.5	25.7	27.8	29.6	31.1	32.6	34.1	35.9	37.1	
270.0	38.6	40.1	41.3	42.8	44.0	44.9	45.2	44.9	
292.5	45.5	45.8	47.6	47.3	47.6	48.5	49.1	49.4	
315.0	49.7	50.9	51.2	51.5	51.5	50.9	50.6	50.9	
337.5	50.9	51.2	50.9	50.6	50.3	50.0	49.7	50.0	

DEPTH:	4540	TILT:	0	RANGE:	70.9	VOS:	5674		
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7	
0.0	48.5	48.2	47.6	46.7	45.8	45.2	43.1	41.6	
22.5	40.7	39.5	38.0	36.5	35.0	33.8	32.9	32.0	
45.0	31.1	30.2	29.3	27.5	26.6	24.8	23.6	23.0	
67.5	21.8	20.4	19.8	18.3	16.8	15.6	14.4	13.5	
90.0	12.3	11.4	10.8	10.5	9.9	9.6	9.0	8.4	
112.5	8.1	7.8	7.5	7.5	7.5	7.2	7.2	7.2	
135.0	7.2	6.9	6.9	6.9	7.2	6.9	6.9	6.9	
157.5	6.9	7.2	7.2	7.2	7.2	7.5	7.8	7.8	
180.0	8.1	8.4	8.4	9.0	9.3	9.3	9.6	9.9	
202.5	10.2	11.4	11.7	12.6	13.2	13.5	14.4	15.3	
225.0	16.5	17.4	18.0	19.2	20.1	21.0	23.0	23.6	
247.5	24.2	25.4	27.8	28.4	30.5	32.6	33.8	35.3	
270.0	37.1	37.7	38.9	40.7	42.8	44.0	44.0	44.6	
292.5	45.5	46.1	47.0	47.3	47.6	48.8	49.1	49.4	
315.0	50.0	50.3	50.9	51.2	51.2	50.9	50.6	50.6	
337.5	50.9	50.9	50.6	50.3	50.6	50.6	49.7	49.1	

DEPTH:	4550	TILT:	0	RANGE:	70.9	VOS:	5674		
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7	
0.0	48.2	48.2	47.3	46.4	45.2	44.3	44.0	41.3	
22.5	39.5	38.3	37.4	35.6	35.0	33.5	32.0	30.8	
45.0	29.3	28.7	27.2	26.3	24.5	23.9	23.0	21.8	
67.5	20.7	18.9	17.1	15.9	14.4	13.2	12.0	11.1	
90.0	10.8	9.9	9.6	9.0	8.7	8.4	8.1	7.8	
112.5	7.5	7.5	7.2	7.2	7.2	6.9	6.9	6.9	
135.0	6.9	6.6	6.6	6.9	6.6	6.3	6.3	6.6	
157.5	6.6	6.9	6.6	6.9	6.9	6.9	7.2	7.2	
180.0	7.5	7.8	7.8	8.1	8.7	9.0	9.3	9.6	
202.5	9.9	10.8	11.1	11.7	12.3	13.2	13.8	14.1	
225.0	15.0	15.9	17.1	17.7	18.9	19.8	22.4	23.0	
247.5	24.5	25.4	26.9	27.8	30.5	32.3	34.1	35.3	
270.0	36.8	37.1	38.9	39.8	41.3	42.8	43.4	44.3	
292.5	45.2	45.5	45.5	46.1	47.0	47.9	48.5	49.4	
315.0	50.3	50.6	51.2	51.2	50.9	50.6	50.3	50.6	
337.5	50.6	50.6	50.6	50.6	49.7	49.7	49.4	49.1	

DEPTH:	4560	TILT:	0	RANGE:	70.9	VOS:	5674		
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7	
0.0	47.9	46.1	46.1	45.5	44.6	43.7	42.8	41.6	
22.5	39.2	37.4	36.5	36.2	34.7	32.6	31.1	29.9	
45.0	28.7	27.2	26.0	25.7	24.2	23.0	21.8	20.4	
67.5	19.2	18.0	17.1	15.9	14.1	12.6	12.3	11.4	
90.0	10.8	10.2	10.2	9.6	9.0	8.1	8.7	8.1	
112.5	7.8	7.5	7.5	7.2	7.2	6.9	6.9	6.6	
135.0	6.9	6.9	6.9	6.9	6.6	6.3	6.6	6.6	
157.5	6.6	6.6	6.6	6.6	6.6	6.6	6.9	6.9	
180.0	7.2	7.5	7.5	7.8	8.1	8.4	8.7	9.3	
202.5	9.6	10.2	10.8	11.4	11.7	12.0	12.6	12.9	
225.0	13.8	14.4	15.0	16.5	18.0	19.8	21.8	22.4	
247.5	23.6	25.4	26.6	28.7	30.8	32.6	34.4	35.3	
270.0	36.5	37.7	38.6	39.8	40.1	41.3	43.1	44.0	
292.5	44.3	44.9	45.2	46.4	46.4	47.3	47.9	48.5	
315.0	49.1	49.4	50.0	49.4	49.7	49.7	49.7	50.6	
337.5	50.0	49.4	49.4	49.1	49.4	49.1	48.8	48.5	

DEPTH:	4570	TILT:	0	RANGE:	70.9	VOS:	5674		
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7	
0.0	46.7	46.4	45.8	44.6	43.7	43.4	42.2	41.0	
22.5	39.5	38.6	36.8	35.3	33.8	32.0	30.5	29.3	
45.0	28.1	26.6	25.4	24.5	23.3	21.5	20.1	18.6	
67.5	17.7	16.5	14.7	13.8	12.9	11.7	10.8	10.2	
90.0	9.9	9.6	9.3	8.4	8.1	7.5	7.2	6.9	
112.5	6.6	6.6	6.3	6.3	6.0	7.8	6.0	6.0	
135.0	7.2	6.0	6.9	6.0	6.0	5.7	5.7	6.0	
157.5	5.7	6.0	6.3	6.0	6.3	6.3	6.3	6.6	
180.0	6.9	6.9	7.2	7.5	7.8	8.1	8.4	8.7	
202.5	9.0	9.3	9.6	9.9	10.2	10.8	11.7	12.3	
225.0	12.9	15.0	16.2	16.8	18.0	18.9	20.1	21.5	
247.5	22.1	24.5	26.6	27.5	28.7	31.4	32.6	35.6	
270.0	36.5	38.0	38.6	40.1	40.4	41.3	42.2	43.4	
292.5	44.0	44.9	45.5	46.7	47.3	47.0	47.9	48.5	
315.0	48.8	49.1	50.0	50.0	49.7	49.7	50.3	50.6	
337.5	50.6	50.3	49.7	49.7	49.1	48.5	47.9	47.0	

DEPTH:	4580	TILT:	0	RANGE:	70.9	VOS:	5674		
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7	
0.0	46.4	47.0	46.4	45.2	43.7	43.4	42.5	41.6	
22.5	40.1	38.3	36.8	35.6	34.1	32.3	31.4	29.9	
45.0	28.1	26.0	25.1	23.9	22.4	21.3	19.5	18.3	
67.5	16.8	15.0	14.1	13.2	12.0	11.1	10.8	9.9	
90.0	9.6	9.0	8.7	8.1	7.8	7.8	7.5	7.2	
112.5	6.9	6.6	6.3	6.3	6.0	6.3	6.0	5.7	
135.0	5.7	5.7	5.7	5.7	5.7	5.4	5.7	5.7	
157.5	5.7	5.7	6.0	5.7	5.7	6.0	6.0	6.0	
180.0	6.0	6.0	6.3	6.3	6.3	6.6	6.9	7.5	
202.5	7.5	7.8	9.3	9.9	10.5	11.7	12.0	12.9	
225.0	13.8	14.7	15.9	17.1	17.7	18.9	19.5	21.0	
247.5	21.8	25.4	27.2	29.0	30.5	32.0	35.0	36.8	
270.0	38.0	38.9	39.5	40.4	41.3	41.9	42.5	43.4	
292.5	44.0	44.9	45.8	46.1	47.3	48.2	48.5	48.8	
315.0	49.4	50.0	50.9	50.3	50.6	50.9	51.2	50.9	
337.5	50.6	50.3	49.4	49.7	49.7	48.8	48.5	47.3	

DEPTH:	4590	TILT:	0	RANGE:	70.9	VOS:	5674		
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7	
0.0	48.5	47.3	46.7	45.5	44.6	43.4	42.5	41.9	
22.5	40.4	38.3	36.8	35.9	34.7	33.5	31.7	29.9	
45.0	28.7	27.2	26.3	25.1	23.3	21.3	19.8	18.3	
67.5	17.1	15.9	14.7	13.8	12.9	12.0	11.1	10.5	
90.0	9.9	9.0	8.7	8.4	8.1	8.1	7.8	7.2	
112.5	7.2	6.9	6.3	6.6	6.3	6.3	6.3	6.3	
135.0	6.0	5.7	5.7	5.7	6.0	6.0	6.0	6.0	
157.5	6.0	5.7	6.0	5.4	5.4	5.4	5.4	5.7	
180.0	6.0	6.0	6.0	6.0	6.3	6.3	6.9	6.9	
202.5	7.5	7.5	7.8	8.7	9.6	10.5	11.1	12.0	
225.0	13.2	15.0	15.0	16.8	16.5	17.7	18.6	20.1	
247.5	21.8	23.6	25.1	27.5	32.0	33.2	34.7	35.9	
270.0	37.4	40.1	40.4	41.3	41.6	42.2	42.5	43.4	
292.5	44.3	45.5	46.7	47.3	47.9	48.2	49.4	49.7	
315.0	50.3	51.2	51.5	52.1	53.0	52.7	52.7	51.8	
337.5	51.5	51.2	51.2	50.9	51.8	50.9	50.3	49.4	

DEPTH:	4600	TILT:	0	RANGE:	70.9	VOS:	5675		
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7	
0.0	50.6	49.4	47.9	47.3	45.2	44.6	43.4	42.5	
22.5	42.2	38.3	37.1	35.3	34.1	32.9	32.9	30.8	
45.0	29.9	28.7	26.9	25.4	23.9	23.0	22.1	19.7	
67.5	18.5	17.1	16.2	13.8	12.0	12.0	11.1	10.2	
90.0	9.9	9.3	9.3	9.0	8.4	8.1	8.1	7.8	
112.5	7.8	7.5	7.2	7.2	7.2	6.6	6.6	5.7	
135.0	5.4	5.4	6.6	5.4	6.3	5.4	5.4	6.3	
157.5	5.4	5.4	5.4	5.4	6.0	5.7	5.1	6.0	
180.0	6.0	5.7	6.3	6.6	6.6	6.9	7.2	7.2	
202.5	7.5	7.8	8.1	9.0	9.0	9.6	11.1	11.7	
225.0	13.2	14.1	14.1	14.7	15.9	17.1	18.2	19.7	
247.5	20.9	22.7	25.1	27.2	29.0	32.0	34.7	35.6	
270.0	36.8	38.6	39.5	40.4	41.3	41.9	43.1	44.3	
292.5	44.9	46.1	47.3	48.2	49.1	49.7	50.3	50.9	
315.0	51.8	52.4	52.7	53.3	53.6	54.5	54.2	54.2	
337.5	53.9	53.9	53.6	53.6	53.0	52.4	51.2	50.9	

DEPTH:	4610	TILT:	0	RANGE:	70.9	VOS:	5675		
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7	
0.0	52.1	51.2	50.0	47.9	47.0	46.1	45.2	43.1	
22.5	42.2	40.4	38.6	35.9	34.4	32.0	30.5	29.6	
45.0	28.1	26.6	25.4	23.9	22.4	21.2	20.3	19.7	
67.5	18.5	17.1	15.9	14.1	13.2	12.3	11.4	10.8	
90.0	10.2	9.9	9.6	9.3	9.0	8.7	8.1	8.1	
112.5	7.8	7.5	6.6	6.6	6.3	6.0	6.0	5.7	
135.0	5.7	5.7	5.4	5.4	5.1	5.4	5.1	5.4	
157.5	5.1	5.1	5.4	4.8	4.8	4.8	4.8	4.8	
180.0	5.1	5.1	5.4	5.4	6.0	6.0	6.3	6.6	
202.5	6.9	7.2	7.8	8.1	8.4	9.6	10.5	11.1	
225.0	11.7	13.2	14.1	14.4	15.9	16.8	17.7	19.4	
247.5	20.3	20.9	24.8	26.3	28.7	30.8	32.9	35.0	
270.0	37.1	38.0	39.5	41.0	41.9	42.8	44.0	44.9	
292.5	45.8	47.0	48.2	48.8	49.1	50.3	51.2	52.1	
315.0	51.5	52.4	53.0	53.9	54.2	54.2	54.5	55.6	
337.5	55.6	54.7	54.5	54.2	53.9	53.6	53.0	52.7	

DEPTH:	4620	TILT:	0	RANGE:	70.9	VOS:	5675		
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7	
0.0	52.1	51.2	50.0	49.1	47.6	46.4	45.8	44.6	
22.5	43.4	41.6	40.1	37.1	34.4	32.0	30.2	28.1	
45.0	26.6	25.1	24.2	21.8	21.2	20.0	18.8	17.7	
67.5	15.9	15.3	14.4	13.8	12.6	11.7	11.4	10.5	
90.0	9.9	9.9	9.3	9.0	9.0	8.4	8.1	8.1	
112.5	6.3	6.3	6.0	5.7	5.7	5.7	5.4	5.4	
135.0	5.7	5.4	5.1	4.8	5.1	4.8	4.8	4.8	
157.5	4.8	4.8	4.8	4.8	4.5	4.8	4.8	5.1	
180.0	5.4	5.4	5.4	5.4	5.7	5.7	6.3	6.3	
202.5	7.2	7.2	7.5	7.8	8.4	9.0	9.6	10.2	
225.0	11.1	11.7	13.2	14.7	15.9	17.7	19.1	19.7	
247.5	21.5	22.7	26.0	28.1	30.2	31.1	34.1	35.9	
270.0	37.7	39.2	40.4	40.7	41.9	43.7	44.9	45.8	
292.5	47.9	48.8	50.0	50.6	51.2	52.1	53.3	53.3	
315.0	52.7	53.0	53.9	54.5	54.5	53.9	55.0	55.0	
337.5	55.0	55.0	55.0	55.3	54.7	54.7	54.2	53.3	

DEPTH:	4630	TILT:	0	RANGE:	70.9	VOS:	5675		
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7	
0.0	51.8	51.5	50.3	48.8	47.9	46.4	44.9	44.3	
22.5	43.1	42.5	38.9	38.0	33.8	32.0	30.5	28.4	
45.0	27.2	24.8	23.0	21.5	20.3	18.0	17.1	15.6	
67.5	15.6	15.0	14.7	13.2	12.9	12.0	11.4	10.5	
90.0	9.9	9.3	9.0	7.2	7.2	7.5	7.2	6.9	
112.5	6.6	6.9	6.6	6.3	5.4	6.0	5.7	5.7	
135.0	5.7	5.1	5.4	5.4	5.1	5.4	4.8	5.4	
157.5	5.4	5.1	5.1	5.4	5.4	5.4	5.4	5.4	
180.0	5.4	5.4	5.7	5.7	6.0	6.9	7.2	7.2	
202.5	7.5	7.8	8.1	8.7	9.3	10.2	10.5	10.8	
225.0	11.4	12.9	13.2	14.7	15.9	16.8	18.0	20.0	
247.5	22.1	23.9	24.8	28.4	30.2	32.0	34.4	36.2	
270.0	37.1	38.9	39.8	41.3	42.8	44.0	45.2	46.4	
292.5	47.6	48.8	49.4	50.9	51.5	51.8	53.3	53.6	
315.0	54.2	54.5	55.3	55.6	54.7	55.0	55.3	55.0	
337.5	55.0	54.7	55.0	55.0	54.5	53.9	53.0	52.7	

DEPTH:	4640	TILT:	0	RANGE:	70.9	VOS:	5675		
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7	
0.0	51.2	51.2	50.3	49.7	48.8	46.4	45.5	43.7	
22.5	41.3	40.1	38.3	36.2	33.5	31.1	29.0	26.9	
45.0	25.1	23.0	21.2	19.7	18.2	16.8	15.3	14.4	
67.5	13.8	13.2	12.3	11.4	11.1	10.5	10.2	9.6	
90.0	9.0	8.7	8.1	7.8	7.5	7.5	7.2	7.2	
112.5	6.9	6.6	6.3	6.3	6.6	5.7	5.7	5.7	
135.0	5.7	5.7	5.7	5.4	5.4	5.4	5.7	5.7	
157.5	5.7	5.7	5.7	5.7	5.7	6.0	6.0	5.1	
180.0	5.7	5.7	5.7	6.0	6.3	6.3	6.6	6.9	
202.5	8.1	8.4	9.0	9.0	9.6	9.9	10.2	9.6	
225.0	11.4	12.0	14.1	15.0	15.6	16.2	17.7	18.8	
247.5	20.6	22.1	25.4	26.9	28.7	30.8	32.9	34.4	
270.0	37.1	38.0	39.2	41.0	41.9	44.0	45.5	46.4	
292.5	47.0	47.9	49.4	50.9	51.5	52.4	52.7	53.9	
315.0	55.0	55.3	55.9	55.9	55.9	55.0	55.3	54.5	
337.5	54.2	53.9	53.9	53.3	52.7	52.7	52.7	51.2	

DEPTH:	4650	TILT:	0	RANGE:	70.9	VOS:	5675		
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7	
0.0	51.5	50.0	49.4	47.9	47.0	46.4	45.5	41.9	
22.5	39.2	36.8	34.4	32.0	30.2	28.4	27.2	24.8	
45.0	24.2	22.7	21.2	20.0	18.8	17.4	15.9	14.7	
67.5	13.5	12.9	12.0	11.4	10.2	9.9	9.0	9.3	
90.0	8.7	8.7	8.1	7.8	7.2	6.6	6.6	6.3	
112.5	5.7	5.7	5.4	5.4	5.1	4.8	4.8	4.5	
135.0	4.5	4.5	4.2	4.2	4.2	4.2	4.2	4.2	
157.5	3.9	3.9	3.9	3.9	3.9	3.9	3.9	4.5	
180.0	4.2	4.2	4.2	4.5	4.8	5.1	6.0	6.0	
202.5	6.3	6.6	6.6	7.2	7.2	7.5	8.7	9.3	
225.0	10.8	11.7	9.0	14.1	15.0	16.2	16.8	18.0	
247.5	19.4	22.4	23.6	24.8	27.8	30.5	31.4	34.4	
270.0	36.2	37.4	38.9	40.4	41.9	44.0	45.5	46.4	
292.5	47.6	48.8	50.0	50.9	51.5	52.7	53.6	55.0	
315.0	55.6	56.2	56.5	56.5	55.9	55.6	55.6	55.0	
337.5	55.3	55.0	55.0	56.2	55.3	55.3	55.0	53.0	

DEPTH:	4660	TILT:	0	RANGE:	70.9	VOS:	5675		
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7	
0.0	50.9	49.4	48.2	47.0	46.4	45.5	44.3	41.3	
22.5	40.1	36.8	33.8	32.3	30.2	28.1	25.7	23.3	
45.0	21.5	20.0	18.5	16.8	15.3	13.5	12.3	11.1	
67.5	10.5	9.6	9.0	7.8	7.2	6.9	6.6	6.0	
90.0	6.0	6.3	6.0	6.3	6.0	5.7	4.8	5.4	
112.5	5.4	5.4	5.1	5.1	4.8	4.5	4.5	4.5	
135.0	3.6	4.2	3.6	4.2	4.2	4.2	4.2	4.2	
157.5	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	
180.0	4.2	4.5	4.5	4.5	5.1	4.8	5.1	5.1	
202.5	5.4	5.7	6.0	6.3	6.3	6.9	8.1	9.0	
225.0	9.6	10.5	11.4	12.6	13.5	14.7	18.2	19.1	
247.5	21.2	22.4	23.3	24.8	28.7	29.6	33.8	35.9	
270.0	36.8	38.9	40.7	41.3	42.5	43.7	47.9	48.5	
292.5	49.7	50.6	52.1	51.5	52.1	53.3	54.2	55.6	
315.0	57.1	57.4	57.7	57.1	55.9	55.9	55.9	55.9	
337.5	55.6	55.9	56.2	55.6	55.6	55.3	54.7	52.1	

DEPTH:	4670	TILT:	0	RANGE:	70.9	VOS:	5675		
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7	
0.0	50.6	49.4	48.2	47.3	46.1	44.9	42.8	39.2	
22.5	38.3	36.8	35.3	32.6	30.8	28.7	27.5	23.6	
45.0	22.1	20.3	18.8	17.7	15.9	14.1	12.9	11.7	
67.5	10.5	9.6	9.0	8.4	8.1	7.8	7.2	6.3	
90.0	6.0	5.7	5.4	5.7	5.4	5.1	4.8	4.5	
112.5	4.5	5.4	4.2	4.2	4.8	3.9	3.9	3.9	
135.0	4.2	3.9	3.9	3.9	3.6	3.9	3.6	3.9	
157.5	3.6	3.9	3.9	3.9	3.9	4.2	4.5	4.5	
180.0	4.5	4.5	4.5	5.1	4.5	4.8	4.8	5.1	
202.5	5.4	5.4	6.0	6.6	6.6	7.5	7.8	8.7	
225.0	9.3	10.5	9.9	11.7	12.6	14.4	16.2	20.3	
247.5	22.7	23.3	24.2	26.0	28.4	30.5	32.9	35.6	
270.0	36.8	38.0	40.7	42.5	43.4	45.8	47.6	48.8	
292.5	50.3	50.0	51.8	52.4	53.0	53.9	54.2	55.6	
315.0	56.2	57.4	55.9	55.9	55.9	55.9	55.9	55.6	
337.5	55.6	56.2	55.9	55.6	54.7	54.7	53.6	52.1	

DEPTH:	4680	TILT:	0	RANGE:	70.9	VOS:	5675		
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7	
0.0	50.6	49.4	48.8	48.8	47.0	44.9	43.1	41.0	
22.5	37.7	35.0	33.5	31.4	28.4	27.2	26.3	24.5	
45.0	23.0	20.9	20.0	16.5	14.4	13.5	12.3	11.7	
67.5	9.6	10.2	8.7	7.5	8.1	6.9	6.6	6.3	
90.0	5.7	5.4	5.7	5.4	5.1	5.4	4.8	4.5	
112.5	4.5	3.6	4.2	4.2	3.6	3.9	4.2	3.9	
135.0	3.9	3.6	3.6	3.3	3.6	3.9	3.9	3.9	
157.5	3.6	3.6	3.9	3.6	3.6	3.9	3.9	4.2	
180.0	4.5	4.5	4.5	4.5	4.8	4.8	5.1	5.1	
202.5	5.4	6.0	6.3	6.9	7.2	7.5	8.1	8.7	
225.0	9.6	10.2	12.0	12.6	12.6	14.1	16.5	18.5	
247.5	20.6	23.0	24.8	27.8	29.9	31.4	32.9	35.3	
270.0	37.1	39.2	41.0	42.8	44.9	46.1	46.7	48.2	
292.5	49.1	50.3	51.2	52.4	53.3	53.9	54.5	55.0	
315.0	55.6	56.5	56.2	55.3	55.3	55.3	54.7	55.0	
337.5	55.0	54.7	54.7	54.7	53.9	53.6	52.7	52.1	

DEPTH:	4690	TILT:	0	RANGE:	70.9	VOS:	5675		
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7	
0.0	51.2	49.7	48.2	47.0	45.8	43.1	41.9	40.7	
22.5	38.0	35.6	33.8	31.7	29.3	27.2	26.0	25.7	
45.0	23.3	21.8	19.4	17.1	15.3	14.1	12.3	11.1	
67.5	10.2	9.6	9.3	8.7	8.1	8.1	7.8	6.9	
90.0	6.3	6.3	6.3	5.7	5.7	5.4	5.1	5.1	
112.5	4.8	4.8	4.8	4.8	4.5	4.5	4.5	4.5	
135.0	4.5	4.5	4.5	4.5	4.5	4.5	4.8	4.8	
157.5	4.8	4.8	4.8	4.8	5.1	5.1	5.1	5.4	
180.0	5.4	5.7	5.4	5.4	5.7	6.0	6.3	6.9	
202.5	6.9	7.2	7.5	7.8	8.4	9.6	9.6	9.6	
225.0	10.2	10.8	12.3	13.2	13.5	14.7	17.7	19.1	
247.5	20.9	21.2	24.8	26.9	31.4	32.9	35.9	36.5	
270.0	38.3	40.1	42.2	43.7	44.9	46.1	47.6	48.8	
292.5	50.6	51.5	53.0	54.2	54.7	55.0	55.9	56.5	
315.0	57.1	57.1	57.1	57.1	57.1	56.5	56.5	56.5	
337.5	56.5	55.3	55.3	54.7	54.2	53.6	53.0	52.1	

DEPTH:	4700	TILT:	0	RANGE:	70.9	VOS:	5676		
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7	
0.0	50.9	50.0	48.2	47.6	45.2	43.7	41.9	41.0	
22.5	39.5	37.4	34.7	32.9	30.5	28.1	25.7	24.5	
45.0	23.3	22.1	20.9	18.6	16.8	15.0	13.8	12.6	
67.5	11.7	10.8	9.9	9.3	8.7	7.2	6.6	6.3	
90.0	5.7	5.4	5.1	5.1	4.8	4.5	4.5	4.2	
112.5	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	
135.0	3.9	4.2	4.2	4.2	4.2	4.2	4.2	4.2	
157.5	4.5	4.5	4.8	4.8	4.8	4.5	4.8	4.8	
180.0	5.1	5.4	5.4	6.0	6.3	6.6	6.9	6.9	
202.5	7.5	7.5	7.8	8.1	8.7	9.0	9.9	10.5	
225.0	10.8	11.1	12.0	13.2	15.3	16.8	18.3	18.9	
247.5	21.5	23.0	26.3	28.7	32.6	35.0	36.5	38.3	
270.0	40.4	41.9	43.1	45.2	47.0	49.1	50.3	51.8	
292.5	53.3	54.2	54.8	56.0	56.6	57.5	57.5	58.9	
315.0	58.9	58.4	58.1	58.6	58.4	58.1	57.8	57.5	
337.5	56.9	56.3	55.4	55.1	54.5	53.9	53.3	52.4	

DEPTH:	4710	TILT:	0	RANGE:	70.9	VOS:	5676		
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7	
0.0	51.2	50.0	49.1	47.9	45.2	43.7	42.2	40.1	
22.5	39.2	37.1	35.0	32.0	30.2	27.8	26.0	24.5	
45.0	22.7	21.8	19.5	17.7	16.2	14.7	13.2	12.0	
67.5	11.1	10.2	9.9	9.3	8.7	8.1	7.8	7.5	
90.0	5.7	5.4	5.1	4.8	4.8	4.5	4.5	4.2	
112.5	4.2	3.9	3.9	3.9	3.9	3.9	3.9	3.6	
135.0	3.6	3.6	3.6	3.6	3.9	3.9	3.9	4.2	
157.5	4.2	4.2	4.2	4.5	4.5	4.8	4.8	5.1	
180.0	5.1	5.4	5.4	5.7	5.7	6.0	6.6	7.2	
202.5	7.5	7.5	7.8	8.4	8.4	9.3	9.3	10.8	
225.0	12.0	12.6	13.5	14.1	15.0	16.2	17.4	19.7	
247.5	21.5	23.6	25.4	28.1	30.2	34.4	36.8	38.3	
270.0	40.1	42.8	44.0	44.6	49.4	51.2	52.1	52.7	
292.5	53.3	55.4	56.0	56.3	57.8	58.4	58.1	57.8	
315.0	58.4	58.9	58.9	58.9	57.8	57.8	57.5	57.5	
337.5	57.5	56.9	56.6	55.4	55.1	54.2	53.0	52.1	

DEPTH:	4720	TILT:	0	RANGE:	70.9	VOS:	5676		
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7	
0.0	51.8	49.4	48.5	47.9	46.4	43.4	41.6	39.5	
22.5	38.6	36.8	34.7	32.0	30.5	28.1	26.3	23.9	
45.0	21.8	19.7	18.3	17.1	16.2	13.2	12.0	9.6	
67.5	8.4	7.8	7.5	6.9	6.6	6.3	6.0	5.7	
90.0	5.4	5.1	5.1	5.1	4.8	4.5	4.5	4.5	
112.5	4.5	4.2	4.2	4.2	4.2	4.2	4.2	3.9	
135.0	3.9	3.9	3.9	3.9	3.9	4.2	4.2	4.2	
157.5	4.2	4.2	4.2	4.2	4.2	4.5	4.5	4.5	
180.0	4.8	4.8	5.1	5.1	5.4	5.4	5.4	6.0	
202.5	6.3	6.6	7.5	8.1	8.7	9.0	9.6	10.5	
225.0	12.0	12.0	11.7	12.9	14.7	16.2	16.5	17.7	
247.5	19.2	21.8	23.6	26.6	30.2	32.6	34.7	35.6	
270.0	38.0	41.0	44.3	44.3	47.9	49.7	51.2	53.0	
292.5	53.6	55.1	56.3	56.9	57.8	57.8	59.2	59.2	
315.0	59.2	59.2	58.9	59.2	58.9	58.6	58.4	58.1	
337.5	57.8	57.5	56.3	55.7	55.1	53.9	53.6	53.0	

DEPTH:	4730	TILT:	0	RANGE:	70.9	VOS:	5676		
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7	
0.0	52.1	50.0	48.8	46.7	45.8	44.6	41.3	39.5	
22.5	37.7	36.5	33.8	31.4	29.6	27.8	26.3	23.9	
45.0	22.1	19.5	17.4	15.6	13.8	12.9	11.7	11.1	
67.5	9.9	8.4	8.1	7.2	6.6	6.3	6.0	5.7	
90.0	5.4	5.1	5.1	4.8	4.5	4.8	4.8	4.5	
112.5	4.5	4.5	4.5	4.2	4.2	3.9	3.9	3.9	
135.0	3.9	3.9	3.9	4.2	4.2	4.2	4.2	4.2	
157.5	4.2	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
180.0	4.5	4.8	5.4	5.4	5.7	5.7	6.0	5.7	
202.5	6.0	6.3	6.9	7.5	8.4	8.4	9.3	10.8	
225.0	11.1	11.7	12.3	13.5	14.7	14.1	15.3	17.1	
247.5	20.0	20.9	22.7	25.7	28.7	32.0	33.8	35.9	
270.0	39.2	41.9	43.4	45.5	47.0	49.1	50.9	52.7	
292.5	54.8	55.7	56.9	57.8	58.6	59.2	59.5	60.4	
315.0	60.7	61.0	61.0	61.0	60.4	60.1	59.8	59.2	
337.5	58.9	58.4	57.5	56.9	55.7	55.1	53.9	53.0	

DEPTH:	4740	TILT:	0	RANGE:	70.9	VOS:	5676		
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7	
0.0	52.1	50.3	49.1	47.0	44.9	43.1	41.9	39.5	
22.5	38.6	36.2	34.7	32.0	29.9	28.4	25.1	23.6	
45.0	22.1	19.5	17.4	15.9	15.0	14.1	11.7	10.5	
67.5	9.9	8.7	8.7	7.5	6.6	6.0	5.4	5.7	
90.0	5.4	5.1	5.1	5.1	4.8	3.6	4.5	4.2	
112.5	4.2	4.2	3.9	3.9	3.9	4.2	3.9	3.9	
135.0	3.9	3.0	3.9	3.9	3.9	3.9	3.9	4.2	
157.5	4.2	4.2	4.2	4.2	4.2	4.5	4.5	4.5	
180.0	4.8	4.8	4.8	5.1	5.1	5.4	5.7	6.0	
202.5	6.3	6.9	6.9	7.2	8.1	8.1	10.2	11.1	
225.0	11.7	12.6	13.5	14.7	15.3	15.3	16.8	18.3	
247.5	19.2	19.7	21.8	24.2	28.1	31.1	34.1	38.0	
270.0	40.4	41.6	43.1	46.1	47.9	50.0	51.8	53.6	
292.5	54.2	55.7	57.2	58.4	59.2	60.7	61.0	61.6	
315.0	61.6	61.3	61.6	61.6	61.9	61.6	61.6	61.3	
337.5	60.7	59.5	58.9	58.1	56.3	55.7	55.1	53.6	

DEPTH:	4750	TILT:	0	RANGE:	70.9	VOS:	5676		
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7	
0.0	52.4	52.1	50.0	47.9	46.1	44.3	41.6	40.7	
22.5	38.9	35.9	34.4	32.0	29.6	27.8	26.0	23.0	
45.0	20.6	19.7	18.0	15.6	14.4	12.9	12.3	11.4	
67.5	10.5	9.9	8.1	8.1	7.5	6.9	6.6	6.3	
90.0	5.7	5.7	5.4	5.4	5.1	4.8	4.8	4.8	
112.5	4.5	4.5	4.5	4.5	4.2	4.2	4.2	4.2	
135.0	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.5	
157.5	4.2	4.2	4.2	4.5	4.5	4.5	4.8	5.1	
180.0	5.4	4.8	5.1	5.4	5.4	5.7	6.0	6.3	
202.5	6.6	6.9	7.8	8.1	8.4	9.3	9.9	10.8	
225.0	11.1	12.3	12.3	12.9	13.2	15.0	16.5	17.4	
247.5	18.9	21.2	22.7	25.7	27.8	30.2	34.1	37.4	
270.0	41.0	42.5	44.6	46.7	49.1	51.8	53.3	54.8	
292.5	56.3	56.9	57.5	58.6	59.2	59.8	60.1	61.0	
315.0	62.2	61.6	62.5	62.8	62.2	61.0	61.0	60.4	
337.5	60.1	59.5	58.9	57.5	57.2	56.6	55.4	53.9	

DEPTH:	4760	TILT:	0	RANGE:	70.9	VOS:	5676		
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7	
0.0	52.7	51.2	50.0	48.5	47.3	44.0	41.9	40.1	
22.5	38.0	35.6	33.2	30.2	28.1	26.6	24.5	21.8	
45.0	20.3	18.6	16.8	16.5	14.7	13.5	12.0	11.1	
67.5	10.5	10.2	9.0	8.4	8.1	7.2	6.9	6.6	
90.0	6.3	6.0	5.7	5.4	5.4	5.1	4.8	4.5	
112.5	4.5	4.2	4.2	4.2	4.2	3.9	3.9	3.9	
135.0	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	
157.5	3.9	4.2	4.2	4.2	4.2	4.2	4.5	4.5	
180.0	4.8	5.1	5.1	5.1	5.4	5.7	5.7	5.7	
202.5	6.6	6.9	7.5	7.8	8.7	9.0	9.6	10.2	
225.0	10.8	11.1	11.7	12.9	13.8	15.0	15.9	17.1	
247.5	18.3	19.2	20.6	24.5	26.6	28.4	35.6	36.8	
270.0	41.3	43.4	43.7	46.4	47.9	49.1	52.1	53.9	
292.5	55.7	56.6	58.1	58.9	59.5	60.1	60.4	60.4	
315.0	61.0	61.0	61.3	61.6	60.7	60.4	60.1	59.2	
337.5	59.8	59.2	57.8	56.9	56.3	55.7	54.5	53.9	

DEPTH:	4770	TILT:	0	RANGE:	70.9	VOS:	5676		
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7	
0.0	54.2	52.7	51.8	49.4	47.6	46.7	43.7	41.3	
22.5	39.5	36.5	32.6	29.0	27.8	24.8	23.0	20.9	
45.0	19.7	17.7	16.8	15.3	14.1	12.9	12.3	11.7	
67.5	11.1	9.6	8.7	8.4	7.5	7.5	6.6	6.3	
90.0	6.0	5.7	5.4	5.4	5.1	4.8	4.5	4.5	
112.5	4.2	4.2	4.2	4.2	4.2	3.9	3.9	3.9	
135.0	3.9	3.9	3.9	3.9	3.9	3.9	4.2	3.9	
157.5	3.9	4.2	4.2	4.2	4.5	4.8	4.8	4.8	
180.0	5.1	5.1	5.4	5.4	5.4	5.7	6.0	6.3	
202.5	6.6	6.6	7.5	7.5	7.5	9.3	9.6	9.9	
225.0	10.5	11.1	11.7	12.3	13.2	14.7	16.2	18.3	
247.5	19.5	20.9	23.0	24.8	26.6	30.5	33.8	37.4	
270.0	39.8	40.7	42.5	45.2	47.3	49.7	50.9	53.9	
292.5	55.7	56.9	57.5	59.2	59.8	60.7	61.0	62.8	
315.0	62.5	62.5	62.2	61.9	60.7	61.3	61.0	61.0	
337.5	59.8	59.2	58.9	58.9	58.4	57.5	56.9	55.7	

DEPTH:	4780	TILT:	0	RANGE:	70.9	VOS:	5676		
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7	
0.0	54.2	53.0	51.2	49.4	47.0	45.2	43.1	40.7	
22.5	38.9	35.9	32.3	29.9	26.3	25.1	22.4	21.2	
45.0	19.5	18.0	17.1	15.9	14.4	13.2	12.0	11.4	
67.5	10.2	10.5	9.6	9.0	8.7	7.8	7.2	6.6	
90.0	6.3	5.7	5.4	6.0	5.7	5.4	5.1	5.1	
112.5	4.8	4.8	4.5	4.5	4.5	4.5	4.2	4.2	
135.0	4.2	4.2	4.2	3.9	3.9	4.2	4.2	4.2	
157.5	4.2	4.2	4.2	4.5	4.5	4.5	4.8	4.8	
180.0	4.8	5.1	5.1	5.4	5.4	5.7	6.0	6.3	
202.5	6.6	6.9	7.2	7.8	9.0	9.3	9.6	10.2	
225.0	11.1	12.0	12.6	13.8	14.7	15.3	16.5	18.0	
247.5	19.2	21.2	22.4	24.8	29.3	32.0	34.4	35.9	
270.0	38.3	40.1	42.8	44.9	46.7	49.1	50.9	52.7	
292.5	55.1	57.2	58.1	59.2	58.9	61.0	61.6	62.8	
315.0	61.9	61.6	61.9	62.2	62.5	62.2	61.9	61.9	
337.5	61.3	60.7	59.8	58.9	58.1	57.5	56.3	56.0	

DEPTH:	4790	TILT:	0	RANGE:	94.6	VOS:	5676		
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7	
0.0	72.2	70.6	68.6	66.6	64.3	61.1	58.3	53.9	
22.5	50.3	45.5	42.3	39.1	36.3	33.9	30.3	27.1	
45.0	24.7	23.1	20.8	19.6	18.0	17.2	15.2	15.2	
67.5	14.0	13.2	12.4	11.6	11.2	10.8	10.0	9.2	
90.0	8.8	8.0	8.0	7.6	7.2	7.2	6.8	6.8	
112.5	6.8	6.4	6.4	6.4	6.0	6.0	6.0	6.0	
135.0	6.0	5.6	5.6	5.6	5.6	5.6	5.6	5.6	
157.5	5.6	5.6	5.6	6.0	6.0	6.0	6.0	6.4	
180.0	6.4	6.8	6.8	6.8	7.2	7.2	7.6	8.0	
202.5	8.8	8.8	9.6	10.0	10.8	11.6	12.4	13.2	
225.0	14.0	14.8	15.2	16.8	18.4	20.0	20.8	23.9	
247.5	25.9	27.5	30.3	37.1	40.7	43.9	45.9	47.5	
270.0	52.3	53.5	55.1	59.1	63.1	65.5	68.2	70.6	
292.5	71.4	73.4	75.8	77.4	78.6	79.8	81.0	81.4	
315.0	82.2	82.2	82.6	82.6	82.6	82.6	83.0	83.4	
337.5	82.2	81.8	80.6	79.4	78.2	76.6	75.8	74.2	

DEPTH:	4800	TILT:	0	RANGE:	94.6	VOS:	5677		
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7	
0.0	73.0	71.4	69.8	67.8	65.0	61.8	58.7	55.9	
22.5	52.3	48.7	45.9	41.9	38.7	35.1	33.1	30.7	
45.0	27.9	24.3	22.3	20.3	18.8	17.6	16.4	16.4	
67.5	14.4	13.6	12.4	11.6	11.2	10.8	10.0	9.6	
90.0	9.2	8.4	8.0	7.6	7.2	6.8	6.4	6.4	
112.5	6.0	6.0	5.6	5.6	5.6	5.2	5.2	5.2	
135.0	5.2	4.8	5.2	5.2	5.2	5.2	5.2	5.2	
157.5	5.2	5.2	5.2	5.2	5.2	5.2	5.6	6.0	
180.0	6.0	6.4	6.4	6.8	6.8	7.2	7.6	8.0	
202.5	8.4	8.8	9.2	9.6	10.0	12.0	11.6	12.4	
225.0	13.2	14.4	15.6	16.0	18.0	19.6	22.3	23.9	
247.5	26.3	27.9	31.5	34.7	38.7	41.5	44.7	47.5	
270.0	51.1	52.7	54.7	58.7	61.8	64.6	67.0	69.8	
292.5	71.8	73.8	76.6	78.6	79.4	80.2	80.6	81.8	
315.0	82.2	82.6	82.6	82.6	81.4	81.8	81.8	83.0	
337.5	82.6	81.0	81.0	79.8	77.8	76.6	75.4	73.8	

DEPTH:	4810	TILT:	0	RANGE:	94.6	VOS:	5677		
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7	
0.0	71.4	70.6	69.0	66.2	63.0	61.4	57.5	55.5	
22.5	51.1	48.7	45.9	40.7	39.5	37.1	35.1	33.5	
45.0	31.1	28.7	26.3	24.7	23.9	19.2	17.6	16.8	
67.5	15.6	14.8	14.0	13.2	12.0	11.2	10.4	9.6	
90.0	8.8	8.4	8.0	7.6	6.8	6.4	6.4	6.0	
112.5	6.0	5.6	5.6	5.6	5.6	5.2	5.2	5.2	
135.0	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	
157.5	5.6	5.6	5.6	5.6	6.0	6.0	6.0	6.4	
180.0	6.4	6.8	6.4	6.8	6.8	7.2	7.2	7.6	
202.5	8.0	8.4	8.8	9.2	9.6	10.8	10.8	12.4	
225.0	12.4	12.4	13.6	14.8	16.4	18.8	21.1	22.7	
247.5	26.7	27.9	31.9	35.5	38.3	41.5	44.3	46.7	
270.0	49.9	50.3	52.7	54.7	56.7	58.3	59.8	61.4	
292.5	62.2	63.4	64.2	65.8	66.2	66.6	67.0	68.2	
315.0	68.6	69.0	69.4	68.2	69.8	70.6	70.6	70.6	
337.5	71.0	71.4	71.8	72.2	73.0	72.2	71.4	71.8	

DEPTH:	4820	TILT:	0	RANGE:	94.6	VOS:	5677		
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7	
0.0	65.8	65.4	65.8	65.4	63.0	59.8	56.7	52.7	
22.5	49.5	47.5	44.7	42.3	39.9	36.3	35.5	34.3	
45.0	30.7	29.5	26.7	24.3	21.5	19.6	18.4	16.8	
67.5	16.4	14.8	14.0	12.8	12.4	11.6	10.8	10.4	
90.0	10.0	9.6	9.2	9.2	8.8	8.4	8.4	8.0	
112.5	8.0	7.6	7.6	7.6	7.6	7.2	7.2	7.2	
135.0	7.2	7.2	7.2	7.2	6.8	6.8	6.8	6.8	
157.5	6.8	7.2	7.2	7.2	7.2	7.2	7.2	7.6	
180.0	7.6	7.6	8.0	8.0	8.0	8.4	8.4	8.4	
202.5	8.8	9.2	9.6	10.0	10.4	11.2	12.0	12.0	
225.0	13.2	12.8	14.4	14.8	16.4	18.4	19.9	22.7	
247.5	25.5	29.1	31.9	33.1	34.3	34.7	36.3	38.3	
270.0	39.1	41.1	41.5	43.5	44.3	45.9	47.1	47.9	
292.5	49.1	49.9	50.3	51.1	51.5	52.3	52.7	54.3	
315.0	54.3	54.7	55.1	55.1	55.5	55.9	56.7	57.9	
337.5	59.4	59.8	61.4	63.8	64.6	65.0	65.8	66.6	

DEPTH:	4830	TILT:	0	RANGE:	94.6	VOS:	5677		
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7	
0.0	65.0	65.4	65.4	67.0	65.4	63.4	59.1	57.9	
22.5	52.7	51.5	49.9	46.7	44.3	41.1	37.9	35.5	
45.0	33.1	29.5	27.5	23.9	21.9	19.9	18.0	17.2	
67.5	16.0	15.2	13.6	13.2	12.8	12.0	11.6	10.4	
90.0	10.0	9.2	9.2	8.8	8.4	8.4	8.0	8.0	
112.5	8.0	7.6	7.6	7.6	7.6	7.2	7.6	7.2	
135.0	7.2	7.2	7.2	6.8	7.2	7.2	7.2	7.2	
157.5	7.6	7.6	8.0	8.0	8.4	8.4	8.4	8.8	
180.0	8.8	8.8	8.8	9.2	9.2	10.0	9.2	9.6	
202.5	10.0	10.4	10.4	11.2	11.6	12.0	12.8	13.2	
225.0	14.0	14.4	16.0	16.4	17.6	19.2	19.9	21.9	
247.5	23.9	26.3	29.9	32.3	34.3	35.9	37.9	38.7	
270.0	39.9	40.7	41.9	42.3	43.5	45.5	46.7	47.9	
292.5	49.1	50.3	51.1	51.5	52.7	53.5	54.3	55.5	
315.0	56.3	56.7	56.7	57.1	57.9	58.3	59.1	59.4	
337.5	60.2	61.8	63.0	63.8	66.6	67.4	67.8	67.8	

DEPTH:	4840	TILT:	0	RANGE:	94.6	VOS:	5677		
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7	
0.0	67.8	68.6	68.6	66.6	66.6	65.4	63.8	60.6	
22.5	57.1	53.9	51.1	48.7	45.5	41.1	38.3	35.9	
45.0	33.1	29.5	23.9	21.9	20.3	18.8	17.2	15.6	
67.5	14.8	14.0	12.8	12.4	12.0	11.6	11.2	11.2	
90.0	10.8	10.4	10.4	10.0	10.0	9.6	8.8	8.4	
112.5	8.4	8.4	8.0	8.0	8.0	7.6	7.6	7.6	
135.0	7.2	7.6	7.6	7.6	6.8	7.2	7.2	7.2	
157.5	7.2	7.2	7.2	7.6	7.2	7.6	8.0	8.4	
180.0	8.4	8.8	8.8	9.2	9.6	10.0	10.0	10.4	
202.5	11.2	11.6	12.0	12.8	13.2	13.6	14.0	14.8	
225.0	15.2	15.6	16.8	17.6	18.0	19.2	20.3	21.1	
247.5	23.1	25.1	27.1	30.3	32.3	33.9	35.5	36.7	
270.0	37.1	38.3	40.3	40.7	42.3	42.7	43.9	44.7	
292.5	45.9	47.1	47.9	48.7	50.3	51.1	52.7	53.1	
315.0	53.9	54.7	55.5	55.9	56.7	57.1	57.1	58.3	
337.5	59.4	60.6	62.2	63.8	65.0	66.2	66.2	67.0	

DEPTH:	4850	TILT:	0	RANGE:	94.6	VOS:	5677		
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7	
0.0	69.0	67.8	68.6	66.2	65.0	64.2	64.6	62.6	
22.5	59.1	54.7	52.3	49.9	46.3	43.5	40.7	38.7	
45.0	32.3	28.7	27.1	24.7	22.3	21.5	19.9	19.2	
67.5	17.6	16.4	14.8	14.0	13.6	12.8	12.4	11.6	
90.0	11.2	10.8	10.8	10.4	9.6	9.6	9.2	9.2	
112.5	8.8	8.8	8.8	8.8	9.2	8.8	8.8	8.8	
135.0	8.8	8.4	8.4	8.4	8.4	8.4	8.4	8.4	
157.5	8.4	8.4	8.4	8.8	8.8	9.2	9.2	9.2	
180.0	9.2	9.6	9.6	10.0	10.4	10.8	11.2	11.6	
202.5	11.6	12.4	12.8	12.8	13.2	13.2	14.0	14.0	
225.0	14.4	14.4	15.6	16.4	16.8	16.8	19.2	19.6	
247.5	23.1	23.9	26.3	27.9	29.5	31.9	34.3	35.1	
270.0	37.9	38.3	39.9	40.7	41.5	43.1	43.5	44.7	
292.5	45.5	45.9	46.7	47.9	48.7	49.9	50.7	51.5	
315.0	52.7	54.3	55.1	55.9	57.1	57.1	57.5	57.5	
337.5	57.5	59.1	61.0	62.6	63.8	63.8	66.2	67.4	

DEPTH:	4860	TILT:	0	RANGE:	94.6	VOS:	5677		
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7	
0.0	67.8	69.4	67.8	67.0	66.6	65.8	64.6	63.8	
22.5	58.3	54.7	51.1	49.1	47.5	43.1	40.3	37.9	
45.0	34.3	30.7	27.9	24.3	22.3	20.7	18.8	19.9	
67.5	17.2	17.6	16.0	15.2	14.4	13.2	12.4	12.4	
90.0	12.0	11.6	10.8	10.8	10.4	11.2	10.8	10.8	
112.5	10.4	10.0	10.0	10.4	10.4	10.4	0.0	10.0	
135.0	0.0	10.0	10.4	10.4	10.0	10.0	10.4	10.4	
157.5	10.0	10.0	10.4	10.4	10.4	10.8	10.8	10.8	
180.0	11.2	11.2	11.6	12.0	12.4	12.4	12.8	12.8	
202.5	12.8	12.8	12.8	13.6	14.0	14.4	14.8	14.4	
225.0	15.6	16.0	17.2	17.6	18.0	18.4	19.9	22.7	
247.5	23.9	24.3	25.1	25.9	25.9	30.3	33.5	35.5	
270.0	35.9	35.9	36.3	39.1	39.5	41.1	41.5	41.5	
292.5	42.7	43.5	44.7	45.9	46.7	45.5	46.3	47.9	
315.0	49.1	51.1	51.9	52.3	53.5	52.7	53.1	54.7	
337.5	55.5	56.7	58.3	60.2	63.0	64.6	65.4	67.0	

DEPTH:	4870	TILT:	0	RANGE:	94.6	VOS:	5677		
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7	
0.0	67.0	66.2	67.4	67.4	67.4	67.8	64.2	61.8	
22.5	59.8	55.9	52.3	49.5	46.3	44.7	42.3	39.1	
45.0	34.3	29.9	26.3	23.1	22.7	21.1	19.6	19.2	
67.5	17.6	16.8	16.4	15.2	14.4	13.6	13.2	12.4	
90.0	11.6	11.6	11.2	10.8	10.8	10.4	10.4	10.0	
112.5	10.0	10.0	9.2	9.6	9.6	9.6	9.6	9.6	
135.0	9.6	9.6	9.6	9.6	9.6	10.0	10.0	9.6	
157.5	9.6	10.0	10.0	10.0	10.0	10.4	11.2	10.8	
180.0	11.2	11.2	12.0	11.6	11.6	11.6	12.0	12.4	
202.5	12.8	12.8	13.2	13.6	14.0	14.0	14.4	15.2	
225.0	16.0	15.6	16.4	17.2	18.4	19.6	21.9	22.3	
247.5	23.1	23.9	25.5	27.1	28.7	29.5	31.5	33.1	
270.0	33.9	34.7	35.9	36.7	38.3	39.1	39.1	39.9	
292.5	40.7	41.5	42.7	43.5	43.9	45.9	46.7	47.9	
315.0	48.7	49.1	49.9	49.9	49.9	50.3	51.1	51.9	
337.5	53.1	54.7	56.7	60.2	61.8	64.2	65.8	67.4	

DEPTH:	4880	TILT:	0	RANGE:	94.6	VOS:	5677		
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7	
0.0	59.1	59.8	59.8	59.8	59.4	60.2	60.2	59.1	
22.5	55.5	53.1	51.1	50.7	49.1	46.7	42.7	38.7	
45.0	37.1	35.5	32.7	29.1	25.9	23.5	21.5	19.2	
67.5	18.4	18.0	17.2	16.8	16.4	16.0	15.6	15.2	
90.0	15.2	14.4	14.0	13.6	13.2	13.2	12.8	12.4	
112.5	12.0	13.2	13.2	12.8	12.4	12.0	12.0	11.6	
135.0	11.6	11.6	11.6	11.2	11.2	11.2	11.2	11.2	
157.5	11.2	11.2	11.2	11.6	12.0	12.0	12.0	12.4	
180.0	12.8	12.8	12.8	13.2	13.6	14.4	14.8	14.8	
202.5	15.2	16.0	16.4	17.2	18.0	18.8	19.2	19.6	
225.0	20.3	20.3	20.7	20.7	21.5	21.9	22.3	25.5	
247.5	25.5	26.3	26.7	27.1	27.9	29.5	30.7	31.1	
270.0	31.1	31.5	31.5	31.9	32.3	33.1	33.1	33.5	
292.5	34.3	34.7	35.1	35.5	35.9	36.7	38.3	39.1	
315.0	41.1	42.3	43.9	45.5	46.7	48.7	49.5	51.1	
337.5	51.9	54.7	55.5	57.5	57.5	58.3	58.7	58.7	

DEPTH:	4890	TILT:	0	RANGE:	94.6	VOS:	5677		
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7	
0.0	51.9	52.3	51.5	51.5	51.1	51.1	50.7	48.7	
22.5	48.7	47.9	46.7	46.7	46.3	46.3	43.9	41.9	
45.0	39.1	36.7	35.5	30.7	25.1	22.7	21.5	19.9	
67.5	18.8	16.8	16.4	15.6	14.8	14.4	13.6	13.2	
90.0	12.8	12.8	12.8	12.8	12.4	12.4	12.0	12.0	
112.5	12.0	12.0	12.0	12.0	12.4	12.4	12.8	12.8	
135.0	12.8	13.2	13.2	13.2	13.6	13.6	13.6	14.0	
157.5	14.0	14.0	14.4	14.4	14.4	14.8	15.2	15.2	
180.0	15.6	15.6	16.0	16.4	16.8	17.2	18.0	18.8	
202.5	19.2	19.9	20.7	21.1	21.5	22.7	22.7	22.7	
225.0	23.1	23.1	23.5	23.9	25.1	25.1	25.9	26.3	
247.5	26.7	27.5	27.9	27.9	28.3	28.3	28.3	28.7	
270.0	28.3	27.9	28.3	29.1	29.1	29.1	28.3	28.7	
292.5	28.7	28.7	28.7	28.7	28.7	29.1	29.1	29.9	
315.0	30.3	30.7	32.3	35.1	39.9	43.1	46.3	50.7	
337.5	52.7	55.9	55.9	53.5	53.5	53.5	53.1	51.9	

DEPTH:	4900	TILT:	0	RANGE:	94.6	VOS:	5678		
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7	
0.0	36.7	36.3	35.5	35.1	35.1	34.7	34.7	34.3	
22.5	34.3	33.1	33.1	32.7	32.3	32.7	33.5	33.9	
45.0	33.5	28.3	27.5	24.3	23.5	21.9	21.2	19.6	
67.5	17.2	16.4	15.6	16.0	14.8	14.8	14.4	14.0	
90.0	14.0	13.6	13.6	13.2	12.8	12.8	12.8	12.4	
112.5	12.4	12.0	12.0	12.0	12.0	12.0	12.0	12.0	
135.0	11.6	12.0	12.0	12.4	12.8	13.2	13.2	13.2	
157.5	13.2	13.6	14.0	14.4	14.4	14.8	14.8	14.8	
180.0	15.2	15.2	15.6	15.6	16.4	16.8	17.6	18.4	
202.5	18.8	19.2	19.6	20.0	20.8	21.2	22.3	22.3	
225.0	22.7	23.1	23.5	24.7	25.1	25.5	24.7	27.1	
247.5	28.3	28.3	28.7	28.3	28.3	28.7	27.9	27.9	
270.0	28.3	28.3	28.3	29.1	29.1	28.3	27.9	27.5	
292.5	27.5	27.5	27.5	27.9	29.1	29.1	29.5	29.9	
315.0	31.9	31.5	31.9	32.3	33.9	33.9	33.9	37.1	
337.5	37.1	37.1	37.5	37.5	37.5	37.1	36.7	36.7	

DEPTH:	4910	TILT:	0	RANGE:	94.6	VOS:	5678		
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7	
0.0	21.5	21.5	21.2	21.5	21.5	21.9	20.4	20.4	
22.5	20.0	20.0	19.6	19.2	19.6	19.2	19.6	19.2	
45.0	19.2	18.8	18.8	18.8	18.4	18.0	17.2	16.4	
67.5	15.6	14.8	14.4	14.0	13.6	13.2	12.8	12.4	
90.0	12.0	11.6	11.6	11.2	10.8	10.4	10.4	10.4	
112.5	10.0	10.0	9.6	9.6	9.6	9.6	9.6	9.6	
135.0	9.6	9.6	9.6	9.6	9.6	10.0	9.6	10.0	
157.5	10.0	10.4	10.4	10.8	11.2	11.6	12.0	12.4	
180.0	12.8	13.2	14.0	14.4	14.0	14.4	14.8	15.6	
202.5	16.4	17.6	17.6	18.4	19.2	19.2	20.8	21.9	
225.0	22.3	22.7	23.1	23.5	23.9	24.7	24.7	24.3	
247.5	24.3	24.3	23.9	24.3	23.9	23.5	23.9	23.9	
270.0	23.9	23.1	22.7	22.3	22.3	22.3	21.9	22.3	
292.5	21.9	21.9	21.9	21.9	21.9	21.9	21.9	23.5	
315.0	23.1	23.5	22.7	22.7	22.7	22.7	22.7	22.3	
337.5	22.3	22.3	21.9	21.9	21.5	21.5	21.2	21.2	

DEPTH:	4915	TILT:	0	RANGE:	94.6	VOS:	5678		
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7	
0.0	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	
22.5	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	
45.0	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	
67.5	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	
90.0	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	
112.5	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	
135.0	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	
157.5	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	
180.0	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	
202.5	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	
225.0	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	
247.5	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	
270.0	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	
292.5	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	
315.0	0.0	0.8	0.8	0.8	0.8	0.8	0.8	0.8	
337.5	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	

DEPTH:	4920	TILT:	0	RANGE:	94.6	VOS:	5678		
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7	
0.0	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
22.5	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
45.0	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
67.5	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
90.0	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
112.5	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
135.0	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
157.5	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
180.0	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
202.5	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
225.0	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
247.5	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
270.0	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
292.5	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
315.0	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
337.5	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8

DEPTH:	4930	TILT:	0	RANGE:	94.6	VOS:	5678		
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7	
0.0	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
22.5	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
45.0	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
67.5	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
90.0	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
112.5	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
135.0	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
157.5	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
180.0	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
202.5	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
225.0	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
247.5	0.8	0.8	0.8	0.8	0.8	0.0	0.8	0.8	0.8
270.0	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.0
292.5	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
315.0	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
337.5	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8

DEPTH:	4940	TILT:	0	RANGE:	94.6	VOS:	5678		
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7	
0.0	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
22.5	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
45.0	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
67.5	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
90.0	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
112.5	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
135.0	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
157.5	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
180.0	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
202.5	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
225.0	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
247.5	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
270.0	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
292.5	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
315.0	0.0	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
337.5	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8

DEPTH:	4950	TILT:	0	RANGE:	94.6	VOS:	5678		
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7	
0.0	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
22.5	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
45.0	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
67.5	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
90.0	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
112.5	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
135.0	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
157.5	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
180.0	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
202.5	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
225.0	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
247.5	0.8	0.8	0.8	0.8	0.8	0.0	0.8	0.8	0.8
270.0	0.8	0.8	0.8	0.8	0.8	0.0	0.8	0.8	0.8
292.5	0.8	0.8	0.8	0.0	0.8	0.8	0.0	0.8	0.8
315.0	0.0	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
337.5	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8

DEPTH:	4955	TILT:	0	RANGE:	94.6	VOS:	5678		
Bearing	+ 0.0	+ 2.8	+ 5.6	+ 8.4	+11.3	+14.1	+16.9	+19.7	
0.0	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
22.5	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
45.0	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
67.5	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
90.0	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
112.5	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
135.0	0.0	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
157.5	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
180.0	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.0
202.5	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
225.0	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
247.5	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
270.0	0.8	0.8	0.0	0.8	0.8	0.8	0.0	0.8	0.8
292.5	0.8	0.8	0.0	0.8	0.8	0.8	0.8	0.8	0.8
315.0	0.8	0.8	0.8	0.8	0.8	0.0	0.8	0.8	0.8
337.5	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8

Division of Oil, Gas and Mining

Operator Change/Name Change Worksheet-for State use only

Effective Date: 2/17/2015

FORMER OPERATOR:	NEW OPERATOR:
Magnum NGLs Solutions Mining, LLC N3995 6965 Union Park Avenue, Suite 27 Midval, UT 84047 801-255-9632	NGL Supply Terminal Solution Mining, LLC N4245 6965 Union Park Avenue, Suite 27 Midval, UT 84047 801-255-9632
CA Number(s):	Unit(s):

WELL INFORMATION:

Well Name	Sec	TWN	RNG	API	Entity	Mineral	Surface	Type	Status
CW-6	26	150S	070W	4302750003	19132	State	State	GS	A
CW-7	23	150S	070W	4302750004	19669	State	State	GS	A
CW-8	23	150S	070W	4302750005		State	State	GS	DRL
CW-9	26	150S	070W	4302750006		State	State	GS	DRL
CW-5	23	150S	070W	4302750002	19046	State	State	GS	I

OPERATOR CHANGES DOCUMENTATION:

1. Sundry or legal documentation was received from the **FORMER** operator on: 4/20/2015
2. Sundry or legal documentation was received from the **NEW** operator on: 4/20/2015
3. New operator Division of Corporations Business Number: 8615504-0160

REVIEW:

1. Surface Agreement Sundry from **NEW** operator on Fee Surface wells received on: 4/20/2015
2. Receipt of Acceptance of Drilling Procedures for APD on: 4/20/2015
3. Reports current for Production/Disposition & Sundries: 7/2/2015
4. OPS/SI/TA well(s) reviewed for full cost bonding: 7/2/2015
5. UIC5 on all disposal/injection/storage well(s) approved on: 4/28/2015
6. Surface Facility(s) included in operator change: N/A
7. Inspections of PA state/fee well sites complete on (only upon operators request): N/A

NEW OPERATOR BOND VERIFICATION:

1. Federal well(s) covered by Bond Number: N/A
2. Indian well(s) covered by Bond Number: N/A
3. State/fee well(s) covered by Bond Number(s): B009096a

DATA ENTRY:

1. Well(s) update in the **OGIS** on: 7/2/2015
2. Entity Number(s) updated in **OGIS** on: 7/2/2015
3. Unit(s) operator number update in **OGIS** on: N/A
4. Surface Facilities update in **OGIS** on: N/A
5. State/Fee well(s) attached to bond(s) in **RBDMS** on: 7/2/2015
6. Surface Facilities update in **RBDMS** on: N/A

LEASE INTEREST OWNER NOTIFICATION:

1. The **NEW** operator of the Fee (Mineral) wells has been contacted and informed by a letter from the Division of their responsibility to notify all interest owners of this change on: N/A

COMMENTS:

STATE OF UTAH
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING

FORM 9

SUNDRY NOTICES AND REPORTS ON WELLS		5. LEASE DESIGNATION AND SERIAL NUMBER: ML-51573.A-OBA
Do not use this form for proposals to drill new wells, significantly deepen existing wells below current bottom-hole depth, reenter plugged wells, or to drill horizontal laterals. Use APPLICATION FOR PERMIT TO DRILL form for such proposals.		6. IF INDIAN, ALLOTTEE OR TRIBE NAME:
1. TYPE OF WELL OIL WELL <input type="checkbox"/> GAS WELL <input type="checkbox"/> OTHER <u>Gas Storage Wells</u>		7. UNIT or CA AGREEMENT NAME:
2. NAME OF OPERATOR: NGL Supply Terminal Solution Mining, LLC		8. WELL NAME and NUMBER: CW-5
3. ADDRESS OF OPERATOR: 6965 Union Park Ave. Ste 27 CITY Midvale STATE UT ZIP 84047		9. API NUMBER: 4302750002
4. LOCATION OF WELL FOOTAGES AT SURFACE: 0147 FSL 0167 FWL		10. FIELD AND POOL, OR WILDCAT: Undesignated
QTR/QTR, SECTION, TOWNSHIP, RANGE, MERIDIAN: SWSW 23 15S 7W S		COUNTY: Millard County
		STATE: UTAH

11. CHECK APPROPRIATE BOXES TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA			
TYPE OF SUBMISSION	TYPE OF ACTION		
<input type="checkbox"/> NOTICE OF INTENT (Submit in Duplicate) Approximate date work will start: <input checked="" type="checkbox"/> SUBSEQUENT REPORT (Submit Original Form Only) Date of work completion: <u>2/17/2015</u>	<input type="checkbox"/> ACIDIZE <input type="checkbox"/> ALTER CASING <input type="checkbox"/> CASING REPAIR <input type="checkbox"/> CHANGE TO PREVIOUS PLANS <input type="checkbox"/> CHANGE TUBING <input type="checkbox"/> CHANGE WELL NAME <input type="checkbox"/> CHANGE WELL STATUS <input type="checkbox"/> COMMINGLE PRODUCING FORMATIONS <input type="checkbox"/> CONVERT WELL TYPE	<input type="checkbox"/> DEEPEN <input type="checkbox"/> FRACTURE TREAT <input type="checkbox"/> NEW CONSTRUCTION <input checked="" type="checkbox"/> OPERATOR CHANGE <input type="checkbox"/> PLUG AND ABANDON <input type="checkbox"/> PLUG BACK <input type="checkbox"/> PRODUCTION (START/RESUME) <input type="checkbox"/> RECLAMATION OF WELL SITE <input type="checkbox"/> RECOMPLETE - DIFFERENT FORMATION	<input type="checkbox"/> REPERFORATE CURRENT FORMATION <input type="checkbox"/> SIDETRACK TO REPAIR WELL <input type="checkbox"/> TEMPORARILY ABANDON <input type="checkbox"/> TUBING REPAIR <input type="checkbox"/> VENT OR FLARE <input type="checkbox"/> WATER DISPOSAL <input type="checkbox"/> WATER SHUT-OFF <input checked="" type="checkbox"/> OTHER: <u>Operator name change</u>

12. DESCRIBE PROPOSED OR COMPLETED OPERATIONS. Clearly show all pertinent details including dates, depths, volumes, etc.

Change of Operator name from Magnum NGLs Solution Mining, LLC to NGL Supply Terminal Solution Mining, LLC effective 2/17/2015

Operator current name:
Magnum NGLs Solution Mining, LLC, 3165 E Millrock Drive, Suite 330, Holladay, Utah 84121 801-993-7001

Operator new name and address:
NGL Supply Terminal Solution Mining, LLC, 6965 Union Park Avenue, Suite 270 Midvale, Utah 84047 801-255-9632

Wells are under State bond number B009096.

Existing lease. Memorandum of Natural Gas Liquid Storage Lease #ML-51573.A-OBA remains in effect.

See attached list of additional included wells (CW-5, CW-6, CW-7, CW-8, CW-9)

NAME (PLEASE PRINT) <u>Adam Richins</u>	TITLE <u>Safety, Compliance & Regulatory Manager</u>
SIGNATURE <u><i>Adam Richins</i></u>	DATE <u>4/20/2015</u>

(This space for State use only)

APPROVED

JUL 02 2015

DIV. OIL GAS & MINING
BY: Rachel Medina

List of Cavern Wells (Magnum NGLs/Sawt

Well Name	Section	Township	Range	API Number	Entity Number	Mineral Lease Type	Well Type
CW-5	23	15 S	7 W	43-027-50002	N/A	State	Gas Storage Well
CW-6	26	15 S	7 W	43-027-50003	N/A	State	Gas Storage Well
CW-7	23	15 S	7 W	43-027-50004	N/A	State	Gas Storage Well
CW-8	23	15 S	7 W	43-027-50005	N/A	State	Gas Storage Well
CW-9	26	15 S	7 W	43-027-50006	N/A	State	Gas Storage Well

ooth)

Well Status

Inactive

Active

Active

Spudded (Drilling commenced: Not yet completed)

New Permit (Not yet approved or drilled)

Delaware

PAGE 1

The First State

I, JEFFREY W. BULLOCK, SECRETARY OF STATE OF THE STATE OF DELAWARE, DO HEREBY CERTIFY THE ATTACHED IS A TRUE AND CORRECT COPY OF THE CERTIFICATE OF AMENDMENT OF "MAGNUM NGLS, LLC", CHANGING ITS NAME FROM "MAGNUM NGLS, LLC" TO "SAWTOOTH NGL CAVERNS, LLC", FILED IN THIS OFFICE ON THE EIGHTEENTH DAY OF MARCH, A.D. 2015, AT 12:21 O'CLOCK P.M.

5037140 8100

150374000




Jeffrey W. Bullock, Secretary of State
AUTHENTICATION: 2211843

DATE: 03-18-15

STATE OF DELAWARE CERTIFICATE OF AMENDMENT

1. Name of Limited Liability Company: MAGNUM NGLS, LLC

2. The Certificate of Formation of the limited liability company is hereby amended as follows:

<ol style="list-style-type: none">1. The name of the Limited Liability Company is Sawtooth NGL Caverns, LLC.
--

IN WITNESS WHEREOF, the undersigned have executed this Certificate on
the 17th day of March, A.D. 2015.

By: 
Authorized Person(s)

Name: William G. Laughlin
Print or Type

STATE OF UTAH
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING

Request to Transfer Application or Permit to Drill

(This form should accompany a Sundry Notice, Form 9, requesting APD transfer)

Well name:	CW-5
API number:	430275002
Location:	Qtr-Qtr: SWSW Section: 23 Township: 15 S Range: 7 W
Company that filed original application:	Magnum NGLs Solution Mining, LLC
Date original permit was issued:	05/02/2013
Company that permit was issued to:	Magnum NGLs Solution Mining, LLC

Check one	Desired Action:
<input type="checkbox"/>	Transfer pending (unapproved) Application for Permit to Drill to new operator
	The undersigned as owner with legal rights to drill on the property, hereby verifies that the information as submitted in the pending Application for Permit to Drill, remains valid and does not require revision. The new owner of the application accepts and agrees to the information and procedures as stated in the application.
<input checked="" type="checkbox"/>	Transfer approved Application for Permit to Drill to new operator
	The undersigned as owner with legal rights to drill on the property as permitted, hereby verifies that the information as submitted in the previously approved application to drill, remains valid and does not require revision.

Following is a checklist of some items related to the application, which should be verified.	Yes	No
If located on private land, has the ownership changed?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
If so, has the surface agreement been updated?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Have any wells been drilled in the vicinity of the proposed well which would affect the spacing or siting requirements for this location?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Have there been any unit or other agreements put in place that could affect the permitting or operation of this proposed well?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Have there been any changes to the access route including ownership or right-of-way, which could affect the proposed location?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Has the approved source of water for drilling changed?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Have there been any physical changes to the surface location or access route which will require a change in plans from what was discussed at the onsite evaluation?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Is bonding still in place, which covers this proposed well? Bond No. <u>B009096</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Any desired or necessary changes to either a pending or approved Application for Permit to Drill that is being transferred, should be filed on a Sundry Notice, Form 9, or amended Application for Permit to Drill, Form 3, as appropriate, with necessary supporting information as required.

Name (please print) Adam Richins Title Safety, Compliance and Regulatory Manager
Signature  Date 04/20/2015
Representing (company name) NGL Supply Terminal Solution Mining, LLC

The person signing this form must have legal authority to represent the company or individual(s) to be listed as the new operator on the Application for Permit to Drill.

STATE OF UTAH
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING

UIC FORM 5

TRANSFER OF AUTHORITY TO INJECT

Well Name and Number CW-5	API Number 4302750002
Location of Well Footage : 147 S 167 W County : Millard County QQ. Section. Township. Range: SWSW 23 15S 7W State : UTAH	Field or Unit Name Lease Designation and Number State ML-51573.A-OBA

EFFECTIVE DATE OF TRANSFER: 2/17/2015

CURRENT OPERATOR

Company: <u>Magnum NGLs Solution Mining. LLC</u>	Name: <u>Adam Richins</u>
Address: <u>3165 E Millrock Drive Suite 330</u>	Signature: <u><i>Adam Richins</i></u>
<u>city Holladay state UT zip 84121</u>	Title: <u>Safety, Compliance & Regulatory Manager</u>
Phone: <u>(801) 993-7001</u>	Date: <u>4-20-15</u>

Comments: Entity is the same. Name of operator is changing.

NEW OPERATOR

Company: <u>NGL Supply Terminal Solution Mining. LLC</u>	Name: <u>Adam Richins</u>
Address: <u>6965 Union Park Avenue Suite 270</u>	Signature: <u><i>Adam Richins</i></u>
<u>city Midvale state UT zip 84047</u>	Title: <u>Safety, Compliance & Regulatory Manager</u>
Phone: <u>(801) 255-9632</u>	Date: <u>4-20-15</u>

Comments: Magnum NGLs Solution Mining. LLC is changing name to NGL Supply Terminal Solution Mining. LLC

(This space for State use only)

Transfer approved by: *[Signature]*
Title: *Field Agent*

Approval Date: 4/28/15

Comments:

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APR 2014

STATE OF UTAH
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING

Request to Transfer Application or Permit to Drill

(This form should accompany a Sundry Notice, Form 9, requesting APD transfer)

Well name:	CW-6
API number:	430275003
Location:	Qtr-Qtr: NWNW Section: 26 Township 15 S Range: 7 W
Company that filed original application:	Magnum NGLs Solution Mining, LLC
Date original permit was issued:	05/02/2013
Company that permit was issued to:	Magnum NGLs Solution Mining, LLC

Check one	Desired Action:
<input type="checkbox"/>	Transfer pending (unapproved) Application for Permit to Drill to new operator
	The undersigned as owner with legal rights to drill on the property, hereby verifies that the information as submitted in the pending Application for Permit to Drill, remains valid and does not require revision. The new owner of the application accepts and agrees to the information and procedures as stated in the application.
<input checked="" type="checkbox"/>	Transfer approved Application for Permit to Drill to new operator
	The undersigned as owner with legal rights to drill on the property as permitted, hereby verifies that the information as submitted in the previously approved application to drill, remains valid and does not require revision.

Following is a checklist of some items related to the application, which should be verified.	Yes	No
If located on private land, has the ownership changed?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
If so, has the surface agreement been updated?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Have any wells been drilled in the vicinity of the proposed well which would affect the spacing or siting requirements for this location?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Have there been any unit or other agreements put in place that could affect the permitting or operation of this proposed well?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Have there been any changes to the access route including ownership or right-of-way, which could affect the proposed location?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Has the approved source of water for drilling changed?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Have there been any physical changes to the surface location or access route which will require a change in plans from what was discussed at the onsite evaluation?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Is bonding still in place, which covers this proposed well? Bond No. <u>B009096</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Any desired or necessary changes to either a pending or approved Application for Permit to Drill that is being transferred, should be filed on a Sundry Notice, Form 9, or amended Application for Permit to Drill, Form 3, as appropriate, with necessary supporting information as required.

Name (please print) Adam Richins Title Safety, Compliance and Regulatory Manager
Signature *Adam Richins* Date 04/20/2015
Representing (company name) NGL Supply Terminal Solution Mining, LLC

The person signing this form must have legal authority to represent the company or individual(s) to be listed as the new operator on the Application for Permit to Drill.

STATE OF UTAH
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING

UIC FORM 5

TRANSFER OF AUTHORITY TO INJECT

Well Name and Number CW-6	API Number 4302750003
Location of Well Footage : 442 N 284 W County : Millard County QQ. Section. Township. Range: NWNW 26 15S 7W State : UTAH	Field or Unit Name Lease Designation and Number State ML-51573.A-OBA

EFFECTIVE DATE OF TRANSFER: 2/17/2015

CURRENT OPERATOR

Company: <u>Magnum NGLs Solution Mining. LLC</u>	Name: <u>Adam Richins</u>
Address: <u>3165 E Millrock Drive Suite 330</u>	Signature: <u><i>Adam Richins</i></u>
<u>city Holladay state UT zip 84121</u>	Title: <u>Safety, Compliance & Regulatory Manager</u>
Phone: <u>(801) 993-7001</u>	Date: <u>4-20-15</u>

Comments: Entity is the same. Name of operator is changing.

NEW OPERATOR

Company: <u>NGL Supply Terminal Solution Mining. LLC</u>	Name: <u>Adam Richins</u>
Address: <u>6965 Union Park Avenue Suite 270</u>	Signature: <u><i>Adam Richins</i></u>
<u>city Midvale state UT zip 84047</u>	Title: <u>Safety, Compliance & Regulatory Manager</u>
Phone: <u>(801) 255-9632</u>	Date: <u>4-20-15</u>

Comments: Magnum NGLs Solution Mining. LLC is changing name to NGL Supply Terminal Solution Mining. LLC

(This space for State use only)

Transfer approved by: EPA
Title: _____

Approval Date: _____

Comments:

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APR 22 2014

Div. of Oil, Gas & Mining

STATE OF UTAH
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING

Request to Transfer Application or Permit to Drill

(This form should accompany a Sundry Notice, Form 9, requesting APD transfer)

Well name:	CW-7
API number:	430275004
Location:	Qtr-Qtr: SWSW Section: 23 Township: 15 S Range: 7 W
Company that filed original application:	Magnum NGLs Solution Mining, LLC
Date original permit was issued:	02/11/2014
Company that permit was issued to:	Magnum NGLs Solution Mining, LLC

Check one	Desired Action:
<input type="checkbox"/>	Transfer pending (unapproved) Application for Permit to Drill to new operator
	The undersigned as owner with legal rights to drill on the property, hereby verifies that the information as submitted in the pending Application for Permit to Drill, remains valid and does not require revision. The new owner of the application accepts and agrees to the information and procedures as stated in the application.
<input checked="" type="checkbox"/>	Transfer approved Application for Permit to Drill to new operator
	The undersigned as owner with legal rights to drill on the property as permitted, hereby verifies that the information as submitted in the previously approved application to drill, remains valid and does not require revision.

Following is a checklist of some items related to the application, which should be verified.	Yes	No
If located on private land, has the ownership changed?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/> If so, has the surface agreement been updated?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Have any wells been drilled in the vicinity of the proposed well which would affect the spacing or siting requirements for this location?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Have there been any unit or other agreements put in place that could affect the permitting or operation of this proposed well?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Have there been any changes to the access route including ownership or right-of-way, which could affect the proposed location?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Has the approved source of water for drilling changed?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Have there been any physical changes to the surface location or access route which will require a change in plans from what was discussed at the onsite evaluation?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Is bonding still in place, which covers this proposed well? Bond No. <u>B009096</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Any desired or necessary changes to either a pending or approved Application for Permit to Drill that is being transferred, should be filed on a Sundry Notice, Form 9, or amended Application for Permit to Drill, Form 3, as appropriate, with necessary supporting information as required.

Name (please print) Adam Richins Title Safety, Compliance and Regulatory Manager
 Signature *Adam Richins* Date 04/20/2015
 Representing (company name) NGL Supply Terminal Solution Mining, LLC

The person signing this form must have legal authority to represent the company or individual(s) to be listed as the new operator on the Application for Permit to Drill.

STATE OF UTAH
 DEPARTMENT OF NATURAL RESOURCES
 DIVISION OF OIL, GAS AND MINING

UIC FORM 5

TRANSFER OF AUTHORITY TO INJECT

Well Name and Number CW-7		API Number 4302750004
Location of Well Footage : 852 S 91 W County : Millard County		Field or Unit Name
QQ. Section. Township. Range: SWSW 23 15S 7W	State : UTAH	Lease Designation and Number State ML-51573.A-OBA

EFFECTIVE DATE OF TRANSFER: 2/17/2015

CURRENT OPERATOR

Company: <u>Magnum NGLs Solution Mining, LLC</u>	Name: <u>Adam Richins</u>
Address: <u>3165 E Millrock Drive Suite 330</u>	Signature: <u><i>Adam Richins</i></u>
<u>city Holladay state UT zip 84121</u>	Title: <u>Safety, Compliance & Regulatory Manager</u>
Phone: <u>(801) 993-7001</u>	Date: <u>4-20-15</u>

Comments: Entity is the same. Name of operator is changing.

NEW OPERATOR

Company: <u>NGL Supply Terminal Solution Mining, LLC</u>	Name: <u>Adam Richins</u>
Address: <u>6965 Union Park Avenue Suite 270</u>	Signature: <u><i>Adam Richins</i></u>
<u>city Midvale state UT zip 84047</u>	Title: <u>Safety, Compliance & Regulatory Manager</u>
Phone: <u>(801) 255-9632</u>	Date: <u>4-20-15</u>

Comments: Magnum NGLs Solution Mining, LLC is changing name to NGL Supply Terminal Solution Mining, LLC

(This space for State use only)

Transfer approved by: EPA
 Title: _____

Approval Date: _____

Comments:

RECEIVED

APR 2014

Div. of Oil, Gas & Mining

STATE OF UTAH
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING

Request to Transfer Application or Permit to Drill

(This form should accompany a Sundry Notice, Form 9, requesting APD transfer)

Well name:	CW-8
API number:	430275005
Location:	Qtr-Qtr: SWSW Section. 23 Township: 15 S Range: 7 W
Company that filed original application:	Magnum NGLs Solution Mining, LLC
Date original permit was issued:	11/25/2014
Company that permit was issued to:	Magnum NGLs Solution Mining, LLC

Check one	Desired Action:
<input type="checkbox"/>	Transfer pending (unapproved) Application for Permit to Drill to new operator
	The undersigned as owner with legal rights to drill on the property, hereby verifies that the information as submitted in the pending Application for Permit to Drill, remains valid and does not require revision. The new owner of the application accepts and agrees to the information and procedures as stated in the application.
<input checked="" type="checkbox"/>	Transfer approved Application for Permit to Drill to new operator
	The undersigned as owner with legal rights to drill on the property as permitted, hereby verifies that the information as submitted in the previously approved application to drill, remains valid and does not require revision.

Following is a checklist of some items related to the application, which should be verified.	Yes	No
If located on private land, has the ownership changed?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
If so, has the surface agreement been updated?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Have any wells been drilled in the vicinity of the proposed well which would affect the spacing or siting requirements for this location?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Have there been any unit or other agreements put in place that could affect the permitting or operation of this proposed well?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Have there been any changes to the access route including ownership or right-of-way, which could affect the proposed location?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Has the approved source of water for drilling changed?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Have there been any physical changes to the surface location or access route which will require a change in plans from what was discussed at the onsite evaluation?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Is bonding still in place, which covers this proposed well? Bond No. <u>B009096</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Any desired or necessary changes to either a pending or approved Application for Permit to Drill that is being transferred, should be filed on a Sundry Notice, Form 9, or amended Application for Permit to Drill, Form 3, as appropriate, with necessary supporting information as required.

Name (please print) Adam Richins Title Safety, Compliance and Regulatory Manager
 Signature *Adam Richins* Date 04/20/2015
 Representing (company name) NGL Supply Terminal Solution Mining, LLC

The person signing this form must have legal authority to represent the company or individual(s) to be listed as the new operator on the Application for Permit to Drill.

STATE OF UTAH
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING

UIC FORM 5

TRANSFER OF AUTHORITY TO INJECT

Well Name and Number CW-8	API Number 4302750005
Location of Well Footage : 805 S 548 W County : Millard County QQ. Section. Township. Range: SWSW 23 15S 7W State : UTAH	Field or Unit Name Lease Designation and Number State ML-51573.A-OBA

EFFECTIVE DATE OF TRANSFER: 2/17/2015

CURRENT OPERATOR

Company: <u>Magnum NGLs Solution Mining. LLC</u>	Name: <u>Adam Richins</u>
Address: <u>3165 E Millrock Drive Suite 330</u> <u>city Holladay state UT zip 84121</u>	Signature: <u><i>Adam Richins</i></u>
Phone: <u>(801) 993-7001</u>	Title: <u>Safety, Compliance & Regulatory Manager</u>
Comments: <u>Entity is the same. Name of operator is changing.</u>	Date: <u>4-20-15</u>

NEW OPERATOR

Company: <u>NGL Supply Terminal Solution Mining. LLC</u>	Name: <u>Adam Richins</u>
Address: <u>6965 Union Park Avenue Suite 270</u> <u>city Midvale state UT zip 84047</u>	Signature: <u><i>Adam Richins</i></u>
Phone: <u>(801) 255-9632</u>	Title: <u>Safety, Compliance & Regulatory Manager</u>
Comments: <u>Magnum NGLs Solution Mining. LLC is changing name to NGL Supply Terminal Solution Mining. LLC</u>	Date: <u>4-20-15</u>

(This space for State use only)

Transfer approved by: EPA
Title: _____

Approval Date: _____

Comments:

RECEIVED
APR 22 2014

STATE OF UTAH DEPARTMENT OF NATURAL RESOURCES DIVISION OF OIL, GAS, AND MINING	FORM 9
5.LEASE DESIGNATION AND SERIAL NUMBER: 51573-OBA	
SUNDRY NOTICES AND REPORTS ON WELLS	
Do not use this form for proposals to drill new wells, significantly deepen existing wells below current bottom-hole depth, reenter plugged wells, or to drill horizontal laterals. Use APPLICATION FOR PERMIT TO DRILL form for such proposals.	
6. IF INDIAN, ALLOTTEE OR TRIBE NAME:	
7.UNIT or CA AGREEMENT NAME:	
1. TYPE OF WELL Gas Storage Well	
8. WELL NAME and NUMBER: CW-7	
2. NAME OF OPERATOR: NGL SUPPLY TERMINAL SOLUTION MINING, LLC	
9. API NUMBER: 43027500040000	
3. ADDRESS OF OPERATOR: 6965 Union Park Avenue, Suite 270 , Midvale, UT, 84047	
PHONE NUMBER: 801 255-9632 Ext	
9. FIELD and POOL or WILDCAT: DELTA SALT CAVERN STORAGE	
4. LOCATION OF WELL FOOTAGES AT SURFACE: 0852 FSL 0091 FWL QTR/QTR, SECTION, TOWNSHIP, RANGE, MERIDIAN: Qtr/Qtr: SWSW Section: 23 Township: 15.0S Range: 07.0W Meridian: S	
COUNTY: MILLARD	
STATE: UTAH	

11. CHECK APPROPRIATE BOXES TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

TYPE OF SUBMISSION	TYPE OF ACTION		
<input checked="" type="checkbox"/> NOTICE OF INTENT Approximate date work will start: 9/26/2016	<input type="checkbox"/> ACIDIZE	<input type="checkbox"/> ALTER CASING	<input type="checkbox"/> CASING REPAIR
<input type="checkbox"/> SUBSEQUENT REPORT Date of Work Completion:	<input type="checkbox"/> CHANGE TO PREVIOUS PLANS	<input type="checkbox"/> CHANGE TUBING	<input type="checkbox"/> CHANGE WELL NAME
<input type="checkbox"/> SPUD REPORT Date of Spud:	<input type="checkbox"/> CHANGE WELL STATUS	<input type="checkbox"/> COMMINGLE PRODUCING FORMATIONS	<input type="checkbox"/> CONVERT WELL TYPE
<input type="checkbox"/> DRILLING REPORT Report Date:	<input type="checkbox"/> DEEPEN	<input type="checkbox"/> FRACTURE TREAT	<input type="checkbox"/> NEW CONSTRUCTION
	<input type="checkbox"/> OPERATOR CHANGE	<input type="checkbox"/> PLUG AND ABANDON	<input type="checkbox"/> PLUG BACK
	<input type="checkbox"/> PRODUCTION START OR RESUME	<input type="checkbox"/> RECLAMATION OF WELL SITE	<input type="checkbox"/> RECOMPLETE DIFFERENT FORMATION
	<input type="checkbox"/> REPERFORATE CURRENT FORMATION	<input type="checkbox"/> SIDETRACK TO REPAIR WELL	<input type="checkbox"/> TEMPORARY ABANDON
	<input type="checkbox"/> TUBING REPAIR	<input type="checkbox"/> VENT OR FLARE	<input type="checkbox"/> WATER DISPOSAL
	<input type="checkbox"/> WATER SHUTOFF	<input type="checkbox"/> SI TA STATUS EXTENSION	<input type="checkbox"/> APD EXTENSION
	<input type="checkbox"/> WILDCAT WELL DETERMINATION	<input checked="" type="checkbox"/> OTHER	OTHER: <input type="text" value="Drilling Mud Pit Closure"/>

12. DESCRIBE PROPOSED OR COMPLETED OPERATIONS. Clearly show all pertinent details including dates, depths, volumes, etc.

Closure of Mud Pit from drilling operations. Pit will be emptied of any water, liner will be perforated and/or shredded, and pit will be filled with native soil to previous grade.

Approved by the
October 27, 2016
Oil, Gas and Mining

Date: _____
By: 

NAME (PLEASE PRINT) Adam Richins	PHONE NUMBER 801 255-9632	TITLE Compliance Manager
SIGNATURE N/A	DATE 9/23/2016	