

RCO III
PETROLEUM PERMITTING

Robert C. Orman III
Consultant
R.O.W.
Drill Site
Seismic

September 12, 2001

State of Utah
Oil & Gas Program – Brad Hill
1594 West North Temple
Suite 1210
Salt Lake City, UT 84114-5801

Dear Brad:

Enclosed is Anschutz Exploration Corporation's Application for Permit to Drill Headwaters Federal #7-15, located in San Juan County, Utah, SW/NE Sec. 15 T28S R23E. If there are any questions please contact me at the following address:

RCO III Petroleum Permitting
2690 Dane Lane
Grand Junction, CO 81506
970-263-0303

Sincerely,



Robert C. Orman

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
APPLICATION FOR PERMIT TO DRILL OR REENTER

1a. Type of Work: <input checked="" type="checkbox"/> DRILL <input type="checkbox"/> REENTER		5. Lease Serial No. UTU-77072
1b. Type of Well: <input checked="" type="checkbox"/> Oil Well <input checked="" type="checkbox"/> Gas Well <input type="checkbox"/> Other <input type="checkbox"/> Single Zone <input checked="" type="checkbox"/> Multiple Zone		6. If Indian, Allottee or Tribe Name N/A
2. Name of Operator Anschutz Exploration Corporation, 555 17 St. Denver, CO 80202 contact Eric Root 303-299-1479		7. If Unit or CA Agreement, Name and No. N/A
3a. Address agent: Robert Orman 2690 Dane Ln, Gr. Junction, CO 81506		8. Lease Name and Well No. Headwaters Fed 7-15
3b. Phone No. (include area code) 970-263-0303		9. API Well No. N/A 43-037-31822
4. Location of Well (Report location clearly and in accordance with any State requirements. *) At surface: SW NE sec. 15 T28S R23E; 2469 FNL 2439 At proposed prod. zone: 4247500N 642010E FEL same +/-		10. Field and Pool, or Exploratory Expl.
14. Distance in miles and direction from nearest town or post office* 33.5 miles from Moab, UT, Hwy 191 S. to Hwy 41 E. Cty Rd. 174 NE		11. Sec., T., R., M., or Blk. and Survey or Area SWNE sec. 15 T28S R23E
15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. unit line, if any) 171' Utah State exception required	16. No. of Acres in lease 1440	17. Spacing Unit dedicated to this well 40 (N/A)
18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft. 5 miles (N/A)	19. Proposed Depth 7050'	20. BLM/BIA Bond No. on file CO-1040
21. Elevations (Show whether DF, KDB, RT, GL, etc.) 6251' GL	22. Approximate date work will start* 10/2001	23. Estimated duration 20-30 days

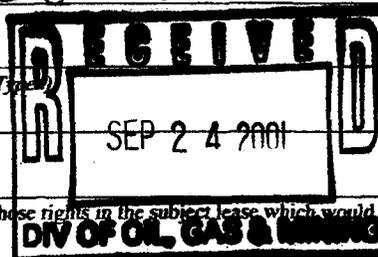
24. Attachments

The following, completed in accordance with the requirements of Onshore Oil and Gas Order No.1, shall be attached to this form:

- Well plat certified by a registered surveyor.
- A Drilling Plan.
- A Surface Use Plan (if the location is on National Forest System Lands, the SUPO shall be filed with the appropriate Forest Service Office).
- Bond to cover the operations unless covered by an existing bond on file (see item 20 above).
- Operator certification.
- Such other site specific information and/or plans as may be required by the authorized officer.

25. Signature <i>Robert C. Orman</i>	Name (Printed/Typed) Robert C. Orman	Date 9-12-01
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Permit Agent for Anschutz Exploration Corporation	Name (Printed/Typed) BRADLEY G. HILL RECLAMATION SPECIALIST III	Date 11-20-01
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Application approval does not warrant or certify the the applicant holds legal or equitable title to these rights in the subject lease which would entitle the applicant to conduct operations thereon.

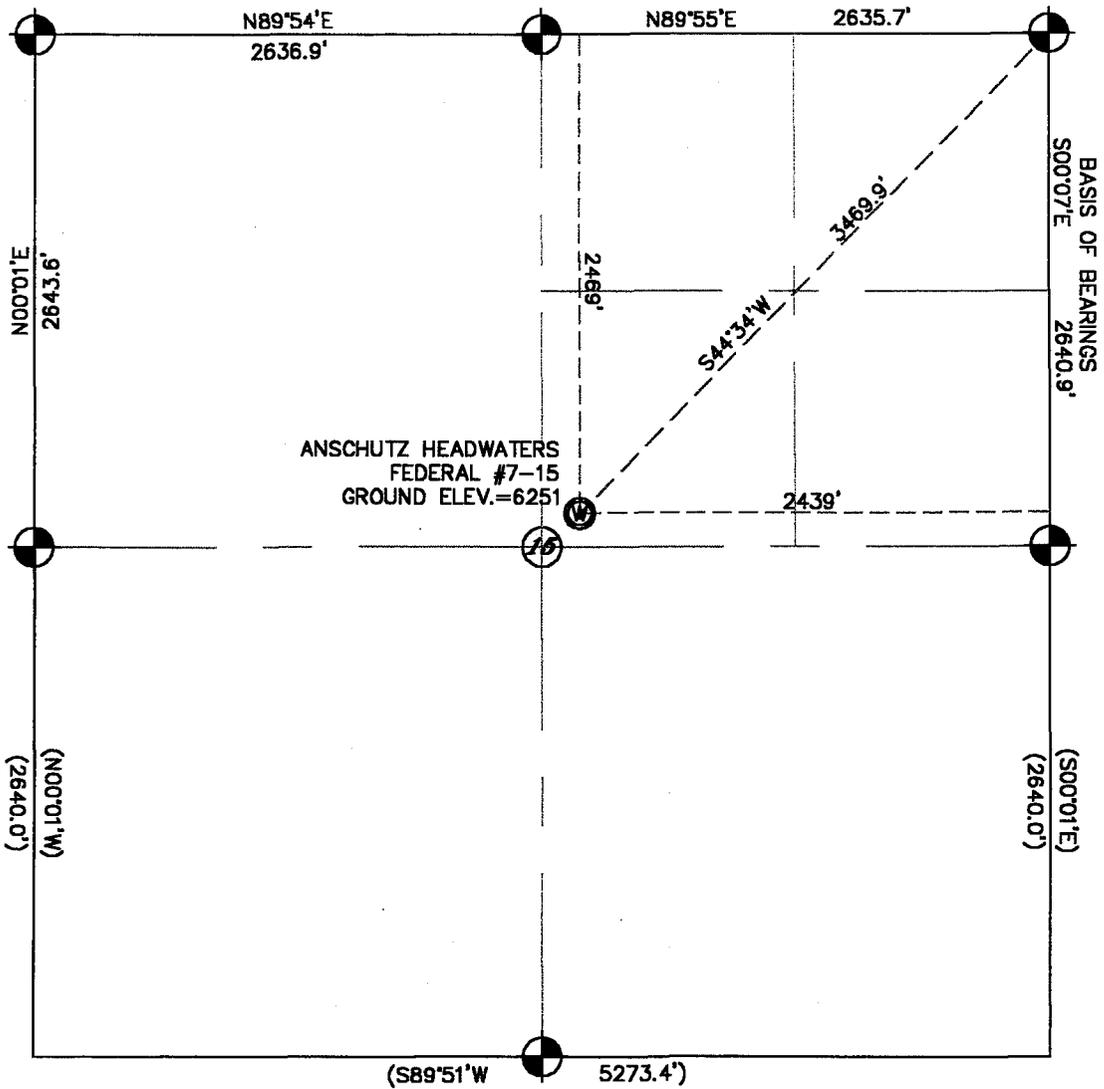
Conditions of approval, if any, are attached.

Title 18 U.S.C. Section 1001 and Title 43 U.S.C. Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

*(Instructions on reverse)

Federal Approval of this Action is Necessary

SECTION 15, T 28 S, R 23 E, SLM



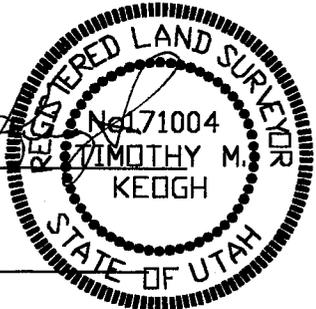
SCALE 1"=1000'

LEGEND

-  FOUND GOVERNMENT BRASS MONUMENT
-  SET SPIKE WITH LATH AT PROPOSED WELL LOCATION

Timothy M. Keogh
TIMOTHY M. KEOGH

Sept. 7-01
DATE



KEOGH LAND SURVEYING

45 EAST CENTER STREET MOAB, UTAH, 84532

A SURVEY OF

**ANSCHUTZ HEADWATERS
FEDERAL #7-15**

WITHIN SECTION 15, T 28 S, R 23 E, SLM,
SAN JUAN COUNTY, UTAH

PREPARED FOR

ANSCHUTZ EXPLORATION CORPORATION

DATE: 9-07-01	DRAWN BY: TMK	CHECKED BY: TMK
SCALE: 1"=1000'	F.B.# 141	ANSCHUTZ

CONFIDENTIAL – TIGHT HOLE

ONSHORE OIL AND GAS ORDER NO. 1

Approval of Operations Onshore
Federal and Indian Oil & Gas Leases

Headwaters Federal #7-15
Anschutz Exploration Corporation
Lease #UTU-77072
SWNE Sec. 15T28SR23E
San Juan County, Moab, Utah

Prepared by:
RCO III Petroleum Permitting
2690 Dane Lane
Grand Junction, CO 81506
(970) 263-0303

Copies Sent To:
3 – BLM – Moab, Utah
2 – State of Utah – Oil & Gas Program
4 – Anschutz Exploration Corporation

Confidential – Tight Hole
Anschutz Exploration Corp.
Lease # UTU-77072
SWNE Sec. 15T28SR23E
San Juan, Co., UT

RCOIII Petroleum Permitting

DRILLING PLAN
Headwaters Fed# 7-15
San Juan Co., Utah

ONSHORE OIL & GAS ORDER NO.1
Approval of Operations on Onshore
Federal and Indian Oil and Gas Leases

All Lease and/or unit operations are to be conducted in such a manner that full compliance is made with applicable laws, regulations (CFR 43, Part 3160) and the approved Application for Permit to Drill. The operator is considered fully responsible for the actions of his subcontractors. A copy of the approved APD must be on location during construction, drilling and completion operations.

Approval of this application does not warrant or certify that the applicant hold legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.

1. The estimated tops of important geological makers are as follows:

Navajo – Surface elevation 6251’
G Sands – none
Hermosa – 4691’
Honaker – Trail 5655’
La Sal – 5980’
Upper Ismay – 6580’
Lower Ismay – 6830’

2. Estimated Depth at Which Oil, Gas, Water or Other Mineral Bearing Zones are Expected to be Encountered:

Depth/Formation

Expected Oil Zones: La Sal 5980’, Upper Ismay 6580’, Lower Ismay 6830’
Expected Gas Zones: Honaker Trail 5655’
Expected Water Zones: Navajo 971’, Wingate 1577’, Hoskinnini 2705’
Expected Mineral Zones: Paradox Salt 6,645’

All fresh water and prospectively valuable minerals encountered during drilling will be recorded by depth and will be cased and cemented. When possible, water flow rates will be measured and samples will be taken and analyzed with the results being submitted to BLM. All oil and gas shows will be tested to determine commercial potential.

3. Surface Location: SW NE 2469' FNL 2439' FEL Sec. 15 T28S R23E. See Location Plat in APD Section.
4. PRESSURE CONTROL EQUIPMENT:

After setting surface casing at 900', 5000 psi equipment is required. Equipment will be installed per Exhibit A & B. Test pressures will be as follows:

11" – 5000 – 5000 psi ram type BOP's	5000 psi
11" – 5000 – 5000 psi annular BOP's	5000
Ancillary equipment and choke manifold	5000

Surface Casing

BOP systems will be consistent with API RP 53 and Onshore Oil and Gas Order No. 2. Pressure tests of the surface casing and all BOP equipment potentially subject to pressure will be conducted before drilling the surface casing shoe. Blowout preventer controls will be installed prior to drilling the surface casing shoe and will remain in use until the well is completed or abandoned. Ram preventers shall be inspected and operated each trip (no more than once a day is necessary), and annular preventers shall be inspected and operated weekly to ensure good mechanical working order. These inspections shall be recorded in the drilling log and in the daily drilling report.

The accumulator will have sufficient capacity to close all rams and annular preventer, and to open the hydraulically controlled valve. Two sets of hydraulic controls will be utilized with one set on the rig floor and one set in the accumulator house.

AUXILIARY EQUIPMENT"

- a. Manually operated kelly cocks.
- b. Full opening floor valves capable of fitting all drillstring connections will be kept on the floor in the open position.

5. CASING PROGRAM:

SIZE	INTERVAL	WEIGHT	GRADE	THREAD	CONDITION
	Top/Bottom				
9-5/8	sfc 900	36	J-55	ST&C	New
5-1/2	sfc 7050	15.5/17	J-55/HCN80	LT&C	New

CASING STRENGTHS:			COLLAPSE	BURST	TENSILE
9-5/8	36	J-55	STC 2020	3520	394
5-1/2	15.5/17	J-55/HCN80	LTC 4040	4810	217
	17	HCN80	LTC 8580	7740	356

MINIMUM DESIGN FACTORS:

Collapse: 1.125
Burst: 1.0
Tension: 1.8
Casing Formation Pressure Gradients: .443-.50 PSI per foot
Area Fracture Gradient: .7-.8 PSI per foot

CEMENTING PROGRAM:

Surface

Lead: 0-659' – 185 sx 50:50 Poz/Class G cement w/2% calcium chloride, 0.25 lbs/sk celloflake & 8% bentonite, yield 2.27 sx/ft3
Tail: 650-900' – 165 sx Class G cement with 2% calcium chloride, and 0.25 lbs/sk celloflake, yield 1.17 ft3/sk
Topout: As needed with Class G cement to get cement to surface

Production

Single System: 4700-7050' – 593 sx Class G cement w/4% bentonite, yield 1.52 ft3/sk

6. MUD PROGRAM:

Spud mud will be used to drill surface (gel & lime). System will be converted to a low solids non-dispersed gel polymer system with WL of 6 to 10 from under surface, wt. Of 9.1-9.8 and Vis of 40-45 will be maintained until more wt. is needed, possibly preparing logs, then will be 9.5-12.0 ppg as needed. Sufficient mud materials to maintain mud properties, control lost circulation, and to contain blowout will be available at the well site. All mud additives are biodegradable and material safety data sheets will be kept on location at all times. No chrome constituent additives will be used in the mud system on Federal and Indian lands without prior BLM approval to ensure adequate protection of fresh water aquifers.

7. LOGGING:

Type Log Suite	Interval Top	Interval Bottom	Log Scale
Dual Laterlog/BHC Sonic/GR/Cal	Surface Casing	TD	1", 2", 5"
Lithodensity/Compensated Neutron/GR	Surface Casing	TD	5", 5"
Possible Structural/Stratigraphic HDT	Surface Casing	TD	2", 5"

Testing: Honaker Trail 5500'

Coring: none

8. ABNORMAL PRESSURE AND TEMPERATURE:

There will be no overpressured formation. A BHT of 175-190 degrees F is expected. A BHP of 3150 psi is expected. No H2S is anticipated.

9. ANTICIPATED STARTING DATE:

October 2001

DURATION OF OPERATION:

20 days

No location will be moved, no well will be plugged and no drilling or workover equipment will be removed from a well to be placed in a suspended status without prior approval of the District Manager. If operations are to be suspended, prior approval of the District Manager will be obtained and notification given before resumption of operations.

The spud date will be reported orally to the District Manager within a minimum of twenty-four (24) hours prior to spudding. Written notification in the form of a Sundry Notice (Form 3160-5) will be submitted to the District Office within twenty-four (24) hours after spudding. If the spudding occurs on a weekend or holiday, the written report will be submitted on the following regular work day.

In accordance with Onshore Oil and Gas Order No. 1, this well will be reported on Form 9-329, "Monthly Report of Operations", starting with the month in which operations commence and continue each month until the well is physically plugged and abandoned. This report will be filed directly with the Minerals Management Office, Production Accounting Division, P.O. Box 25765, Denver, CO 80225.

Immediate Report: Spills, blowouts, fires, leaks, accidents, or any other unusual occurrences shall be promptly reported to the Resource Area in accordance with requirement of NTL-3A.

If a replacement rig is contemplated for completion operations, a "Sundry Notice" (Form 3160-5) to that effect will be filed for prior approval of the District Manager and all conditions of this approved plan are applicable during all operations conducted with the replacement rig. In emergency situations, verbal approval to bring on a replacement rig will be approved by the District Petroleum Engineer.

Should the well be successfully completed for production, the District Manager will be notified when the well is placed in a producing status. Such notification will be sent by telegram or other written communication, not later than 5 (5) business days following the date on which the well is placed into production.

A first production conference will be scheduled within fifteen (15) days after receipt of the first production report. The Resource Area Office will coordinate the field conference.

No well abandonment operations will be commenced without prior approval of the District Manager. In the case of newly drilled dry holes or failures, and in emergency situations, oral approval will be obtained from the District Petroleum Engineer. A "Subsequent Report of Abandonment" (Form 3160-5) will be filed with the District Manager within thirty (30) days following completion of the well abandonment. This

report will indicate where plugs were placed and the current status of surface restoration. Final abandonment notice has been completed to the satisfaction of the Area Manager or his representative, or the appropriate surface managing agency.

Approval to vent/flare gas during initial well evaluation will be obtained from the District Office. The preliminary approval will not exceed 30 days or 50 MMCF gas. Approval to vent/flare beyond this initial period will require District Office approval pursuant to guidelines in NTL-4A.

Upon completion of approval plugging, a regulation marker will be erected in accordance with 43 CFR 3152.6. The marker will be constructed after contouring. The top of the marker will be closed or capped and the following minimum information will be permanently placed on the marker with a plate, cap or beaded-on with a welding torch: "Fed", "Well number, location by ¼ section, township and range", and "Lease Number".

10. Anschutz will be operating under BLM Bond# CO-1040.

Confidential – Tight Hole
Anschutz Exploration Corp.
Lease # UTU-77072
SWNE Sec. 15T28SR23E
San Juan, Co., UT

RCOIII Petroleum Permitting

SURFACE USE PLAN
Headwaters Fed# 7-15
San Juan Co., Utah

ONSHORE OIL & GAS ORDER NO.1
Approval of Operations on Onshore
Federal and Indian Oil and Gas Leases

1. Existing Roads: From Moab take Highway 191 south 22 miles to La Salle Junction, turn east on Highway 46, go 6 miles to County Road 174 (C.O. Rd. 174 is just before Uranium Mine Mill hopper, on left side of road), Go back to the north (left) on County Road 174, approximately 7.5 miles. Location on east side of County Road.

Anschutz/Contractor will contact the County Road Department for use of county roads. The use of San Juan County roads will require an encroachment permit from the San Juan County Road Department.

Improvement and/or maintenance of existing roads will be done as needed.

2. Planned Access Road:

1. Location staked and flagged – see map. Less than 300 feet of new access to be constructed. There are no existing roads to be upgraded.

Maximum total width disturbed 35 feet

Maximum travel surface width 18-21 feet

Maximum grade less than 5%. No turnouts. No surface materials. None for drilling. Drainage (crowning, ditching, culverts, etc.) will be done as needed for production.

No cattle guards are needed.

The length of new and/or existing roads which lie outside the lease or unit boundary for which a BLM right-of-way is required is a portion of the new access between County Road 174 and lease boundary.

This APD provides all specifications for the right-of-way and we request the APD be used for the right-of-way application.

Surface disturbance and vehicular travel will be limited to the approved location and access road. Any additional area needed must be approved by BLM in advance.

If a right-of-way is necessary, no surface disturbing activities shall take place on the subject right-of-way until the associated APD is approved. The holder will adhere to conditions of approval in the Surface Use Program of the approved APD, relevant to any right-of-way facilities.

If a right-of-way is secured, boundary adjustments in the lease or unit shall automatically amend this right-of-way to include that portion of the facility no longer contained within the lease or unit. In the event of an automatic amendment to this right-of-way grant, the prior on-lease/unit conditions of approval of this facility will not be affected even though they would now apply to facilities outside of the lease/unit as a result of a boundary adjustment. Rental fees, if appropriate shall be recalculated based on the conditions of this grant and the regulations in effect at the time of an automatic amendment.

If at any time the facilities located on public lands authorized by the terms of the lease are no longer included in the lease (due to a contraction in the unit or other lease or unit boundary change) the BLM will process a change in authorization to the appropriate statute. The authorization will be subject to appropriate rental, or other financial obligations determined by the BLM.

If the well is productive, the access road will be rehabilitated or brought to Resource (Class III) Road Standards within 60 days of dismantling the rig. If upgraded, the access road must be maintained at these standards until the well is properly abandoned. If this time frame cannot be met, the Field Office Manager will be notified so that temporary drainage control can be installed along the access road.

3. Proposed Pipeline Access: To be determined if production is obtained
4. Location of Existing Wells: No wells within a 5 mile radius
5. Location of Tank Batteries and Production Facilities: See Exhibit "C".

All permanent (onsite for six (6) months or longer) structures constructed or installed will be painted a flat, non-reflective, earth tone color to match the standard environmental colors, as determined by the Rocky Mountain Five State Interagency Committee. All facilities will be painted within six (6) months of installation. Facilities required to comply with the Occupational Safety and Health Act (OSHA) may be excluded. Colors will match trees and/or rocks, etc. Paint used on above ground structures will be as required by BLM.

All site security guidelines identified in 43 CFR ss 3162.7-5 and Onshore Oil and Gas Order No.3 shall be followed.

If a gas meter run is constructed, it will be located on lease within 500 feet of the wellhead. The gas flowline will be buried from the wellhead to the meter and will be buried downstream of the meter until it leaves the pad. Meter runs will be housed and/or fenced. The gas meter shall be calibrated prior to first sales and shall be calibrated quarterly thereafter. All gas production and measurement shall comply with the provisions of 43 CFR ss 3162.7, Onshore Oil and Gas Order No.5, and American Gas Association (AGA) Report No.3.

If a tank battery is constructed on this lease, it will be surrounded by a berm of sufficient capacity to contain 1 ½ times the storage capacity of the largest tank. All loading lines and valves will be placed inside the berm surrounding the tank battery. All oil production and measurement shall conform to the provisions of 43 CFR ss 3162.7 and Onshore Oil and Gas Order No.4.

Production facilities on location may include a lined or unlined produced water pit as specified in Onshore Oil and Gas Order No.7. If water is produced from the well, an application in conformance with Order No.7 must be submitted.

6. Location and Type of water Supply: Will be purchased from an undetermined water source/hauler. Will be specified prior to drilling; possibly Moab City or Rattlesnake Ranch, or water well will be drilled. A temporary water use permit for this operation will be obtained from the Utah State Engineer in Price, Utah, at (801) 637-1303 and provided by water well driller.
7. Source of Construction Materials: none required
8. Methods of handling waste disposal: The mud pits will be well constructed and under no circumstances will they be allowed to leak or be cut to drain. They will not be located on natural drainages. Waste or discharge of any kind will not be allowed to enter any drainage. All unattended pits containing will be fenced (stock tight) and the liquid portion allowed to evaporate before the pits are broken. Three (3) sides of the pits will be fenced while drilling is being done; the fourth to be done as soon as drilling is completed. When it has been determined to backfill reserve pit, there will be a cover of 4 to 5 feet.

Produced wastewater is used in our drilling operations after completion of the well.

A permanent steel tank will be installed in the ground next to the production facilities to contain produced water for the duration of the well. It will be disposed of at the Black Mountain disposal facility.

Cuttings: These will be contained on the location in the reserve pit.

Drilling fluids and chemicals: These will be contained in the reserve pit.

Sewage: Chemical toilets or an enclosed sewer system will be used. Contents will be disposed of at an approved disposal facility.

Garbage and other waste materials: All garbage and trash will be stored in a totally Enclosed trash container and removed and deposited in an approved sanitary landfill within one week following termination of drilling operations. No garbage or trash will be disposed of in the reserve pit. The well site and access road will be kept free of trash and debris at all times.

9. Ancillary Facilities: none

10. Well Site Layout: Exhibit 1A shows the rig layout. Exhibit 1A shows the pad pit layout. Exhibits 2A illustrate cuts and fills. Exhibit 3A shows production equipment layout.

The reserve pit will be located on south/west corner of the location. A pit liner, if needed, will be used in accordance to section 02666C Temporary Lining For Reserve Pits or acceptable specifications.

There is no topsoil. Wood and vegetation remains will be stockpiled on the north/northwest side of location on Two Track Road.

The access road to the location will come from the west off of County Road 174.

The trash cage will be located on the south end of the location.

The reserve pit will be constructed in cut construction with at least 50% of the pit volume being below original ground level.

All cut slopes associated with pad construction will be "step cut" and left rough to provide a seed catchment surface. Cut slopes required for pad construction will not be steeper than 2:1 or 3:1. Cut slopes for required ancillary pits may be steeper.

The surface location is on BLM property therefore the authorized officer for the Bureau of Land Management will be notified prior to constructing the well pad, access road, pipeline and/or related facilities.

11. Plans for Restoration of Surface:

Immediately upon completion of drilling, the location and surrounding area will be cleared of all remaining debris, materials, trash and junk not required for production and hauled to the nearest legal landfill.

Before any dirt work to restore the location takes place the reserve pit will be dry.

The operator or his contractor will notify the Bureau of Land Management, Moab Resource Are, 435-259-6111, forty-eight (48) hours before starting reclamation work that involves earth moving equipment and upon completion of restoration measures.

All disturbed areas will be recontoured to the approximate natural contours with the compacted area ripped 12" to 18" before the topsoil is redistributed.

The stockpile topsoil will be evenly distributed over the disturbed areas.

Seed will be broadcast at a time specified by the BLM. When seed is broadcast, the surface will be left rough after ripping so that seed can have natural cover. Seed mix when broadcast will be at 19-21 lbs. If drilled, the same mix will be used at 10-12 lbs. Per acre. Noxious weeds will be controlled on disturbed areas in accordance with guidelines established by BLM, EPA, and State land authorities. The reserve pit and that portion of the location and access road not needed for production facilities will be reclaimed.

Reclamation Goals: The reclamation goal is to control erosion on the site and establish desirable (seeded and native) vegetation to set the stage for natural processes to restore the site. Anschutz will implement any/all reasonable and prudent practices necessary to achieve the reclamation goal. Seed will be broadcast or drilled between October 1 and

December 15 or at a time specified by the BLM. If broadcast a harrow or some other implement will be dragged over the seeded area to assure seeded coverage. The following seed mixture will be used: Fourwing Saltbush-four pounds per acre, Indian Ricegrass four pounds per acre, Western Wheatgrass four pounds per acre, Cliffrose 2 pounds per acre.

Reclamation Objectives: Erosion on a site will be considered controlled when water naturally infiltrates into soil; gulleying, headcutting or slumping is not observed; rills are less than 3 inches deep; and deeper or excessive rilling is not observed. The site will be photographed to document the presence or absence of gullies, headcuts, slumps or rills and observations noted.

Desirable vegetation on a site will be considered when:

No noxious weeds are present. Noxious weeds are listed on the county and state noxious weed lists. All noxious weeds will be treated. On a case-by-case basis, it will be photographed at representative locations on the site and adjacent undisturbed areas. The site will be diagrammed. A site form will be filled out; BLM will monitor reclamation status as necessary to ensure operator compliance with the APD.

Evaluation of current reclamation: The results of the monitoring will determine whether and to what degree the objectives are being achieved and thus form the basis for necessary follow up actions, such as retreatment, determination of the reclamation categories, and releasing the Anschutz bond.

Operator Monitoring: Anschutz shall report annually to the BLM the reclamation status of all sites categorized as "operator reclamation in progress". The purpose of this reporting is to document the operator's compliance with reclamation stipulations in the APD, reclamation practices, and the success of those practices.

12. Surface and mineral ownership: Federal/Federal

13. Other information:

There will be no deviation from the proposed drilling and/or workover program without prior approval from the District Manager. Safe drilling and operating practices must be observed.

Sundry Notice an Report on Wells (Form 3160-5) will be filed for approval for all changes or plans and other operations in accordance with 43 CFR 3164.

The dirt contractor will be provided with an approved copy of the surface use plan.

A cultural resource clearance inventory has been completed. A copy will be sent to Moab office. If any new cultural resources are found during construction, all work will stop and the Area Manager will be notified.

a. Archeological Concerns: Archaeological side north of well site will be avoided. Trees and brush will be stockpiled on old two track trail to block access to the archaeological site.

The operator is responsible for informing all persons in the area who are associated with this project that they will be subject to prosecution for knowingly disturbing historic or archaeological sites, or for collecting artifacts. If historic or archaeological materials are uncovered during construction, the operator is to immediately stop work that might further disturb such materials, and contact the BLM Field Office. Within five (5) working days, the BLM will inform the operator as to:

- whether the materials appear eligible for the National Register of Historic Places;
- the mitigation measures the operator will likely have to undertake before the site can be used (assuming in situ preservation is not necessary); and
- a time frame for the BLM to complete an expedited review under 36 CFR § 800.11 to confirm, through the State Historic Preservation Officer, that the findings of the BLM are correct and that mitigation is appropriate.

If the operator wishes, at any time, to relocate activities to avoid the expense of mitigation and/or the delays associated with this process, the BLM will assume responsibility for whatever recordation and stabilization of the exposed materials may be required. Otherwise, the operator will be responsible for mitigation costs. The BLM will provide technical and procedural guidelines for the conduct of mitigation. Upon verification from the BLM that the required mitigation has been completed, the operator will then be allowed to resume construction.

This permit will be valid for a period of one (1) year from the date of approval. After permit termination, a new application will be filed for approval for any future operations.

Chemical pesticides or any other control agent which represents a potential soil, air, or water pollutant will not be utilized for any purpose on public lands without expressed written authorization from the authorized officer of the BLM which may be necessary to treat adjacent lands in order to prevent the spread of noxious weeds onto reclaimed sites. Undesirable vegetation comprises little (less than 5%) of the species composition on sites with 3 or more growing seasons. On sites with one or two growing seasons post treatment, some undesirable vegetation is expected, but will be considered a problem only when there is no emergence of the planted species. For this objective, desirable vegetation is native or species included in the seed mix.

Desirable vegetation appears vigorous and self-sustaining. The plants have the opportunity to complete their annual life cycles. This objective will be evaluated by observing the size, color and vigor of the plants, and noting the presence of new growth shoots, flowers, litter build-up, and seedlings.

Adequate diverse vegetation is present. The site appears to be fully occupied with primarily desirable vegetation and contains a mixture of grasses, forbs, and shrubs. Ideally a good grass cover with an estimated 10% forbs and 5%-10% shrubs would be present and the canopy cover of the reclaimed site should be equal to or greater than similar sites on the adjacent undisturbed area.

14. The Reclamation Timeline: A site goes through four distinct stages from initial disturbance to Restoration. A site can be in more than one stage of reclamation.

Area in use: At first this is the entire site. After drilling is complete and the site is in production, this area includes the road surface, production facilities and the associated vehicle access areas.

Operator Reclamation in Progress: Anschutz will implement reclamation practices as soon as possible after disturbance and every year thereafter as necessary to achieve the reclamation objectives.

Operator Reclamation Complete: When reclamation objectives have been achieved for two consecutive years. Periodic monitoring of these sites will continue until they are abandoned by the operator.

Restored: Successional processes no longer associated with oil and gas development are the dominant modifiers, and the site is no longer distinctly different from the surrounding area. In the harsh and arid environment of the western portion of the resource area, and because perennial species were planted as a reclamation practice, it is likely that sites would not be considered restored any sooner than 20 years after disturbance.

Monitoring Methods: To evaluate achievement of the objectives and determine the stage of reclamation, canopy cover by species will be measured or estimated and a 3-foot by 3 foot grid.

15. Lessee's or Operator's Representative and Certification:

Permitting Agent: Robert C. Orman
RCOIII Petroleum Permitting
2690 Dane Lane
Grand Junction, CO 81506
Phone: 970-263-0303
Fax: 970-263-0414
Email: rcorman3@aol.com

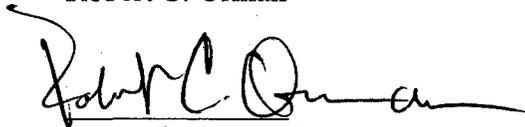
Operator: Anschutz Exploration Corp.
555 17th St., Suite 2400
Denver, CO 80202
Eric Root, Engineer, (303) 299-1479
Haw Gallagher, Drilling Superintendent
Office (303) 299-1532
Cell (303) 898-7464

Emergency phone line: (888) 696-1300

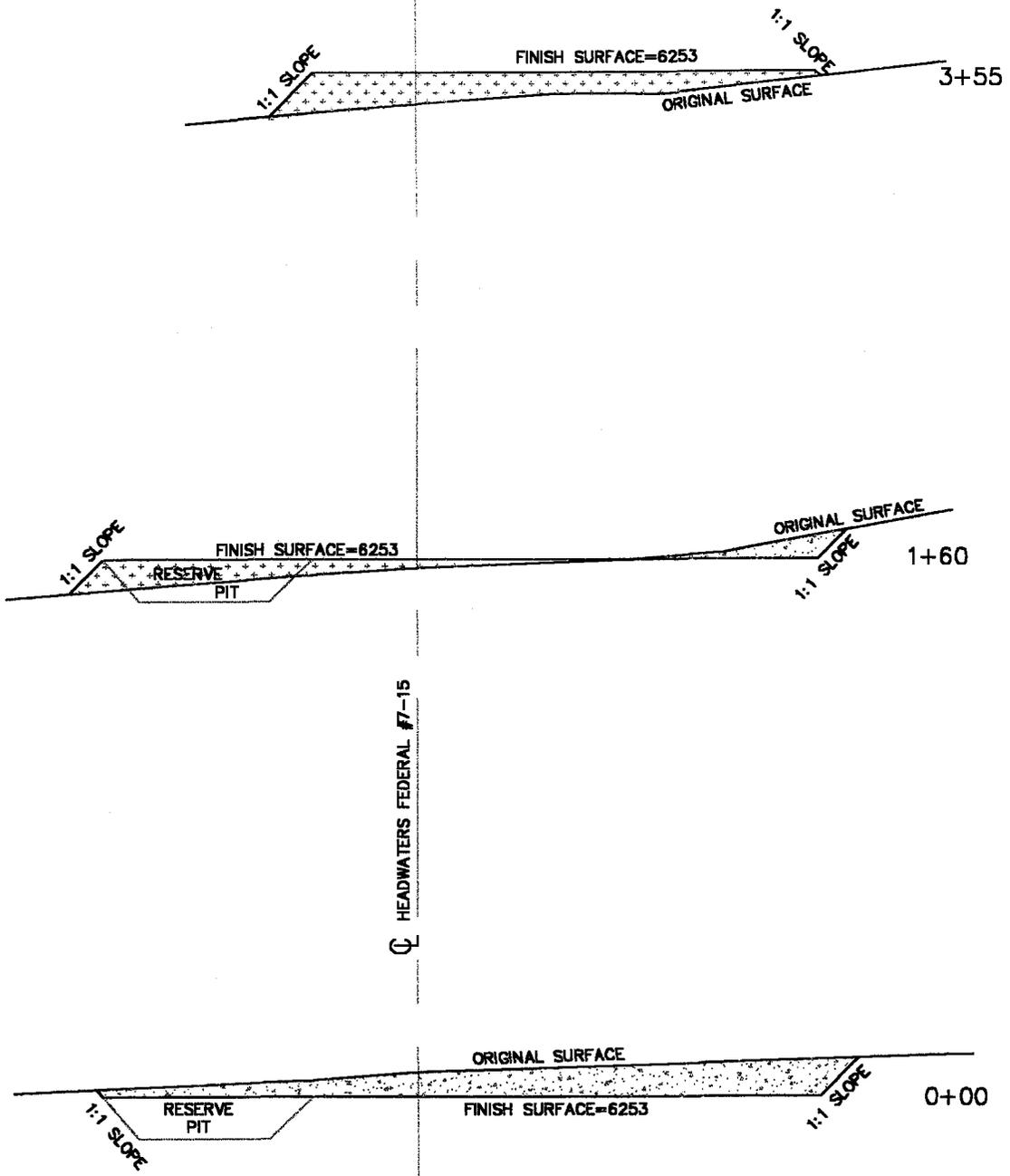
Certification: I hereby certify that I, or persons under my direct supervision, have inspected the proposed drill site and access route; that I am familiar with the conditions which currently exist; that the statements made in the plan are, to the best of my knowledge, true and correct; and that work associated with the operations proposed

herein will be performed by Anschutz Exploration Corp. and its contractors and subcontractors in conformity with this plan and the terms and conditions under which it is approved. This statement is subject to the provisions of 18 U.S.C. 1001 for the filing of false statements.

By: Robert C. Orman

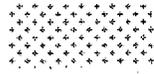
A handwritten signature in black ink, appearing to read "Robert C. Orman", written over a horizontal line.

Date: September 12, 2001

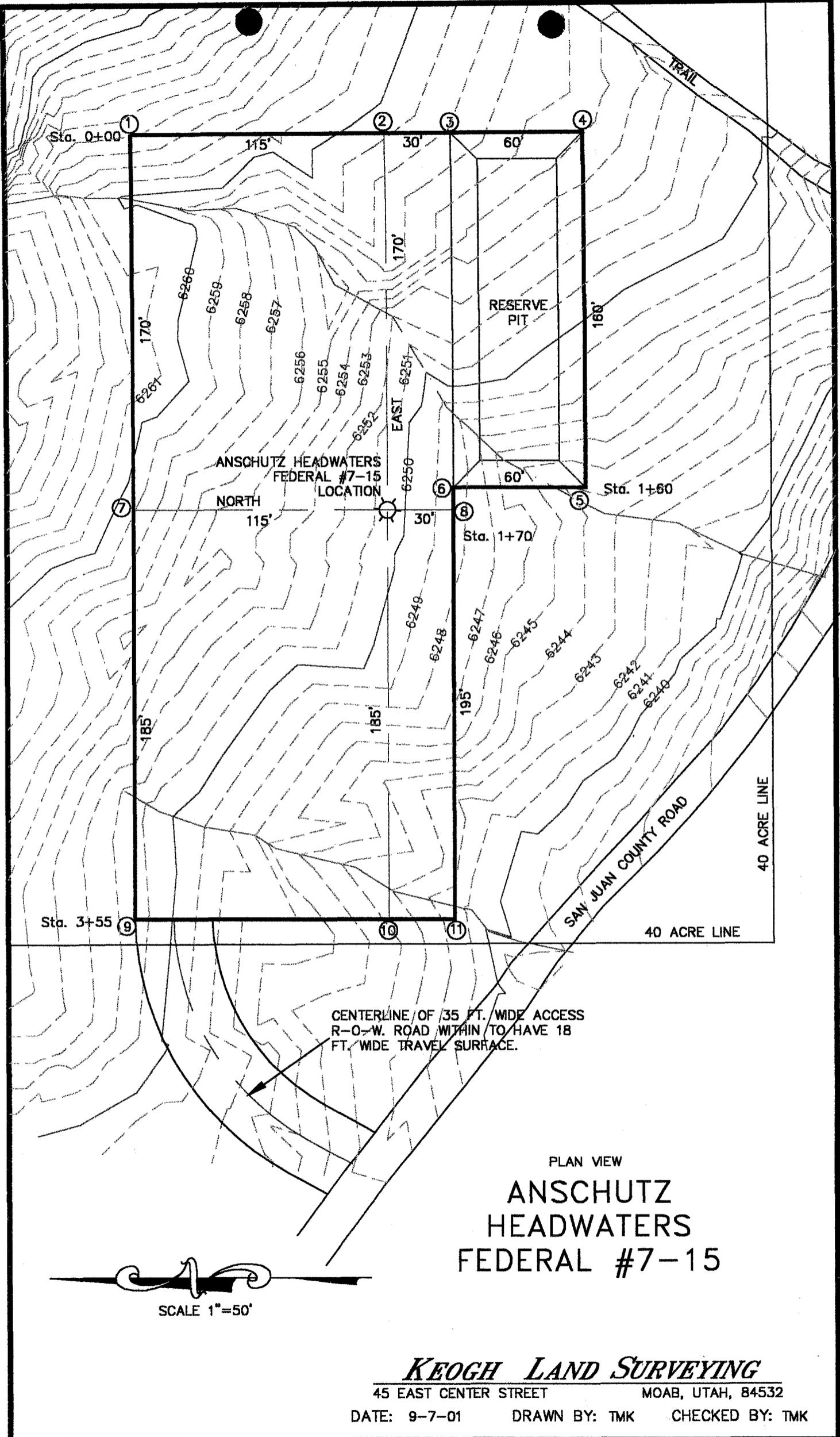


HORIZONTAL & VERTICAL SCALE 1"=50'

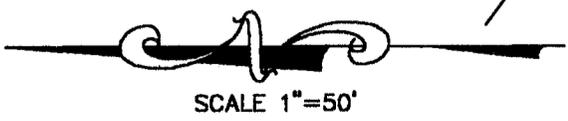
CROSS SECTIONS
**ANSCHUTZ
 HEADWATERS
 FEDERAL #7-15**

 FILL AREA
 CUT AREA

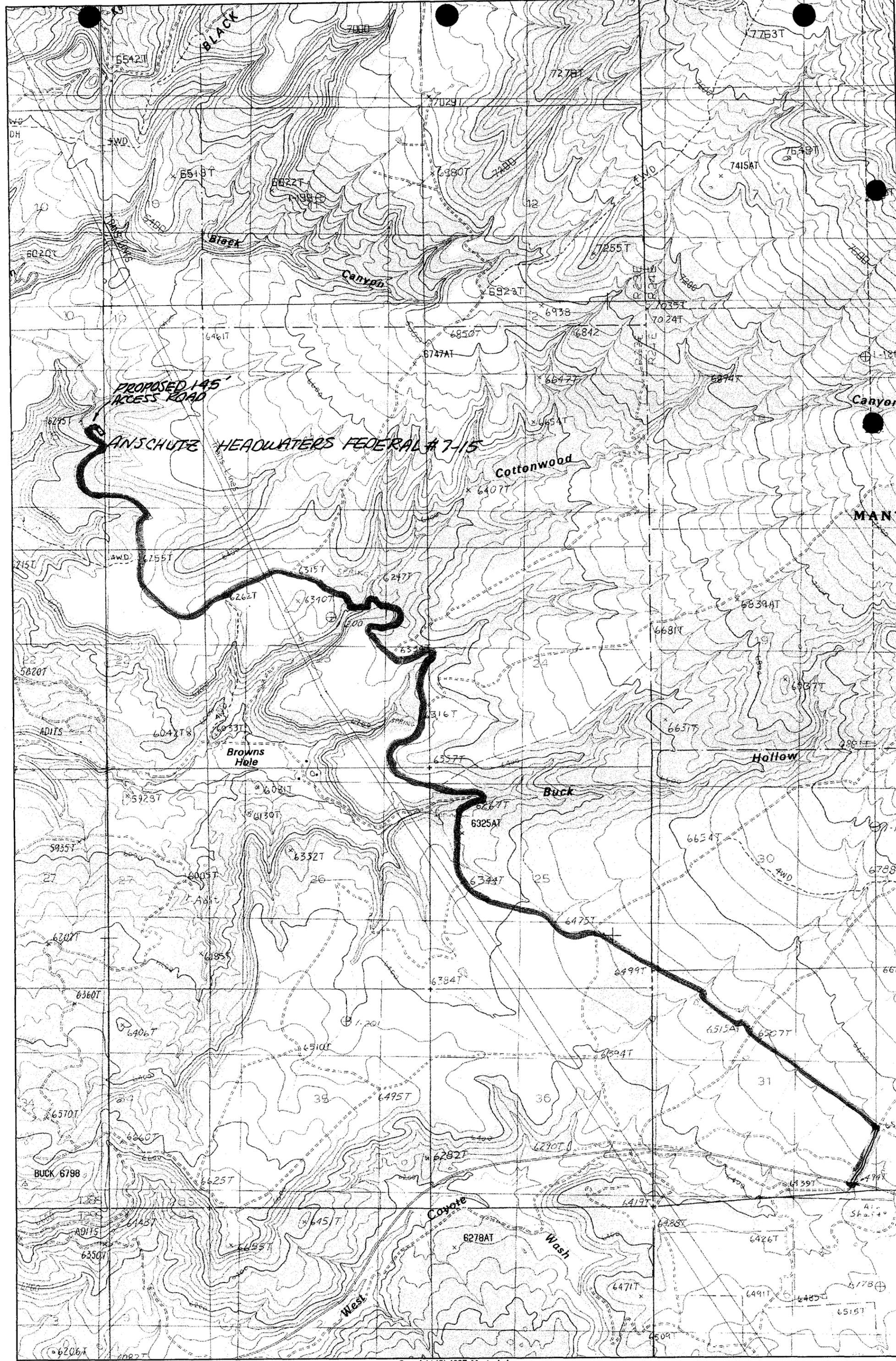
PREPARED BY
KEOGH LAND SURVEYING
 45 EAST CENTER STREET MOAB, UTAH, 84532
 DATE: 9-7-01 DRAWN BY: TMK CHECKED BY: TMK



PLAN VIEW
**ANSCHUTZ
 HEADWATERS
 FEDERAL #7-15**



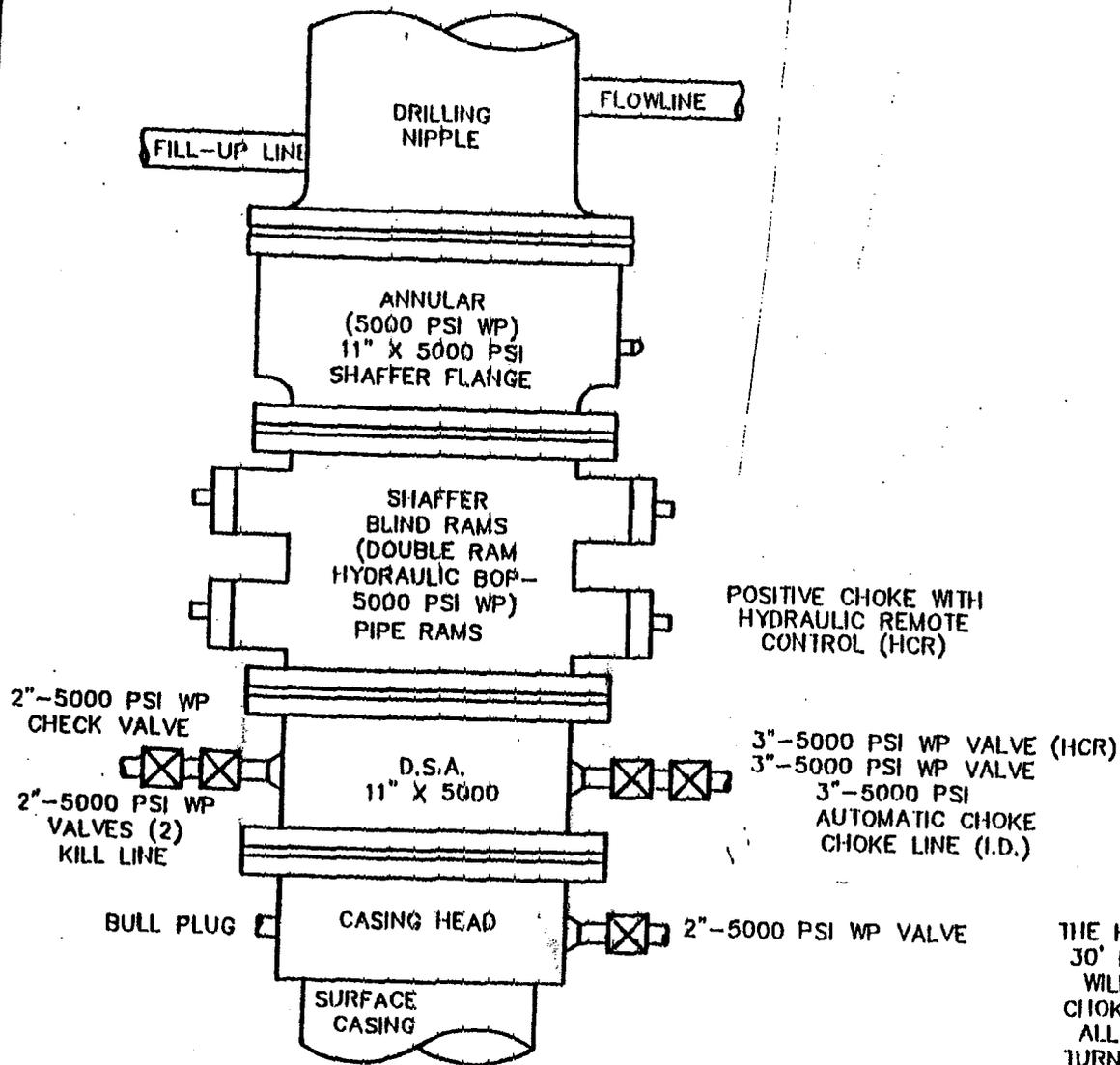
KEOGH LAND SURVEYING
 45 EAST CENTER STREET MOAB, UTAH, 84532
 DATE: 9-7-01 DRAWN BY: TMK CHECKED BY: TMK



PROPOSED 1.45 ACCESS ROAD

ANSCHUTZ HEADWATERS FEDERAL # 7-15

BOP SCHEMATIC
5000 PSI WORKING PRESSURE



THE HYDRAULIC CLOSING UNIT WILL BE LOCATED MORE THAN 30' FROM THE WELLHEAD. CHOKE AND BLEED/PANIC LINES WILL GO TO THE PIT AND FLARE. ALL CONNECTIONS IN CHOKE LINES AND MANIFOLD WILL BE FLANGED OR WELDED. ALL FLANGES SHOULD BE RING JOINT GASKET TYPE. ALL TURNS IN LINES SHALL BE CONSTRUCTED USING TARGETING 90' TEES OR ELLS. ALL LINES SHALL BE ANCHORED.

Exhibit "A"

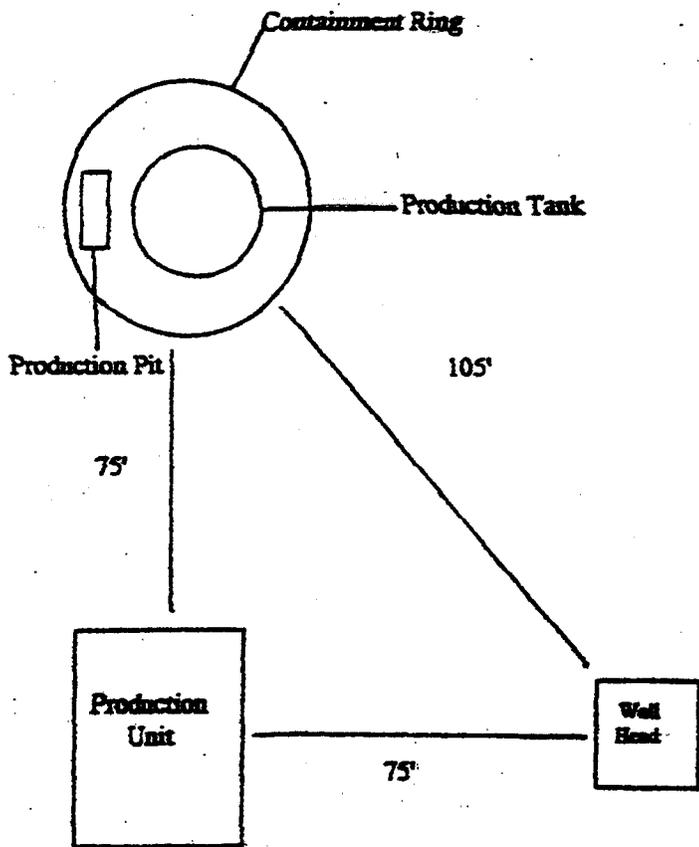


Exhibit "C"

RCOIII
PETROLEUM PERMITTING

Robert C. Orman III

Consultant

**R.O.W.
Drill Site
Seismic**

Bureau of Land Management
82 Dogwood
Moab, UT 84352
Attn: Rich McClure

July 30, 2001

Re: Notice of Staking
Federal Headwater
#7-15

Rich,

Attached is the Notice of Staking, etc. Please contact me when an on site inspection can be done.

An authorization letter will be sent under separate cover to you from Todd Kalstrom, Anschutz Exploration Corporation, designating RCOIII Petroleum Permitting as agent for all permit matters.

Thanks,


Robert Orman

NOTICE OF STAKING Not to be used in place of Application for Permit to Drill (Form 3160-3)		6. Lease Number UTU-77072	
1. Oil Well <input checked="" type="checkbox"/> <u>secondary</u> Gas Well <input checked="" type="checkbox"/> <u>primary</u> Other (Specify)		7. If Indian, Allottee or Tribe Name N/A	
2. Name of Operator: Anschutz Exploration Corp.		8. Unit Agreement Name N/A	
3. Name of Specific Contact Person: Robert C. Orman Permit Agent		9. Farm or Lease Name Headwater Fed.	
4. Address & Phone No. of Operator or Agent 2690 Dane Lane Grand Jct., CO 81506 970-263-0303		10. Well No. 7-15	
5. Surface Location of Well 1980' FNL 1980' FEL, Sec. 15 T28S R23E		11. Field or Wildcat Name NW Lisbon (prospect)	
Attach: a) Sketch showing road entry onto pad, pad dimensions, and reserve pit. b) Topographical or other acceptable map showing location, access road, and lease boundaries.		12. Sec., T., R., M., or Blk and Survey or Area SWNE Sec. 15 T28S R23E Salt Lake Mer.	
15. Formation Objective(s) Hermosa/Honaker Tr. Ismay	16. Estimated Well Depth 7050'	13. County, Parish, or Borough San Juan, Co.	14. State UT
17. Additional Information (as appropriate; shall include surface owner's name, address and, if known, telephone number)			

18. Signed Robert C. Orman Title Permit Agent Date 7-30-01
 Robert C. Orman Permit Agent 7-30-01

Note: Upon receipt of this Notice, the Bureau of Land Management (BLM) will schedule the date of the onsite predrill inspection and notify you accordingly. The location must be staked and access road must be flagged prior to the onsite.

Operators must consider the following prior to the onsite:

- a) H₂S Potential
- b) Cultural Resources (Archeology)
- c) Federal Right of Way or Special Use Permit



EXPLORATION CORPORATION

555 SEVENTEENTH STREET • SUITE 2400 • DENVER, COLORADO 80202 • 303-298-1000 • FAX 303-298-8881

July 31, 2001

Bureau of Land Management
Moab Field Office
82 E. Dogwood
Moab, UT 84532
Attn: Rich McClure

RE: Headwaters Federal #7-15 Well
San Juan County, Utah

Ladies and Gentlemen:

This letter is to inform you that RCO III Petroleum Permitting is authorized to act as Agent and to sign documents on behalf of Anschutz Exploration Corporation when necessary for filing county, state and federal permits including Onshore Order No. 1, Right of Way applications, etc., for the above-mentioned well.

It should be understood that RCO III Petroleum Permitting is acting as Agent only in those matters stated above and is not responsible for drilling, completion, production, or compliance with regulations.

Anschutz Exploration Corporation agrees to accept full responsibility for operations conducted in order to drill, complete, and produce the above-mentioned well.

Sincerely,

ANSCHUTZ EXPLORATION CORPORATION

Todd Kalstrom
Land Manager

TK/cv

**WORKSHEET
APPLICATION FOR PERMIT TO DRILL**

APD RECEIVED: 09/24/2001

API NO. ASSIGNED: 43-037-31822

WELL NAME: HEADWATERS FED 7-15
 OPERATOR: ANSCHUTZ EXPLORATION (N7940)
 CONTACT: ROBERT ORMAN, AGENT

PHONE NUMBER: 970-263-0303

PROPOSED LOCATION:

SWNE 15 280S 230E
 SURFACE: 2469 FNL 2439 FEL
 BOTTOM: 2469 FNL 2439 FEL
 SAN JUAN
 WILDCAT (1)

INSPECT LOCATN BY: / /		
Tech Review	Initials	Date
Engineering		
Geology		
Surface		

LEASE TYPE: 1 - Federal
 LEASE NUMBER: UTU-77072
 SURFACE OWNER: 1 - Federal

PROPOSED FORMATION: ISMY

RECEIVED AND/OR REVIEWED:

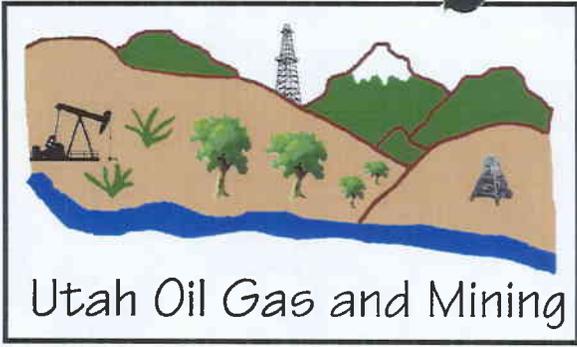
- Plat
- Bond: Fed[1] Ind[] Sta[] Fee[]
(No. CO-1040)
- Potash (Y/N)
- Oil Shale 190-5 (B) or 190-3 or 190-13
- Water Permit
(No. 05-570)
- RDCC Review (Y/N)
(Date: _____)
- Fee Surf Agreement (Y/N)

LOCATION AND SITING:

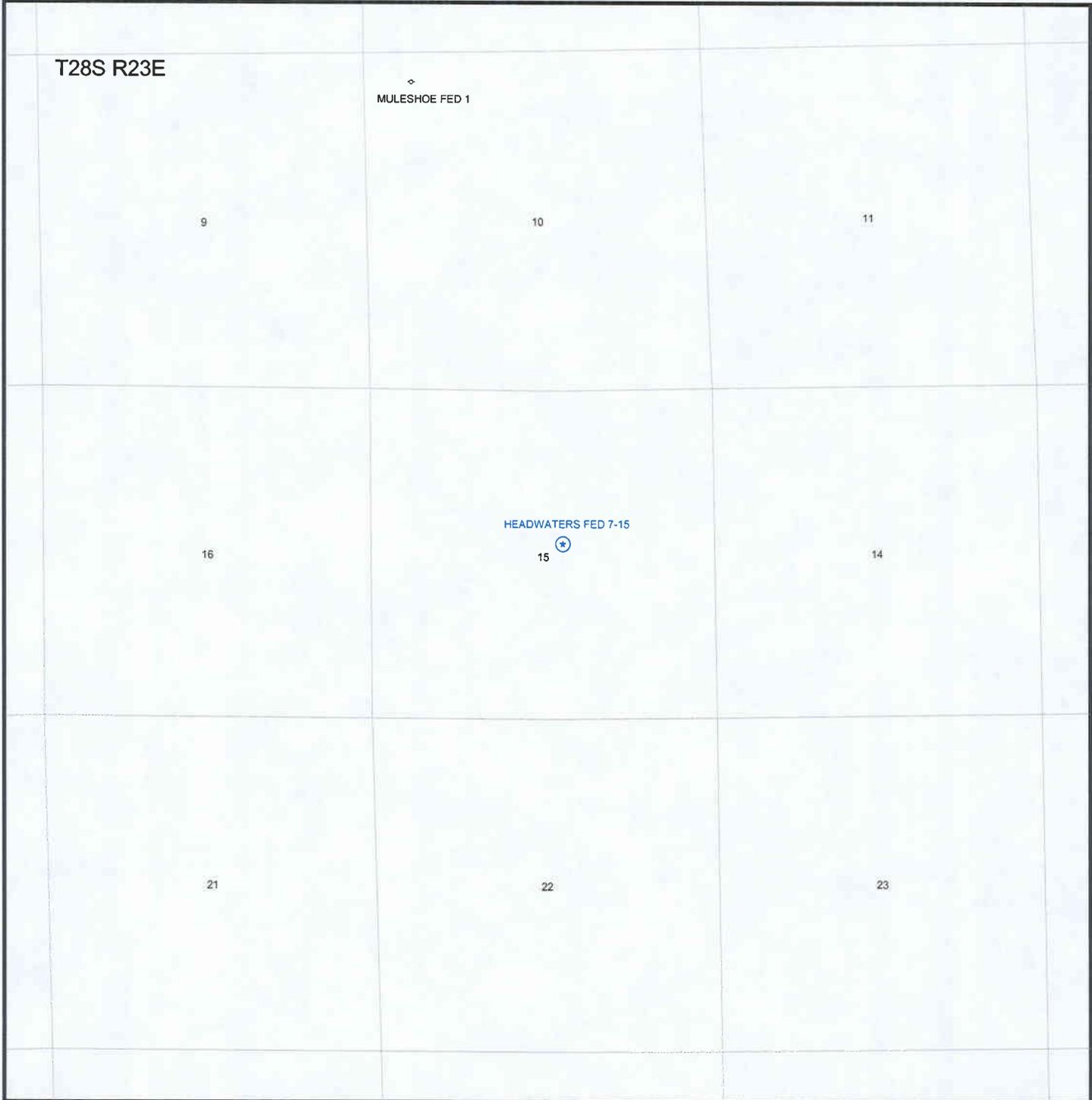
- R649-2-3. Unit _____
- R649-3-2. General
- Siting: 460 From Qtr/Qtr & 920' Between Wells
- R649-3-3. Exception
- Drilling Unit
- Board Cause No: _____
- Eff Date: _____
- Siting: _____
- R649-3-11. Directional Drill

COMMENTS: Need "Ex. Loc" info. (Rec'd 10-3-01)

STIPULATIONS: ① FEDERAL APPROVAL



OPERATOR: ANSCHUTZ EXPL CORP (N7940)
SEC. 15, T28S, R23E
FIELD: WILDCAT (001)
COUNTY: SAN JUAN SPACING: R649-3-3/EX LOC





EXPLORATION CORPORATION

555 SEVENTEENTH STREET • SUITE 2400 • DENVER, COLORADO 80202 • 303-298-1000 • FAX 303-298-8881

October 2, 2001

VIA FEDERAL EXPRESS

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

RE: Exception Location
Headwaters Federal #7-15 Well
Township 28 South, Range 23 East, SLM
Section 15: SW/4NE/4
San Juan County, Utah

Dear Lisha:

Anschutz Exploration Corporation has applied to permit the captioned well at an Exception Location (2469' FNL, 2439' FEL of Section 15) due to the severe topography of the area and the necessity of having an access road which would be near an existing county road. A legal location in the SW/4NE/4 of Section 15 was possible to build but at a high cost to Anschutz.

Attached for your consideration are Exception Location Waiver Letter Agreements as executed by Gulf Exploration, LLC and Wilshire Oil Co. Gulf and Wilshire are the leaseholders within 460' of our Exception Location (USA Oil and Gas Lease U-77291 covering, among other lands, the W/2 and SE/4 of Section 15, Township 28 South, Range 23 East). As evidenced by these Letter Agreements, both Gulf and Wilshire consent to Anschutz' Exception Location.

Therefore, pursuant to R649-3-3 of the Utah Oil and Gas Conservation General Rules, Anschutz requests that administrative approval be granted for our Exception Location of the Headwaters Federal #7-15 well.

As always, your cooperation in this matter is appreciated.

Sincerely,

ANSCHUTZ EXPLORATION CORPORATION

Todd Kalstrom
Land Manager

TK/cv
Enclosures

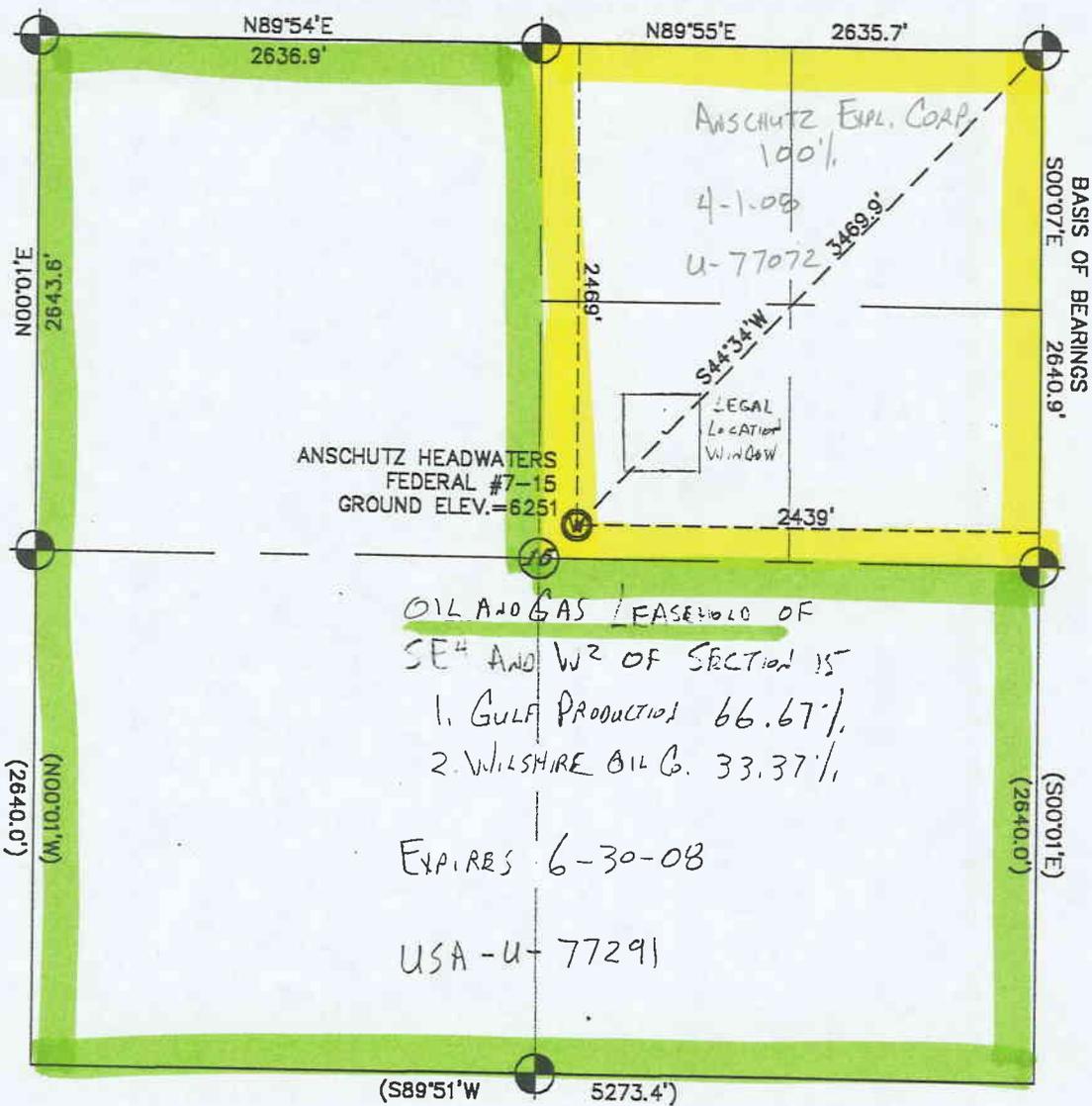
cc: Rob Orman
2690 Dane Lane
Grand Junction, CO 81506

RECEIVED

OCT 03 2001

DIVISION OF
OIL, GAS AND MINING

SECTION 15, T 28 S, R 23 E, SLM



LEGEND

-  FOUND GOVERNMENT BRASS MONUMENT
-  SET SPIKE WITH LATH AT PROPOSED WELL LOCATION

KEOGH LAND SURVEYING
 45 EAST CENTER STREET MOAB, UTAH, 84532

A SURVEY OF
**ANSCHUTZ HEADWATERS
 FEDERAL #7-15**
 WITHIN SECTION 15, T 28 S, R 23 E, SLM,
 SAN JUAN COUNTY, UTAH

PREPARED FOR
ANSCHUTZ EXPLORATION CORPORATION

DATE: 9-07-01	DRAWN BY: TMK	CHECKED BY: TMK
SCALE: 1"=1000'	F.B.# 141	ANSCHUTZ

Timothy M. Keogh
 TIMOTHY M. KEOGH
 Sept. 7-01
 DATE

REGISTERED LAND SURVEYOR
 No. 171004
 TIMOTHY M. KEOGH
 STATE OF UTAH



EXPLORATION CORPORATION

555 SEVENTEENTH STREET • SUITE 2400 • DENVER, COLORADO 80202 • 303-298-1000 • FAX 303-298-8881

September 20, 2001

VIA FEDERAL EXPRESS

Gulf Exploration, LLC
9701 N. Broadway Extension
Oklahoma City, OK 73114
Attn: George Bradley

Wilshire Oil Co.
200 N. Harvey, Suite 717
Oklahoma City, OK 73102
Attn: Perry McAnally

RE: Exception Location Waiver Request
Headwaters Federal #7-15 Well
Township 28 South, Range 23 East, SLM
Section 15: SW¹/₄NE¹/₄
San Juan County, Utah

Gentlemen:

Anschutz has been aggressively attempting to permit the Initial Test Well at a location in the NE¹/₄ of Section 15, Township 28 South, Range 23 East, SLM, San Juan County, Utah. We have elected to move our location due to topographical problems which could not be overcome and archaeological sites that must be protected. Anschutz and the BLM have mutually decided to place the surface location of our well 2469' FNL and 2439' FEL of Section 15. This location is within a 460 foot radius of your lease and is subject to Anschutz seeking your consent pursuant to R649-3-2 of the Utah Oil and Gas Conservation General Rules.

Since Gulf Exploration and Wilshire Oil Co. are the only offset owners who are affected by Anschutz' exception location, please indicate your approval of this action by signing below and returning one copy of this letter to my office. Please call me at 303-299-1339 if you have any questions.

Thanks for your help in this matter.

Sincerely,

ANSCHUTZ EXPLORATION CORPORATION

Todd Kalstrom
Land Manager

TK/cv

Gulf Exploration, LLC

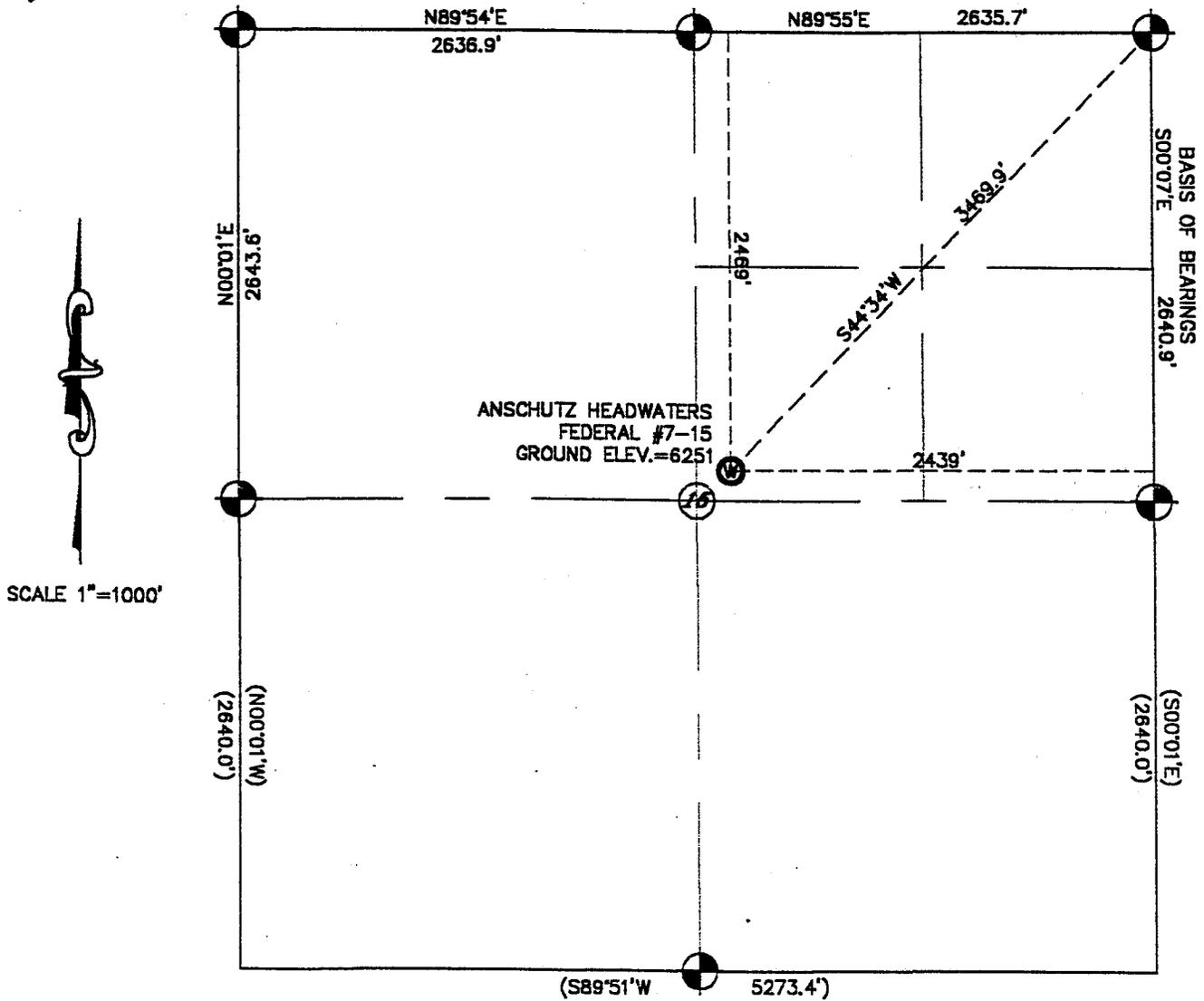
Wilshire Oil Co.

Agrees to Anschutz' exception location for the Headwaters Federal #7-15 well.

Does not agree to Anschutz' exception location for the Headwaters Federal #7-15 well.

By: Steve Boone
Name: STEVE BOONE
Title: CO MANAGER

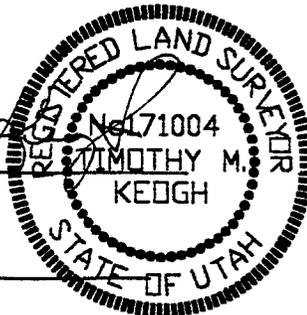
SECTION 15, T 28 S, R 23 E, SLM



LEGEND

-  FOUND GOVERNMENT BRASS MONUMENT
-  SET SPIKE WITH LATH AT PROPOSED WELL LOCATION

Timothy M. Keogh
TIMOTHY M. KEOGH



Sept. 7-01
DATE

KEOGH LAND SURVEYING
45 EAST CENTER STREET MOAB, UTAH, 84532

A SURVEY OF
**ANSCHUTZ HEADWATERS
FEDERAL #7-15**
WITHIN SECTION 15, T 28 S, R 23 E, SLM,
SAN JUAN COUNTY, UTAH

PREPARED FOR
ANSCHUTZ EXPLORATION CORPORATION

DATE: 9-07-01	DRAWN BY: TMK	CHECKED BY: TMK
SCALE: 1"=1000'	F.B.# 141	ANSCHUTZ



RECEIVED

SEP 27 2001

555 SEVENTEENTH STREET • SUITE 2400 • DENVER, COLORADO 80202 • 303-298-1000 • FAX 303-298-8881

September 20, 2001

VIA FEDERAL EXPRESS

Gulf Exploration, LLC
9701 N. Broadway Extension
Oklahoma City, OK 73114
Attn: George Bradley

Wilshire Oil Co.
200 N. Harvey, Suite 717
Oklahoma City, OK 73102
Attn: Perry McAnally

RE: Exception Location Waiver Request
Headwaters Federal #7-15 Well
Township 28 South, Range 23 East, SLM
Section 15: SW $\frac{1}{4}$ NE $\frac{1}{4}$
San Juan County, Utah

Gentlemen:

Anschutz has been aggressively attempting to permit the Initial Test Well at a location in the NE $\frac{1}{4}$ of Section 15, Township 28 South, Range 23 East, SLM, San Juan County, Utah. We have elected to move our location due to topographical problems which could not be overcome and archaeological sites that must be protected. Anschutz and the BLM have mutually decided to place the surface location of our well 2469' FNL and 2439' FEL of Section 15. This location is within a 460 foot radius of your lease and is subject to Anschutz seeking your consent pursuant to R649-3-2 of the Utah Oil and Gas Conservation General Rules.

Since Gulf Exploration and Wilshire Oil Co. are the only offset owners who are affected by Anschutz' exception location, please indicate your approval of this action by signing below and returning one copy of this letter to my office. Please call me at 303-299-1339 if you have any questions.

Thanks for your help in this matter.

Sincerely,

ANSCHUTZ EXPLORATION CORPORATION

Todd Kalstrom
Land Manager

TK/cv

Gulf Exploration, LLC

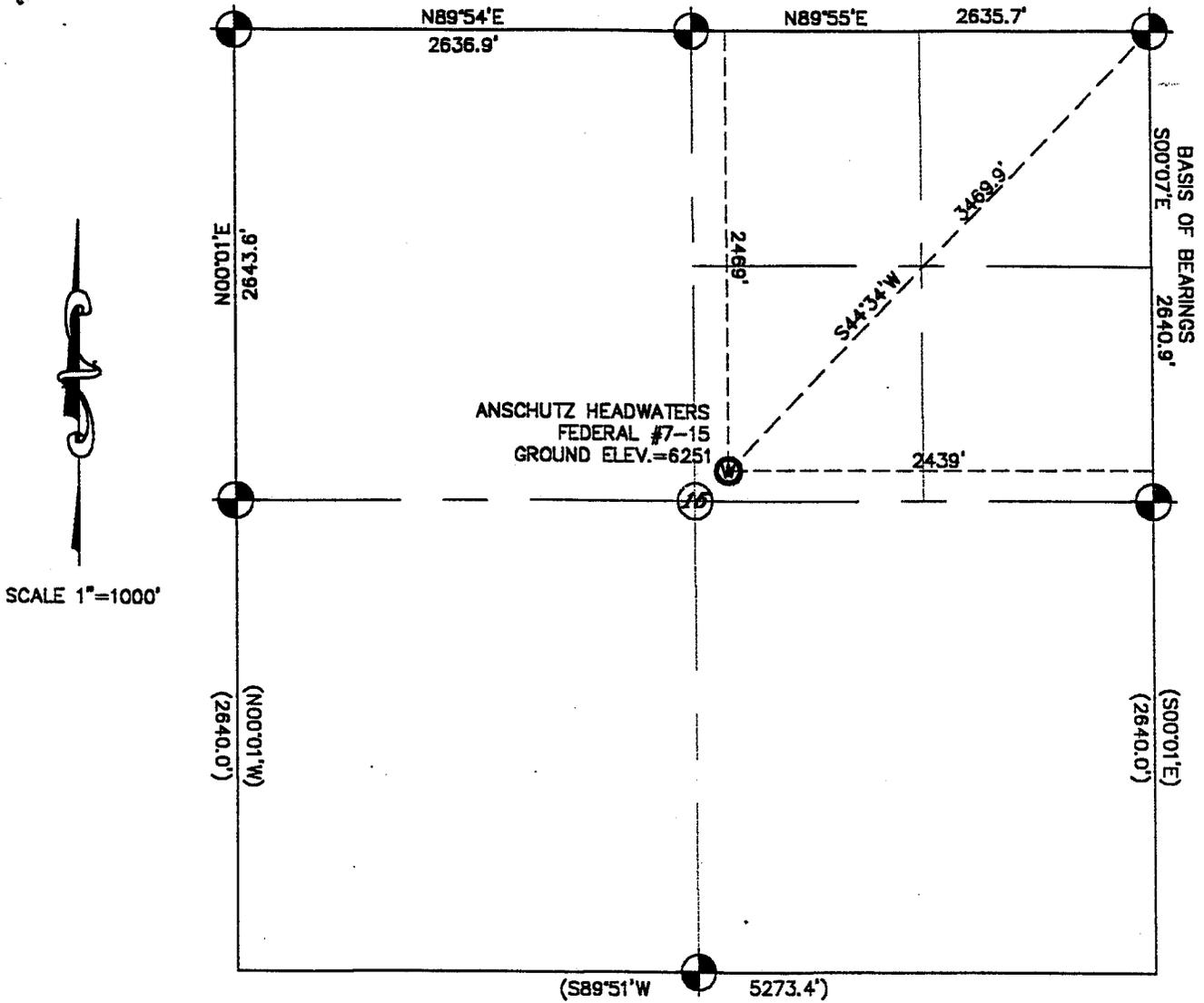
Wilshire Oil Co. of Texas

Agrees to Anschutz' exception location for the Headwaters Federal #7-15 well.

Does not agree to Anschutz' exception location for the Headwaters Federal #7-15 well.

By: Perry McAnally
Name: Perry McAnally
Title: Vice-President

SECTION 15, T 28 S, R 23 E, SLM

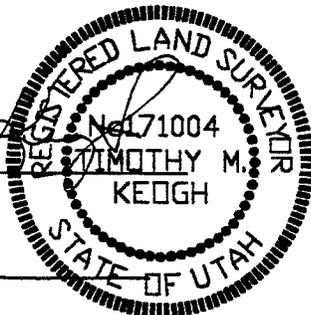


LEGEND

-  FOUND GOVERNMENT BRASS MONUMENT
-  SET SPIKE WITH LATH AT PROPOSED WELL LOCATION

Timothy M. Keogh
TIMOTHY M. KEOGH

Sept. 7-01
DATE



KEOGH LAND SURVEYING		
45 EAST CENTER STREET		MOAB, UTAH, 84532
A SURVEY OF		
ANSCHUTZ HEADWATERS FEDERAL #7-15		
WITHIN SECTION 15, T 28 S, R 23 E, SLM, SAN JUAN COUNTY, UTAH		
PREPARED FOR		
ANSCHUTZ EXPLORATION CORPORATION		
DATE: 9-07-01	DRAWN BY: TMK	CHECKED BY: TMK
SCALE: 1"=1000'	F.B.# 141	ANSCHUTZ



555 SEVENTEENTH STREET • SUITE 2400 - DENVER, COLORADO 80202 • 303-298-1000 • FAX 303-298-8881

November 20, 2001

VIA FAX 801-359-3940

State of Utah
Division of Oil, Gas & Mining
1594 West North Temple
Suite 1210
Salt Lake City, UT 84114
Attn: Lisa Cordova

Re Permit for Headwaters Federal #7-15
Township 28 South - Range 23 East
Section 15: SENE
San Juan County, Utah

**11-2001 Water Rights / Mark Page
Correct water right 05-570,
See attached. JC*

Dear Lisa:

Pursuant to our conversation yesterday, I have made several calls and have arranged to buy water for the captioned well from Rattlesnake Ranch [Jim Blankenagle (435)-686-2364]. He could not find his water appropriation number or a water right number but he did locate his Water Certificated #1009 which he said had been sufficient for selling water in the past. Anschutz also will utilize the services of Ollie Knutson, Moab, Utah, for water hauling from Rattlesnake Ranch to our location.

Since we are planning on building our location next week, I would appreciate a call if the above information is not sufficient to finalize the processing of our drilling permit. My direct line is 303-299-1339. If is sufficient, I look forward to receiving the approved permit.

Thank you for your help in this matter.

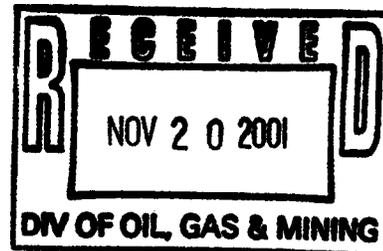
Sincerely,

ANSCHUTZ EXPLORATION CORPORATION

Todd R. Kalstrom
Land Manager, CPL

TRK/jp

cc: Dan Gallagher



ANSCHUTZ EXPLORATION CORPORATION

555 17TH STREET, SUITE 2400, DENVER, CO 80202

ANSCHUTZ

Date: November 20, 2001

Number of pages including cover sheet: 2

To: Lisa Cordova

Phone: _____

Fax phone: 801-359-3940

CC: _____

From: Judy Paisley for Todd Kalstrom

Phone: (303) 299-1339

Fax phone: (303) 299-1518

REMARKS: Urgent For your review Reply ASAP Please comment

Confidentiality Note: The information contained in this facsimile transmittal sheet and document(s) that follow are for the exclusive use of the addressee and may contain confidential, privileged, proprietary, and non-disclosable information. If the recipient of this facsimile is not the addressee, or person responsible for delivering this facsimile to the addressee, such recipient is strictly prohibited from reading, photocopying, distributing, or otherwise using this facsimile transmission, or its contents, in any way. If the recipient has received this facsimile transmission in error, please call us immediately and return the facsimile transmission to us via the United States Postal service. We will gladly reimburse your telephone and postage expenses. Thank you.

RECEIVED

NOV 20 2001

DIVISION OF
OIL, GAS AND MINING





UTAH DIVISION OF WATER RIGHTS

WRPRINT Water Right Information Listing

Version: 2001.09.26.00 Rundate: 11/20/2001 11:57 AM

Water Right 05-570

[WRPRINT] ***WR#: 05 570 has been PRINTED!!
 (WARNING: Water Rights makes NO claims as to the accuracy of the information)
 WRNUM: 05-570 APPLICATION/CLAIM NO.: D838 CERT. NO.:
 CHANGES: t19063 Approved, a19310 Withdrawn

 OWNERSHIP*****

NAME: Blankenagel, Norma P. OWNER MISC:
 ADDR:
 CITY: LaSal STATE: UT ZIP: 84530 INTEREST: 100%
 LAND OWNED BY APPLICANT? Yes

 DATES, ETC.*****

FILING: 09/01/1960	PRIORITY: 00/00/1913	ADV BEGAN: / /	ADV ENDED: / /
PROTST END: / /	PROTESTED: []	APPR/REJ: []	APPR/REJ: / /
ELEC/PROOF: []	ELEC/PROOF: / /	CERT/WUC: / /	LAP, ETC: / /
PD Book No.	Type of Right: DIL	Status:	Source of Info: DIL Map:

 LOCATION OF WATER RIGHT*****

FLOW: 0.111 cfs SOURCE: Rattlesnake Spring
 COUNTY: San Juan COMMON DESCRIPTION:

POINT OF DIVERSION -- SURFACE:
 (1) N 3125 ft E 1070 ft from SW cor, Sec 7, T 29S, R 24E, SLBM
 Diverting Works: Sour

 USES OF WATER RIGHT*****

CLAIMS USED FOR PURPOSE DESCRIBED: 570
 Referenced To: Claims Groups: Type of Reference

###IRRIGATION *---NORTH WEST QUARTER--*---NORTH EAST QUARTER--*---SOUTH
 Tot Irr. Acrg.: 7.12* NW NE SW SE * NW NE SW SE * NW N
 Sec 12 T 29S R 23E SLBM * : : : * : 2.60: : 0.32* :
 Sec 7 T 29S R 24E SLBM *LOT 2
 Sec 7 T 29S R 24E SLBM *LOT 3
 or a Total of 7.12 acres.

Sole Supply: acres Diversion Lin
 ###STOCKWATERING: 1200 Cattle or Equivalent Diversion Lin



State of Utah
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING

Michael O. Leavitt
Governor
Kathleen Clarke
Executive Director
Lowell P. Braxton
Division Director

1594 West North Temple, Suite 1210
PO Box 145801
Salt Lake City, Utah 84114-5801
801-538-5340
801-359-3940 (Fax)
801-538-7223 (TDD)

November 20, 2001

Anschutz Exploration Corporation
555 - 17th St, Suite 2400
Denver CO 80202

Re: Headwaters Federal 7-15 Well, 2469' FNL, 2439' FEL, SW NE, Sec. 15, T. 28 South,
R. 23 East, San Juan County, Utah

Gentlemen:

Pursuant to the provisions and requirements of Utah Code Ann. § 40-6-1 *et seq.*, Utah Administrative Code R649-3-1 *et seq.*, and the attached Conditions of Approval, approval to drill the referenced well is granted.

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

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. The API identification number assigned to this well is 43-037-31822.

Sincerely,

John R. Baza
Associate Director

er

Enclosures

cc: San Juan County Assessor
Bureau of Land Management, Moab District Office

Operator: Anschutz Exploration Corporation
Well Name & Number Headwaters Federal 7-15
API Number: 43-037-31822
Lease: UTU 77072

Location: SW NE Sec. 15 T. 28 South R. 23 East

Conditions of Approval

1. 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.

2. Notification Requirements

Notify the Division within 24 hours of spudding the well.

- Contact Carol Daniels at (801) 538-5284.

Notify the Division prior to commencing operations to plug and abandon the well.

- Contact Dan Jarvis at (801) 538-5338

3. Reporting Requirements

All required reports, forms and submittals will be promptly filed with the Division, including but not limited to the Entity Action Form (Form 6), Report of Water Encountered During Drilling (Form 7), Weekly Progress Reports for drilling and completion operations, and Sundry Notices and Reports on Wells requesting approval of change of plans or other operational actions.

4. State approval of this well does not supersede the required federal approval, which must be obtained prior to drilling.

RECEIVED
MOAB FIELD OFFICE

Form 3160-3
(August 1999)

2001 SEP 21 P 2:27

FORM APPROVED
OMB No. 1004-0136
Expires November 30, 2000

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

APPLICATION FOR PERMIT TO DRILL OR REENTER

5. Lease Serial No.	UTU-77072
6. If Indian, Allottee or Tribe Name	N/A
7. If Unit or CA Agreement, Name and No.	N/A
8. Lease Name and Well No.	Headwaters Fed 7-15
9. API Well No.	N/A
10. Field and Pool, or Exploratory	Expl.
11. Sec., T., R., M., or Blk. and Survey or Area	SWNE sec. 15 T28S R23E
12. County or Parish	San Juan County
13. State	CO

1a. Type of Work: DRILL REENTER

1b. Type of Well: Oil Well Gas Well Other Single Zone Multiple Zone

2. Name of Operator
Anschutz Exploration Corporation, 555 17 St. Denver, CO 80202 contact Eric Root 303-299-1479

3a. Address agent: Robert Orman 2690 Dane Ln, Gr. Junction, CO 81506
3b. Phone No. (include area code) 970-263-0303

4. Location of Well (Report location clearly and in accordance with any State requirements.)*
At surface SW NE sec. 15 T28S R23E; 2469 FNL 2439
At proposed prod. zone FEL same +/-

14. Distance in miles and direction from nearest town or post office*
33.5 miles from Moab, UT, Hwy 191 S. to Hwy 41 E. Cty Rd. 174 NE

15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. unit line, if any) exception required
171' Utah State

16. No. of Acres in lease
1440

17. Spacing Unit dedicated to this well
40 (N/A)

18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft.
5 miles (N/A)

19. Proposed Depth
7050'

20. BLM/BIA Bond No. on file
CO-1040

21. Elevations (Show whether DF, KDB, RT, GL, etc.)
6251' GL

22. Approximate date work will start*
10/2001

23. Estimated duration
20-30 days

24. Attachments

The following, completed in accordance with the requirements of Onshore Oil and Gas Order No.1, shall be attached to this form: *BLM Bmd #CO1040*

- Well plat certified by a registered surveyor.
- A Drilling Plan.
- A Surface Use Plan (if the location is on National Forest System Lands, the SUPO shall be filed with the appropriate Forest Service Office).
- Bond to cover the operations unless covered by an existing bond on file (see Item 20 above).
- Operator certification.
- Such other site specific information and/or plans as may be required by the authorized officer.

25. Signature *Robert C. Orman* Name (Printed/Typed) Robert C. Orman Date 9-12-01

Title Permit Agent for Anschutz Exploration Corporation

Approved by (Signature) */s/ WILLIAM C. STRINGER* Name (Printed/Typed) Assistant Field Manager, Date NOV 19 2001

Title Office Division of Resources

Application approval does not warrant or certify the the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.
Conditions of approval, if any, are attached.

Title 18 U.S.C. Section 1001 and Title 43 U.S.C. Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

*(Instructions on reverse)

RECEIVED

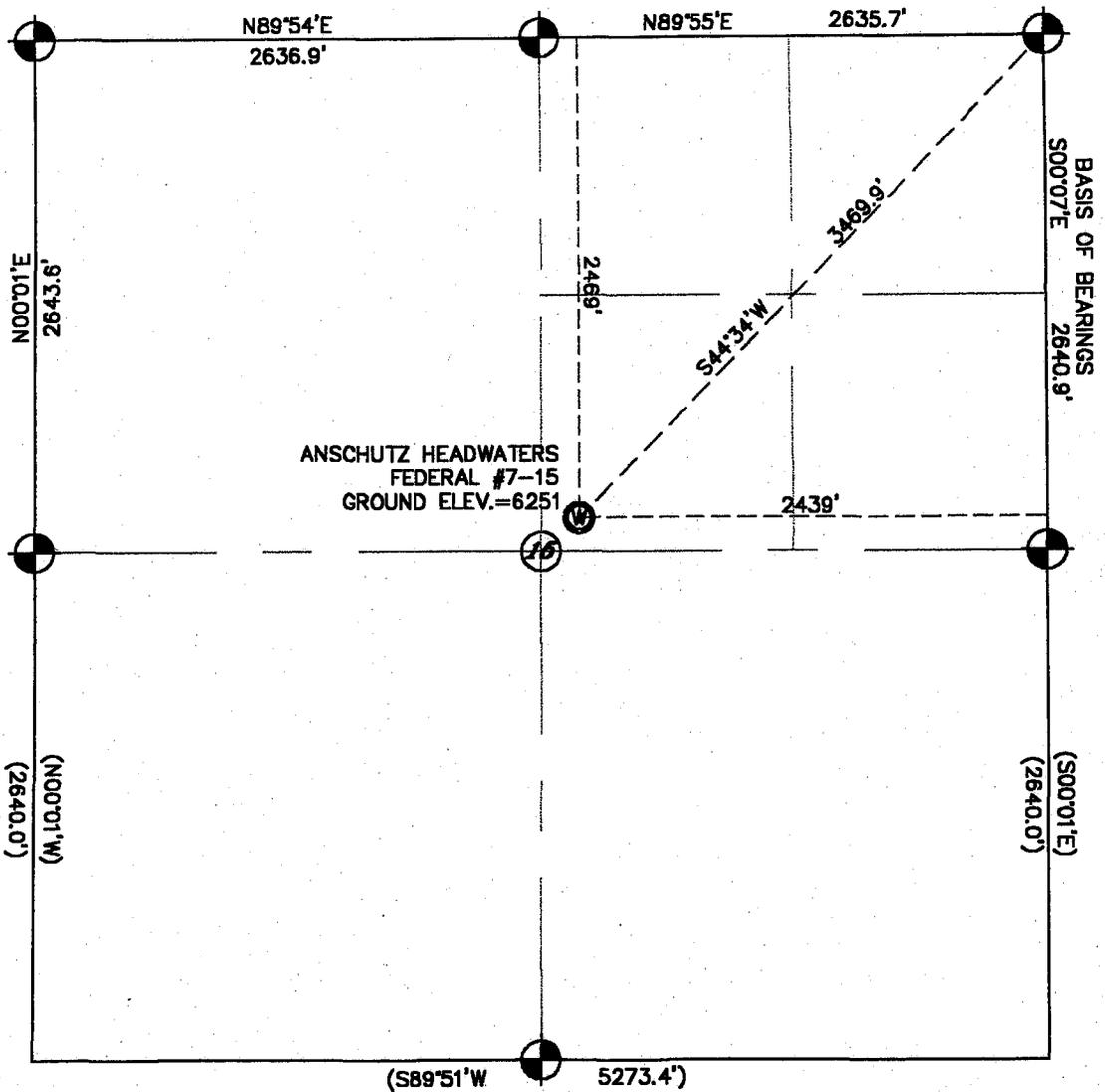
NOV 23 2001

DIVISION OF
OIL, GAS AND MINING

CONDITIONS OF APPROVAL ATTACHED

FLARING OR VENTING OF
GAS IS SUBJECT TO NTL 4-A
Dated 1/1/80

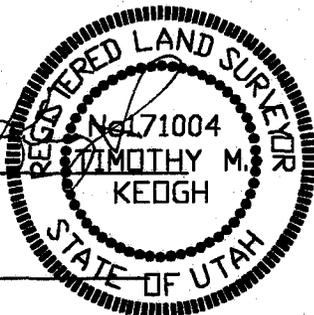
SECTION 15, T 28 S, R 23 E, SLM



LEGEND

-  FOUND GOVERNMENT BRASS MONUMENT
-  SET SPIKE WITH LATH AT PROPOSED WELL LOCATION

Timothy M. Keogh
TIMOTHY M. KEOGH



Sept. 7-01
DATE

KEOGH LAND SURVEYING		
45 EAST CENTER STREET		MOAB, UTAH, 84532
A SURVEY OF		
ANSCHUTZ HEADWATERS FEDERAL #7-15		
WITHIN SECTION 15, T 28 S, R 23 E, SLM, SAN JUAN COUNTY, UTAH.		
PREPARED FOR		
ANSCHUTZ EXPLORATION CORPORATION		
DATE: 9-07-01	DRAWN BY: TMK	CHECKED BY: TMK
SCALE: 1"=1000'	F.B.# 141	ANSCHUTZ

Anschutz Exploration Corporation
Headwaters Federal No. 7-15
Lease U-77072
SW/NE Section 15, T28S, R23E
San Juan County, Utah

A COMPLETE COPY OF THIS PERMIT SHALL BE KEPT ON LOCATION from the beginning of site construction through well completion, and shall be available to contractors to ensure compliance.

CONDITIONS OF APPROVAL

Approval of this application does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.

Be advised that Anschutz Exploration Corporation is considered to be the operator of the above well and is responsible under the terms and conditions of the lease for the operations conducted on the leased lands.

Bond coverage for this well is provided by CO 1040 (Principal - Anschutz Exploration Corporation) via surety consent as provided for in 43 CFR § 3104.2.

This office will hold the aforementioned operator and bond liable until the provisions of 43 CFR § 3106.7-2 continuing responsibility are met.

This permit will be valid for a period of one year from the date of approval. After permit termination, a new application must be filed for approval.

All lease operations will be conducted in full compliance with applicable regulations (43 CFR § 3100), Onshore Oil and Gas Orders, lease terms, notices to lessees, and the approved plan of operations. The operator is fully responsible for the actions of his subcontractors. A copy of these conditions and the approved plan will be made available to field representatives to insure compliance.

A. DRILLING PROGRAM

1. The proposed 5M BOPE system is appropriate for this well, and anticipated conditions. Installation, testing and operation of the system shall be in conformance with Onshore Oil and Gas Order No. 2.
2. The surface casing (9-5/8") shall extend through the sandstones of the Glen Canyon Group (Navajo, Kayenta and Wingate), and be set at least 50 feet into the Chinle Formation, regardless of the depth at which the Chinle is encountered.
3. A Cement Bond Log (CBL), temperature survey or other appropriate tool shall be used to determine the top-of-cement behind the production casing.
4. Concurrent approval from the State of Utah, Division of Oil, Gas & Mining is required before conducting any surface disturbing activities.

B. SURFACE USE PLAN

1. The reserve pit will be inspected during construction to determine if a pit liner will be required. Notify the Moab Field Office (Rich McClure at 435-259-2127) when the reserve pit construction begins.

C. REQUIRED APPROVALS, REPORTS AND NOTIFICATIONS

Required verbal notifications are summarized in Table 1, attached.

Building Location- Contact the BLM Natural Resource Protection Specialist at least 48-hours prior to commencing construction of location.

Spud- The spud date will be reported to BLM 24-hours prior to spudding. Written notification in the form of a Sundry Notice (Form 3160-5) will be submitted to the Moab Field Office within 24-hours after spudding, regardless of whether spud was made with a dry hole digger or big rig.

Daily Drilling Reports- Daily drilling reports shall detail the progress and status of the well and shall be submitted to the Moab Field Office on a weekly basis.

Monthly Reports of Operations- In accordance with Onshore Oil and Gas Order No. 1, this well shall be reported on Minerals Management Service (MMS) Form 3160, "Monthly Report of Operations," starting the month in which operations commence and continuing each month until the well is physically plugged and abandoned. This report will be filed directly with MMS.

Sundry Notices- There will be no deviation from the proposed drilling and/or workover program without prior approval. "Sundry Notices and Reports on Wells" (Form 3160-5) will be filed, with the Moab Field Office, for approval of all changes of plans and subsequent operations in accordance with 43 CFR § 3162.3-2. Safe drilling and operating practices must be observed.

Drilling Suspensions- Operations authorized by this permit shall not be suspended for more than 30 days without prior approval of the Moab Field Office. All conditions of this approval shall be applicable during any operations conducted with a replacement rig.

Undesirable Events- Spills, blowouts, fires, leaks, accidents, or any other unusual occurrences shall be immediately reported to the BLM in accordance with requirements of NTL-3A.

Cultural Resources- If cultural resources are discovered during construction, work that might disturb the resources is to stop, and the Moab Field Office is to be notified.

First Production- Should the well be successfully completed for production, the Moab Field Office will be notified when the well is placed in producing status. Such notification may be made by phone, but must be followed by a sundry notice or letter not later than five business days following the date on which the well is placed into production.

A first production conference will be scheduled as soon as the productivity of the well is apparent. This conference should be coordinated through the Moab Field Office, and they shall be notified prior to the first sale.

Well Completion Report- Whether the well is completed as a dry hole or as a producer, "Well Completion and Recompletion Report and Log" (Form 3160-4) will be submitted to the Moab Field Office not later than thirty-days after completion of the well or after completion of operations being performed, in accordance with 43 CFR § 3162.4-1. Two copies of all logs, core descriptions, core analyses, well test data, geologic summaries, sample description, and all other surveys or data obtained and compiled during the drilling, workover, and/or completion operations, will be filed with Form 3160-4. When requested, samples (cuttings and/or samples) will be submitted to the Moab Field Office.

Venting/Flaring of Gas- Gas produced from this well may not be vented/flared beyond an initial, authorized test period of 30 days or 50 MMcf, whichever first occurs, without the prior, written approval of the Moab Field Office. Should gas be vented or flared without approval beyond the authorized test period, the well may be ordered shut-in until the gas can be captured or approval to continue the venting/flaring as uneconomic is granted. In such case, compensation to the lessor shall be required for that portion of the gas that is vented/flared without approval and which is determined to have been avoidably lost.

Produced Water- An application for approval of a permanent disposal method and location will be submitted to the Moab Field Office for approval pursuant to Onshore Oil and Gas Order 7.

Off-Lease Measurement, Storage, Commingling- Prior approval must be obtained from the Moab Field Office for off-lease measurement, off-lease storage and/or commingling (either down-hole or at the surface).

Plugging and Abandonment- If the well is completed as a dry hole, plugging instructions must be obtained from the Moab Field Office prior to initiating plugging operations.

A "Subsequent Report of Abandonment" (Form 3160-5) will be filed with the Moab Field Office within thirty-days following completion of the well for abandonment. This report will indicate where plugs were placed and the current status of surface restoration. Upon completion of approved plugging, a regulation marker will be erected in accordance with 43 CFR § 3162.6. Final abandonment will not be approved until the surface reclamation work required by the approved APD or approved abandonment notice has been completed to the satisfaction of the Moab Field Office or the appropriate surface managing agency.

TABLE 1

NOTIFICATIONS

The following notifications are required. Notify Rich McClure (435-259-2127) for construction and reclamation matters. Notify Jeff Brown (435-587-1525) for spud, surface casing and other matters relative to drilling:

2 days prior to commencement of dirt work, construction and reclamation;

1 day prior to spudding;

50 feet prior to reaching the surface casing setting depth

If the people above cannot be reached, notify the Moab Field Office at (435) 259-2100. If unsuccessful, contact the person listed below.

Well abandonment operations require 24 hour advance notice and prior approval. In the case of newly drilled dry holes, verbal approval can be obtained by calling the Moab Field Office at (435) 259-2100. If approval is needed after work hours, you may contact the following:

Eric Jones, Petroleum Engineer

Office: (435) 259-2117

Home: (435) 259-2214



Baker Oil Tools

Operator: Anschutz Exploration Corp.
Well Name: Headwaters Federal #7-15
Dst No: 2
Date: 06-08-2002

Drillstem Test Report

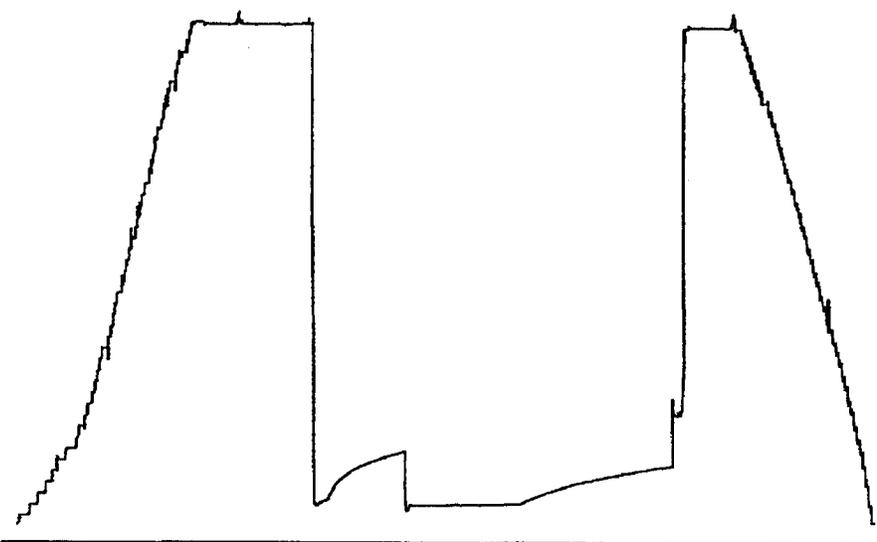
<p>Contractor Cyclone Drilling Rig No. 16 Spot 2469' FNL & 2439' FEL Sec 15 Twp 28 S Rng 23 E Field Wildcat County San Juan State Utah Elevation 6263' KB Formation Cutler</p>	<p>Surface Choke 1/8" Bottom Choke 3/4" Hole Size 8 3/4" Core Hole Size DP Size & Wt 4 1/2" 20.00 Wt Pipe ID of DC 2 1/4" Length of DC 621' Total Depth 7145' Type of Test Inflate Straddle Interval 4376'- 4410'</p>	<p>Mud Type Weight 10.1 Viscosity 43 Water Loss Filter Cake RW @ Deg F 3,000 Ppm B.H.T. 97.0 Deg F Co. Rep. Bryan Cook Tester Robert Ables</p>
<p>Pipe recovery: 94' Mud = 0.46 bbl.</p> <p>Top: 3,000 ppm Cl. Bottom: 3,000 ppm Cl.</p>		<p>Pressure in Sampler 28 psig Volume of Sampler 2600 cc Volume of Sample 2600 cc Oil: 0 cc Water: 0 cc Mud: 2600 cc Gas: 0 cu ft Other: 0 Sample: 3,000 ppm Cl.</p> <p>Gas/Oil Ratio Gravity API @ 60 Deg F</p>
		<p>Gauge Type Electronic No. 21108 Cap 10000 psi Depth 4380 ft Inside Outside X</p>
		<p>Initial Hydrostatic A 2191 Final Hydrostatic K 2171 Initial Flow 1 B 103 Final Flow 1 C 118 Initial Flow 2 E 69 Final Flow 2 F 99 Initial Flow 3 H Final Flow 3 I</p> <p>Shut-in 1 D 324 Shut-in 2 G 262 Shut-in 3 J</p> <p>Reported Corrected Opened Tool @ 14:08 hrs Flow 1 10 10 min Shut-in 1 60 61 min Flow 2 90 90 min Shut-in 2 120 119 min Flow 3 min Shut-in 3 min</p>

COMPANY ANSCHUTZ EXPLORATION CORP.
 LEASE NAME & NO HEADWATERS FEDERAL #7-15
 INTERVAL TESTED 4376'- 4410'

COUNTY SAN JUAN
 STATE UTAH
 FORMATION CUTLER

DATE 06-08-2002
 TICKET # 346649
 TEST # 2





Gauge Type	Electronic		
No.	21065	Cap.	10000 psi
Depth	4351		ft.
Inside	x		Outside

Initial Hydrostatic	A	2178
Final Hydrostatic	K	2157
Initial Flow 1	B	99
Final Flow 1	C	111
Initial Flow 2	E	65
Final Flow 2	F	94
Initial Flow 3	H	
Final Flow 3	I	
Shut-in 1	D	321
Shut-in 2	G	259
Shut-in 3	J	

Gauge Type			
No.		Cap.	psi
Depth			ft.
Inside			Outside

Initial Hydrostatic	A
Final Hydrostatic	K
Initial Flow 1	B
Final Flow 1	C
Initial Flow 2	E
Final Flow 2	F
Initial Flow 3	H
Final Flow 3	I
Shut-in 1	D
Shut-in 2	G
Shut-in 3	J

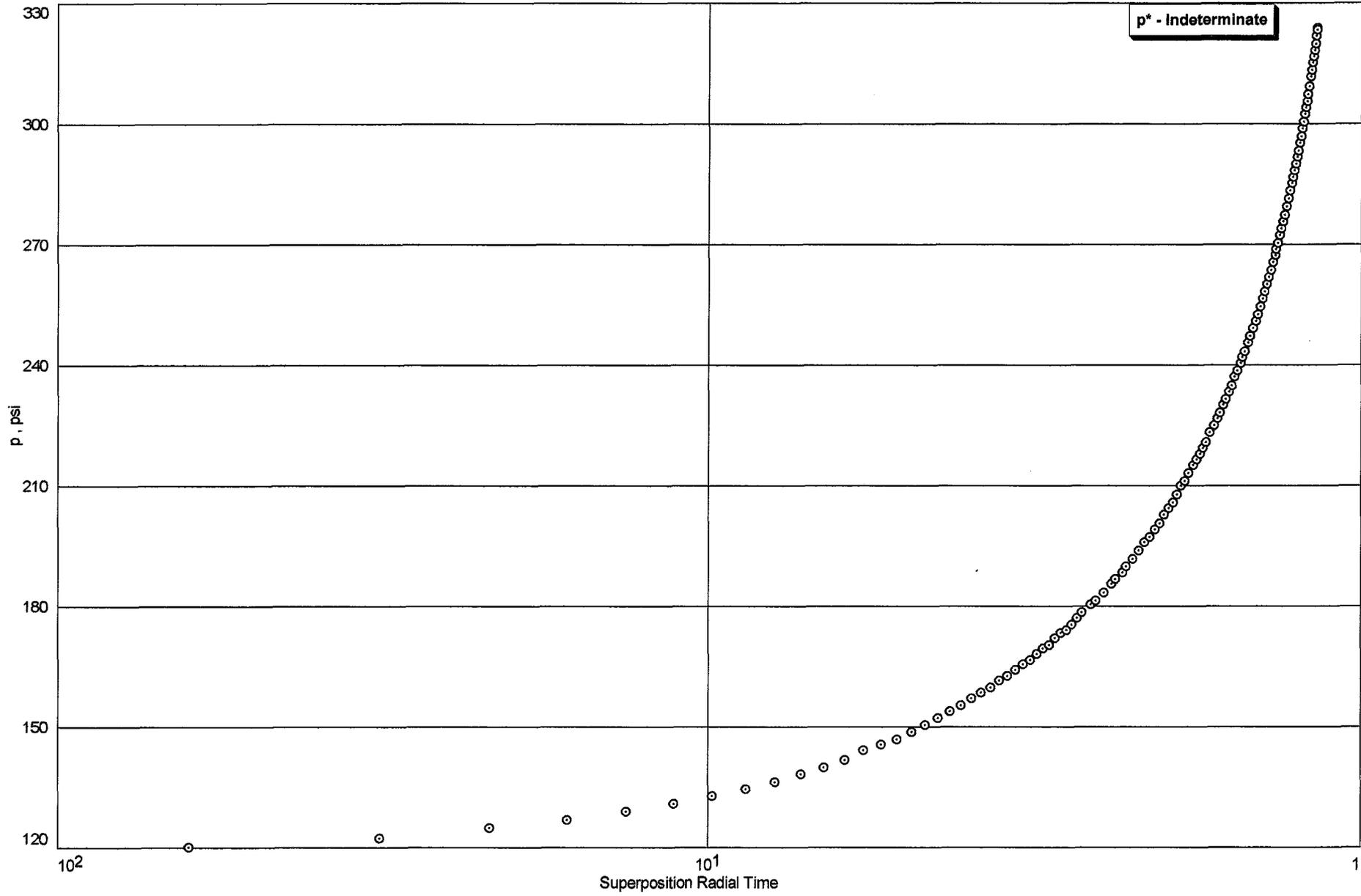
Gauge Type			
No.		Cap.	psi
Depth			ft.
Inside			Outside

Initial Hydrostatic	A
Final Hydrostatic	K
Initial Flow 1	B
Final Flow 1	C
Initial Flow 2	E
Final Flow 2	F
Initial Flow 3	H
Final Flow 3	I
Shut-in 1	D
Shut-in 2	G
Shut-in 3	J



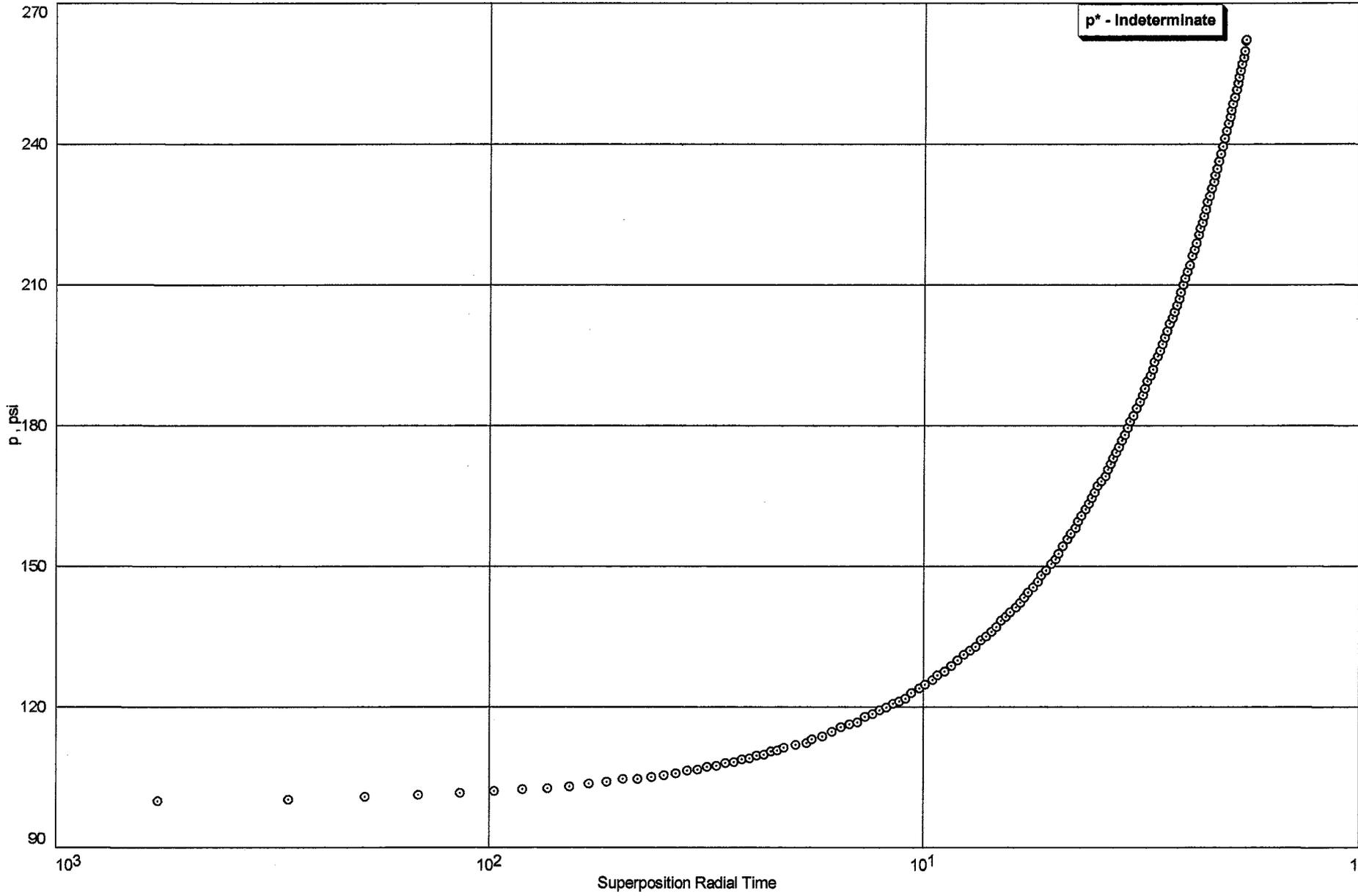
Anschutz Exploration Corp.
Headwaters Federal 7-15, Dst 2, Gauge 21108

RADIAL PLOT - SHUT-IN 1

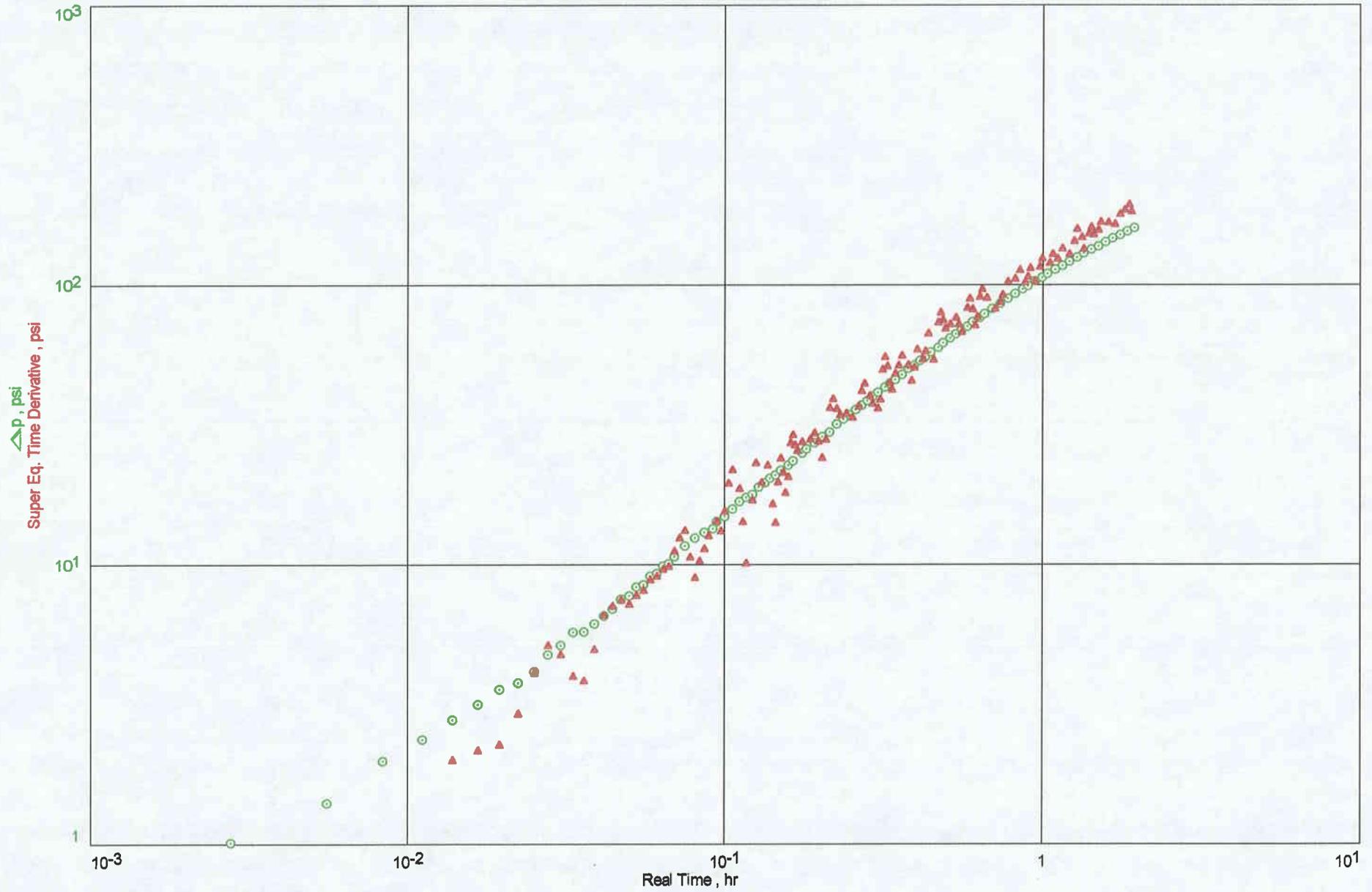


Anschutz Exploration Corp.
Headwaters Federal 7-15, Dst 2, Gauge 21108

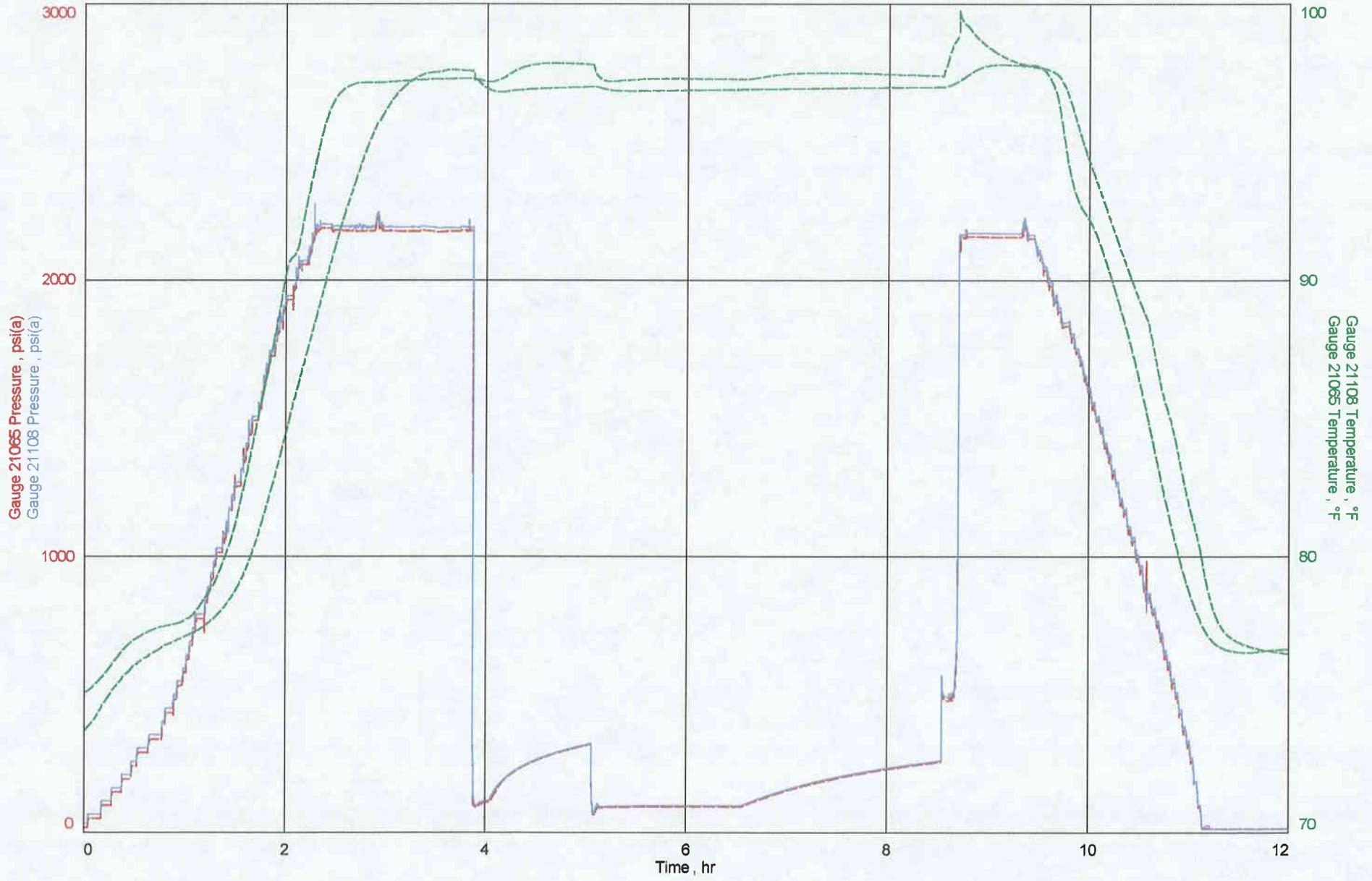
RADIAL PLOT - SHUT-IN 2



DERIVATIVE PLOT - SHUT-IN 2



Anschutz Exploration Corp.
Headwaters Federal 7-15, Dst 2



Anschutz Exploration Corp.
Headwaters Federal #7-15

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Denver CO 80202-3987

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Wilshire Oil Co. of Texas
200 N. Harvey, Ste 717
Oklahoma City OK 73102

Steve Jones or Steve Boone [1]
Gulf Exploration, LLC.
9701 N. Broadway Extension
Oklahoma City OK 73114

Hugh Harvey, Jr. [1]
Intrepid Oil & Gas, LLC.
700-17th St., Ste 1700
Denver CO 80202

Jeff Brown [1]
Bureau of Land Management
82 E. Dogwood
Moab UT 84532

John Baza [2]
State of Utah / Division of Oil Gas Mining
1594 W. North Temple, Ste 1210
Salt Lake City UT 84116



Baker Oil Tools

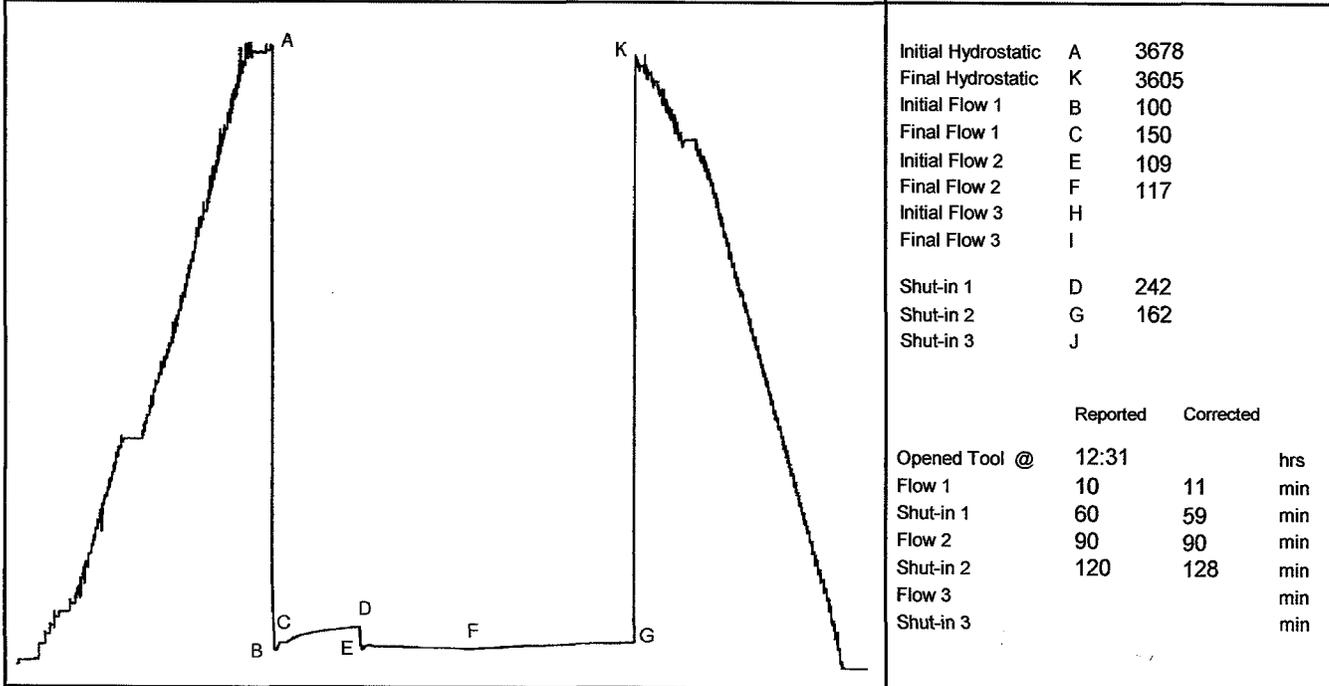
Operator: Anschutz Exploration Corp.
Well Name: Headwaters Federal #7-15
Dst No: 1
Date: 06-06-2002
API#: 43-037-31822

Drillstem Test Report

Contractor Rig No. Spot Sec Twp Rng Field County State Elevation Formation	Cyclone Drilling 16 2469' FNL & 2439' FEL 15 28 S 23 E Wildcat San Juan Utah 6263' KB Gothic Shale	Surface Choke Bottom Choke Hole Size Core Hole Size DP Size & Wt Wt Pipe ID of DC Length of DC Total Depth Type of Test Interval	1/8" 3/4" 8 3/4" 4 1/2" 20.00 4 1/2" 2 1/4" 621.04' 7145' Conventional 7102'- 7145'	Mud Type Weight Viscosity Water Loss Filter Cake RW B.H.T. Co. Rep. Tester	10.1 46 @ 3,000 119.5 Bryan Cook Robert Ables	Deg F Ppm Deg F
--	--	--	--	--	---	-----------------------

Pipe recovery: 187' Slightly gas cut mud = 0.92 bbl. Top: 3,000 ppm Cl. Bottom: 3,000 ppm Cl.	Pressure in Sampler Volume of Sampler Volume of Sample Oil: Water: Mud: Gas: Other: Sample: 3,000 ppm Cl. Gas/Oil Ratio Gravity	40 2600 2550 0 0 2550 0.008 0 API @ 60 Deg F	psig cc cc cc cc cc cu ft
--	---	--	---

Gauge Type No. Depth Inside	Electronic 21065 7102	Cap 10000	psi ft. X
--------------------------------------	-----------------------------	--------------	-----------------



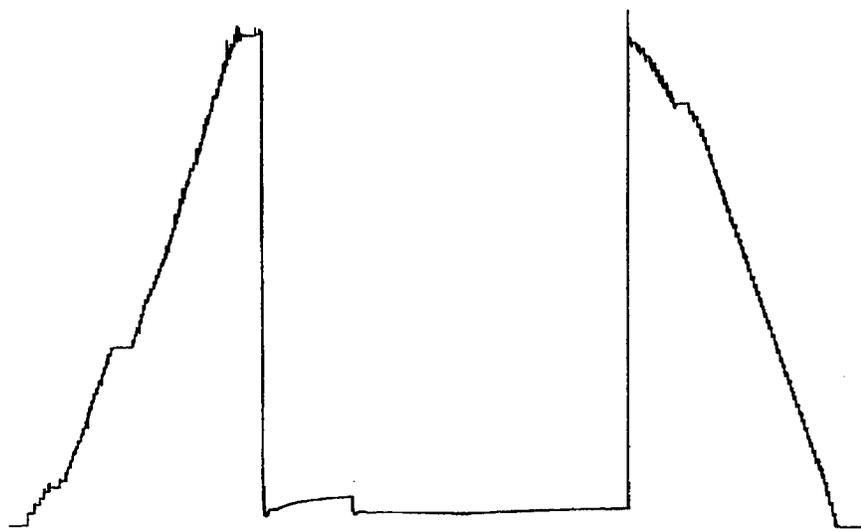
	Reported	Corrected	
Opened Tool @	12:31		hrs
Flow 1	10	11	min
Shut-in 1	60	59	min
Flow 2	90	90	min
Shut-in 2	120	128	min
Flow 3			min
Shut-in 3			min

COMPANY ANSCHUTZ EXPLORATION CORP.
LEASE NAME & NO HEADWATERS FEDERAL #7-15
INTERVAL TESTED 7102'- 7145'

COUNTY SAN JUAN
STATE UTAH
FORMATION GOTHIC SHALE

DATE 06-06-2002
TICKET # 346649
TEST # 1





Gauge Type	Electronic		
No.	21108	Cap.	10000 psi
Depth	7079		ft.
Inside	x		Outside

Initial Hydrostatic	A	3660
Final Hydrostatic	K	3590
Initial Flow 1	B	93
Final Flow 1	C	139
Initial Flow 2	E	100
Final Flow 2	F	106
Initial Flow 3	H	
Final Flow 3	I	
Shut-in 1	D	233
Shut-in 2	G	151
Shut-in 3	J	

Gauge Type			
No.		Cap.	psi
Depth			ft.
Inside			Outside

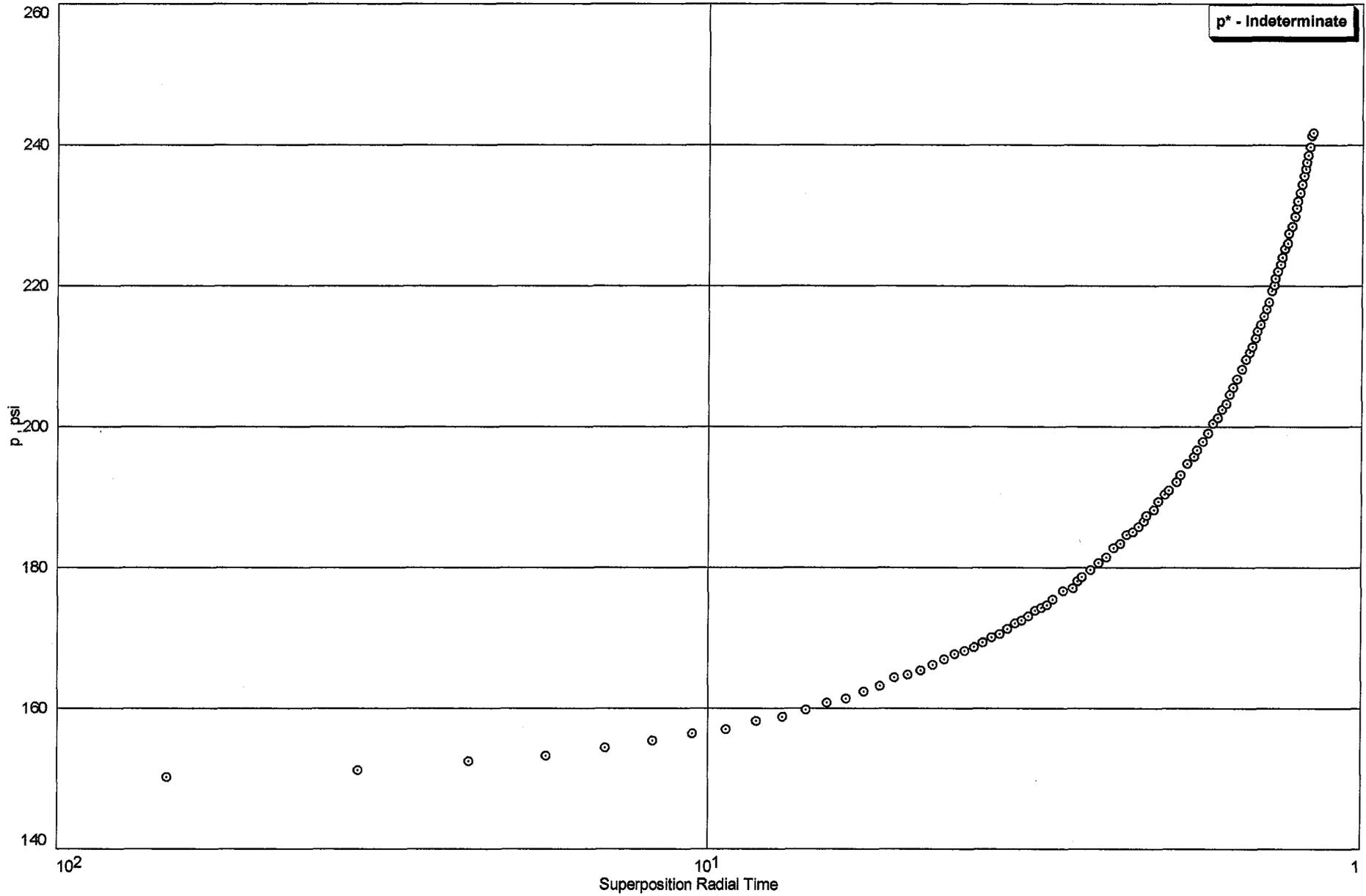
Initial Hydrostatic	A
Final Hydrostatic	K
Initial Flow 1	B
Final Flow 1	C
Initial Flow 2	E
Final Flow 2	F
Initial Flow 3	H
Final Flow 3	I
Shut-in 1	D
Shut-in 2	G
Shut-in 3	J

Gauge Type			
No.		Cap.	psi
Depth			ft.
Inside			Outside

Initial Hydrostatic	A
Final Hydrostatic	K
Initial Flow 1	B
Final Flow 1	C
Initial Flow 2	E
Final Flow 2	F
Initial Flow 3	H
Final Flow 3	I
Shut-in 1	D
Shut-in 2	G
Shut-in 3	J

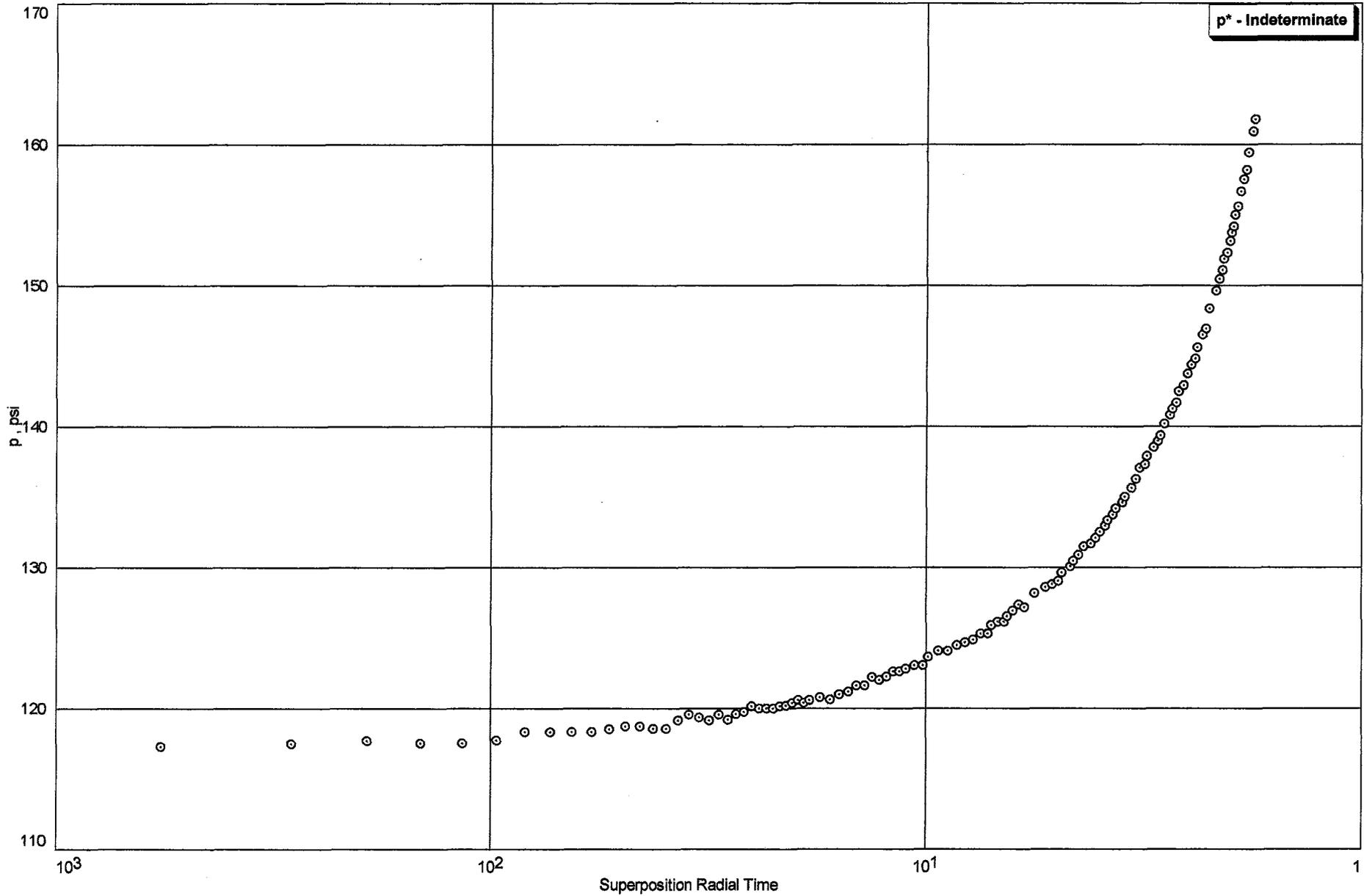
Anschutz Exploration Corp.
Headwaters Federal 7-15, Dst 1, Gauge 21065

RADIAL PLOT - SHUT-IN 1

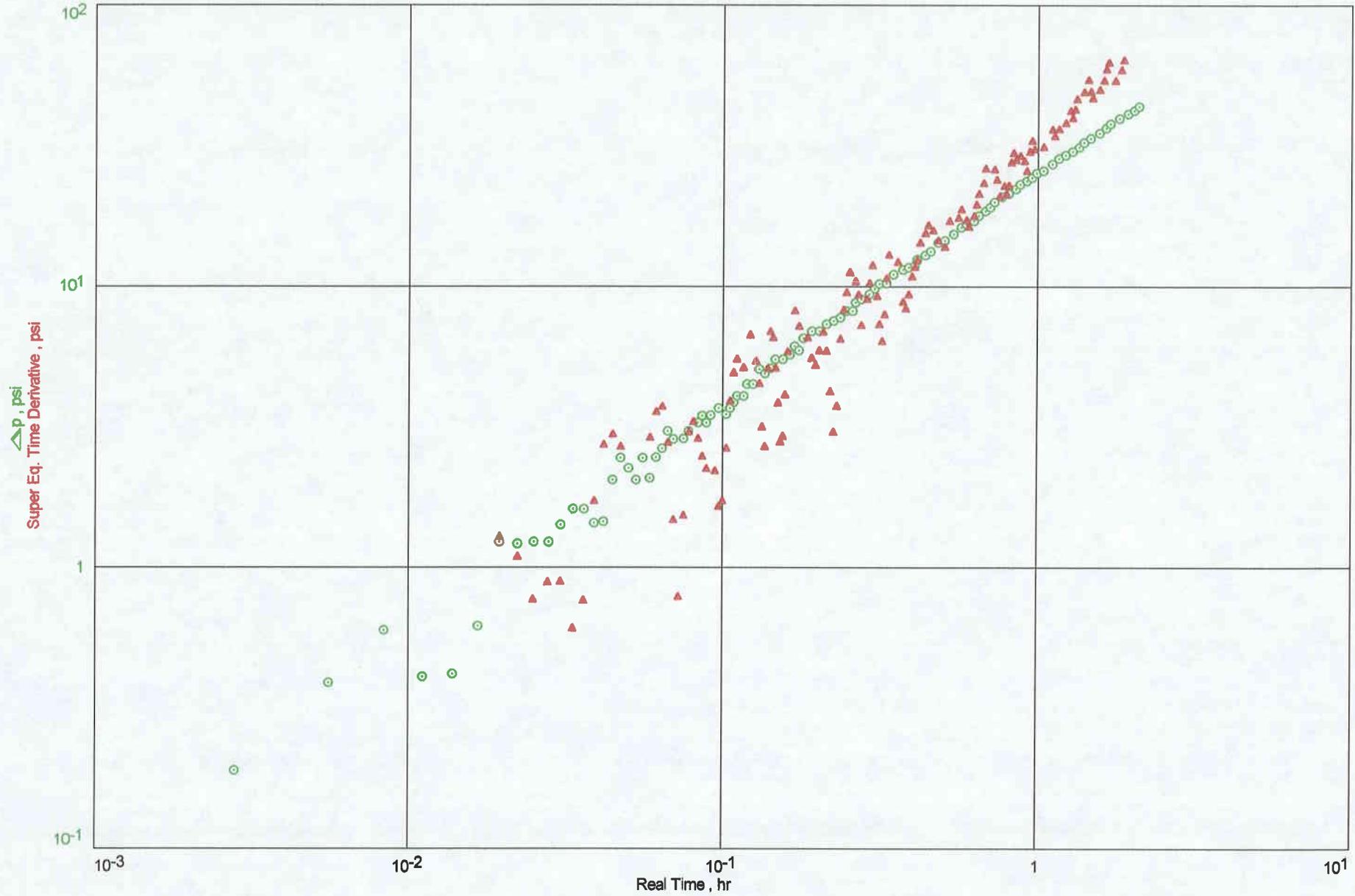


Anschutz Exploration Corp.
Headwaters Federal 7-15, Dst 1, Gauge 21065

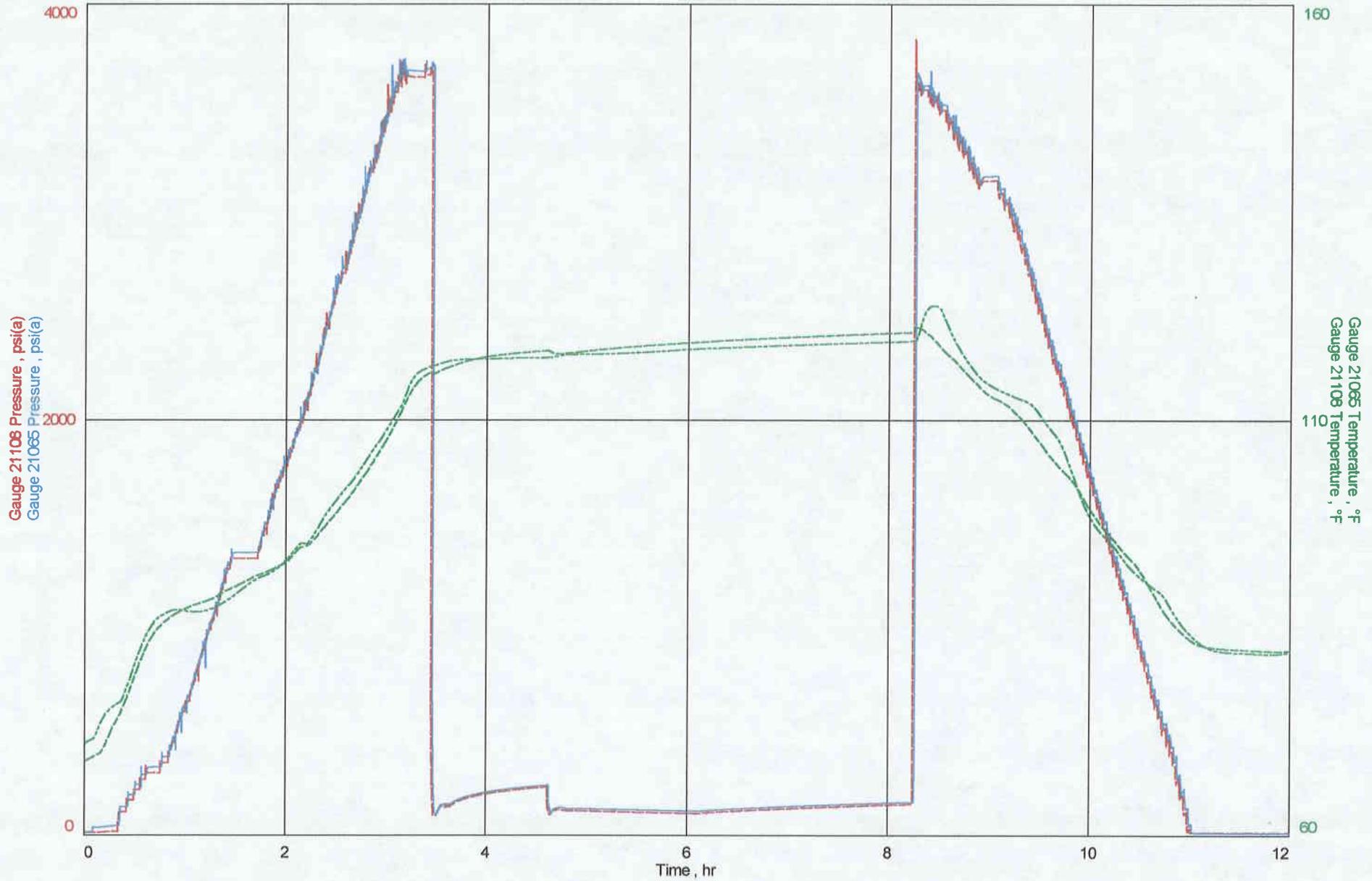
RADIAL PLOT - SHUT-IN 2

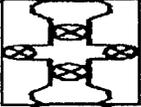
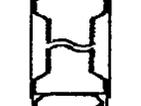
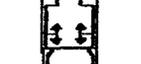
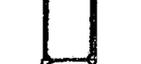


DERIVATIVE PLOT - SHUT-IN 2



Anschutz Exploration Corp.
Headwaters Federal 7-15, Dst 1



TOOL SCHEMATIC	TOOL DESCRIPTION	O.D.	I.D.	LENGTH	DEPTH
	SURFACE FLOWHEAD				
	DRILL PIPE TO SURFACE	4.50	3.83	6434.07	6434.07
	DRILL COLLARS	6.25	2.25	527.00	6961.07
	REVERSING SUB	6.25	2.25	1.50	6962.57
	DRILL COLLARS	6.25	2.25	94.04	7056.61
	CROSSOVER SUB	6.25	2.25	1.00	7057.61
	ROTATING SHUT-IN TOOL	5.00	0.75	11.75	7069.36
	HYDRAULIC TOOL	5.00	1.17	4.95	7074.31
	INSIDE RECORDER	5.00	0.80	5.00	7079.31
	HYDRAULIC JARS	4.75	2.38	8.09	7087.40
	SAFETY JOINT	4.75	1.50	1.80	7089.20
	PACKER	8.00	1.50	3.90	7093.10
	PACKER	8.00	1.50	8.81	7101.91
	OUTSIDE RECORDERS	5.00	1.50	5.69	7107.60
	PERFORATION	5.00	3.00	32.00	7139.60
	PERFORATED SHOE	5.00	3.00	5.40	7145.00

Anschutz Exploration Corp.
Headwaters Federal #7-15

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9701 N. Broadway Extension
Oklahoma City OK 73114

Hugh Harvey, Jr. [1]
Intrepid Oil & Gas, LLC.
700-17th St., Ste 1700
Denver CO 80202

Jeff Brown [1]
Bureau of Land Management
82 E. Dogwood
Moab UT 84532

John Baza [2]
State of Utah / Division of Oil Gas Mining
1594 W. North Temple, Ste 1210
Salt Lake City UT 84116



www.pason.com
16080 Table Mountain Parkway Ste 500 • Golden • CO • 80403
720-880-2000 • FAX: 720-880-0016

Tuesday, June 11, 2002

John Baza
Utah Division Of Oil, Gas, & Mining
1594 W. North Temple
Suite 1210
Salt Lake City, UT 84116

RE: THE ANSCHUTZ EXPLORATION CORP.
HEADWATER FEDERAL 7-15
SEC. 15, T28S, R23E
SAN JUAN COUNTY, UT

43-037-31822

Dear John:

Enclosed are the final computer colored logs and geology reports for the above referenced well.

We appreciate the opportunity to be of service to you and look forward to working with you in the near future.

If you have any questions regarding the enclosed data, please contact us.

Sincerely,

Bill Nagel
Geological Manager

BN/alb

Encl: 2 Computer Colored Logs and 2 Geology Reports.

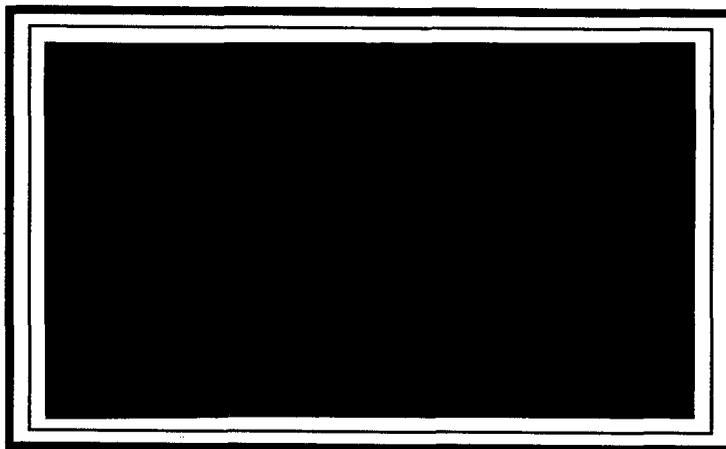
Cc: Dan Bean, Anschutz Exploration Corp., Denver, CO.

RECEIVED

JUN 13 2002

DIVISION OF
OIL, GAS AND MINING

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systems usa corp



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Monitoring Systems*

*Off-Site Data Storage
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*Electronic Pit and Flow
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THE ANSCHUTZ CORPORATION
HEADWATERS FEDERAL #7-15
2469' FNL & 2439' FEL
SECTION 15, T28S, R23E
SAN JUAN COUNTY, UTAH
API # 43-037-31832

GEOLOGY REPORT
by
JASON G. BLAKE
PASON USA
GOLDEN, COLORADO
(720) 880-2000

RECEIVED

JUN 13 2002

DIVISION OF
OIL, GAS AND MINING

WELL SUMMARY

OPERATOR: THE ANSCHUTZ CORPORATION

NAME: HEADWATERS FEDERAL #7-15

LOCATION: 2469' FNL, 2439' FEL, SEC 15, T28S, R23E

COUNTY/STATE: SAN JUAN COUNTY, UTAH

ELEVATION: GR 6251', KB 6262'

SPUD DATE: 5/5/02

COMPLETION DATE: 6/8/02

DRILLING ENGINEER: BRIAN COOK

WELLSITE GEOLOGY: JASON BLAKE-TITAN ENERGY RESOURCES

**MUD LOGGING:
LOGGERS:** PASON USA, FID TOTAL GAS & FID CHROMATOGRAPH
JASON BLAKE, DAWN ENGLISH

**CONTRACTOR:
TOOL PUSHER:** CYCLONE DRILLING COMPANY, RIG #16
ROGER SCHLINDER

HOLE SIZE: 12 ¼", 75'-2058'; 8 ¾" 2058" TO 7145'

CASING RECORD: 9 5/8" TO 2058' w 692 SX

**DRILLING MUD:
ENGINEER:
MUD TYPE:** NEWPARK DRILING FLUIDS, EVANSTON, WY
REED SUCHY
WATER TO 3100'; LSND 3100' TO TOTAL DEPTH

ELECTRIC LOGS: SCHLUMBERGER, FARMINGTON, NM
RUN 1: ARRAY IND, DENS-NEUT, FMI, NAT GAMMA, SONIC
RUN 2: INDUCTION, DIPOLE SONIC

SAMPLES 30' SAMPLES-SURF-5200', 10' SAMPLES-5200'-TD

TOTAL DEPTH: 7145' REACHED AT 3:30 PM 6-5-02

**DRILL STEM TESTS:
TESTERS:** BAKER OIL TOOLS, HOBBS, NM
MIKE FRALEY, ROBERT ABLES

DRILLING CHRONOLOGY
THE ANSCHUTZ CORPORATION
HEADWATERS FEDERAL #7-15

DATE	DEPTH	DAILY	ACTIVITY
5/5/02	60'	52'	On location and rigged up Titan Energy Resources field unit (geologic consulting). Spud well at 1800 hours MDT. Drill 60'- 112'.
5/6/02	112'	621'	Drlg 112'- 733'.
5/7/02	733'	398'	Drlg 733'- 1131'. Circ out & Trip out of hole to work on pump.
5/8/02	1131'	347'	Work on #2 pump. Trip back in hole and resume drilling at 0345. Drlg 1131'- 1478'. Work on #1 pump.
5/9/02	1478'	219'	Work on #1 pump. Drlg 1478'-1500'. Work on #1 pump. Resume drilling at 0700. Drlg 1500'- 1694'. Repair #2 pump. Drlg 1694'-1697'.
5/10/02	1697'	234'	Drill 1697'-1703'. Trip out of hole for NB #2. Lay down shock sub, PU NB #2 & trip in hole. Ream 90' to bottom. Shut down to replace liners in #1 pump. Resume drilling at 1600 hrs. Depth correction to 1716'. Drlg 1716'- 1931'.
5/11/02	1931'	127'	Drlg 1931'- 2058'. Circ 1 hour and pull short trip to surface. Trip back in to TD & condition hole for 2 hours. TOH to run 9 5/8" casing. Run 2068' casing and land at 2059:5' KB. Cement with 492 sacks premium lite & 200 sacks type III. WOC, cut off casing and weld on wellhead. Nipple up BOP.
5/12/02	2058'	0'	Nipple up BOP & test. BLM requirement of 5000# stack required BOP to be nipped down and wait on new stack. Nipple up 5000# stack.
5/13/02	2058'	0'	Nipple up 5000# stack and test stack. Nipple up choke manifold and test. Bad kill line. Wait on parts.
5/14/02	2058'	197'	Wait on parts. Nipple up kill line and rest of choke manifold and test. PU NB #3, mud motor and TIH. Tagged cement at 1960'. Pressure test casing to 1566# for 30". Drill float to 2035' & test casing. Drill shoe & begin making new hole at 1630 hours. Drlg 2058'-2255'.
5/15/02	2255'	762'	Drlg 2255'-3017'.
5/16/02	3017'	535'	Drlg 3017'- 3552'
5/17/02	3552'	207'	Drlg 3552'- 3759'.
5/18/02	3759'	197'	Drlg 3759'- 3956'. TOH for NB #4.
5/19/02	3956'	156'	Finish TOH for NB #4. Swap out mud motor & PU NB#4. TIH and resume drilling @ 0730 hours. Drlg 3956'-4112'.
5/20/02	4112'	390'	Drlg 4112'- 4502'.

DRILLING CHRONOLOGY (CONT.)
THE ANSCHUTZ CORPORATION
HEADWATERS FEDERAL #7-15

DATE	DEPTH	DAILY	ACTIVITY
5/21/02	4502'	293'	Drlg 4502'- 4795'.
5/22/02	4795'	194'	Drlg 4795'- 4989'.
5/23/01	4989'	123'	Drlg 4989'- 5112'. Circ out & TOH. PU new motor & NB #5.
5/24/02	5112'	183'	TIH with NB #5 and resume drilling at 0330 hours. Drlg 5112'- 5295'
5/25/02	5295'	246'	Drlg 5295'- 5541'.
5/26/02	5541'	259'	Drlg 5541'- 5800'.
5/27/02	5800'	269'	Drlg 5800'- 6069'.
5/28/02	6069'	119'	Drlg 6069'- 6174'. Circ out & TOH for NB #6. PU new mud motor & NB #6 & TIH. Resume drilling at 2300 hours. Drlg 6174'-6288'.
5/29/02	6188'	236'	Drlg 6288'- 6424'.
5/30/02	6424'	25'	Drlg 6424'- 6449. Pump pill & pull short trip to shoe of casing. TOH for logs. Rig up Schlumberger and run Platform Express, Dipole Sonic, Spectral Gamma Ray and FMI (dipmeter).
5/31/02	6449'	20'	Complete logging runs. Send logs to hub & wait on orders. Decision to continue drilling ahead received at 1330 hours. PU Bit #7 & TIH. Resume drilling at 1800 hours. Drlg 6449'- 6469'.
6/1/02	6469'	166'	Drlg 6469'- 6635'.
6/2/02	6635'	116'	Drlg 6635'- 6751'.
6/3/02	6751'	112'	Drlg 6751'- 6863'.
6/4/02	6863'	178'	Drlg 6863'- 7041'.
6/5/02	7041'	104'	Drlg 7041'- 7125'. Circ samples. Drlg 7135-7145'. Circ samples. Short trip to casing. Circ out & TOH for DST #1 from 7102'-7145'.
6/6/02	7145'	0'	Finish TOH for DST #1. PU test tools and TIH. Open tool at 12:35 PM. Shut in tool at 12:48 PM. Open tool at 1:45 PM. Shut in tool at 3:15 PM. Pull test at 5:15 PM. Break down and load out DST tools. PU bit #6 & conventional drilling assembly and TIH.
6/7/02	7145'	0'	Finish tripping in hole & circ out. TOH for logs. Rig up Schlumberger and run Dipole Sonic and Resistivity logs. Prepare to plug back to test Cutler zone at 4400 feet. Pason logging unit released. TIH & Condition hole.
6/8/02	7145'	0'	TOH, PU tools & Run DST #2 straddle test in Cutler zone at 4400'

BIT RECORD

OPERATOR: THE ANSCHUTZ CORPORATION
WELL NAME: HEADWATERS FEDERAL #7-15

RUN	SIZE	MAKE	TYPE	SERIAL #	IN	OUT	FTG	HRS	FT/HR
1	12 ¼"	HTC	GT-09C	W56DC	75'	1703'	1628'	71	22.93
2	12 ¼"	HTC	GR-CS09	510CC	1703'	2058'	355'	28.4	12.5
3	8 ¾"	HTC	HP5060	5010749	2058'	3956'	1898'	97.5	19.46
4	8 ¾"	HTC	HX 30	S11JM	3956'	5112'	1156'	96.5	11.99
5	8 ¾"	HTC	EP4892	S22JL	5112'	6174'	1062'	87.5	12.14
6	8 ¾"	HTC	EP4892	S23JL	6174'	6449'	275'	25.0	11.00
7	8 ¾"	HTC	EP4892	S25JL	6449'	7145'	696'	105.5	6.60

DEVIATION RECORD

OPERATOR: THE ANSCHUTZ CORPORATION
WELL NAME: HEADWATERS FEDERAL #7-15

DEPTH	ANGLE	AZIM	DEPTH	ANGLE	AZIM	DEPTH	ANGLE	AZIM	DEPTH	ANGLE	AZIM
242'	1/4	N/A	3821'	3 1/4	N/A	5077'	3	N/A	6323'	4	N/A
489'	3/4	N/A	3914'	4 1/4	N/A	5170	2 1/2	N/A	6502'	5 1/4	N/A
985'	1/4	N/A	4007'	2 3/4	N/A	5261'	2 1/2	N/A	6594'	6 1/2	N/A
1430'	2	N/A	4101'	3 1/4	N/A	5357'	2	N/A	6625'	6 3/4	N/A
2058'	3	N/A	4194'	3 1/4	N/A	5442'	2	N/A	6718'	8 1/2	N/A
2301'	1 3/4	N/A	4288'	2 1/4	N/A	5532'	1	N/A	6812'	9	N/A
2540'	1	N/A	4380'	2 1/4	N/A	5633'	1	N/A	6937'	10	N/A
2818'	3/4	N/A	4471'	2 3/4	N/A	5722'	2 1/2	N/A	7000'	10 1/2	N/A
3071'	1 1/4	N/A	4566'	2 1/4	N/A	5818'	2 1/2	N/A			
3243'	2 1/2	N/A	4660'	2 1/2	N/A	5919'	2	N/A			
3539'	3 1/4	N/A	4754'	2 1/2	N/A	6003'	1 1/2	N/A			
3621'	3 1/4	N/A	4847'	3	N/A	6097'	2 1/4	N/A			
3726'	3 1/4	N/A	4940'	3 1/2	N/A	6190'	2 1/2	N/A			

MUD REPORT

OPERATOR: THE ANSCHUTZ CORPORATION
WELL NAME: HEADWATERS FEDERAL #7-15

DATE	DEPTH	WT	VIS	PV	YDD	GEL	PH	WT	CK	CHL	CA	SD	SO	WTR
5-5-02	DRILL	WITH	WTR											
5-6-02	DRILL	WITH	WTR	&	POLY									
5-7-02	DRILL	WITH	WTR	&	POLY									
5-8-02	DRILL	WITH	WTR	&	POLY									
5-9-02	DRILL	WITH	WTR	&	POLY									
5-10-02	DRILL	WITH	WTR	&	POLY									
5-11-02	DRILL	WITH	WTR	&	POLY									
5-12-02	NIPPLE	UP	BOP											
5-13-02	NIPPLE	UP	BOP											
5-14-02	DRILL	WITH	WTR											
5-15-02	DRILL	WITH	WTR											
5-16/02	3115'	8.9	33	10	2	1/3	9.5	16	2/32	400	80	.15	4.3	95.7
5-17-02	3630'	9.0	33	6	1	1/3	10.3	20	2/32	400	220	.25	5.0	95.0
5-18-02	3826'	9.0	33	5	5	1/4	10.0	16	2/32	400	200	.25	5.0	95.0
5-19-02	3960'	8.9	32	5	4	2/4	10.0	14	2/32	550	250	.25	4.3	95.7
5-20-02	4170'	8.9	36	10	6	2/6	10.0	8.8	2/32	600	120	.25	4.3	95.8
5-21-02	4584'	9.3	40	10	9	3/9	10.0	7.8	2/32	700	60	.30	4.5	95.5
5-22-02	4858'	9.4	42	20	10	3/10	10.5	8.0	2/32	700	40	.30	6.5	93.5
5-23-02	5058'	9.5	42	16	8	3/10	10.5	8.4	2/32	700	60	.30	6.5	93.5
5-24-02	5165'	9.7	45	18	8	2/8	9.6	7.6	2/32	800	130	.30	7.0	93.0
5-25-02	5377'	9.8	47	18	13	3/10	10.0	7.2	2/32	1000	100	.30	7.0	93.0
5-26-02	5622	10.0	47	19	11	4/13	9.5	7.02	2/32	900	120	.30	7.0	93.0
5-27-02	5876'	10.0	45	18	11	3/9	9.0	7.2	2/32	900	120	.30	7.0	93.0
5-28-02	6134'	10.0	45	19	11	3/11	10.0	6.6	2/32	900	140	.30	8.0	92.0
5-29-02	6256'	9.9	46	18	10	3/8	9.7	6.4	2/32	1000	120	.30	7.0	93.0
5-30-02	6449'	9.9	45	18	10	2/8	10.0	6.6	2/32	1000	100	.25	7.0	93.0
5-31-02	RUN	LOGS												
6-1-02	6526'	9.7	43	15	6	2/8	9.7	7.2	2/32	1100	180	.25	6.0	94.0
6-2-02	6650'	10.0	45	19	11	3/10	10.2	7.4	2/32	1100	120	.25	7.5	92.5
6-3-02	6769'	9.9	45	18	12	4/17	9.8	7.2	2/32	1200	180	.50	8.5	91.5
6-4-02	6909'	9.9	46	20	10	3/10	10.3	7.2	2/32	1200	180	.40	9.0	91.0
6-5-02	7075'	10.1	49	20	15	4/11	10.0	7.2	2/32	1800	400	.30	8.0	92.0
6-6-02	7145'	10.1	46	18	12	3/9	9.8	6.8	2/32	1800	180	.30	8.5	91.5
6-7-02	7145'	9.9	47	18	9	3/8	9.0	7.8	2/32	1600	500	.30	7.0	93.0

DRILL STEM TEST REPORT

OPERATOR: THE ANSCHUTZ CORPORATION
WELL NAME: HEADWATERS FEDERAL #7-15

DST NUMBER: 1	DATE: JUNE 6, 2002
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INTERVAL: 7102'-7145'	TYPE: CONVENTIONAL ON BOTTOM
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FORMATION: GOTHIC SHALE

SHOW(S) TESTED:

DEPTH	DRILL RATE	PEAK	BG GAS	C ₁ (ppm)	C ₂ (ppm)	C ₃ (ppm)	C ₄ (ppm)	other
7129-44'	2.5/.9/1.5 min/ft	2394 U	360 U	183,088	35,699	13,263	7343	TRACE

PRESSURES AND TIMES:

Pressure (inside)	Field Reading	Time	Pressure (outside)	Field Reading	Time
Initial Flow	N/A		Initial Flow	100-150#	10 min
Initial Shut In	N/A		Initial Shut In	241#	60 min
Final Flow	N/A		Final Flow	109-119#	90 min
Final Shut In	N/A		Final Shut In	161#	120 min
Hydrostatic	N/A		Hydrostatic	3866-3680#	

BOTTOM HOLE SAMPLER:

Pressure in Sampler	40 PSI
Total Volume of Sampler	2600cc
Volume of Sample	2550 cc
Breakout of Sample	2550 cc mud, 0.0080252 cu. ft. gas
Gravity of Oil	N/A
Sample Rw	3000 ppm chlorides

RESISTIVITIES: Make Up Water Rw: N/A

Mud Pit Sample Rw: 3000 PPM Chlorides

GAS TO SURFACE? YES - IN 16 MINUTES - AMOUNT TSTM

BLOW: 1ST OPEN: BOTTOM OF BUCKET IN 1", 9.5 # IN 5", 10# IN 10 MIN
 2ND OPEN: 2.5# IN 5", 2.3# IN 10", 2.1# IN 30", 1.8# IN 60", 1.4# IN 90"

RECOVERY: 187' SLIGHTLY GAS CUT MUD (.92 BBL)

BOTTOM HOLE TEMPERATURE: 120° F

REMARKS: MECHANICALLY SUCCESSFUL TEST. LIMITED RESERVOIR. NON COMMERCIAL.

DRILL STEM TEST REPORT

OPERATOR: THE ANSCHUTZ CORPORATION
WELL NAME: HEADWATERS FEDERAL #7-15

DST NUMBER: 2	DATE: JUNE 8, 2002
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INTERVAL: 4376-4410' (elog depth)	TYPE: INFLATABLE STRADDLE PACKER
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FORMATION: CUTLER FORMATION

SHOW(S) TESTED:

DEPTH	DRILL RATE	PEAK	BG GAS	C ₁ (ppm)	C ₂ (ppm)	C ₃ (ppm)	C ₄ (ppm)	other
4393-98'	1.4/.6/1.1 min/ft	804 U	20 U	68,049	8205	3219	881	
4400-07'	1.1/.6/1.7 min/ft	1024 U	25 U	86,610	10,443	4097	1121	

PRESSURES AND TIMES:

Pressure (inside)	Field Reading	Time	Pressure (outside)	Field Reading	Time
Initial Flow	N/A		Initial Flow	98-116#	10 min
Initial Shut In	N/A		Initial Shut In	323#	60 min
Final Flow	N/A		Final Flow	69-99#	90 min
Final Shut In	N/A		Final Shut In	561#	120 min
Hydrostatic	N/A		Hydrostatic	2195-2166#	

BOTTOM HOLE SAMPLER:

Pressure in Sampler	28 PSI
Total Volume of Sampler	2600cc
Volume of Sample	2600cc
Breakout of Sample	2600cc mud
Gravity of Oil	N/A
Sample Rw	3000 ppm chlorides

RESISTIVITIES: Make Up Water Rw: N/A

Mud Pit Sample Rw: 3000 PPM chlorides

GAS TO SURFACE? NO

BLOW: 1ST OPEN: BOTTOM OF BUCKET 1.5", 2# IN 3.5", 3# IN 7", 3.8 # IN 10"
 2ND OPEN: BOTTOM OF BUCKET 1", 4.5# IN 5", 5.8# IN 30", 6.0# IN 60", 5.8# IN 90"

RECOVERY: 94' MUD (.46 BBL)

BOTTOM HOLE TEMPERATURE: 97° F

REMARKS: MECHANICALLY SUCCESSFUL TEST. TIGHT RESERVOIR. NON COMMERCIAL.

SAMPLE DESCRIPTIONS

OPERATOR: THE ANSCHUTZ CORPORATION

WELL NAME: HEADWATERS FEDERAL #7-15

DEPTH	LITHOLOGY
75.00 90.00	SS,clr-lt pnk,fn-md grn,md wl rnd,md wl srt,pred lse qtz grns,scat wht feld grns,com rd Fe stn,NFSOC
90.00 110.00	SHL,varicol grn-yel-wht-pnk,sl frm-sft,blky,slty ip,mic pyr ip,sl-non calc
110.00 130.00	varicol SHL aa,grn-yel-wht-pnk-muave,sl frm-sft,blky,slty ip,mic pyr ip,sl-non calc
130.00 140.00	intrbd SS,clr-lt pnk,fn-md grn,md wl rnd,md wl srt,pred lse qtz grns,scat wht feld grns,com rd Fe stn,NFSOC
140.00 160.00	SHL grd to SLTSTN,rd-rd brn-grn-wht,vfn grn,md frm ip-sft ip,rthy tex ip,mic pyr ip,pred non-calc
160.00 170.00	SS,wht-clr,vfn-fn grn,sb ang-sb rnd,md wl srt,pred cln qtz grn snd,non-calc,poss qtz ovrgrth cem,com wht cly fill por,NFSOC
170.00 200.00	SHL,pred rd-rd brn-scat grn-gr,blky-sb plty,md frm-md sft,rthy-grny tex ip,slty ip w occ snd grn inclus,sl mic ip,pri non-calc
200.00 230.00	SHL aa,pred rd-rd brn-scat grn-gr,blky-sb plty,md frm-md sft,rthy-grny tex ip,slty ip w occ snd grn inclus,sl mic ip,pri non-calc
230.00 260.00	SHL,off wht-pnk-brn-rd brn-occ grn,blky-sb plty,pred sft-sl frm ip,wht-pnk shl bent,rd brn-brn shl rthy-slty ip,vsl mic ip,vsl pry ip-grn shl,pred non-calc
260.00 290.00	SHL grd to SLTSTN ip,pred brn-rd brn-occ pl grn-crm,blky-sb plty,sl frm-md sft,rthy-grny tex ip (brn shl) to bent tex ip (grn shl),scat qtz grn inclus,rr drk min grn inclus,pred non-calc
290.00 320.00	SHL grd to SLTSTN aa,brn-rd brn-occ pl grn-crm,blky-sb plty,sl frm-md sft,rthy-grny tex to bent tex ip aa,scat qtz grn & rr drk min grn inclus,pred non-calc
320.00 350.00	SHL,varicol,lt gr-gr grn-crm-rd brn-occ pl lav,md frm ip-sft,bent,sl grny tex ip,occ snd grn incl,bcm calc ip
350.00 380.00	SHL grd to MUDSTN,rd brn-brn,sft,gummy,slty-grny tex ip,occ snd grns,non-calc
380.00 390.00	scat SS,wht-lt pnk-clr,fn-crs grn,md wl rnd,pr srt,scat lithic frags,com grn inclu,com wht cly por fill,NFSOC
390.00 410.00	SHL grd to SLTSTN,pred brn-rd brn-occ pl grn-crm,blky-sb plty,sl frm-md sft,rthy-grny tex,scat qtz grn inclus,sl calc
410.00 440.00	SHL,pred lt-md gr-occ gr grn-rd brn,sl mfr-md sft,blky,bent,scat snd grn inclu,calc ip□

DEPTH

LITHOLOGY

440.00 450.00 SS,clr-pl orng-wht,md-crs grn,sb rnd-wl rnd,md wl srt,pred qtz grns,scat calc cem,sl qtz ovrgrth cem,wht cly fill,NFSOC

450.00 470.00 SHL,varicol,lt gr-gr grn-rd brn-brn-crm,sl frm-md sft,blky,bent ip (grn) to rthy-grny tex ip (brn),calc

470.00 500.00 SS,clr-wht-pl orng,md-crs grn,sb rnd-rnd,md wl srt,pred lse qtz grns,sl scat Fe stn,sl calc cem,gd intrgrn POR,NFSOC

500.00 530.00 varicol SHL aa,lt gr-gr grn-rd brn-brn-crm,sl frm-md sft,blky,bent ip (grn) to rthy-grny tex ip (brn),calc

530.00 560.00 SS,wht-lt tn-sl lt orng,fn-md grn,sb ang-sb rnd,md wl srt,com feld grns, scat dk lithic grns,sl calc cem,com wht cly por fill,NFSOC

560.00 590.00 SHL grd to SLTSTN,pred rd brn-occ gr grn-gr,sl frm-md sft,blky-sb plty,rthy-slty tex (rd shl),occ snd grn inclus,vsl mic & micr pyr,calc

590.00 605.00 SS aa,wht-lt tn-sl lt orng,fn-md grn,sb ang-sb rnd,md wl srt,com feld grns, scat dk lithic grns,sl calc cem,com wht cly por fill,NFSOC

605.00 620.00 SHL grd to SLTSTN aa,rd brn-gr grn-gr,sl frm-md sft,blky-sb plty,rthy-slty tex (rd shl),occ snd grn inclus,vsl mic & micr pyr,calc

620.00 635.00 SS,wht-lt tn-sl lt orng,vfn-fn grn,sb ang-sb rnd,md wl srt,pred qtz grns,scat dk lithic grns,sl calc cem,com wht cly por fill,NFSOC

635.00 660.00 SHL grd to SLTSTN,pred rd brn-lt orng-wht,sl frm-md sft,blky-sb plty,rthy-slty tex,occ snd grn inclus,vsl mic ip,calc

660.00 680.00 SS,wht-lt orng-occ rd ip,vfn-fn grn,sb ang-sb rnd,wl srt,pred qtz grns,sl Fe stn ip,sl calc cem,com wht cly por fill,NFSOC

680.00 710.00 SS,clr-lt pnk-wht,fn-occ md grn,md wl rnd,md wl srt,pred qtz snd w abund lse grns,sl Fe stn,sl calc & qtz ovrgrth cem,NFSOC

710.00 740.00 SS,clr-lt pnk-wht,fn-md grn,sb ang-sb rnd,md wl srt,pred qtz,occ dk lithic frags,sl Fe stn,sl calc & incr qtz ovrgrth cem,NFSOC

740.00 770.00 SS aa,clr-lt pnk-wht,fn-md grn,sb ang-sb rnd,md wl srt,pred qtz,occ dk lithic frags,sl Fe stn,sl calc & incr qtz ovrgrth cem,NFSOC

770.00 800.00 SS,clr-lt pnk-wht,fn-occ md grn,md wl rnd,md wl srt,pred qtz snd w com lse grns,sl Fe stn,sl calc & qtz ovrgrth cem,NFSOC

800.00 830.00 SHL,pred rd brn-brn-occ gr grn-grn-yel,sl frm-md sft,blky-sb plty,rthy-grny tex,com snd grn inclus,sl mic ip,grn shl sl mic pyr,calc

830.00 850.00 SS,wht-lt orng-clr,fn grn,md wl rnd,wl srt,pred qtz w sl Fe stn,qtz ovrgrth & sl calc cem,NFSOC

DEPTH

LITHOLOGY

850.00 870.00 SHL aa,pred rd brn-brn-occ gr grn-grn-yel,sl frm-md sft,blky-sb plty,rthy-grny tex,com snd grn inclus,sl mic ip,grn shl sl mic pyr,calc

870.00 890.00 rr LS,lt brn-tn,micro xln,md hd,den;scat pcs tn-lt orng transl CHT

890.00 910.00 SHL,varicol,red brn-brn-pl grn-grn-gr-wht,sl frm-md sft,blky-sb plty,rthy-grny tex,slty ip,pri non-calc

910.00 940.00 SS,orng-lt rd,fn grn,sb ang-sb rnd,wl srt,pred qtz,scat dk min inclus,Fe stn,qtz ovrgrth & min calc cem,NFSOC

940.00 960.00 SHL,rd brn-brn-gr-grn,blky,sl frm-md sft,rthy-grny tex ip,snd grn inclus,sl-non calc

960.00 980.00 SS aa,orng-lt rd,fn grn,sb ang-sb rnd,wl srt,pred qtz,scat dk min inclus,Fe stn,qtz ovrgrth & min calc cem,NFSOC

980.00 1010.00 SS aa,orng-lt rd,fn grn,sb ang-sb rnd,wl srt,pred qtz,scat dk min inclus,Fe stn,qtz ovrgrth & min calc cem,NFSOC

1010.00 1040.00 SS,orng rd,fn-occ md grn,sb ang-rnd,wl srt,pred qtz,min feld,com dk lithic frags,sl calc & Fe ox cem,NFSOC

1040.00 1070.00 SS aa,orng rd,fn-occ md grn,sb ang-rnd,wl srt,pred qtz,min feld,com dk lithic frags,sl calc & Fe ox cem,NFSOC

1070.00 1100.00 SS aa,orng rd,fn-occ md grn,sb ang-rnd,wl srt,pred qtz,min feld,com dk lithic frags,sl calc & Fe ox cem,NFSOC

1100.00 1130.00 SS aa,orng rd,fn-occ md grn-bcm crs grn ip,sb ang-rnd,com lse frost qtz grns,wl srt,pred qtz,min feld,com dk lithic frags,sl calc & Fe ox cem,NFSOC

1130.00 1160.00 SS,orng-rd,fn-occ md grn,sb ang-sb rnd,md wl srt,scat frst grns,pri qtz,scat dk min grns,Fe oxid & min calc cem,NFSOC

1160.00 1190.00 SS aa,orng-rd,fn-occ md grn,sb ang-sb rnd,md wl srt,scat frst grns,pri qtz,scat dk min grns,Fe oxid & min calc cem,NFSOC,com wht sl calc cly

1190.00 1220.00 SS,orng-rd,fn-occ md grn,sb ang-sb rnd,md wl srt,sl frm-fri ip,scat frst grns,pri qtz,scat dk min grns,Fe oxid & min calc cem,sm qtz ovrgrth,NFSOC,decr wht calc cly

1220.00 1250.00 SS aa,orng-rd,fn-occ md grn,sb ang-sb rnd,md wl srt,sl frm-fri ip,scat frst grns,pri qtz,scat dk min grns,Fe oxid & min calc cem,sm qtz ovrgrth,NFSOC,decr wht calc cly

1250.00 1265.00 SS,orng-rd-wht-transl clr,fn-occ md grn,md frm ip to fri ip,sb ang-rnd,md srt,scat frost grns,pri qtz w min dk lithic grns,slty ip grd to sndy SLTSTN ip,pri non-calc,NFSOC

1265.00 1280.00 SHL grd to SLTSTN,rd brn-brn-occ orng,sb plty,sl frm,rthy-grny tex w com-abund snd grn inclus grd to v argil SS ip,pri non-calc

DEPTH	LITHOLOGY
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1280.00 1310.00	SS,pink tan-salm,fn grn,sb ang-sb rnd,wl srt,sl frm-fri,pred qtz w scat dk lithic grns,min calc cem,min wht intrstt cly,NFSOC
1310.00 1340.00	SS aa,pink tan-salm,fn grn,sb ang-sb rnd,wl srt,sl frm-fri,pred qtz w scat dk lithic grns,min calc cem,min wht intrstt cly,NFSOC
1340.00 1355.00	scat SHL grd to SLTSTN,rd brn-brn-occ orng,sb plty,sl frm,rthy-grny tex w com-abund snd grn inclus,pri non-calc
1355.00 1370.00	SS aa,pink tan-salm,fn grn,sb ang-sb rnd,wl srt,sl frm-fri,pred qtz w scat dk lithic grns,min calc cem,min wht intrstt cly,NFSOC
1370.00 1400.00	SS aa,pink tan-salm,fn grn,sb ang-sb rnd,wl srt,sl frm-fri,pred qtz w scat dk lithic grns,min calc cem,min wht intrstt cly,NFSOC
1400.00 1430.00	SS aa,pink tan-salm,fn grn,sb ang-sb rnd,wl srt,sl frm-fri,pred qtz w scat dk lithic grns,min calc cem,min wht intrstt cly,NFSOC
1430.00 1450.00	prim SS aa,pink tan-salm,fn grn,sb ang-sb rnd,wl srt,sl frm-fri,pred qtz w scat dk lithic grns,min calc cem,com wht cly (bit flour?),NFSOC
1450.00 1470.00	scat SHL grd to MUDSTN,brn,sft,blky,rthy-grny tex,com snd grn inclus,md calc ip-non calc
1470.00 1490.00	SS aa,pink tan-salm,fn grn,sb ang-sb rnd,wl srt,sl frm-fri,pred qtz w scat dk lithic grns,min calc cem,com wht cly (bit flour?),NFSOC
1490.00 1520.00	sl incr SHL,brn-rd-occ grn,sft-sl frm,blky,rthy-grny tex,com snd grn inclus,md calc ip-non calc
1520.00 1550.00	SHL aa,brn-rd-occ grn,sft-sl frm,blky,rthy-grny tex,com snd grn inclus,prim non calc-sl calc ip
1550.00 1580.00	SS,lt pnk tn,fn grn,sb ang-sb rnd, md wl srt,prim qtz w minor dk lith frags,com wht cly (bit flour?),prim non-calc,NFSOC
1580.00 1610.00	SHL grd to SLTSTN,rd brn-brn-occ gr grn, blky,md sft-sft,rthy-grny tex,scat-com qtz grn inclus,calc ip to non calc
1610.00 1630.00	SS,orng-rd-salm,fn grn,sl frm,sb ang-sb rnd,wl srt,pred qtz grns w com blk min grns,Fe stn,non-calc,NFSOC
1630.00 1650.00	SHL,brn-rd brn-pnk-orng-occ grn,blky-sb plty,sl frm-md sft,rthy to chky tex ip,rr mic pyr ip,calc
1650.00 1670.00	SS,lt rd brn-wht-pnk,vfn-fn-occ md grn,sb rnd,md srt,md hd-qtzitic ip-md sft-fri ip,calc cem,NFSOC
1670.00 1700.00	SS,lt rd brn-lt orng,fn-vfn grn,sb ang-sb rnd,wl srt,md frm,md wl cem w qtz ovrgth? & min calc cem,NFSOC
1700.00 1730.00	SS,tn-lt gr-wht-lt orng,fn grn,sb rnd-rnd,md wl srt,frm ip to fri ip,rr glauc? grns,calc cem,cly fill por ip,NFSOC□

DEPTH

LITHOLOGY

1730.00 1760.00 SS aa,tn-lt gr-wht-lt orng,fn grn,sb rnd-rnd,md wl srt,frm ip to fri ip,rr glauc? grns,rr dk min grns,argil ip grd to SLTSTN ip,calc cem,cly fill por ip,NFSOC

1760.00 1790.00 SS,pnk tn-lt gr ip,fn grn,sb ang-sb rnd,md wl srt,pred qtz w scat grn & dk min incl,scat feld grns,Fe oxid cem & calc cem ip,NFSOC

1790.00 1820.00 SS,tn-lt gr-wht-lt orng,fn grn,sb rnd-rnd,md wl srt,frm ip to fri ip,scat grn & dk min grns,calc cem,cly fill por ip,NFSOC

1820.00 1850.00 SS,lt gr-wht-pnk-lt rd,fn grn,sb ang-sb rnd,md wl srt,pred qtz,com lt Fe oxid stn,md frm ip w qtz ovrgrth cem,min calc cem,NFSOC

1850.00 1880.00 SS,pnk tn-lt gr ip,fn grn,sb ang-sb rnd,md wl srt,pred qtz w scat feld grns,sl mic ip,Fe oxid cem,sl cly fill,non-calc,NFSOC

1880.00 1900.00 SS,orng-lt rd,fn grn,sb rnd,md wl srt,com-abund Fe oxid stn,argil,mic ip,slty ip grd to sndy SLTSTN ip,sl-non calc,NFSOC

1900.00 1920.00 SHL,rd brn,md sft,blky-sb plty,rthy-slty tex,pri non-calc

1920.00 1940.00 SS,wht-lt gr-lt pnk,fn grn,sb rnd,wl srt,sl S&P w com dk min inclus,fri ip-md hd ip,non calc,NFSOC

1940.00 1970.00 SS,lt orng-lt salm,fn grn,sb rnd-rnd,wl srt,cln w scat dk min inclus,sl frm ip-fri,non-calc,NFSOC

1970.00 1990.00 SS aa,lt orng-lt salm,fn grn,sb rnd-rnd,wl srt,cln w scat dk min inclus,sl frm ip-fri,non-calc,NFSOC

1990.00 2010.00 SHL,rd brn-brn-pale grn,blky,sl frm-sft,gry tex ip,sndy ip,prim non-calc to sl calc

2010.00 2030.00 SS,orng-salm,fn grn,sb ang-sb rnd,md wl srt,rr mic ip,argil ip,Fe oxid stn,md wl cem w qtz ovrgrth & Fe cem,pri non-calc,NFSOC

2030.00 2060.00 SHL,varicol,rd brn-brn-pale grn-bl gr-ochr,blky,sl frm-sft,gry tex ip,sndy ip,prim non-calc to sl calc

2060.00 2090.00 SS,orng-salm,offwh,ltgy,vfn-fn grn,sb ang-sb rnd,occ ang,md wl srt,rr mic ip,argil ip,Fe oxid stn,tr md wl cem w qtz ovrgrth & Fe cem,pri sl-mod calc,rr vcalc,NFSOC

2090.00 2100.00 SHL,rd brn-brn,mgly,blky,sl frm-sft,gry tex ip,sndy ip,prim non-calc to sl calc

2100.00 2125.00 SS,orng-orngbrn,offwh,vfn-fn grn,sb ang-sb rnd,occ ang,md wl srt,v argil ip,Fe oxid stn,tr md wl cem w qtz ovrgrth & Fe cem,pri non-sl calc,rr vcalc,NFSOC

2125.00 2150.00 SS,pale orng-orng,tr orngbrn,offwh,vfn grn,rnd-sb rnd,wl srt,sl frm,v argil ip,argil cmt thru,sl-tr Fe oxid stn,non-sl calc,NFSOC

2150.00 2180.00 SHLY SS,orng-orngbrn-brn,offwh,vfn grn,rnd-sb rnd,wl srt,sft-sl frm,v argil ip,argil cmt thru,fmt-mod Fe oxid stn,pred sl-mod calc,occ ncalc,NFSOC

DEPTH

LITHOLOGY

2180.00 2195.00 SH,crm,rd brn,brn,plty-sbptly,sft,sbwxy-rthy tex,occ sm,vslty ip,sndy ip,non-sl calc,grdg to & intbd w/ SLTY SH & SHLY SS

2195.00 2210.00 SLTY SH,rd brn,brn,plty-sbptly,sft,rthy tex,sl-non calc,occ mod calc, grdg to SHLY SS & redbrn SH ip

2210.00 2240.00 SS,pale orng,ltgy,offwh,vfn grn,rnd-sb rnd,wl srt,sl frm,v argil ip,argil cmt,sl-tr Fe oxid stn,non-sl calc,NFSOC,grdg to SHLY SS ip

2240.00 2260.00 SH,crm,rd brn,brn,plty-sbptly,sft,sbwxy-sm tex,tr sd ip,non-sl calc,grdg to & intbd w/ SLTY SH & SHLY SS

2260.00 2280.00 SHLY SS,rd brn,brn,vfgr,wsrt,fri-sl frm,mod calc,rthy tex,congl ip,grdg to SLTY SH & SH ip,NFSOC

2280.00 2300.00 SH,crm,rd brn,brn,gygn,ltgy,ltbrn,salm,plty-sbptly,sbblky,sft,sbwxy-sm tex,occ sbrthy,sd ip,slty ip,non-sl calc,occ argil,grdg to & intbd w/ SLTY SH & SHLY SS

2300.00 2330.00 SHL grd to SLTSTN ip,orng-rd-rd brn,sb blky-sb plty,md sft-sl frm ip,slty ip,slty-grny tex ip,sb wxy tex ip,sl-mod calc

2330.00 2360.00 SHL grd to SLTSTN aa,orng-rd-rd brn,sb blky-sb plty,md sft-sl frm ip,slty ip,slty-grny tex ip,sb wxy tex ip,sl-mod calc

2360.00 2390.00 SHL grd to SLTSTN aa,orng-rd-rd brn,sb blky-sb plty,md sft-sl frm ip,slty ip,slty-grny tex ip,sb wxy tex ip,sl-mod calc

2390.00 2420.00 SHL,brick rd-rd brn,blky-sb blky,sl frm-md sft,rthy tex,slty ip,calc

2420.00 2450.00 pred SHL aa,brick rd-rd brn,blky-sb blky,sl frm-md sft,rthy tex,slty ip,rr mic,calc;scat SLTSTN,pnk-gr,vfn grn,blky,md frm,sndy ip,sl mic,calc

2450.00 2480.00 SHL grd to SLTSTN ip,varicol,rd brn-brn-bl grn-grn-yel,blky,md-sl frm,argil,mic ip,sndy ip grd to vfn grn argil SS ip,mod calc

2480.00 2510.00 SS,lt gr-mott blk ip,vfn-fn-occ md grn,sb ang-sb rnd,md srt,prim qtz w scat feld,dk min grns,scat-rr glauc?,scat-com blk shl (coal) ptgs,calc cem,NFSOC

2510.00 2540.00 SS aa,lt gr-mott blk ip,vfn-fn-occ md grn,sb ang-sb rnd,md srt,scat feld,dk min grns & glauc? ss,scat-com blk shl (coal) ptgs,scat foss hash,calc cem-bcm v calc grd to sndy LS ip,NFSOC

2540.00 2550.00 scat LS,gr-tn-brn,mic xln,dens,md hd,argil ip w snd grn inclus ip,evid op frac w calc xtls,NFSOC

2550.00 2570.00 SS,pred lt gr,vfn-fn grn,sb ang-sb rnd,md srt,scat feld,dk min grns & glauc? grns,scat-com blk shl (coal) ptgs,calc cem,NFSOC

2570.00 2600.00 SS aa,pred lt gr,vfn-fn grn,sb ang-sb rnd,md srt,scat feld,dk min grns & glauc? grns,scat-com blk shl ptgs,com blk vit coal,calc ip grd to LS ip,NFSOC

DEPTH

LITHOLOGY

2600.00 2630.00 SHL grd to SLTSTN,gr-rd brn-brn,blky-sb blky,md sft-sl frm ip,rthy-grny tex ip to wxy tex ip (poss bentic),sl calc ip to non calc

2630.00 2660.00 SHL grd to SLTSTN aa,gr-rd brn-brn,blky-sb blky,md sft-sl frm ip,rthy-grny tex ip to wxy tex ip (poss bentic),sl calc ip to non calc

2660.00 2675.00 SS,lt gr-clr,crs-v crs grn,ang-md wl rnd,md wl srt,pred unconsol qtz grns,min Fe stn,NFSOC

2675.00 2690.00 SHL grd to SLTSTN ip,rd brn-brn-gr grn,blky-sb blky,md sft-sl sft,rthy-grny tex ip,wxy tex ip,sl calc

2690.00 2720.00 SHL grd to SLTSTN ip,rd-rd brn-gr-brn,blky-sb blky,sl frm-md sft,rthy-grny tex ip,slty/sndy ip grd to vfn grn argil SS ip,sl calc

2720.00 2750.00 prim SHL grd to SLTSTN aa,rd-rd brn-gr-brn,blky-sb blky,sl frm-md sft,rthy-grny tex ip,slty/sndy ip,sl calc

2750.00 2780.00 SLTSTN,rd-rd brn-orng brn,sb plty-plty,sb blky,sl frm,rthy-grny tex ip,sndy ip,sl-mod calc, grgd to & intbd w/ SHL aa & SHLY SS

2780.00 2810.00 SHL grd to SLTSTN,rd-rd brn-gr-brn,blky-sb blky,sl frm-md sft,pred rthy-grny tex,occ subwxy,slty/sndy ip grd to vfn grn argil SS ip,sl calc

2810.00 2840.00 SHL,rd brn-gr-gygrn,sb blky-sb plty,plty,sl frm-sl hd,pred rthy-grny tex,occ subwxy,slty/sndy ip grd to vfn grn argil SS ip,sl calc w/ tr LS strg,pale grn,crm,crpxln,sft

2840.00 2870.00 SHL,rd brn,orng brn,sb blky-sb plty,plty,sl frm-sl hd,rthy-grty tex,tr subwxy,slty,tr grd to vfn grn argil SS,sl calc w/ tr LS strg,pale grn,crm,crpxln,sft

2870.00 2900.00 SHL,rd brn,orng brn,tr gy,tr crm,sb blky-sb plty,plty,sl frm-sl hd,rthy-grty tex,tr subwxy,slty,rr grd to vfn grn argil SS,sl-mod calc ip

2900.00 2930.00 SHL,med-lt orng brn,tr gy,tr brn,tr crm,sb blky-sb plty,plty,sft,rthy-grty tex,rr sb wxy,v slty,argil ip,sl-mod calc

2930.00 2960.00 SHL,orng brn-gy-brn-orm,sb blky-sb plty,plty,frm-sft,rthy-grty tex,v slty,argil ip,sl calc

2960.00 2990.00 SHL,orng brn-orng-gr-gngy,sb blky-sb plty,plty,frm-sft,rthy-grty tex,slty ip,argil ip,sl-mod calc ip

2990.00 3000.00 SHL,orng brn-orng-gngy,sb blky,plty,frm-sft,rthy-grty tex,slty ip,argil ip,tr sd ip,sl-mod calc ip

3000.00 3015.00 tr LS,gy,crpxln,frm,blky-sb blky,intbd w/ SH aa

3015.00 3030.00 3015.85 0 tr SS,ltgy-ltgygrn,frm-fri,vfg,sb ang-sb rnd,w srt,limy,scat lith frag,tr glau,NFSOC

3030.00 3050.00 SHL,orng brn-orng-gngy-brn,tr purp,sb blky-blky,frm-sft,rthy-grty tex,slty ip,argil ip,rr sd ip,mod-v calc,ncalc ip,w/ tr SS aa & SLTST

3050.00 3080.00 SHL,orng brn-orng-gngy-brn,sb blky-blky,frm-sft,rthy-grty tex,slty ip,mod-v calc,alc ip,w/ tr SS aa,scat pcs congl SHL,brn,mott,sft,non calc w sand grn inclus

DEPTH

LITHOLOGY

3080.00 3095.00 SHL grd to SLTSTN,orngrd brn,blky,sl frm-md sft,rthy-grny tex,sl brec aa ip,calc ip-non calc ip

3095.00 3110.00 SS,orngr,fn-vfn grn,sb ang-sb rng,md srt,v argil,sl mic ip,calc cem,NFSOC

3110.00 3140.00 SHL,pred brk rd-orngr rd-scat gr-gr grn,sb blky,md frm ip to sft,rthy-slty tex (rd shl) to sb wxy tex (gr grn shl),slty ip grd to SLTSTN ip,calc ip

3140.00 3170.00 SHL grd to SLTSTN,pred brk rd-orngr rd-scat gr-gr grn,sb blky,md frm ip to sft,rthy-slty tex (rd shl) to sb wxy tex (gr grn shl),SLTSTN mic,calc ip

3170.00 3200.00 SHL grd to SLTSTN aa,pred brk rd-orngr rd-scat gr-gr grn,sb blky,md frm ip to sft,rthy-slty tex (rd shl) to sb wxy tex (gr grn shl),SLTSTN mic,calc ip

3200.00 3230.00 SHL grd to SLTSTN aa,pred brk rd-orngr rd-scat gr-gr grn,sb blky,md frm ip to sft,rthy-slty tex (rd shl) to sb wxy tex (gr grn shl),SLTSTN mic,calc ip,scat pcs brecc sltstn & shl w snd grns aa

3230.00 3260.00 SHL,pred brk rd-orngr rd-occ lt gr-wht,blky-sb blky,md frm ip to sft,rthy-slty tex,slty ip grd to SLTSTN ip,sl calc ip

3260.00 3275.00 scat SS,lt gr-lt pnk,md frm,wl rnd,wl sft,vfn grn grd to SLTSTN,sl mic,sl calc,NFSOC

3275.00 3290.00 SHL grd to SLTSTN ip,rd-orngr rd-scat gr,sb blky,md frm ip to sft,rthy-grny tex,mic ip,sl calc

3290.00 3320.00 SHL grd to SLTSTN ip,pred brk rd-orngr rd-scat gr-gr grn,sb blky,md frm ip to sft,rthy-slty tex (rd shl) to sb wxy tex (gr grn shl),SLTSTN mic,calc ip

3320.00 3350.00 SHL aa grd to SLTSTN ip,pred brk rd-orngr rd-scat gr-gr grn,sb blky,md frm ip to sft,rthy-slty tex (rd shl) to sb wxy tex (gr grn shl),SLTSTN mic,calc ip

3350.00 3380.00 SHL,pred brk rd-orngr rd-occ lt gr-GRN,blky-sb blky,md frm ip to sft,rthy-slty tex,slty ip grd to SLTSTN ip,mic ip,sl calc ip

3380.00 3410.00 SHL,pred brk rd-orngr rd-occ lt gr-GRN,sb blky-sb plty,plty,md frm ip to sft,rthy-slty tex,slty ip grd to SLTSTN ip,mic ip,sl calc ip,scat congl SHL,brn-dkgy,sft,ncalc w/ sd gr incl

3410.00 3440.00 SHL aa w/ incr congl SHL & tr SS,wh-ltgy,vfgr,sbrnd,wsrt,ncalc,argil mtx,gr supt,NFSOC

3440.00 3470.00 SHL,pred brk rd-orngr rd-occ lt gr-grn,tr crm,sb blky-sb plty,plty,md frm to sft,rthy-slty tex,slty ip grd to SLTSTN ip,mic ip,mod calc ip,argil ip,scat congl SHL,brn-dkgy,sft,ncalc w/ sd gr incl,tr mic mica ip

3470.00 3500.00 SHL,pred brk rd-orngr rd-brn-occ lt grgrn,tr crm,sb blky-sb plty,plty,md frm to sft,rthy-slty tex,slty ip grd to SLTSTN ip,mic ip,mod calc ip,argil ip,scat congl SHL,brn-dkgy,sft,ncalc w/ sd gr incl,tr mic mica ip

3500.00 3530.00 SHL,pred brk rd-orngr rd-brn-occ lt grgrn,tr crm,sb blky-sb plty,sft,grty-slty tex,mod calc ip,argil ip,incr congl SHL,ncalc w/ sd gr incl grd to SLTST ip,tr mic mica ip

3530.00 3560.00 SHL,pred brk rd-orngr rd-brn-tr lt grgrn-tr crm,sb blky-sb plty,sft,sme hd,slty-rthy tex,sl-mod calc,v calc ip,tr argil ip,congl ip,grdg to SLTST ip□

DEPTH

LITHOLOGY

3560.00 3590.00 SHL, pred brk rd-orgn rd-brn, sb blk-y-sb plty, sme plty, v sft-firm, grty-slty-rthy tex, non-mod calc, incr congl, grdg to SLTST ip

3590.00 3620.00 SHL, rd brn-brn-occ pnk-lt gr, md frm-md sft ip, blk-y-plty, rthy-slty tex ip, rr mic ip, sl calc ip, rr wl rnd qtz grn inclus, scat lt gr bent cly

3620.00 3650.00 SHL aa, rd brn-brn-occ pnk-lt gr, md frm-md sft ip, blk-y-plty, rthy-slty tex ip, rr mic ip, sl calc ip, scat lt gr-wht bent cly

3650.00 3665.00 scat SS, brn, sft, fn-crs grn, ang-sb ang, pr srt, qtz & feld grns, v argil, mic, brn cly fill POR, NFSOC

3665.00 3680.00 SHL, rd brn-orgn-brn-occ gr grn, sb blk-y-plty, sl frm-md sft, rthy tex ip, silty ip grd to SLTSTN ip, sl calc ip to non calc, scat crm bent cly

3680.00 3710.00 SHL, rd brn-orgn-brn-tr grngy, sb blk-y-plty, sl frm-md sft, rthy tex-occ subwxy, silty ip grd to SLTSTN ip, sl calc ip to non calc, scat crm bent cly

3710.00 3740.00 SHL, orgn-brn-tr grngy, sb blk-y-plty, sl frm-md sft, rthy tex-occ subwxy, silty ip grd to SLTSTN ip, sl calc ip to non calc, scat crm bent cly

3740.00 3750.00 SS, orgn, md-crs grn, wl rnd, md srt, pred unconsol qtz grns, abund rd cly fill POR, NFSOC

3750.00 3770.00 SHL, orgn-brn-rr grngy, sb blk-y-plty, v-sl sft, rthy tex, silty ip grd to SLTSTN ip, sl calc ip to non calc

3770.00 3780.00 SS, orgn, md-crs grn-bcm fn grn ip, sb ang-wl rnd, md srt, pred unconsol qtz grns, com-abund rd cly fill POR, NFSOC

3780.00 3800.00 SHL, brk rd-rd brn-occ gr grn, sb blk-y-plty, sl frm-sft, rthy-slty tex grd to SLTSTN ip, sl-non calc

3800.00 3830.00 SHL grd to SLTSTN, orgn-rd brn-brn-gr grn, blk-y-sb plty, sl frm-md sft, rthy-grny tex w snd grn inclus, com lse wl rnd qtz grns aa, sl calc ip-non calc

3830.00 3860.00 pr smp-abund sft gummy wht-orgn anhy, SHL aa, rd brn-orgn, blk-y-sb plty, sft, rthy-slty, sl calc ip-non calc

3860.00 3880.00 SHL, pnk-orgn-rd brn-brn-gr grn, plty-tab-occ blk-y, sft-sl frm ip, rthy-slty ip to gummy-anhy aa ip, mod calc ip-non calc

3880.00 3900.00 SS, lt orgn-lt rd-clr, md-crs grn, sb-wl rnd, sl frost, md wl srt, pred lse qtz grns, prob cly fill por, NFSOC

3900.00 3920.00 SS aa, SHL, pnk-orgn-rd brn-brn-gr grn, sb blk-y, sft, rthy-slty ip to gummy-anhy aa ip, mod calc ip-non calc, sd ip w/ SLTST, dkbrn, blk-y, frm, rthy, calc

3920.00 3950.00 SS, gy-brn-wh mott, f-mgr, ang-sbang, wsrt, frm-sft, ncalc, abnt cly fl, dk lith frags, NFSOC w/ SH aa and tr SLTST aa

3950.00 3980.00 SHL, rd orgn-brn-occ gr grn, plty-sb blk-y, sl frm-md sft, rthy-grny tex, slty ip grd to SLTSTN ip, sl calc ip, sl anhy, scat lse wl rnd qtz grns aa

DEPTH

LITHOLOGY

3980.00 4010.00 SHL grd to SLTSTN aa,rd orng-brn-occ gr grn,plty-sb blkyl,sl frm-md sft,rthy-grny tex,slty,scat lse wl rnd qtz grns aa,sl calc,sl anhy,abund rd cly & mud wash from smps

4010.00 4040.00 SHL grd to SLTSTN aa,rd orng-brn-occ gr grn,plty-sb blkyl,sl frm-md sft,rthy-grny tex,slty,scat lse wl rnd qtz grns aa,sl-mod calc,abund rd cly & mud wash from smps

4040.00 4070.00 SLTSTN,rd orng-brn,sb blkyl,sl frm,rthy-grny tex,tr lse wl rnd qtz grns,mod-v calc,occ sl calc,grdg to SHL aa

4070.00 4100.00 SHL,rd orng-brn-occ gr grn,plty-sb blkyl,sl frm-md sft,rthy-grny tex,sme sb wxy,pred slty grdg to SLTSTN ip,mod-sl calc ip,argil ip,scat lse wl rnd qtz grns aa & tr SS,wh,gy,vfg,fri-frm,rnd-sb rnd,w-mod srt,argil ip,mod calc ip,mic mica ip,NFSOC

4100.00 4130.00 SLTSTN,orng-orngbrn-brn,tr dkgy,sb blkyl,frm,rthy-grny tex,tr lse wl rnd qtz grns,mod-v calc,occ sl calc,grdg to SHL aa ip

4130.00 4160.00 SHL grd to SLTSTN aa,rd brn-orng-rd-brn,blkyl-sb plty,md sft-sl frm,v argil,mic,sndy ip grd to v argil SS ip,sl-mod calc,NFSOC

4160.00 4180.00 SHL,rd brn-orng-rd-brn,blkyl-sb plty,md sft-sl frm,v argil,mic,slty grd to SLTSTN,sndy ip grd to v argil SS ip,sl-mod calc,NFSOC

4180.00 4200.00 scat SS,rd-rd brn,fn-md grn,sb ang,md srt,sft,v argil w abund rd cly fill,mic,sl calc,NFSOC

4200.00 4220.00 SS,rd-rd brn,fn-md-crs grn,ang-sb ang,pr srt,sft-sl frm,v argil w abund rd cly fill,mic,sl calc,NFSOC

4220.00 4240.00 SHL grd to SLTSTN,rd brn-orng-brn,blkyl-sb plty,md sft-sl frm,v argil,mic,sndy ip grd to v argil SS ip,sl-mod calc,NFSOC

4240.00 4260.00 SS,crm-wht,fn grn,sb-wl rnd,md wl srt,clean,fri,qtz-feld & scat lithic frags,calc cem,NFSOC

4260.00 4280.00 SHL grd to SLTST aa,rd brn-orng-brn,blkyl-sb plty,md sft-sl frm,v argil,mic,sndy ip grd to v argil SS ip,sl-mod calc,NFSOC

4280.00 4310.00 SS,transl gr-clr,md-crs-vcrs grn ip,sb ang-sb rnd,md srt,pred lse qtz grns washed from mud matrix,smp pred SLTSTN & SHL aa

4310.00 4336.00 SLTSTN,orng-orngbrn-brn-dkgy,sb blkyl,frm,rthy-grny tex,mod-v calc,occ sl calc,grdg to SHL ip

4336.00 4346.00 SS,transl gr-clr,md-crs-f grn ip,sb ang-sb rnd,md srt,pred lse qtz grns washed from mud matrix,mod calc,NFSOC

4346.00 4370.00 SLTSTN,orng-orngbrn-brn-dkgy,sb blkyl,frm,rthy-grny tex,mod-v calc,occ sl calc,grdg to SHL ip

4370.00 4406.00 SS,orng-orng brn-brn,md-crs gr,fn grn ip,sb ang-sb rnd,md-p srt,pred lse qtz grns,mod calc,NFSOC

4406.00 4414.00 SS,ltgy-ltbrn,vf grn,sb ang-sb rnd,w srt,sl hd,mod calc,mic mica,bri gld mnrl FLOR,fst mlky yel bldg CUT,bri yel ring CUT

DEPTH

LITHOLOGY

4414.00 4440.00 SLTSTN,orgng-orngbrn-brn-dkgy,sb blkly,frm,rthy-grny tex,mod-v calc,occ sl calc,grdg to SHL ip & fgr SS

4440.00 4460.00 SHL,orgng-orng brn-crm-gy,sbblkly-plty,rthy-sb wxy,slty ip,sd ip,v-mod calc,argil ip,grdg to SLTSTN ip,scat lse crs-m gr sd

4460.00 4490.00 SLTSTN,orgng-orngbrn-brn-ltgy-brn,frm-fri,sb blkly,rthy-grty tex,v calc,mic mica,argil ip,grdg to vfgr SS ip

4490.00 4520.00 SLTSTN aa w/ SHL,orgng-orng brn-crm-gy,sbblkly-sb plty,rthy-sb wxy,slty ip,sd ip,v-mod calc,argil ip,grdg to SS,brn-orng brn,orgng,vf gr,ang-sb ang,w srt,frm-fri,v slty,v calc mtx,pred shly,argil ip,NFSOC

4520.00 4550.00 SHL,lt orgng-orng brn-gygn-tr crm,sbblkly-plty,rthy-sb wxy,slty ip,v-mod calc,argil ip,SLTSTN aa,SS aa

4550.00 4565.00 SHL grd to SLTSTN,orgng-rd-brn-occ wht-gr,sb blkly-sb splint,sl frm-sft gummy,rthy-sb wxy tex ip,sl anhy,sndy ip,mic ip,mod-v calc

4565.00 4580.00 SS,rd brn,fn-vfn grn,sb ang-sb rnd,md wl srt,md sft-fri,argil,mic,cly fill por,Fe oxid & calc cem,NFSOC

4580.00 4610.00 SHL grd to SLTSTN aa,orgng-rd-brn-occ wht-gr,sb blkly-sb splint,sl frm-sft gummy,rthy-sb wxy tex ip,sl anhy,sndy ip,mic ip,mod-v calc

4610.00 4630.00 SHL grd to SLTSTN aa,sft-gummy-sl frm ip,orgng-rd-brn-occ wht-gr,sb blkly-sb plty,rthy,sl anhy,sndy ip,mic ip,mod-v calc

4630.00 4650.00 SS,rd-rd brn,fn-occ md grn,sb ang,md srt,md sft,argil w abund rd cly por plug,mic,calc,NFSOC

4650.00 4670.00 SHL,rd-brn-orng,blkly-sb plty,md sft,gummy,rthy-slty-grny tex,snd grn inclus,md-v calc,com wht bent cly

4670.00 4700.00 SHL grd to SLTSTN,sft-gummy-sl frm ip,orgng-rd-brn,sb blkly-sb plty,rthy,sl anhy,sndy ip,mic ip,mod-v calc,scat SS,lt gr-lt rd,fn grn,sb rd,cln,calc,NFSOC

4700.00 4730.00 SS,rd-rd brn,fn-occ m grn,sb ang,mod srt,sl sft,argil w/ abnt rd cly por plug,mic,calc,NFSOC w/ rr LS,dk gygn,sb blkly,crpxln-mic xln,sm tex

4730.00 4760.00 SHL grd to SLTSTN,sft-frm,orgng-rd-brn,sb blkly-sb plty,plty,rthy,sl anhy,sndy ip,mic ip,non-mod calc,scat SS,rd brn-crm-lt gy,vf gr,sb rd,argil ip,mod calc ip,NFSOC

4760.00 4790.00 SLTST aa,SS,off wh-clr-gy,m-f gr,ang-sb ang,w srt,sl-n calc,arig ip,mic mica,sp fnt gld mnrl FLOR,fnt mlky blmg & bri yel slo stmg CUT w/ gld ring CUT

4790.00 4820.00 SS,wht-lt gr-off wh-orng,mott blk,m-crs grn-occ fn grn,ang,p srt,hd,mic,n-v sl calc,ark,com-abund blkly bit btwn grns,no FLOR,slo fnt mlky blmg CUT w/ fnt yel ring CUT

4820.00 4850.00 SHL grd to SLTSTN,rd brn-brn-orng,blkly-sb plty,md frm ip-sft,rthy-grny tex,slty,mic,sndy ip grd to v argil SS ip,sl-non calc,NFSOC

DEPTH	LITHOLOGY
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4850.00 4880.00 pred SHL grd to SLTSTN aa,rd brn-brn-orng,blky-sb plty,md frm ip-sft,rthy-grny tex,slty,mic,sl-non calc

4880.00 4910.00 SHL grd to SLTSTN,rd brn-brn-orng,blky-sb plty,md frm ip-sft,rthy-grny tex,slty,mic,sndy ip,scat SS,crm-off wht,fn-vfn grn,sb rnd,wl srt,sl-non calc,NFSOC

4910.00 4940.00 SHL grd to SLTSTN aa,rd brn-brn-orng,blky-sb plty,md frm ip-sft,rthy-grny tex,slty,mic,sndy ip,scat SS,rd-brn,md-crs grn,ang-sb rnd,argil,mic,cly fill por,sl-non calc,NFSOC

4940.00 4970.00 SLTSTN,rd brn-brn-orng,sb blky-sb plty,md frm ip-sft,rthy-grny tex,sl calc,mic,sndy ip,scat SS,rd-brn,md-crs grn,ang-sb rnd,argil,mic,cly fill por,sl-non calc,NFSOC,SHL aa

4970.00 5000.00 SHL grd to SLTSTN,rd brn-brn-orng,sb blky-sb plty,md frm ip-sft,rthy-grny tex,v-sl calc,slty,mic,sd ip,scat peb frags (CHT & DOLO),rr scat SS,crm-off wht,fn-vfn grn,sb rnd,wl srt,sl-non calc,NFSOC

5000.00 5015.00 scat pcs LS,tn-lt brn-brn,md hd,mic xln,dens,argil ip,sndy ip grd to v calc fn grn SS ip,NFSOC

5015.00 5030.00 SS,rd-brn,fn-crs grn,sb ang-sb rnd,pr srt,v argil,mic ip,cly fill por,sl calc,NFSOC

5030.00 5050.00 SS,lt gr-transl v faint pnk,crs-v crs grn,sb ang-sb rnd,md srt,pred unconsol grns,pred qtz w com feld,cht,lithic frags & scat carb grns,scat gr grn cly por fill,scat blk bit stn,no flour,v faint mlky resid cut

5050.00 5070.00 grd to SLTSTN,rd brn-brn-orng,sb blky-sb plty,md frm ip-sft,rthy-grny tex,v-sl calc,slty,mic,sndy ip,com lse qtz grns aa,sl-non calc,NFSOC

5070.00 5090.00 SHL grd to SLTSTN aa,rd brn-brn-orng,sb blky-sb plty,md frm ip-sft,rthy-grny tex,v-sl calc,slty,mic,com wht calc cly-prob cont from mud,sl-non calc,NFSOC

5090.00 5120.00 SHL grd to SLTSTN aa,rd brn-brn orng-crm,sb blky-sb plty,md frm ip-sft,rthy-grny tex,v-sl calc,pred slty,argil ip,mic

5120.00 5140.00 SS,wht-transl lt gr-brn ip,fn-vcrs grn,ang-sb rnd ip,pr srt,qtz-feld-lithic frags,argil ip,com wht cly fill (mud contam?),crs grn snd pred unconsol,fn grn brn snd calc cem,scat blk bit btwn grns,NFSOC

5150.00 5170.00 SHL grd to SLTSTN,orng-wht-rd-brn-occ gr,blky-sb plty,pred sft-gummy-sl frm ip,slty-grny tex ip,mic ip,sndy ip,sl calc ip-non calc

5170.00 5190.00 SS,lt gr-gr-brn,fn-vfn grn,sb ang-sb rnd,md wl srt,pred cly fill por,scat cln por w blk bit btwn grns,blk bit floating in smps & attached to grains,fr odor,no fluor,sl mlky blm w fr resid rng CUT

5190.00 5210.00 SHL grd to SLTSTN,orng-rd-brn,blky-sb plty,pred sft-gummy-sl frm ip,rthy-grny tex ip,mic ip,sndy ip,sl calc ip-non calc

5210.00 5220.00 SS,transl wht-lt gr-brn,md-vcrs grn,ang-sb ang,md-pr srt,com feld-lithic-mic grns,com-abund blk bit,no flour,no cut

5220.00 5230.00 abund SLTSTN,rd-brn,blky,rthy-grny tex,mic,sndy ip,sl calc ip-non calc

5230.00 5240.00 SS,transl wht-lt gr-brn,f-md-vcrs grn,sb ang-sb rnd,md-pr srt,fr,com feld-lithic-mic grns,com-abund blk bit,NFSOC

DEPTH	LITHOLOGY
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5240.00 5250.00 SS,transl wht-lt gr-brn,md-vcrs grn,ang-sb ang,md-pr srt,uncons-fri,com feld-lithic,com-abund blk bit,NFSOC

5250.00 5260.00 SLTSTN,rd-brn,blky,rthy-grny tex,mic,sndy ip,sl-mod calc

5260.00 5270.00 SHL grd to SLTSTN,ormg-wht-rd-brn-occ gy,blky-sb plty,pred sft-gummy-sl frm ip,slty-grny tex ip,mic ip,sndy ip,sl-mod calc ip-non calc

5270.00 5290.00 SS,transl wht-lt gr,md-vcrs grn,sme fgr,ang-sb ang-sbrnd,pr srt,uncons-fri,com feld-lithic,com-abund blk bit,tr scat v wk dul gld mnrl FLOR,wk slo blm mlky CUT,bri yel resid ring CUT

5290.00 5300.00 SHL,ormg brn-crm-brn,sb blky-sb plty,frm-v sft,sl calc,slty,grdg to SLTSTN ip

5300.00 5310.00 SLTSTN,rd-brn,blky,rthy-grny tex,mic,sndy ip,n calc,grdg to SHL aa w/ rr pyr

5310.00 5320.00 SS,transl wht-lt gr,md-vcrs grn,ang-sb ang-sbrnd,pr srt,uncons-fri,com feld-lithic,com-abund blk bit,no mnrl FLOR,wk slo blm mlky CUT,v fnt yel resid ring CUT

5320.00 5330.00 SS aa,w/ incr m-crs lse gr,decr blk bit cmt,NFSOC

5330.00 5340.00 SHL grd to SLTSTN,rd-rd brn,blky-sb plty,sl frm,rthy,mic,sndy ip,pri non-calc

5340.00 5350.00 LS,lt gr-lt brn,mic xln,dens,md hd,argil,NFSOC

5350.00 5360.00 LS,tn-lt brn,mic-crypto xln,dens,md hd,argil-sndy ip,dull min fluor,no cut

5360.00 5370.00 LS,crm-tn-gr,mic-crypt xln,dens-md hd to sl chky-md sft,sl foss ip,rr pyr w iron leaching,rr ppt POR,no vis STN,FLUR or CUT

5370.00 5380.00 SHL,gr-blk-occ rd,blky-sb plty,md sft-sft gummy,md calc

5380.00 5390.00 SS,wht-clr-lt gr,fn-crs grn,sb ang-sb rnd,pr srt,v argil ip grd to SLTSTN,abund lt gr-crm calc cly,scat blk bit,no FLUOR,v wk blm CUT

5390.00 5400.00 SS aa bcm pred unconsol,crs-vcrs grn,com wht chky cly,scat-com blk bit btwn grns w no fluor,vsl cut aa

5400.00 5410.00 LS,gr,fn grn,dens-sub suc tex ip,md hd,argil-sndy ip,sl dolo ip,NFSOC

5410.00 5420.00 LS,crm-tn-gr,mic-crs xln,dens-sl chky tex ip,vsl foss ip,crs grn qtz grn inclus ip,dull min FLUOR,no CUT

5420.00 5430.00 SHL,rd brn-gr,sl frm,sb blky-plty,grsy tex ip,sl calc,abund wht-crm calc cly in smp

5430.00 5440.00 SS,crm-tn-gr,vfn-occ fn grn,sb ang-sb rnd,md wl srt,rr glauc,mic ip,slty grd to SLTSTN ip,NFSOC

5440.00 5450.00 LS,tn-gr,mic-crypt xln,dens,mhd-hd,scat calc frac fill,v sndy ip grd to calc SS

5450.00 5460.00 LS,gy-lt gybrn,mic-crypt xln,dens,mhd-hd,scat calc frac fill,v sndy ip grd to calc SS

DEPTH	LITHOLOGY
5460.00 5470.00	SS,crm-gy-dkgy,vfn-occ fn grn,sb ang-sb rnd,md wl srt,rr glauc,mic ip,slyt grd to SLTSTN ip,NFSOC
5470.00 5480.00	LS,lt gybrn-gy,mic-crypt xln,dens,mhd-hd,scat calc frac fill,sd-slt ip grd to calc SS
5480.00 5490.00	LS,crm-lt gy-gybrn,mic-crpt xln,dens-chky tex ip
5490.00 5500.00	SLTSTN,rdbrn-brn,sb blk,frm-fri,rthy-grny tex,mic ip,sndy ip,v calc
5500.00 5510.00	SHL,rd brn-brn-frm,sl frm,sb blk-pty,grsy tex ip,sl calc,abund wht-frm calc cly in smp
5510.00 5520.00	SLTSTN,rdbrn-brn,sb blk,frm-fri,rthy-grny tex,mic ip,sndy ip,v calc,pyr ip,w/ med-crs lse qtz sd gr
5520.00 5530.00	SS,lt gy-fros-frm,crs-v crs-m gr,ang-sb ang-sb rnd,md wl srt,pred uncons,qtz rexl ip,mic ip,tr cht ip,NFSOC
5530.00 5540.00	LS,lt gybrn-lt gy-lt tan,mic-crypt xln,dens,mhd-hd,SLTSTN aa
5540.00 5550.00	MARL,vltgy-off wh,sft,rthy-sbwxy tex,v calc,tr vf lam,LS aa
5550.00 5560.00	LS,crm-lt gy-gybrn,mic-crpt xln,dens,argil,calc frac fl ip
5560.00 5570.00	LS,lt gy-lt gybrn,crpt-mic xln,dens,hd,calc frac fl ip
5570.00 5580.00	SHL,dk gr,md frm-hd ip,blk,sndy ip grd to v argil SS ip,v calc,NFSOC
5580.00 5590.00	SHL,md-dk gr,blk-pty,md frm-sft gummy ip,grny tex ip,sndy ip grd to v argil SS ip,v calc
5590.00 5600.00	LS,wht-frm-lt gr,fn-mic xln,pred sft gummy wht calc cly (marl),scat md frm-hd dens,argil,NFSOC
5600.00 5610.00	SS,lt gr-brn,fn-vfn grn,sb ang-sb rnd,md wl srt,argil ip,mic ip,tt,calc cem,NFSOC
5610.00 5620.00	SLTSTN,lt gr,blk,sft,vfn grn,sndy ip,calc
5620.00 5630.00	SHL,dk gr-occ md gr,frm (dk gr)-sft (md gr),lt gr powd strk,rr mic pyr,v calc
5630.00 5640.00	SHL aa,dk gr-occ md gr,frm-sft,lt gr powd strk,rr mic pyr,v calc
5640.00 5650.00	SHL,dk gr-occ blk,blk-sb tab,md frm-frm,rr mic pyr,v calc
5650.00 5660.00	SHL,dk gr-occ md gr,md frm-sl sft ip,blk-sb tab,lt gr powd strk,sl mic pry,v calc
5660.00 5670.00	LCM sweep-PR SMP
5670.00 5680.00	SLTSTN,rd-brn-gr,blk,sl frm-md sft,rthy-grny tex ip,sndy ip,mic,v calc,NFSOC
5680.00 5690.00	SHL,dk gy-brn,sb blk-sb tab,sb pty,md frm-frm,rthy-sb wxy,scat vf gr dism pyr,sl-n calc,scat pp calc incl□

DEPTH	LITHOLOGY
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5690.00 5700.00 SLTSTN,rd-brn-gr,blky,sl frm-md sft,rthy-grny tex ip,sndy ip,mic,v calc,NFSOC

5700.00 5710.00 MARL,vltgy-off wh-crm-pale orng,sft,chlky-sbwxy tex,v calc

5710.00 5720.00 LS,off wh-pale gy-lt gy-pale orng-tr gy,sb blky-sb plty-blky,sl hd-v sft,crpt xln-chlky,calc fl vn ip,tr vf sd gr ip,tr sl argil ip

5720.00 5730.00 LS,crm-off wh-pale gy,sb blky-sbplty,sft-frm,sb chlky-grsy tex,argil ip,intbd w/ vf gr SS ip

5730.00 5740.00 SLTSTN,dk gy-gy-red brn-brn,sb blky-sb plty,grty-rthy tex,mod-sl calc,abnt mic mica ip,vf dism pyr ip,grdg to vfg SS ip

5740.00 5750.00 SLTSTN aa,DOL,tan-crm-pale pnk,blky-sb blky,pred crpt xln-mic xln,rr mic euhd saddle back xls

5750.00 5760.00 SS,wh-fros-lt gy,crs-v crs-med-f gr,sb ang-ang,p srt,uncons-wl cmt(f gr),n-mod calc,mic mica,tr pyr,tr dk gm cht ip,wh cly fl ip,fmt pale gld mnrl FLOR,no CUT

5760.00 5770.00 MARL,off wh-crm,v sft,chlky-sbwxy tex,v calc

5770.00 5780.00 SLTSTN,brn-red brn-gy brn,sb blky-sb plty,grty-rthy tex,sl-mod calc,mic mica ip,vf dism pyr ip,grdg to vfg SS ip

5780.00 5790.00 SS,wh-fros-lt gy,crs-v crs-med-f gr,sb ang-ang,p srt,uncons-wl cmt(f gr),mōd-v calc,wh cly fl ip,NFSOC

5790.00 5800.00 MARL,off wh-crm,v sft,chlky-sbwxy tex,v calc ip,dol ip,gr sd ip

5800.00 5810.00 LS,dk gy-lt gy-lt tan-crm,sb blky-sbplty,mic-crpt xln,sft-frm,slty ip,argil ip,tr sl dol ip

5810.00 5820.00 LS,pale gy-lt gy-dk gy-gy brn-lt tan,blky-sb tab,mic xln,sft-frm,grdg to MARL aa

5820.00 5830.00 LS,pale gy-lt gy-brn-lt tan-dk gy,sb blky-sb tab,mic xln,sft-frm,sl dol ip,grdg to MARL aa

5830.00 5840.00 LS,pale gy-lt gy-dk gy-gy brn-lt tan,blky-plty,crpt-mic xln,sft-frm,sl dol ip,grdg to MARL aa

5840.00 5850.00 LS,crm-gr,mic-vfn xln,md frm-dens ip to sft chlky micritic mud (marl)ip,sl argil ip,sl foss ip,dull min FLUOR,no STN or CUT

5850.00 5860.00 SS,wht-lt gr,vfn gm,sb rnd,wl srt,v calc grd to sndy LS,tt,NFSOC

5860.00 5870.00 LS,wht-gr,mic xln,md hd-dens to sft chky micritic mud (marl),argil/sndy ip,rr mic pyr,dull min FLUOR,no STN or CUT

5870.00 5880.00 scat SHL,dk gr-blk,blky,sft,carb ip,v calc

5880.00 5890.00 SS grd to SLTSTN,lt gr,vfn gm,sb rnd,sl frm-sft/slty,mic ip,argil,pry,v calc grd to sndy LS,pr POR,NFSOC

5890.00 5900.00 SHL grd to SLTSTN,varicol,crm-gr-brn-crm,blky-sb fiss ip,rthy/grny tex ip,mic ip,v calc,sndy ip grd to argil SS ip,NFSOC

DEPTH	LITHOLOGY
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5900.00 5910.00 SS grd to SLTSTN,lt gr,vfn grn,sb rnd,md frm,mic ip,argil,calc,pr POR,NFSOC

5910.00 5920.00 SHL grd to SLTSTN aa,crm-gr-brn,blky,rthy/grny tex ip,mic ip,v calc,sndy ip grd to argil SS ip,NFSOC

5920.00 5930.00 LS,crm-tn-gr,mic-crypt xln,dens-chky tex ip,argil,v sndy ip grd to v calc SS ip,dull min FLUOR,no STN or CUT

5930.00 5940.00 SHL grd to SLTSTN,crm-lt gr,blky,sft gummy tex ip,v calc,sndy ip grd to argil SS ip,NFSOC

5940.00 5950.00 SS,pred lt gr,sl-md frm,mic-fn xln,dens,argil,mic pyr,v calc grd to sndy LS ip

5950.00 5960.00 SHL,lt-dk gr,blky-sb fiss,md frm to sft-slty,sl mic pyr,calc

5960.00 5970.00 SHL aa,lt-dk gr,blky-sb fiss,md frm to sft-slty,sl mic pyr,calc

5970.00 5980.00 SHL,lt-dk gr,blky-sb fiss,md frm to sft-slty,sl mic pyr,calc

5980.00 5990.00 SHL,dk gy-lt gy,blky-sb fiss,md frm to sft-slty,sl mic pyr,calc

5990.00 6000.00 SHL aa,w/ incr sd & slt gr,grdg to sdy & slty LS

6000.00 6010.00 LS,dk gy-tn-frm,mic-crypt xln,dens-chky tex ip,argil ip,rr fos

6010.00 6020.00 LS,crm-tn-gr,mic-crypt xln,dens-chky tex ip,argil ip

6020.00 6030.00 LS,dk gy-tn-frm,crpt-mic xln,dens-chky tex ip,abnt calc incl,argil ip

6030.00 6040.00 aa,SHL,dk gy-lt gy,blky-plty,frm,sl mic pyr,v calc

6040.00 6050.00 SHL,dk gy-lt gy,blky-sb blky,plty,frm to sl sft,slty,tr mic pyr,abnt calc incl

6040.00 6050.00 LS,crm-tn-gy,mic-crypt xln,dens-chky tex ip,argil ip,scat carb flks ip

6060.00 6070.00 SS,wh-pale gy,vf-f gr,pred w rnd,occ ang-sb ang,w srt,w-mod indur,cly fl mtz,gr supt,limy,scat dk grn cht frag,tr mas pyr,NFSOC

6070.00 6080.00 SS,wh-m gy-trans,vf-f gr,ang-sb ang,occ rnd,w srt,w-mod indur,cly fl mtz,sil ip,gr supt,limy ip,scat dk lith frag,scat dk grn cht frag,tr mas pyr,NFSOC

6080.00 6090.00 SS aa w/ incr pyr,SLTSTN red brn-brn,sbblky,rthy,frm,mod-sl calc,vf dism pyr ip,mas pyr ip,tr vf gr sd gr ip

6090.00 6100.00 LS,tan-frm-gybrn,sbblky,occ plty,hd-frm,sft,crpt xln,scat calc incl,chonc frac ip,argil ip

6100.00 6115.00 SS,gy-lt gy-off wh,vf-f gr,ang-sb ang,w srt,w-mod indur,cly fl mtz ip,bit cmt ip,sil ip,gr supt,limy ip,scat dk lith frag,mas pyr ip,fnt dull gld mnrl FLOR,fnt mlkyCUT w/ fnt dull gld resid CUT

6115.00 6130.00 LS,cr-tn-gr,mic-vfn xln,dens-md hd to sl chky-md sft,argil ip,abund lt gr-tn transl sl pyr CHT,NFSOC

DEPTH	LITHOLOGY
6130.00	6140.00 LS,lt gr-gr,mic-vfn xln,md hd-hd dens to sft chky ip,argil,sndy ip,com lt gr transl CHT,NFSOC
6140.00	6150.00 SLTSTN,lt gr,sft,rthy,scat snd grn inclus,v calc grd to v argil LS,scat lt gr transl CHT,NFSOC
6150.00	6160.00 LS,gr,mic xln,md hd,dens,sl pyr,argil,scat lt gr transl CHT,NFSOC
6160.00	6170.00 SHL,md-dk gr,sl frm-md sft,blky-sb fiss,sl mic ip,v calc
6170.00	6180.00 SLTSTN,red brn-brn-dkgy,sb blky,frm,rthy,vf gr sd ip,non-v sl calc,grdg to SH ip
6180.00	6190.00 SS,dk brn-gy-wh-tan,vf-f gr,fri-sft,w rnd,sb rnd-sb ang,w srt,slty ip,wh cly fl ip,mod-v calc,NFSOC
6190.00	6200.00 SS aa w/ LS,gy-crm,mic-crpt xln,md hd-sft,dens-argil,slty ip,vf sd gr ip
6200.00	6210.00 LS,gy-crm-dk gy,mic-crpt xln,md hd-sft,argil-dens
6210.00	6230.00 LS,lt gr-gr-occ brn,mic-crypt xln,dens-md hd-hd to sl chky tex-md sft ip,argil,scat md gr transl CHT,NFSOC
6230.00	6240.00 LS,lt gr-tn-gr,fn-mic xln,dens-md hd to sft-chky tex ip,scat gr transl CHT,scat blk dd STN,no FLUOR,no CUT
6240.00	6250.00 LS,lt gr,vfn xln,sft,chky,poss ool rem,scat-com blk stn in frac,dul min fluor,sl resid rnd cut,fr-gd ODOR in smps
6250.00	6260.00 scat SS,lt gr,vfn grn,sb rnd,wl srt,calc cem,NFSOC
6260.00	6270.00 LS,crm-tn-gr,fn-mic xln,dens-md hd ip to sft-chky tex,pos sl sil ip,scat blk stn on frac,no fluor,no cut
6270.00	6280.00 LS aa,crm-tn-gr,fn-mic xln,dens-md hd ip to sft-chky tex,NFSOC
6280.00	6290.00 LS,crm-brn-dk gr,mic-vfn xln,dens-md hd to chky-sft,argil ip,scat-com gr transl CHT,NFSOC
6290.00	6310.00 LS aa,crm-brn-dk gr,mic-vfn xln,dens-md hd to chky-sft,argil ip,bcm sil ip,com gr transl CHT,NFSOC
6310.00	6320.00 LS aa,crm-brn-dk gr,mic-vfn xln,dens-md hd to chky-sft,argil ip,bcm sil ip,com gr transl CHT,NFSOC
6320.00	6330.00 SS,lt gr,fn-vfn grn,sb ang-sb rnd,wl srt,sl mic,sl argil,calc cem,tt,NFSOC
6330.00	6340.00 LS,crm-md gr,mic-crypto xln,dens-md hd ip to sft-chky tex ip,argil,sndy ip grd ip to vfn grn SS,NFSOC
6340.00	6350.00 LS,md-dk gr,mic-vfn xln,md hd-hd,dens,argil,sil,sl mic,mic pyr ip,NFSOC
6350.00	6360.00 LS,pred dk gr,vfn-mic xln,dens,hd,sil,v argil grd to hd calc SHL ip,com dk gr op CHT

DEPTH	LITHOLOGY
6360.00 6370.00	LS,dk gy-gy brn,vfn-mic xln,dens,hd,sil,v argil,rr frac w/ euhd calc xls,grd to hd calc SHL ip
6370.00 6380.00	LS,md-dk gr,mic-vfn xln,md hd-hd,dens,argil,grdg to dk gy SHL ip
6380.00 6390.00	SHL, dkgy,firm-hd,sb blk-ply,grty tex,sil cmt,abnt calc incl & lam,grdg to LS ip
6390.00 6400.00	SHL aa w/ tr SHLY SS,wh,vfg,rnd,w srt,calc,scat mic mica,NFSOC
6400.00 6420.00	rr SS,off wh,vf-f gr,ang,mod indur,calc,scat grn cht frag,tr mic mica,scat vf dism pyr,mod ODOR,mod yel gld mnrl FLOR,slo-mod pale yel blmg CUT,fmt yel-gld resid RING CUT
6420.00 6430.00	LS,gy brn-lt gy brn-tan-crm,sb blk-sb bply,mic-crpt xln,firm-brit,sft,sd ip,calc incl,scat blk-blk brn CHT,dull gld mnrl FLOR w/ v pale gld RING CUT
6430.00 6450.00	LS,tn-lt brn,fn xln,sl-md frm,sl suc tex,dolo ip,argil/sndy ip,sl pyr,rr lt gr trnsl CHT,NFSOC
6450.00 6460.00	SHL,gy-red brn-brn,sb blk-sb ply,brit-firm,rthy,sl-n calc,calc incl,sly ip,scat vf gr dism pyr,grdg to LS ip
6460.00 6470.00	LS,gy-tan,sb blk,mic xln,firm-sft,argil ip,grdg to SHL ip
6470.00 6480.00	SHL,gy-dk gy-red brn-brn,sb blk-sb ply,ply,brit-firm,rthy,sl-n calc,calc incl,sly ip,scat vf gr dism pyr,grdg to LS ip
6480.00 6490.00	scat LS,gy-tan,sb blk,mic xln,firm-sft,argil ip,scat calc incl,grdg to SHL ip
6490.00 6500.00	SHL,md-dk gr,blk-sb ply,sl-md frm,sly/grny tex ip grd to SLTSTN ip,mic pyr ip,v calc
6500.00 6510.00	SS,lt-md gr,fn-vfn grn,sb rnd,md wl srt,sl frm-sl fri ip,sl pyr ip,dk min inclus,sl argil,sl calc cem,sl ODOR in smp,no vis STN,FLUOR or CUT
6510.00 6520.00	SLTSTN,md gr,blk,md-sl frm,sndy ip grd to argil SS ip,calc,SS w carb flks,no FLUOR or CUT
6520.00 6530.00	SHL,md-dk gr,blk-ply,sl-md frm,sly/sndy tex,carb ip,lt gr-brn strk,v calc
6530.00 6540.00	LS,md-dk gr,mic xln,hd,dens,argil,sil,NFSOC
6540.00 6550.00	SHL,md-dk gr,blk-sb ply,md frm-hd,calc grd to argil LS aa ip,scat wht ANHY
6550.00 6560.00	SHL grd to SLTSTN,md-dk gr,md hd-hd-sft,blk-sb ply,gr-brn strk,vsl mic pyr,v calc
6560.00 6570.00	SS,wht-md gr,vfn-fn grn,sb ang-sb rnd,wl srt,firm-wl cem w calc,NFSOC
6570.00 6580.00	abund CLYSTN in smps,lt gr,sft,gummy,v calc-much of smp washes away
6580.00 6590.00	SLTSTN,md gr,blk,sft,sndy ip,v calc
6590.00 6600.00	LS,gy brn-tan,sb blk,crpt xln,hd-sft,argil ip,calc incl ip,sd ip,grg to SHL
6600.00 6610.00	SHL,md-dk gy,blk-sb ply-pty,md frm-hd,calc,grd to argil LS aa ip

DEPTH	LITHOLOGY
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6610.0 6620.00 LS,tn-brn,fn-md-occ crs xln,dens,md hd-hd,sil,sl argil,scat lt brn transl CHT,scat crs xln calc,NFSOC

6620.00 6630.00 SHL,md-dk gy,sb blk-y-sb plty-plty,md frm-hd,sil cmt,calc incl ip,tr LS lam,tr dk brn CHT

6630.00 6640.00 SHL,md-dk gy,sb blk-y-sb plty-plty,md frm-hd,sil cmt,calc incl ip,tr org & brn CHT,rr LS lam

6640.00 6650.00 SHL aa,md-dk gy,sb blk-y-sb plty,md frm-sil ip-md sft-slty ip,calc,tr brn CHT

6650.00 6660.00 scat LS,dk brn,mic-crypt xln,dens,md hd-hd,argil,sil ip

6660.00 6670.00 LS,lt gr-md gr brn,mic xln,dens-md hd-hd to sl chky tex-md sft,sil ip,argil ip,sndy ip grd to vfn grn calc SS,NFSOC

6670.00 6680.00 LS,md-dk gr,mic-crypt xln,dens,md hd,sil ip,argil grd to vcalc SHL ip,scat wht xln calc frac fill,rr dk gr CHT,NFSOC

6680.00 6690.00 LS aa,md-dk gr,mic-crypt xln,dens,md hd,sil ip,argil grd to v calc SHL ip,rr dk gr CHT,NFSOC

6690.00 6700.00 SHL,dk gr-occ blk,blk-y-plty,sl-md frm,sl grny tex,v calc,sl carb,gr brn powd-sl grsy strk

6700.00 6710.00 SHL,dk gy-occ blk-brn,blk-y-plty,sb blk-y,sl-md frm-occ sft,sl grny tex,v calc,sl carb ip

6710.00 6720.00 LS,md-dk gy,mic-crypt xln,dens,md hd,sil ip,argil grd to vcalc SHL ip,scat wht xln calc frac fill,rr dk gy CHT,rr euhd qtz xls,NFSOC

6720.00 6730.00 LS,md-dk gy,mic-crypt xln,dens,md hd,sil ip,argil grd to vcalc SHL ip,scat wht xln calc frac fill,rr slt ip,tr dk gy-dk gy brn CHT,rr euhd qtz & calc xls,NFSOC

6730.00 6740.00 LS aa w/ incr argil,SHL aa,CHT aa

6740.00 6750.00 LS,md-dk gy-tan,mic-crypt xln,dens,hd-sl sft,sil ip,argil ip,scat wh ANHY,rr slt ip

6750.00 6760.00 LS,md-dk gy-gy blk-tan,mic-crypt xln,dens-fri,occ brit,sil ip,argil ip,com-abund wh ANHY,intbd w/SLST,red brn-brn,sb blk-y,frm,rthy,v calc

6760.00 6770.00 pred CLYSTN,lt gr,vfn grn,sft,gummy,v calc

6770.00 6780.00 LS,dk gr,mic-crypt xln,dens,hd,sil ip,com dk gr-brn transl CHT,argil grd to v calc sil SHL,scat xln ANHY w LS

6780.00 6790.00 SHL,dk gr,blk-y,md frm-frm,sil,calc grd to v argil sil LS ip,NFSOC

6790.00 6800.00 SHL aa,dk gr,blk-y,md frm-frm,sil,calc grd to v argil sil LS ip,NFSOC,abund lt gr sft calc CLYSTN aa

6800.00 6810.00 CLYSTN,lt gr,vfn grn,sft,occ slty,gummy,v calc

6810.00 6820.00 LS,med-dk gr,mic xln,hd-sft,v argil ip,sil ip,grdg to v calc sil SHL,calc incl,NFSOC

DEPTH	LITHOLOGY
6820.00 6830.00	SHL,dk gr,blky-sb blky-occ plty,md frm-frm,sil,calc fill frac,slty ip,vf gr sd ip,grd to v argil sil LS ip,NFSOC
6830.00 6840.00	LS,med-dk gr,mic xln,frm-sft,v argil ip,sil ip,grdg to v calc sil SHL,calc incl,calc fill frac ip,NFSOC
6840.00 6850.00	SHL,dk gr,blky-sb blky-occ plty,md frm-frm,sil,calc fill frac,pred sltyp,rthy,tr grd to v argil sil LS ip,NFSOC
6850.00 6860.00	SHL,dk gr,blky-sb blky-occ plty,md frm-frm,sil,tr calc fill frac,pred sltyp,rthy,NFSOC
6860.00 6870.00	tr LS,med-dk gr,mic-crpt xln,hd-sft(v argil ip),sil ip,tr grd to v calc sil SHL,calc incl,calc fill frac ip,v fnt pale dull gld mnrl FLOR w/ v pale dull gld RING CUT,com-abund wht chky/gummy ANHY
6870.00 6880.00	SS,lt gr,vfn-fn grn,sb rnd-rnd,wl srt,sl argil ip,sl anhy,calc cem,pos vsl blk resid STN,no FLUOR,no CUT
6880.00 6890.00	SS aa,lt gr,vfn-fn grn,sb rnd-rnd,wl srt,sl argil ip,sl anhy,calc cem,pos vsl blk resid STN,no FLUOR,no CUT
6890.00 6900.00	com-abund CLYSTN,lt gr,blky,sft,sndy,v calc
6900.00 6910.00	SS aa grd to SLTSTN,lt gr,vfn-fn grn,blky,sl frm-md sft,sb rnd-rnd,wl srt,v calc grd to sndy argil LS ip,NFSOC
6910.00 6920.00	com-abund CLYSTN aa,lt gr,blky,sft,sndy,v calc,SS,lt gr,vfn grn aa,infered SALT STRINGERS based on incr chl & ROP
6920.00 6930.00	SS aa grd to SLTSTN,lt gr,vfn-fn grn,blky,sl frm-md sft,sb rnd-rnd,wl srt,v calc grd to sndy argil LS ip,NFSOC
6930.00 6940.00	abund ANHY,wht,md frm-xln to sft-gummy
6940.00 6950.00	SS grd to SLTSTN,lt-md gr,vfn-fn grn,blky,sl frm-md sft,sb rnd-rnd,wl srt,calc,anhy stringers,abund lt gr sft calc CLYSTN aa,NFSOC
6950.00 6960.00	pred ANHY,wht,sft,gummy
6960.00 6970.00	ANHY aa,SHL dk brn,sb blky,sft-sl frm,scat vf dism pyr
6970.00 6980.00	LS,tan-lt brn,mic xln,sb plty,pred argil,sme chn,sil ip,calc incl ip,calc fill frac ip,grdg to calc SHL ip
6990.00	SHL,v dk brn-gybrn,blky-sb blky,rthy-grty,hd-frm,pred sltly,scat vf-f gr sd ip,carb lam ip,calc incl,limy ip,occ sil,vf dism pyr ip,NFSOC
6990.00 7000.00	SHL,gybrn-brn-tan,sb blky,rthy,v sft-tr frm,slty ip,tr carb lam ip,calc incl,grdg to argil LS ip,tr sil
7000.00 7010.00	SHL aa,SS,wh-lt gy,vf gr,w rnd,w srt,fri,wh cly fl,n calc,NFSOC

DEPTH	LITHOLOGY
7010.00	7020.00 SHL,dk gy-gy brn-brn blk,sb blk-y-sb plty,rthy,slty ip,carb frag ip,v-mod calc,calc fl frac ip w/ tr intbd LS & fv gr SS
7020.00	7030.00 SHL aa,CLYSTN,lt gr-off wh-crm,sb blk-y,sft,slty-sndy,v calc
7030.00	7040.00 SS,lt gr-brn,vfn-fn grn,sb rnd-rnd,wl srt,sft-fri,mod-sl calc,argil ip,tr anhy,no FLUOR,no CUT
7040.00	7050.00 SHL,dk gy-gy brn-brn blk,sb blk-y-sb plty,rthy,slty ip,carb frag ip,v-mod calc,calc fl frac ip w/ tr intbd LS & fv gr SS
7050.00	7060.00 SHL aa,CLYSTN,lt gr-off wh-crm,sb blk-y,gummy-sft,slty-sndy,mod calc,abund wht gummy ANHY
7060.00	7070.00 abund ANHY,wht-crm,pred sft-gummy to sl xln ip
7070.00	7080.00 prim ANHY aa,wht-crm,pred sft-gummy to sl xln ip,scat fn grn ss grns in gummy anhy
7080.00	7090.00 SS,crm-tn-lt gr,vfn-fn grn,sb rnd-rnd,wl srt,calc cem ip,anhy fill por,NFSOC
7090.00	7100.00 scat SHL,dk gr-occ blk,blk-y-sb plty,sl frm-md sft,lt brn strk,sl carb,calc
7100.00	7110.00 SHL,lt gr,blk-y,sft,calc,slty grd to SLTSTN ip
7110.00	7120.00 SHL,dk gr-md gr,blk-y,md sft-sft,gummy ip,slty/grny tex,carb,dolo-calc
7120.00	7130.00 SHL aa,bcm pred dk brn gr-dk gr,blk-y,md sft-sft,slty/grny tex,carb,dolo to calc
7130.00	7140.00 SHL,pred dk brn gr-dk gr,blk-y,md sft-sft,slty/grny tex,carb,dolo to calc,prob fract POR,gd ODOR at possum belly
7140.00	7145.00 SHL,md-dk gr,blk-y,md frm-sft,carb,calc/dolo,frm shl slty/vfn sndy & dolo grd to argil DOLO ip

FORMATION TOPS

OPERATOR: THE ANSCHUTZ CORPORATION
WELL NAME: HEADWATERS FEDERAL #7-15

FORMATION NAME	SAMPLES		E-LOG			STRUCTURAL COMPARISON - WESTCOAST-MULESHOE #1
	MEASURED DEPTH	TRUE VERTICAL DEPTH	MEASURED DEPTH	TRUE VERTICAL DEPTH	DATUM	
MORRISON	Est. 75'	Est. 75'	N/A			none
ENTRADA	465'	465'	844'	844'	5418	-122
NAVAJO	918'	918'	1266'	1266'	4996	-94
KAYENTA	1444'	1444'	1673'	1673'	4589	-7
WINGATE	1646'	1646'	1892'	1892'	4370	+3
CHINLE	1986'	1986'	2063'	2063'	4199	+173
MOSS BACK	2495'	2495'	2496'	2496'	3766	+266
MOENKOPI	2618'	2618'	2614'	2614'	3648	+288
CUTLER	3205'	3205'	3213'	3213'	3049	+57
HONAKER TR.	5350'	5350'	5346'	5346'	916	+982
LA SAL LS	6200'	6200'	6206'	6206'	56	+1236
UPPER ISMAY	6861'	6861'	6852'	6852'	-590	+1334
PARADOX SALT	NONE		NONE			
HOVENWEEP	6969'	6969'	6962'	6962'	-700	+1370
LOWER ISMAY	7036'	7036'	7030'	7030'	-768	+1382
GOTHIC SHL	7112'	7112'	7092'	7092'	-830	+1395
DESERT CREEK	NOT	REACHED	AT	TD		

The discrepancies shown between the sample tops and the log tops in the upper portion of the hole (surface through top of the Chinle) are discussed in the following section.

GEOLOGICAL SUMMARY AND

ZONES OF INTEREST

The Anschutz Corporation, Headwaters Federal #7-15 well was spud on May 5, 2002 as a test of the NW Lisbon Prospect. The NW Lisbon Prospect consisted of a buried salt "pillow" with targets in the structural drape of the overlying Honaker Trail and Ismay formations. The well was spud in the Dakota Formation, with geological supervision starting from surface. The Headwaters Federal #7-15 reached a total measured depth of 7145 feet on June 5, 2002 within the upper portion of the Gothic Shale. One conventional drill stem test was run at total depth in the Gothic Shale, and a straddle test was run on a potential gas zone in the Cutler following the second logging run.

Primary objectives of the Headwaters Federal #7-15 well were the clastic intervals in the lower portion of the Honaker Trail Formation that are productive in the Big Indian (Hermosa) Field on the northeast flank of Lisbon Valley, 11 miles to the southeast. Secondary objectives included the sandstone intervals in the Cutler formation that are known producing horizons in the Andy's Mesa Field to the east, and the Ismay and Desert Creek cycles of the Paradox Formation. The Ismay was of specific interest due to the amplitude anomaly seen on the seismic over the crest of the salt pillow feature.

The surface hole was drilled using water with polymer and gel as the circulating medium. The hole was gradually mudded up starting at 3100 feet, and from there to TD the circulating medium was a low solids non-dispersed mud system with low water loss properties. Discussions took place while drilling as to whether a salt saturated mud system would be needed to drill the Ismay section as a 120 foot thick salt section is present in the Lundell well 2 ¼ miles west. Based on the geology, it was felt that there was a good possibility no salt section would be present in this well, so the decision was made to drill with the LSND system to TD. As predicted, only very thin salt stringers were encountered in the Upper Ismay.

Geological supervision began from surface so as to pick the surface casing depth in the top of the Chinle Formation. The formation tops called from the lithology picks in the upper part of the hole down to the top of the Mossback Sandstone were off in comparison with the tops picked from electric logs by anywhere from 75 feet (top of the Chinle) to 400 feet (top of the Summerville). Fortunately, enough of the section was drilled so that the surface casing ended up being set very near the actual top of the Chinle.

The formation tops picked from lithology while drilling and the tops picked from the electric logs are both shown on the mudlog for comparison purposes. As can be seen, no obvious lithology change is present at many of the log top picks. These erroneous top picks resulted from a combination of factors. First, the geological prognosis called for the tops through the Mesozoic section to be about 250 feet high to the Westcoast-Muleshoe #1 comparison well located in section 10-T28S-R23E, 1¼ miles to the northwest. The tops picked from lithologies appeared to substantiate the structural development. Second, the Morrison Formation was about 200 feet thicker than expected compared to the published stratigraphy of the area (Parker, 1981), with the majority of the increased thickness due to thicker sandstones developed in the Salt Wash member. This resulted in having the top of the Entrada erroneously picked on these well-developed sands of the Salt Wash, with subsequent picks hung on that datum. Third, the lithology logged from that point down to the top of the Mossback followed the expected sequence with a consistent structural comparison to the Muleshoe well, thus the error in the initial pick was not discovered prior to the electric log run.

Following the discovery of the discrepancies in the formation top picks after the initial log run, the author performed an in-depth re-evaluation of the lithologies encountered in comparison to what should have been seen based on the log tops. This review indicated some definite conflicts (i.e. sands where there should be shales and vice-versa). Although there were some questions concerning the pipe

strap after the bit trip at 1700 feet, and the samples were being caught by the drilling crews in this upper section, these factors alone can't account for the observed variations. The author has no adequate explanation for these discrepancies.

The following are brief descriptions of the lithologies encountered while drilling. For detailed lithologic descriptions, the reader should refer to either the preceding section or the accompanying mud log.

The Jurassic age Morrison Formation was drilled from the base of the conductor pipe to the top of the Summerville Formation at 777 feet. The first samples caught at approximately 75 feet were primarily unconsolidated clear quartz sands, and probably represented the basal portion of the Dakota. The upper (Brushy Basin) portion of the Morrison was characterized by interbedded shales, silty shales, siltstones and mudstones. Colors ranged from green to gray-green to red-brown and cream with some intervals displaying pale greens and mauves. Textures were generally very fine grained, with the red and brown shales being silty to earthy and slightly sandy in part, and the green and cream shales being more bentonitic in appearance. Minor micro-pyrite inclusions were noted in the green shales while the red-brown shales were slightly micaceous in part. The lower portion of the Brushy Basin section was characterized by red gummy non-calcareous mudstones. The Salt Wash member of the Morrison was thicker than expected with some well developed sandstones. This section was drilled from 465 feet to the top of the Summerville at 777 feet. These sands were primarily clear to white to pale orange, medium to coarse grained with sub-rounded to rounded grains and were moderately to well sorted. The mineralogy of the sand was primarily quartz with common feldspar grains and, to a lesser amount dark gray lithic fragments. These sands exhibited common light red iron staining and were cemented with a combination of calcite and quartz overgrowth cements. No shows were noted in this section.

The top of the Summerville Formation was penetrated at a depth of 777 feet with a corresponding datum of 5485 feet, 75 feet low to the Muleshoe #1 comparison well. The Summerville consisted of interbedded sandstones and shales with the sandstones being similar in appearance to those above. The shales were red-brown to gray green to white to occasionally yellow, blocky to sub platy, moderately soft to firm with an earthy to silty texture in part and a waxy texture in part. No shows were noted in the Summerville.

The top of the Entrada was penetrated at a depth of 844 feet (5418 foot datum), 122 feet low to the comparison well. The Entrada section was an orange to light red, fine grained sandstone with sub angular to sub rounded grains, was well sorted and composed primarily of quartz grains with a minor constituent of dark mineral (probably hornblende) grains. Cementing appeared to be a combination of quartz overgrowths, iron oxide and calcite. No shows were noted in the Entrada section. Of note in the 860-890 foot sample was a very minor amount of limestone that was light brown to tan in color, microcrystalline, hard and dense. The same sample interval also exhibited scattered pieces of tan to light orange translucent chert.

The Carmel was penetrated at a depth of 1214 feet with a corresponding subsea datum of 5048 feet, 97 feet low to the Westcoast comparison well. The expected Carmel lithology was not very well represented, but what was present was a minor amount of shale grading to siltstone. These were red brown to brown to occasionally orange in color, sub platy and slightly firm with an earthy to grainy texture with common to abundant sand grain inclusions. No shows were noted in the Carmel.

The Navajo Sandstone was drilled from 1266 feet (4996 foot datum) to 1673 feet. This put the Navajo 94 feet low to the Westcoast-Muleshoe #1 comparison well. The section was almost exclusively pinkish tan to light salmon colored fine grained sandstone with sub angular to sub rounded grains, was well sorted and composed primarily of quartz grains with a minor constituent of dark mineral grains. Cementing appeared to be a combination of quartz overgrowths, iron oxide and calcite. A minor amount of white interstitial clay was noted through the Navajo section. Many frosted and well rounded sand grains were also noted throughout the section, reflecting the eolian environment of deposition. No shows were noted through the Navajo section.

The Kayenta Formation was penetrated at a depth of 1673 feet with a corresponding datum of 4589', only 7 feet low to the comparison well. The section was logged as primarily sandstone, with only minor amounts of interbedded siltstones and shales. The colors seen in the sandstones were variable, ranging from pinkish tan to salmon to light pink to orange red to light gray. The textures were all similar however, being fine grained, sub-rounded to well rounded and moderately well sorted. They also displayed scattered dark to green (fluorite?) mineral grains and were slightly argillaceous in part and slightly micaceous in part. They were firm to friable in part with varying amounts of quartz overgrowth and calcite cement. The shales through the Kayenta section were brown to red brown to pink to orange and occasionally green. They were blocky, moderately soft to soft with an earthy to grainy texture, were slightly to non-calcareous with common quartz grains incorporated into the matrix. No shows were noted in the Kayenta section.

The Wingate Sandstone was drilled from 1892 feet to 2063 feet. This corresponded to a datum of 4370 feet, 3 feet high to the Muleshoe comparison well. The upper 90 feet of the section was primarily sandstone. These sandstones were light gray to white to light pink in color, fine grained, sub rounded to well rounded and moderately well sorted. They were very clean in appearance with scattered dark mineral inclusions, and were slightly firm to friable and non calcareous. Cementing appeared to be a combination of iron oxide and quartz overgrowths. The lower 70 feet of the section displayed a much higher percentage of shales and was the contributing factor for calling the top of the Chinle 70 feet high. These shales were red brown to brown to pale green in color, blocky, slightly firm to soft with a grainy texture. They were also sandy in part and primarily non-calcareous. No shows were noted in the Wingate section.

The Chinle Shale was penetrated from 2063 feet to 2495 feet. The top of the Chinle was 173 feet high to the Muleshoe #1 comparison well. The Chinle interval displayed considerable sandstone and silty sandstone in the upper portion of the section and graded into primarily siltstones and shales in the lower portion of the section. This upper sandy portion of the Chinle is most likely part of the Church Rock Member, with the shaly section below belonging to the Owl Rock Member. It might be noted that the Church Rock Member might often not be recognized on electric logs as the top of the Chinle, resulting in the log top being called on the underlying shaly Owl Rock Member. This can create discrepancies in apparent Chinle tops.

The upper sandstones of the Owl Rock Member were pale orange to orange to salmon in color, fine to very fine grained, moderately firm, sub angular to sub rounded, moderately well sorted and were generally very argillaceous with iron oxide staining. The sands appeared to be cemented primarily with iron oxide and quartz overgrowth cement with minor calcite cement. The sandstones and silty sandstones of the upper section were interbedded with red brown to brown to pale green shales that were slightly firm to soft, silty and slightly to non-calcareous. The siltstones and shales of the lower Owl Rock section were red to red brown to orange, blocky to sub-platy, moderately soft to slightly firm in part and were slightly to moderately calcareous. The shales displayed earthy to silty to sub-waxy textures. No shows were noted in the Chinle section.

The Moss Back Member of the Chinle was drilled from 2495 feet to 2618 feet and was composed of very fine to fine grained sandstone that was light gray in color, sub angular to sub rounded and moderately sorted. Quartz and scattered feldspar grains with minor amounts of dark mineral and glauconite grains were present, and the sands were fairly well cemented with calcite. Scattered intervals within the sandstone displayed very poorly defined fossil hash. Black shale partings and thin interbeds of black vitreous coals were also observed in the sands. One thin coal at 2600 feet gave up a minor amount (4 units) of gas, all C₁ (methane). Scattered thin limestones were also noted through the Moss Back section. These limestones were gray to tan to brown, microcrystalline, dense, moderately hard and argillaceous in part with sand grain inclusions. The limestones also showed evidence of open fracturing with well formed calcite crystals lining the fractures. No shows other than the slight gas from the coals were seen in the Moss Back section.

The Moenkopi top was called at the base of the Mossback, as no basal Shinurump marker was present at this location. According to literature, (Molenaar, 1981), the lower members of the Chinle, i.e. Shinurump and Monitor Butte Members both pinch out in the central Paradox Basin. Additionally, Molenaar notes that abrupt local variations in thickness of the Moenkopi can be present (from zero to 2500 feet) in the salt anticline area of the basin.

The Moenkopi Formation was penetrated at a depth of 2618 feet with a corresponding subsea datum of 3644, 284 feet high to the Muleshoe #1 comparison well. The thickness of the Moenkopi in the Headwaters well was 427 feet, compared to a thickness of 368 feet in the Muleshoe #1 comparison well. In addition, no White Rim Sandstone was observed in the Headwaters well, whereas it appears there may have been upwards of 60 feet of White Rim (Hoskinni) Sandstone in the Muleshoe well. These changes in stratigraphy over short distances in this area of the Fold and Fault Belt of the Paradox most likely are caused by continued salt displacement through time creating localized structural relief. Similar stratigraphic variations have been observed between other wells in this area.

The lithology of the Moenkopi Formation was predominately red to red brown to gray and brown siltstones and shales that were blocky to sub platy, slightly firm and sandy in part to soft and earthy. Generally, both the siltstones and shales were moderately calcareous and slightly micaceous in part with occasional carbonaceous inclusions. A few thin interbedded sandstones were present near the top of the section. They were generally clear to translucent light gray in color, coarse to very coarse grained, predominately unconsolidated, angular to moderately well rounded and moderately to well sorted. They also exhibited iron oxide staining.

The basal Black Dragon Member of the Moenkopi was penetrated from 3050 feet to 3200 feet and was characterized by a higher claystone and mudstone content with very gummy cuttings when drilled. The mudstones through this section were brick red to orange red to occasionally light gray green in color, sub blocky to sub platy, soft to slightly firm in part and exhibited an earthy to grainy texture (red and brown shales) to a sub waxy texture (gray to gray green shales). A brecciated appearance was noted in some of the shales near the top of the section. These rip-up clasts are most likely indicative of occasional flooding surfaces in the low energy tidal flat environment of the basal Moenkopi. No shows were noted through the Moenkopi section.

The top of the Cutler was reached at a depth of 3205 feet, 429 feet low to the prognosis and 63 feet high to the Muleshoe #1 comparison well. The lithology of the upper section of the Cutler down to 3700 feet was very similar to the overlying Black Dragon Member of the Moenkopi with the exception that the samples became noticeably less gummy.

The Cutler interval from 3700 feet to 4300 feet displayed an increase in sand content with a number of fairly well developed sandstone intervals. These sands appeared to be correlative with sandstones encountered at about 4140 feet in the Muleshoe #1 comparison well, suggesting the Headwaters well to be approximately 272 feet structurally higher at this depth. The sands encountered in the section were orange in color, medium to coarse grained, well rounded and moderately sorted. The majority of them were characterized by unconsolidated quartz grains with the uppermost sands exhibiting abundant brown clay porosity plugging. Scattered minor gas shows were noted in this section and are summarized in the table below. It should be noted that the gas chromatography indicated C₁ through C₄ gas constituents.

DEPTH	ROP	BG GAS	PEAK	C ₁ (ppm)	C ₂ (ppm)	C ₃ (ppm)	C ₄ (ppm)
3661-65'	4.5 min/ft.	1 unit	10 units	891	80	12	neglig
3735-56'	3.8 min/ft.	2-3 units	31 units	2153	608	290	trace
3770-76'	2.8 min/ft.	2-3 units	40 units	2765	782	373	trace
4154-59'	2.5 min/ft.	1-2 units	26 units	2174	265	133	53
4184-92'	2.0 min/ft.	1-2 units	38 units	3286	326	142	14

Many of the cleaner sands in this section are water wet and contributed to slight water influx into the wellbore when static conditions existed (not drilling). Due to the slight water flow into the wellbore, the mud weight was slowly increased to about 10.1 lbs/gal., and the well was drilled to total depth with a barite weighted mud system.

In the Cutler interval from 4300 feet to 4750 feet, two sand intervals were encountered that exhibited fairly significant shows. The first at 4334 feet was similar to those described above, but possibly with slightly less clay porosity plugging. The sand encountered at 4400 feet was primarily unconsolidated and was light red, medium to coarse grained, sub angular to sub rounded and moderately well sorted. The sand appeared to be fairly clean with less clay porosity plugging. Of interest was an associated light gray sandstone which was fairly well cemented with calcite that displayed fair fluorescence and a slow to moderate streaming and good residual ring cut in chloroethene. This sand was different in character, being fine grained, sub angular and moderately well sorted. The gas show from the unconsolidated sand at 4400 feet was very similar to Cutler sands that are known to be productive at the Andy's Mesa Field in Colorado, and was analyzed on the logs for potential gas production. The zone from 4393 feet to 4407 feet was straddle tested by DST #2. These two zones are summarized in the following table.

DEPTH	ROP	BG GAS	PEAK	C ₁ (ppm)	C ₂ (ppm)	C ₃ (ppm)	C ₄ (ppm)
4337-42'	1.0 min/ft..	2-3 units	358 units	30,269	3650	1432	392
4393-4407'	.6 min/ft.	14-20 units	1024 U	86,670	10,443	4097	1121

The lower portion of the Cutler from 4750 feet to the top of the Honaker Trail at 5350 feet displayed interbedded sandstones, shales and siltstone, with a distinct change in the appearance of the sandstones. The shales and siltstones were very similar in character to those in the overlying section, being predominately red brown to brown to orange, blocky to sub platy, moderately firm in part to soft with an earthy to silty/grainy texture. They were also micaceous in part and sandy in part grading occasionally into very argillaceous sandstones. They were generally only slightly calcareous to non-calcareous. The sandstones showed a color change from the orange and reds seen above, to light grays and very pale oranges to pink. The sands through this section ranged from fine grained to very coarse grained, were unconsolidated in part to fairly well cemented, and were generally angular to sub angular and moderately sorted. Quartz was the primary grain constituent, with common to occasionally abundant feldspar, chert and lithic fragments of carbonates and quartzites. The sands through this section displayed varying amounts of black bitumen between grains. This bitumen had no fluorescence, but did display a very weak bloom cut with fair residual ring cut in chloroethene. A number of the sands through this section had associated gas shows, and are summarized in the table below. Of note, the zone from 5171 feet through 5187 feet had an abundant amount of bitumen with individual sand grains attached to it floating in the possum belly when it was drilled. This zone also had a fair gas odor in the samples during washing.

DEPTH	ROP	BG GAS	PEAK	C ₁ (ppm)	C ₂ (ppm)	C ₃ (ppm)	C ₄ (ppm)
4805-09'	2.5 min/ft.	5-8 units	50 units	1711	1879	1627	252
4931-35'	3.0 min/ft.	4-6 units	25 units	1903	460	249	trace
5036-55'	1.2 min/ft.	4-6 units	207 units	14,665	3371	1696	931
5122-34'	1.8 min/ft.	4-7 units	111 units	9146	1386	410	122
5171-87'	1.7 min/ft.	4-6 units	447 units	37,779	7736	3130	1028
5202-15'	3.1 min/ft.	3-14 units	83 units	6111	1442	584	192
5235-42'	2.1 min/ft.	6-10 units	88 units	4990	2588	1038	186
5263-82'	2.8 min/ft.	7-8 units	70 units	4332	1893	655	218
5308-27'	1.8 min/ft.	7-8 units	75 units	5122	1559	688	171

The top of the Honaker Trail was picked on the first limestone bench encountered at a drill depth of 5350 feet. This corresponds to a subsea datum of 912 feet, making it 659 feet low to the prognosis, but 978 feet high to the Westcoast Muleshoe #1 comparison well. The upper 850 feet of the section was a series of interbedded limestones, shales, siltstones and occasional sandstones. The limestones were varicolored being cream to tan to gray to gray brown, were generally micro to cryptocrystalline, dense, moderately hard and argillaceous. They were also occasionally pyritic, rarely fossiliferous and in the lower part of the interval displayed a fair amount of light gray to tan translucent chert.

The shales and siltstones of this upper portion of the Honaker Trail were primarily medium to dark gray to occasionally red brown in color, were blocky to sub-platy to occasionally sub-fissile, slightly firm and generally very calcareous. They were also occasionally micro-pyritic, were micaceous in part with an earthy to sub waxy texture and a light gray powdery streak.

Two sandstone intervals with shows were encountered from 5750 feet to 5800 feet. These were white to light gray, displayed frosted grains, were coarse to very coarse to fine grained with sub angular to angular grains and were poorly sorted. The coarse grains were mainly unconsolidated and the fine grained sandstone was fairly well cemented with calcite. They also appeared to be partially clay filled with white soft clay, and displayed a pale gold mineral fluorescence with no cut. These two shows are summarized in the following table.

DEPTH	ROP	BG GAS	PEAK	C ₁ (ppm)	C ₂ (ppm)	C ₃ (ppm)	C ₄ (ppm)
5748-61'	1.9 min/ft.	3-4 units	131 units	9617	2631	423	363
5783-88'	2.0 min/ft.	4-10 units	123 units	9591	1751	744	248

Three other shows of note were encountered from 5800 feet to 6200 feet in thin sandstones. These sands were primarily light gray to gray in color, fine to very fine grained, angular to sub angular and well sorted. They were slightly pyritic in part, displayed scattered dark lithic fragments and a minor amount of black residual staining/bitumen. This bitumen had an associated dull gold fluorescence with a faint milky cut and faint dull gold residual cut. These three shows are summarized below.

DEPTH	ROP	BG GAS	PEAK	C ₁ (ppm)	C ₂ (ppm)	C ₃ (ppm)	C ₄ (ppm)
5988-96'	1.6 min/ft.	14-16 units	207 units	15,405	3185	1489	600
6098-6114'	1.6 min/ft.	4-6 units	149 units	9189	3099	1603	926
6178-84'	3.5 min/ft.	10-14 units	107 units	7779	1595	746	562

The top of the La Sal limestone marker was penetrated at a drill depth of 6200 feet with a corresponding subsea datum of 62 feet, putting it 220 feet low to the prognosis and 1242 feet high to

the Muleshoe #1 comparison well. The La Sal interval was about 120 feet thick in this well and was composed of tan to light gray to gray to brown slightly argillaceous limestone. It was very fine to microcrystalline, dense and moderately hard to slightly chalky and soft in part and was slightly siliceous in part with scattered gray translucent chert.

Two unusual and unexpected shows were encountered in the La Sal section. The upper zone at 6240 feet was in a 10 foot thick chalky limestone. The sample collected through the show zone was almost exclusively composed of a light gray, soft chalky limestone with possible oolite remnants. The zone displayed scattered to common black residual staining on fracture faces, dull mineral fluorescence with a slight residual ring cut in chloroethene. Good odor was noted in the samples. The lower zone was at 6400 feet was only 3 or 4 feet thick, was possibly a sandy limestone, and had an associated oil show with a slight amount of oil floating in the possum belly. This oil was dark brown to black, had a moderately strong odor, moderate yellow gold fluorescence with a very good bright white fast bloom cut and bright yellow white residual ring cut. After log analysis, these two zones were deemed non-productive and were not tested. These two shows are summarized in the following table.

DEPTH	ROP	BG GAS	PEAK	C ₁ (ppm)	C ₂ (ppm)	C ₃ (ppm)	C ₄ (ppm)
6239-49'	1.9 min/ft	10-15 units	1800 units	118,652	36,549	19,625	5581
6406-11'	5.2 min/ft.	10-15 units	398 units	22,053	8840	5143	3825

The lower portion of the Honaker Trail section from the base of the La Sal to the Upper Ismay was a series of interbedded limestones and shales with scattered thin sandstones. The limestones benches were similar to those seen above with varying amounts of light gray translucent to dark gray opaque chert and minor calcite fracture fill with no shows. The shale sections became primarily medium to dark gray in color with a sub blocky to platy appearance and were moderately firm to firm and highly calcareous with white calcite filled fractures. The shale sections became quite gummy and anhydritic in places with anhydrite stringers present around 6540 feet. An increase in background gas was noticed when drilling the Paradox Shale section above the Upper Ismay.

The thin sandstones of this interval were poorly represented in the samples, and were more inferred based on the minor gas shows encountered. Those that were seen were light to medium gray, fine to very fine grained, sub rounded, moderately well sorted and firm to slightly friable. They were also slightly pyritic in part, slightly argillaceous with scattered dark mineral inclusions and were cemented with calcite. A summary of the shows through this section is shown in the following table.

DEPTH	ROP	BG GAS	PEAK	C ₁ (ppm)	C ₂ (ppm)	C ₃ (ppm)	C ₄ (ppm)
6505-11'	2.9 min/ft.	18-25 units	112 units	7142	2460	1156	488
6549-52'	3.1 min/ft.	25-30 units	255 units	16,474	5240	2556	1270
6659-62'	4 min/ft.	26-34 units	68 units	4205	1416	758	416
6697-6703'	7.8 min/ft.	16-20 units	60 units	3694	1244	666	365
6740-44'	4.5 min/ft.	8-10 units	53 units	3144	1235	690	282

The top of the Upper Ismay was drilled at a depth of 6861 feet with a corresponding datum of -599 feet. This put the top 281 feet low to the prognosis and 1325 feet high to the Westcoast comparison well. The lithology of the Upper Ismay was primarily light gray, very fine grained sandstones with interbedded anhydrite, shale and salt. One of the offset wells (Lundell well-SW 17-T28S-R23E) had about 120 feet of salt in the Upper Ismay section, but only two thin stringers of salt were present in this well. The top of the Ismay was marked by a 2 to 3 foot thick bedded anhydrite, below which were 10 feet of gray shales. The sandstones seen in the Upper Ismay section were fine to very fine grained, sub rounded to rounded and well sorted, slightly argillaceous and anhydritic in part with calcite cement. A very slight amount of black residual staining with no associated fluorescence or cut was observed. In

the lower portion of the section between 6914 to 6940 feet, two thin salt stringers were encountered. These zones were circulated up and a slight increase in chlorides in the mud was noted (from 1200 to 2200 ppm). The basal portion of the Upper Ismay consisted of interbedded anhydritic claystone, shales and anhydrites. No reservoir development was noted in the Upper Ismay, and no shows were encountered.

The Hovenweep Shale was drilled at a depth of 6966 feet with a subsea datum of -707. The shale through this section was gray brown to brown in color, blocky to sub blocky, moderately firm to soft and displayed an earthy to grainy texture. It was silty in part with scattered carbonaceous inclusions, was quite calcareous/limey in part and displayed very finely disseminated pyrite in part. As throughout the Paradox Shale section above the Ismay, an increase in background gas was observed through the Hovenweep, however the breakout of gas was markedly different with C₃ being predominant.

The Lower Ismay was penetrated at a drill depth of 7036 feet with a corresponding datum of -774 feet, 1376 feet high to the Westcoast comparison well. The lower Ismay was very anhydritic with thick beds of white to cream, soft gummy to slightly crystalline anhydrite. Thin interbeds of dark gray shales and light gray fine grained sandstones similar to those seen in the Upper Ismay were also present through the section. No porosity development and no shows were noted in the Lower Ismay.

The top of the Gothic Shale was encountered at 7112 feet, 1375 feet high to the comparison well. The lithology of the Gothic was the classic dark gray to gray brown to black shale, carbonaceous and calcareous to dolomitic with a silty to grainy texture and a brown powdery to slightly greasy streak. The lowermost portion of the section penetrated also exhibited thin stringers of dark gray, brittle argillaceous dolomites. These brittle dolomitic shales and dolomites appeared to be highly fractured with an associated drilling break. An unexpected gas show was associated with the drilling break with a slight to fair oil odor noted at the shaker. This show is summarized in the table below and was tested by drill stem test #1.

DEPTH	ROP	BG GAS	PEAK	C ₁ (ppm)	C ₂ (ppm)	C ₃ (ppm)	C ₄ (ppm)
7129-36'	.9 min/ft	45 units	1800 units	137,580	26,826	9967	5522
7136-43'	.7 min/ft.	360 units	2394 units	183,088	35,699	13,263	7343

DISCUSSION & CONCLUSIONS:

The Headwaters Federal #7-15 was drilled to test the hydrocarbon potential of the Cutler, Honaker Trail and Ismay formations over a buried salt "pillow" of the Paradox Salt. The objective horizons exhibited up to 350 feet of structural closure (drape) over the salt pillow at the Ismay horizon. The primary objectives of the test were the sandstones of the lower Honaker Trail that are the producing horizons in the Big Indian (Hermosa) field 12 miles to the south. Secondary objectives included the overlying Cutler that is productive at the Andy's Mesa gas field to the east, and the underlying Ismay Formation that displayed an amplitude anomaly on seismic suggesting porosity development and/or gas effect.

Considerable thinning of the Mesozoic section was observed in comparison to the Westcoast-Muleshoe #1 well used for structural comparison. At the Entrada horizon, the Headwaters well was 122 feet low to the Muleshoe well, but by the time the Chinle was penetrated, the well was 173 feet high to the comparison well. This thinning of the section was one of the contributing factors to the erroneous formation tops originally called on the lithology log. By the top of the Moenkopi, this well was running 288 feet high to the Muleshoe well. The influence of salt movement in the fold and fault belt of the Paradox Basin can cause large localized variations in the thickness of the Moenkopi (Molenaar, 1981). This well exhibited a considerably thicker Moenkopi section than the Muleshoe well (599 feet vs. 483 feet respectively) with a resultant top of the Cutler being only 57 feet high to the comparison well. The structural influence of the buried salt pillow beginning midway in the Cutler section was

very apparent by the top of the Honaker Trail with the top 982 feet high to the comparison well. At the Ismay through Gothic level, structural advantage over the Muleshoe well was in excess of 1300 feet.

A number of shows were encountered while drilling the Cutler section, but after review of the logs, it was apparent that only the zone with the best gas show at 4400 feet was prospective. As the drilling plan called for the well to be cased and potential zones tested through pipe, this zone was not tested when encountered. At the end of the well, as this was the only zone showing potential that hadn't already been tested, a straddle test was run across the zone. The test was mechanically successful and recovered 94 feet of mud with declining pressures, indicative of a tight reservoir.

Twelve zones were penetrated in the Honaker Trail section that exhibited gas shows, with five of them having sufficient shows to warrant further evaluation. Shows ranged from 112 to 398 units of gas. For comparison purposes, most Honaker Trail productive horizons in the Andy's Mesa field exhibit shows when drilled ranging from 800 to over 3000 units of gas. The zones in the Honaker Trail section were not very well developed, with considerable clay plugging, and the log analysis of the zones substantiated them as being non-commercial. While the structural closure was apparently present at the lower Honaker Trail horizon, reservoir quality was lacking.

The gas show zone in the upper Cutler zone would have to be stratigraphic in nature as there was no structural closure at that horizon. The well developed sands encountered in the lower Cutler section may have had a slight structural advantage, however it appears there was insufficient structural closure to create a trap. These zones in the lower Cutler exhibited only fair to poor gas shows (less than 100 units to 450 units) and had negative evaluations on the electric logs.

An unexpected gas show from brittle fractured dolomitic Gothic Shale was tested by DST #1. The zone built up pressure rapidly on the initial flow and flowed gas to surface in 14 minutes indicating the shale was hydrocarbon charged, but with very limited reservoir extent as the zone was depleted by the test and therefore deemed non-commercial.

The premise of a structural development as mapped from seismic over the buried salt pillow at the NW Lisbon Prospect was substantiated. The gas shows from both the La Sal limestone and Gothic Shale sections indicate the structure was also hydrocarbon charged. Unfortunately, no viable reservoirs were developed within the structural closure. The Upper and Lower Ismay sections were very anhydritic with no evidence of the suspected porosity development inferred from the seismic amplitude anomaly. The only potential zone uphole in the Cutler appears to be a tight non-commercial reservoir based on the results of drill stem test #2. Due to the lack commercial shows, the decision was made to plug and abandon the Headwaters Federal #7-15 as a dry hole.

Jason G. Blake, CPG, RPG
Consulting Geologist

REFERENCES:

Molenaar, C. M., 1981, Mesozoic Stratigraphy of the Paradox Basin-An Overview, *in* Del Wiegand, ed, Geology of the Paradox Basin, Rocky Mountain Association of Geologists 1981 Field Conference, pp 119-127.

Parker, J. M., 1981, Lisbon Field Area, *in* Del Weigand, ed, Geology of the Paradox Basin, Rocky Mountain Association of Geologists 1981 Field Conference, pp 89-100.

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

FORM 6

ENTITY ACTION FORM

Operator: Anschutz Exploration Corporation Operator Account Number: N 7940
 Address: 555 17th Street, Suite 2400
city Denve
state Co zip 80202 Phone Number: (303) 298-1000

Well 1

API Number	Well Name		QQ	Sec	Twp	Rng	County
4303731822	Headwaters Federal 7-15		SWNE	15	28S	23E	San Juan
Action Code	Current Entity Number	New Entity Number	Spud Date			Entity Assignment Effective Date	
A	99999	13538	5/5/2002			7-10-03 5/5/2002	
Comments: Well was spud on 5/5/02 and drilled to a total depth of 7146'. No hydrocarbons were encountered, and the well was plugged and abandoned on 6/11/02.							

Well 2

API Number	Well Name		QQ	Sec	Twp	Rng	County
Action Code	Current Entity Number	New Entity Number	Spud Date			Entity Assignment Effective Date	
Comments:							

Well 3

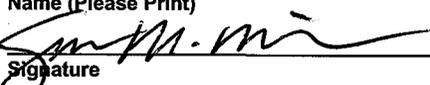
API Number	Well Name		QQ	Sec	Twp	Rng	County
Action Code	Current Entity Number	New Entity Number	Spud Date			Entity Assignment Effective Date	
Comments:							

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ACTION CODES:

- A - Establish new entity for new well (single well only)
- B - Add new well to existing entity (group or unit well)
- C - Re-assign well from one existing entity to another existing entity
- D - Re-assign well from one existing entity to a new entity
- E - Other (Explain in 'comments' section)

Susan M. Miller
 Name (Please Print)

 Signature
 Operations Tech. Date 6/25/2002
 Title Date

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

FORM APPROVED
OMB No. 1004-0137
Expires: November 30, 2000

WELL COMPLETION OR RECOMPLETION REPORT AND LOG

5. Lease Serial No.
UTU-77072

1a. Type of Well Oil Well Gas Well Dry Other
b. Type of Completion New Well Work Over Deepen Plug Back Diff. Resvr.
Other _____

6. If Indian, Allottee or Tribe Name

7. Unit or CA Agreement Name and No.

2. Name of Operator ANSCHUTZ EXPLORATION CORP. Contact: SUSAN MILLER
E-Mail: Susan.Miller@AEC-Denver.com

8. Lease Name and Well No.
HEADWATERS FEDERAL 7-15

3. Address 555 17TH ST., STE. 2400 DENVER, CO 80202
3a. Phone No. (include area code) Ph: 303.299.1344

9. API Well No.
43-037-31822

4. Location of Well (Report location clearly and in accordance with Federal requirements)*
At surface SWNE 2469FNL 2439FEL
At top prod interval reported below SWNE 2469FNL 2439FEL
At total depth SWNE 2469FNL 2439FEL

10. Field and Pool, or Exploratory
WILDCAT

11. Sec., T., R., M., or Block and Survey or Area Sec 15 T28S R23E Mer SLB

12. County or Parish SAN JUAN
13. State UT

14. Date Spudded 05/05/2002
15. Date T.D. Reached 06/06/2002
16. Date Completed D & A Ready to Prod. 06/11/2002

17. Elevations (DF, KB, RT, GL)*
6262 KB

18. Total Depth: MD 7146 TVD
19. Plug Back T.D.: MD TVD

20. Depth Bridge Plug Set: MD TVD

21. Type Electric & Other Mechanical Logs Run (Submit copy of each)
ARRAY IND, DENS-NEUT, FMI, NAT GAMMA, SONIC, DIPOL
REC 7-15-02

22. Was well cored? No Yes (Submit analysis)
Was DST run? No Yes (Submit analysis)
Directional Survey? No Yes (Submit analysis)

23. Casing and Liner Record (Report all strings set in well)

Hole Size	Size/Grade	Wt. (#/ft.)	Top (MD)	Bottom (MD)	Stage Cementer Depth	No. of Sk. & Type of Cement	Slurry Vol. (BBL)	Cement Top*	Amount Pulled
12.250	9.625 J55	36.0		2058		692			

24. Tubing Record

Size	Depth Set (MD)	Packer Depth (MD)	Size	Depth Set (MD)	Packer Depth (MD)	Size	Depth Set (MD)	Packer Depth (MD)

25. Producing Intervals

Formation	Top	Bottom	Perforated Interval	Size	No. Holes	Perf. Status
A)						
B)						
C)						
D)						

26. Perforation Record

27. Acid, Fracture, Treatment, Cement Squeeze, Etc.

Depth Interval	Amount and Type of Material

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28. Production - Interval A

Date First Produced	Test Date	Hours Tested	Test Production	Oil BBL	Gas MCF	Water BBL	Oil Gravity Corr. API	Gas Gravity	Production Method
			→						
Choke Size	Tbg. Press. Flwg. SI	Csg. Press.	24 Hr. Rate	Oil BBL	Gas MCF	Water BBL	Gas:Oil Ratio	Well Status	
			→						PA

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28a. Production - Interval B

Date First Produced	Test Date	Hours Tested	Test Production	Oil BBL	Gas MCF	Water BBL	Oil Gravity Corr. API	Gas Gravity	Production Method
			→						
Choke Size	Tbg. Press. Flwg. SI	Csg. Press.	24 Hr. Rate	Oil BBL	Gas MCF	Water BBL	Gas:Oil Ratio	Well Status	
			→						

28b. Production - Interval C

Date First Produced	Test Date	Hours Tested	Test Production →	Oil BBL	Gas MCF	Water BBL	Oil Gravity Corr. API	Gas Gravity	Production Method
Choke Size	Tbg. Press. Flwg. SI	Csg. Press.	24 Hr. Rate →	Oil BBL	Gas MCF	Water BBL	Gas:Oil Ratio	Well Status	

28c. Production - Interval D

Date First Produced	Test Date	Hours Tested	Test Production →	Oil BBL	Gas MCF	Water BBL	Oil Gravity Corr. API	Gas Gravity	Production Method
Choke Size	Tbg. Press. Flwg. SI	Csg. Press.	24 Hr. Rate →	Oil BBL	Gas MCF	Water BBL	Gas:Oil Ratio	Well Status	

29. Disposition of Gas(Sold, used for fuel, vented, etc.)
UNKNOWN

30. 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.

31. Formation (Log) Markers

Formation	Top	Bottom	Descriptions, Contents, etc.	Name	Top
					Meas. Depth
CUTLER	3213	5385	SANDSTONE	SUMMERVILLE	606
HONAKER TRAIL	5385	6180	SANDSTONE	ENTRADA	844
GOthic SHALE	7102	7145	DST 1, RECOVERED 187' SGCM	CARMEL	1214
CUTLER FORMATION	4376	4410	DST 2, RECOVERED 94' OF MUD	NAVAJO	1266
				KAYENTA	1673
				WINGATE	1892
				CHINLE	2063
				MOENKOPI	2730
				CUTLER	3213
				HONAKER TRAIL	5385
				LA SAL	6180
				UPPER ISMAY	6852
				HOVENWEEP	6962
				LOWER ISMAY	7030
				GOthic SHALE	7092

32. Additional remarks (include plugging procedure):

All electrical logs, DST reports and Geologic report, previously submitted to the BLM. Plugging operations witnessed and approved by BLM Rep., Jeff Brown.
 Plug #1 from 6150-6050' with 47 sks Class H cement
 Plug #2 from 5000-4900' with 70 sks Class H cement
 Plug #3 from 3700-3600' with 68 sks Class H cement
 Plug #4 from 3600-3400' with 156 sks Class H Neat cement
 Plug #5 from 2250-2000' with 180 sks Class H cement
 Surface plug with 20 sks cement

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OIL, GAS AND MINING**

33. Circle enclosed attachments:

- 1. Electrical/Mechanical Logs (1 full set req'd.)
- 2. Geologic Report
- 3. DST Report
- 4. Directional Survey
- 5. Sundry Notice for plugging and cement verification
- 6. Core Analysis
- 7. Other:

34. I hereby certify that the foregoing and attached information is complete and correct as determined from all available records (see attached instructions):

**Electronic Submission #12313 Verified by the BLM Well Information System.
For ANSCHUTZ EXPLORATION CORP., will be sent to the Moab**

Name (please print) SUSAN MILLER Title GENERAL CONTACT

Signature (Electronic Submission) Date 06/28/2002

Title 18 U.S.C. Section 1001 and Title 43 U.S.C. Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

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UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

FORM APPROVED
OMB NO. 1004-0135
Expires: November 30, 2000

SUNDRY NOTICES AND REPORTS ON WELLS
Do not use this form for proposals to drill or to re-enter an abandoned well. Use form 3160-3 (APD) for such proposals.

SUBMIT IN TRIPLICATE - Other instructions on reverse side.

1. Type of Well <input type="checkbox"/> Oil Well <input checked="" type="checkbox"/> Gas Well <input type="checkbox"/> Other		5. Lease Serial No. UTU-77072
2. Name of Operator ANSCHUTZ EXPLORATION CORP.		6. If Indian, Allottee or Tribe Name
3a. Address 555 17TH ST., STE. 2400 DENVER, CO 80202		7. If Unit or CA/Agreement, Name and/or No.
3b. Phone No. (include area code) Ph: 303.299.1344 Fx: 303.299.1518		8. Well Name and No. HEADWATERS FEDERAL 7-15
4. Location of Well (Footage, Sec., T., R., M., or Survey Description) Sec 15 T28S R23E SWNE 2469FNL 2439FEL		9. API Well No. 43-037-31822
		10. Field and Pool, or Exploratory WILDCAT
		11. County or Parish, and State SAN JUAN COUNTY, UT

12. CHECK APPROPRIATE BOX(ES) TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

TYPE OF SUBMISSION	TYPE OF ACTION			
<input type="checkbox"/> Notice of Intent	<input type="checkbox"/> Acidize	<input type="checkbox"/> Deepen	<input type="checkbox"/> Production (Start/Resume)	<input type="checkbox"/> Water Shut-Off
<input checked="" type="checkbox"/> Subsequent Report	<input type="checkbox"/> Alter Casing	<input type="checkbox"/> Fracture Treat	<input type="checkbox"/> Reclamation	<input type="checkbox"/> Well Integrity
<input type="checkbox"/> Final Abandonment Notice	<input type="checkbox"/> Casing Repair	<input type="checkbox"/> New Construction	<input type="checkbox"/> Recomplete	<input type="checkbox"/> Other
	<input type="checkbox"/> Change Plans	<input checked="" type="checkbox"/> Plug and Abandon	<input type="checkbox"/> Temporarily Abandon	
	<input type="checkbox"/> Convert to Injection	<input type="checkbox"/> Plug Back	<input type="checkbox"/> Water Disposal	

13. Describe Proposed or Completed Operation (clearly state all pertinent details, including estimated starting date of any proposed work and approximate duration thereof. If the proposal is to deepen directionally or recomplate horizontally, give subsurface locations and measured and true vertical depths of all pertinent markers and zones. Attach the Bond under which the work will be performed or provide the Bond No. on file with BLM/BIA. Required subsequent reports shall be filed within 30 days following completion of the involved operations. If the operation results in a multiple completion or recompletion in a new interval, a Form 3160-4 shall be filed once testing has been completed. Final Abandonment Notices shall be filed only after all requirements, including reclamation, have been completed, and the operator has determined that the site is ready for final inspection.)

The well was spud on 5/5/02 and drilled to a total depth of 7146'. No hydrocarbons were encountered, and the well was plugged and abandoned on 6/11/02 as follows:
 Plug #1 from 6150-6050' with 47 sks Class H cement
 Plug #2 from 5000-4900' with 70 sks Class H cement
 Plug #3 from 3700-3600' with 68 sks Class H cement
 Plug #4 from 3600-3400' with 156 sks Class H neat cement
 Plug #5 from 2250-2000' with 180 sks Class H cement
 Surface plug with 20 sks cement
 Plugging operations witnessed by BLM Rep., Jeff Brown.

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JUL 10 2002
DIVISION OF
OIL, GAS AND MINING

14. I hereby certify that the foregoing is true and correct.
**Electronic Submission #12365 verified by the BLM Well Information System
 For ANSCHUTZ EXPLORATION CORP., sent to the Moab
 Committed to AFMSS for processing by Marie McGann on 06/27/2002 ()**

Name (Printed/Typed) SUSAN MILLER	Title GENERAL CONTACT
Signature (Electronic Submission)	Date 06/26/2002

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

Approved By _____	Title _____	Date _____
Conditions of approval, if any, are attached. Approval of this notice does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.		Office _____

Title 18 U.S.C. Section 1001 and Title 43 U.S.C. Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

FORM APPROVED
OMB NO. 1004-0135
Expires: November 30, 2000

SUNDRY NOTICES AND REPORTS ON WELLS
Do not use this form for proposals to drill or to re-enter an abandoned well. Use form 3160-3 (APD) for such proposals.

5. Lease Serial No.
UTU-77072

6. If Indian, Allottee or Tribe Name

SUBMIT IN TRIPLICATE - Other instructions on reverse side.

7. If Unit or CA/Agreement, Name and/or No.

1. Type of Well
 Oil Well Gas Well Other

8. Well Name and No.
HEADWATERS FEDERAL 7-15

2. Name of Operator
ANSCHUTZ EXPLORATION CORP.
Contact: SUSAN MILLER
E-Mail: Susan.Miller@AEC-Denver.com

9. API Well No.
43-037-31822

3a. Address
555 17TH ST., STE. 2400
DENVER, CO 80202
3b. Phone No. (include area code)
Ph: 303.299.1344
Fx: 303.299.1518

10. Field and Pool, or Exploratory
WILDCAT

4. Location of Well (Footage, Sec., T., R., M., or Survey Description)
Sec 15 T28S R23E SWNE 2469FNL 2439FEL

11. County or Parish, and State
SAN JUAN COUNTY, UT

12. CHECK APPROPRIATE BOX(ES) TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

TYPE OF SUBMISSION	TYPE OF ACTION			
<input type="checkbox"/> Notice of Intent	<input type="checkbox"/> Acidize	<input type="checkbox"/> Deepen	<input type="checkbox"/> Production (Start/Resume)	<input type="checkbox"/> Water Shut-Off
<input type="checkbox"/> Subsequent Report	<input type="checkbox"/> Alter Casing	<input type="checkbox"/> Fracture Treat	<input type="checkbox"/> Reclamation	<input type="checkbox"/> Well Integrity
<input checked="" type="checkbox"/> Final Abandonment Notice	<input type="checkbox"/> Casing Repair	<input type="checkbox"/> New Construction	<input type="checkbox"/> Recomplete	<input checked="" type="checkbox"/> Other
	<input type="checkbox"/> Change Plans	<input type="checkbox"/> Plug and Abandon	<input type="checkbox"/> Temporarily Abandon	Final Abandonment Notice
	<input type="checkbox"/> Convert to Injection	<input type="checkbox"/> Plug Back	<input type="checkbox"/> Water Disposal	

13. Describe Proposed or Completed Operation (clearly state all pertinent details, including estimated starting date of any proposed work and approximate duration thereof. If the proposal is to deepen directionally or recomplate horizontally, give subsurface locations and measured and true vertical depths of all pertinent markers and zones. Attach the Bond under which the work will be performed or provide the Bond No. on file with BLM/BIA. Required subsequent reports shall be filed within 30 days following completion of the involved operations. If the operation results in a multiple completion or recompletion in a new interval, a Form 3160-4 shall be filed once testing has been completed. Final Abandonment Notices shall be filed only after all requirements, including reclamation, have been completed, and the operator has determined that the site is ready for final inspection.)

The subject well was plugged and abandoned 6/11/02. A Subsequent P&A report was submitted and approved by the BLM on 7/5/02, along with a Completion Report.

Reclamation of the reserve pit and location was conducted from 9/16/02 to 9/27/02 by Reams Construction. Re-contoured & re-seeded location and backfilled & closed pit. The location was inspected by BLM Rep., Rich McClure on 9/27/02.

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OCT 28 2002
DIVISION OF
OIL, GAS AND MINING

cc: STATE UTAH, DNR

14. I hereby certify that the foregoing is true and correct.
Electronic Submission #15354 verified by the BLM Well Information System For ANSCHUTZ EXPLORATION CORP., sent to the Moab

Name (Printed/Typed) SUSAN MILLER

Title GENERAL CONTACT

Signature (Electronic Submission)

Date 10/22/2002

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

Approved By _____	Title _____	Date _____
Conditions of approval, if any, are attached. Approval of this notice does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.		Office _____

Title 18 U.S.C. Section 1001 and Title 43 U.S.C. Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

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