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

FORM 3

AMENDED REPORT ☐
(highlight changes)

APPLICATION FOR PERMIT TO DRILL

5. MINERAL LEASE NO.: UTU-82619
6. SURFACE: Fee/Private

1A. TYPE OF WORK: DRILL ☒ REENTER ☐ DEEPEN ☐

7. IF INDIAN, ALLOTTEE OR TRIBE NAME:

B. TYPE OF WELL: OIL ☐ GAS ☐ OTHER Injection SINGLE ZONE ☐ MULTIPLE ZONE ☒

8. UNIT or CA AGREEMENT NAME:

2. NAME OF OPERATOR: Westwater Farms, LLC (also land owner)

9. WELL NAME and NUMBER: Harley Dome 1

3. ADDRESS OF OPERATOR: P. O. Box 23358, CITY Silverthorne, STATE CO ZIP 80498
PHONE NUMBER: 970-513-8034

10. FIELD AND POOL, OR WILDCAT: Greater Cisco 205

4. LOCATION OF WELL (FOOTAGES) 661253X 4337601Y 39.174575 -109.133300
AT SURFACE: 600.5 feet fnl and 2,139.0 feet fel
AT PROPOSED PRODUCING ZONE: As above (vertical well)

11. QTR/QTR, SECTION, TOWNSHIP, RANGE, MERIDIAN: NWNE 10, T19S, R25E, SLM

14. DISTANCE IN MILES AND DIRECTION FROM NEAREST TOWN OR POST OFFICE: 18 mi NE Cisco, UT via I-70 to Exit 227 then NW 0.6 mi to Old Hwy 6-50 then SW 0.2 mi

12. COUNTY: Grand

13. STATE: UTAH

15. DISTANCE TO NEAREST PROPERTY OR LEASE LINE (FEET): 600.5 feet from N property & nearest lease line

16. NUMBER OF ACRES IN LEASE: 90 acres more or less

17. NUMBER OF ACRES ASSIGNED TO THIS WELL: 10

18. DISTANCE TO NEAREST WELL (DRILLING, COMPLETED, OR APPLIED FOR) ON THIS LEASE (FEET): First well on property

19. PROPOSED DEPTH: 1,750 feet

20. BOND DESCRIPTION:

21. ELEVATIONS (SHOW WHETHER DF, RT, GR, ETC.): 4,864 feet GL (ungraded ground level)

22. APPROXIMATE DATE WORK WILL START: UIC Permit applied for (ASAP)

23. ESTIMATED DURATION: 21 days

24. **PROPOSED CASING AND CEMENTING PROGRAM**

SIZE OF HOLE	CASING SIZE, GRADE, AND WEIGHT PER FOOT	SETTING DEPTH	CEMENT TYPE, QUANTITY, YIELD, AND SLURRY WEIGHT
11"	8.625" J-55, 24.00 ppf	214'	Class A, 92 sx, 1.18 cuft/sk, 15.6 ppg circ to surface
7.875"	5.5" J-55, 15.50 ppf	1,750'	Class H (50-50 Poz), 144 sx, 1.84 cuft/sk, 12.5 ppg to 735'

25. **ATTACHMENTS**

VERIFY THE FOLLOWING ARE ATTACHED IN ACCORDANCE WITH THE UTAH OIL AND GAS CONSERVATION GENERAL RULES:

☒ WELL PLAT OR MAP PREPARED BY LICENSED SURVEYOR OR ENGINEER (Keough Land Surveying well location plat (Att. 1-A)
☒ EVIDENCE OF DIVISION OF WATER RIGHTS APPROVAL FOR USE OF WATER (Water supplies listed in Att. 2, Drilling Plan)
☒ COMPLETE DRILLING PLAN and Compliance Checklist (Att. 2)
☐ FORM 5, IF OPERATOR IS PERSON OR COMPANY OTHER THAN THE LEASE OWNER

NAME (PLEASE PRINT) David L. Allin (970) 254-3114 TITLE Permit Agent

SIGNATURE [signature] DATE May 28, 2009

(This space for State use only)

API NUMBER ASSIGNED: 43-019-31622

Approved by the Utah Division of Oil, Gas and Mining

Date: 12-01-09 (See Instructions on Reverse Side)

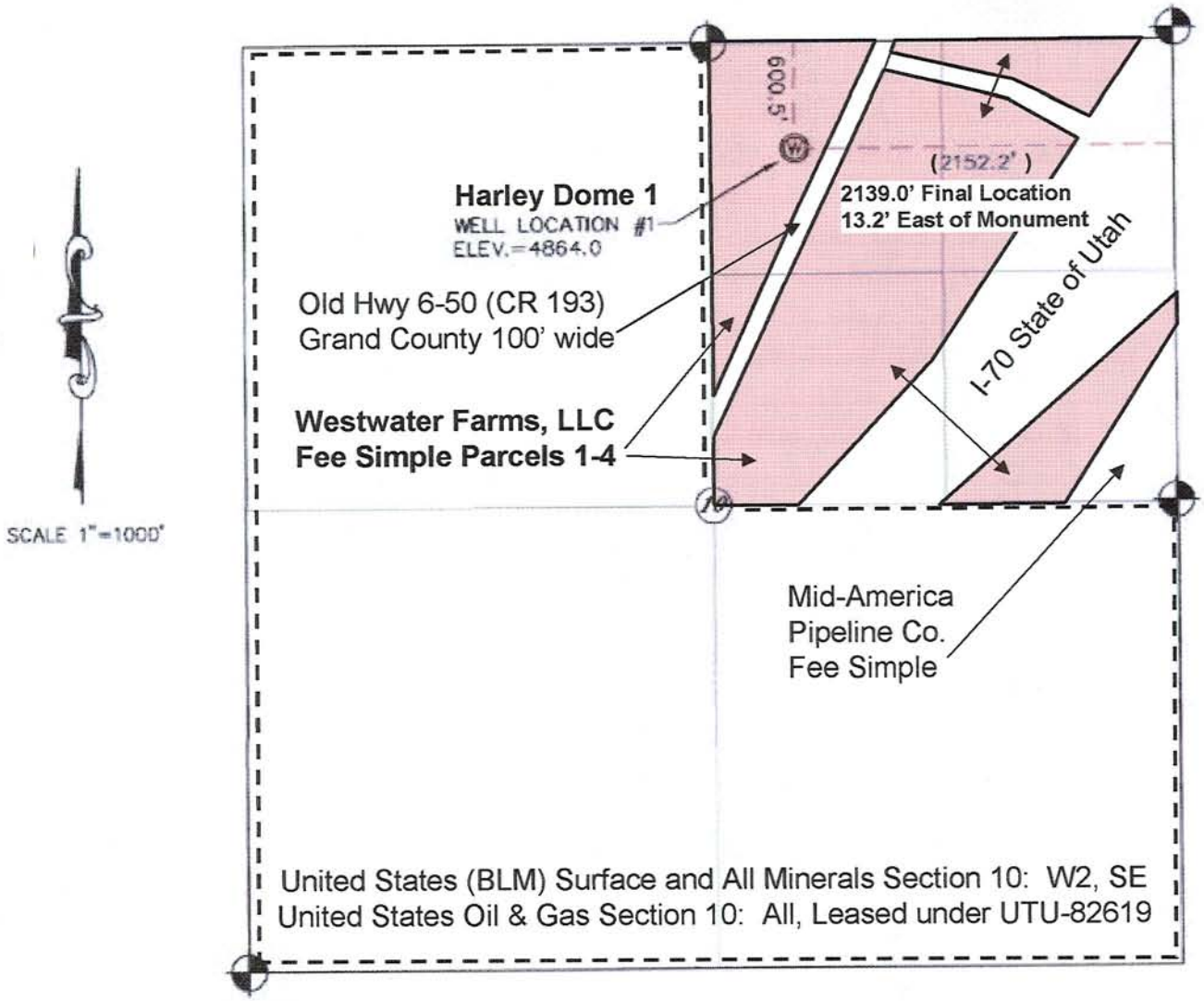
By: [signature]

RECEIVED
JUN 01 2009
DIV. OF OIL, GAS & MINING

(11/2001)

Attachment 1-A

WELL LOCATION PLAT IN SECTION 10, T 19 S, R 25 E. SLM 600.5 FT. FNL & 2139.0 FT. FEL



LEGEND

Attachment 1-A

FOUND GOVERNMENT MONUMENT

SET SPIKE WITH LATH AT PROPOSED WELL LOCATION **13.2' west offset of final Location to be 600.5' FNL & 2139.0' FEL**

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

TIMOTHY M. KEOGH

DATE

KEOGH LAND SURVEYING

45 EAST CENTER STREET MOAB, UTAH, 84532

A SURVEY OF

HARLEY DOME #1

WITHIN SECTION 10, T 19 S, R 25 E, SLM, ~~SAN JUAN COUNTY,~~ Grand UTAH

PREPARED FOR

GOLD MTN. REALTY

DATE: 4-7-09	DRAWN BY: TMK	CHECKED BY: TMK
SCALE: 1"=1000'	F.B.# 141	HARLEYDOME.DWG

Allin Proprietary/David L. Allin-Consultant
AAPG Certified Petroleum Geologist 2934 ☼ Utah Licensed Professional Geologist 5526699-2250
475 Seasons Drive, Grand Junction, CO, USA 81507-8749
Telephone: 970-254-3114 Facsimile: 970-254-3117 Mobile: 801-231-7102
E-mail: allinpro@bresnan.net

May 29, 2009

State of Utah
Division of Oil, Gas and Mining
P.O. Box 145801
Salt Lake City, UT 81114-5801

Re: Transmittal of APD for Harley Dome 1 Class II Injection Well
Filed by Westwater Farms, LLC

Ladies and Gentlemen:

Please find enclosed two complete copies of the Form 3, Application for Permit to Drill, and attachments for the Harley Dome 1. This injection well is proposed to be constructed at a regular location per Cause No. 102-16B in NWNE Section 10, T19S, R25E, SLM, Grand County, Utah immediately upon issuance of the UIC permit dated May 21, 2009, the enclosed Application for Permit to Drill and any other permits required.

If you have questions regarding the planning of this project and the permit application, you may direct them to me at the contact points given in the letterhead above.

The applicant and property owner, Westwater Farms, LLC, will be making arrangements with Earlene Russell for the bond on this well and can be contacted at:

Westwater Farms, LLC
c/o Tom Warnes (970) 513-8034
P.O. Box 23358
Silverthorne, CO 80498

Thank you for your attention to this submittal and your help with this important production water recycling and disposal project.

Sincerely yours,

David L. Allin
Permit Agent for Westwater Farms, LLC

cc: Tom Warnes

RECEIVED
JUN 01 2009
DIV. OF OIL, GAS & MINING

Attachment 2: Drilling Program and Compliance Checklist Submittal for
Westwater Farms, LLC Harley Dome 1
New Class II Injection Well on Fee Land
600.5' fnl and 2,139.0' fel, NWNE Section 10, T19S, R25E, SLM, Grand County, Utah

R649-3-4.1 See Form 3, Application for Permit to Drill ("APD") submitted to the Utah Division of Oil, Gas and Mining ("Division") for approval herewith.

R649-3-4.2.1 The Permit Agent, David L. Allin, can be reached at (970) 254-3114 in Grand Junction, Colorado.

R649-3-4.2.2 Westwater Farms, LLC ("Applicant") is entitled to file this APD under the authority of R649-5-2 and the Harley Dome 1 Underground Injection Control permit application dated May 21, 2009 as the owner of the patented fee surface. U.S. Bureau of Land Management ("BLM") Oil and Gas Lease UTU-82619 is in effect for the Federal oil and gas rights in the Applicant's private land. The proposed Harley Dome 1 injection well will not be authorized under the BLM oil and gas lease, and those rights will be preserved and protected.

R649-3-4.2.3 The proposed well is not located in a unit.

R649-3-4.2.4 The location of the proposed well as monumented in the field is depicted by the surveyor's plat. See Attachment 1-A Keough Land Surveying survey of the site of the Harley Dome 1 injection well.

R649-3-4.2.5 The water to be used for the proposed drilling and completion operations will be trucked to the site from the Ute Water Conservancy District tap in Mack, Colorado or a municipal source in Fruita, Colorado. Water from sources requiring Division of Water Rights approval will not be utilized.

R649-3-4.2.6 Elements of the proposed drilling program:

R649-3-4.2.6.1 The estimated tops of important geological markers below GL:

Tununk Shale Mbr of Mancos Shale	Surface
Dakota Sandstone	15'
Cedar Mountain Formation	95'
Brushy Basin Mbr Morrison Formation	160'
Salt Wash Mbr Morrison Formation	580'
Tidwell Mbr Morrison Formation	797'
Summerville Formation	832'
Entrada Sandstone (Slick Rock Mbr)	877'
Kayenta Formation	1,125'
Wingate Sandstone	1,333'
Chinle Formation	1,667'
TD	1,750'

R649-3-4.2.6.2 Prediction and protection of water, oil, gas or other mineral-bearing formations: Coal beds of subcommercial quality and seepage of fresh water may be encountered in the Dakota Sandstone between 15' and 95'. Surface casing will be set at 214' below GL in the upper part of the Brushy Basin Member of Morrison Formation and cemented to the surface to protect any possible resources of fresh water or other minerals near the surface. Natural gas in subcommercial volumes may be encountered in fluvial sandstone layers 8 to 20 feet in thickness located anywhere from 250' to 797' in the Brushy Basin and Salt Wash members of the Morrison Formation. The long (injection) string casing is planned to be set to TD near 1,750' in drilling mud and cemented back up to about 735' to isolate it from the contents of all formations below the surface. No resources of any kind are anticipated below the Morrison Formation.

R649-3-4.2.6.3 The pressure control equipment will be composed of a blow-out preventer with both blind and pipe rams rated for 3,000 psi working pressure that can be operated from a remote control station at least 50' from the well plus a rotating head rated for 500 psi working pressure. The drilling spool on the surface casing head below the blow-out preventer will be equipped with a kill line and check valve and a flow line with a gauge, valve and second valve or adjustable choke all of minimum 2" diameter and rated for no less than 1,500 psi working pressure. See Attachment 2-A schematic diagram of the blow-out prevention equipment ("BOPE"). Upon installation on the surface casing, the double-ram preventer and surface casing will be tested to 1,000 psi for ten minutes with no more than 5% pressure loss. The Division will be notified 24 hours in advance of all testing to be performed on the BOPE as required by R649-3-6.2.3. A record of the BOPE and casing tests will be maintained until the well is completed and that record will be submitted to the Division if required per R649-3-7.3.

Before drilling through the surface casing shoe, the bit will be checked to verify the presence of an operable float valve, the Kelly cock will be checked for operation and repaired if necessary. A stabbing valve suitable for use in the boxes of the drill pipe plus the Kelly cock wrench will be kept handy at the driller's station.

In accordance with R649-3-7.4 the double ram blow-out preventer will be checked for physical operation each trip and all BOPE components will be tested monthly to 250 psi for ten minutes with no more than 5% pressure loss. All tests of BOPE will be noted in the driller's log and that log will be available for examination by the Director or an authorized agent during routine inspections.

R649-3-4.2.6.4 The primary rotary rig included with the drilling equipment will be the Gardner-Denver 3000 fielded by Propetroco, Inc. of Moab, Utah or a similar mobile rig. The rig and its auxiliary equipment and supplies are typically rigged up on a level pad 150' in width and 250' in length (parallel to the rig). A blooie pit will be dug at a position generally south of the well at a distance to accommodate a 105' blooie line. A reserve pit will be dug next to the steel mud pits if and when the drilling system must be converted to circulate mud as dictated by conditions in the well. See Attachment 2-B depicting the drilling pad layout.

Two strings of casing are planned to be run to complete the construction of the well. Five joints of 8.625" 24.0 ppf, J-55, 8 rd ST&C casing will be set in 11.0" diameter hole with a cement float shoe on bottom at a depth of approximately 214' below the surface of the ground. The surface

casing string will be cemented from the float shoe to the surface with 92 sacks (including 100% excess) Class A cement mixed to yield 1.18 cubic ft/sack with 15.6 lbs/gallon slurry weight. The gross slurry volume available will be 19.3 barrels to allow topping off the annulus if the cement sinks. The injection casing or long string will be composed of 5.5" 15.5 ppf, J-55, 8 rd ST&C casing that will be set in 7.875" hole with a guide shoe on bottom near 1,750' and a cement float collar one joint up. The injection casing will be cemented from the guide shoe to approximately 100' over the top of the Summerville formation near 735' with 144 sacks (with 50% excess) of Class H (50-50 Pozmix) cement containing 4.0 lbs/sk gel, 8.0 lbs/sk Silicalite, 4.0 lbs/sk Granulite, 0.5 lb/sk Halad-344, 0.5 lb/sk Versaset and 0.25 lb/sk Poly-E-Flake to yield 1.84 cubic ft/sack with 12.5 lbs/gallon slurry weight. The gross slurry volume available will be 47.0 barrels.

R649-3-4.2.6.5 The surface and long string segments of the well will be drilled as far as possible circulating with air/mist/foam. Water production or caving problems in the well will determine the points where the well must be continued using gel/chem mud composed of bentonite, a polymer viscosity-builder and shale stabilizer and a pH modifier if necessary. No weighting material will be necessary. Sufficient supplies of the ingredients to mix mud and circulate the well will be on site when the surface casing shoe is drilled. The mud system will be monitored by visually checking the steel mud pit level.

R649-3-4.2.6.6 No testing or coring is planned. Upon reaching TD and achieving circulation with conditioned mud, the well will be logged with tools to record gamma ray, neutron-density, caliper, spontaneous potential and resistivity data. All logs will be recorded from TD to the surface casing shoe and the gamma ray log will be recorded to the surface for correlation purposes.

R649-3-4.2.6.7 The expected bottom hole pressure will not exceed 700 psi. The Lansdale Government 13 (API No. 43-019-30008) at a distance of 1.1 miles to the northwest from the proposed site drilled into Pre-Cambrian granite at 1,820' during 1968 without encountering abnormal pressures or temperatures or potential hazards, such as hydrogen sulfide. Similar benign conditions are anticipated in the proposed well.

R649-3-4.2.6.8 The proposed well will be completed and tested in conformance with the requirements of R649-5 as they pertain to underground injection control of Class II wells.

Westwater Farms, LLC as the owner of the underlying property and the operator of the proposed well wishes to exert and maintain control over the management of the surface and uses of the surrounding property to the full extent allowed while insuring compliance with the Division's Rules and other State of Utah, Federal and Grand County regulations or ordinances.

R649-3-4.2.6.9 The requirements of this rule are not applicable to this vertical well.

R649-3-4.2.7 The Applicant, Westwater Farms, LLC will also be the operator of the well nullifying the need to file Form 5, Designation of Agent or Operator.

R649-3-4.2.8 An Onsite Predrill Evaluation is required under this rule prior to approval of an APD because of Fee surface. The Applicant as both owner of the surface and operator of the well is

willing to proceed without an onsite meeting, but will leave the decision to hold such a meeting solely in the hands of the Division.

R649-3-4.3 This APD used Form 3 provided by the Division.

R649-3-5 The well will be identified by a sign posted in a conspicuous place near the well. The sign will be of durable construction with lettering kept in legible condition large enough to be read under normal conditions at a distance of 25'. The well numbering system utilized on the property will be a non-repetitive, logical and distinctive sequence. The sign will show the name of the well, the operator, emergency contact number, lease name and location by quarter section, township and range.

R649-3-6.1 Drilling operations will be conducted according to the drilling program approved under this APD by the Division. Any changes except mitigation of emergency conditions will be submitted to the Division on Form 9, Sundry Notices and Reports on Wells, for approval, and Division approval will be obtained prior to implementation. The Division will be given verbal notice of emergency changes within 24 hours and the operator will file a written notice using Form 9 within five days.

R649-3-6.2 *Reporting Requirements*. Written notices and filing of forms with the Division will be directed to:

Utah Division of Oil, Gas and Mining
P.O. Box 145801
Salt Lake City, UT 84114-5801

The telephone number of the Division receptionist during business hours and number to be used for leaving routine messages after business hours is:

Utah DOGM: (801) 538-5340.

MAJOR UNDERSIRABLE EVENTS must be reported by telephone immediately after calling for emergency services if needed. In the case of a major undesirable event ONLY, a notification to the Division can be made after business hours by calling (801) 243-9466.

Westwater Farms, LLC as operator will comply with the following routine reporting requirements to the Division:

1. The spudding of this well will be reported within 24 hours. This report will include the well name, drilling contractor, rig number and type, spud date and time, the date that continuous drilling will commence, the name of the reporter and the reporter's contact number. The spud report can be directed to Oil and Gas Well Information Specialist, Carol Daniels, verbally by calling (801) 538-5284 or transmitting e-mail to Ms. Daniels at carooidaniels@utah.gov.

2. Within five working days of spudding the well, the operator will fill out and file Form 6, Entity Action Form, to receive the well's entity number for future operational reporting requirements.

3. 24 hours advance notice of testing blow-out preventer equipment.

4. A monthly status report on the well will be filed until such time as the well is completed and the well completion report is filed. The monthly reports will be filed on Form 9 and include the well depth and a description of the operations conducted on the well during the month. The reports are due no later than the fifth day of the following calendar month.

5. 24 hours advance notice of casing tests required prior to drilling through the casing shoe or continuing with completion operations.

6. Fresh water aquifer layers encountered during drilling will be reported on Form 7, Report of Water Encountered During Drilling. This report will be filed with Form 8, Well Completion or Recompletion Report and Log.

R649-3-14 *Fire Hazards on the Surface*. All rubbish or debris that might constitute a fire hazard shall be removed to a distance of at least 100' from the well location, tanks, separator, or any structure. All waste oil or gas shall be burned or disposed of in a manner to avert creation of a fire hazard.

Any gas other than poisonous gas escaping from the well during drilling operations will be conducted to the blooie pit by the blooie line or gas buster line where a continuous igniter will insure that the gas is burned. The end of the blooie line will be 105' from the well.

R649-3-15 *Pollution and Surface Damage Control.* Westwater Farms, LLC will take all reasonable precautions to avoid polluting lands, streams, reservoirs, natural drainage ways, and underground water.

Westwater Farms, LLC will carry on all operations and maintain the property at all times in a safe and workmanlike manner having due regard for the preservation and conservation of the property and for the health and safety of employees and people residing in close proximity to those operations.

At a minimum, Westwater Farms, LLC will:

1. Take reasonable steps to prevent and will remove accumulations of oil or other materials deemed to be fire hazards from the vicinity of the well locations, lease tanks and pits;

2. Remove from the property or store in an orderly manner, all scrap or other materials not in use;

3. Provide secure workmanlike storage for chemical containers, barrels, solvents, hydraulic fluid and other non-exempt materials;

4. Maintain tanks in a workmanlike manner that will preclude leakage and provide for all applicable safety measures and construct berms of sufficient height and width to contain the quantity of the largest tank at the storage facility;

5. Insure that the use of storage tanks for crude oil or water without tops is limited to well testing operations;

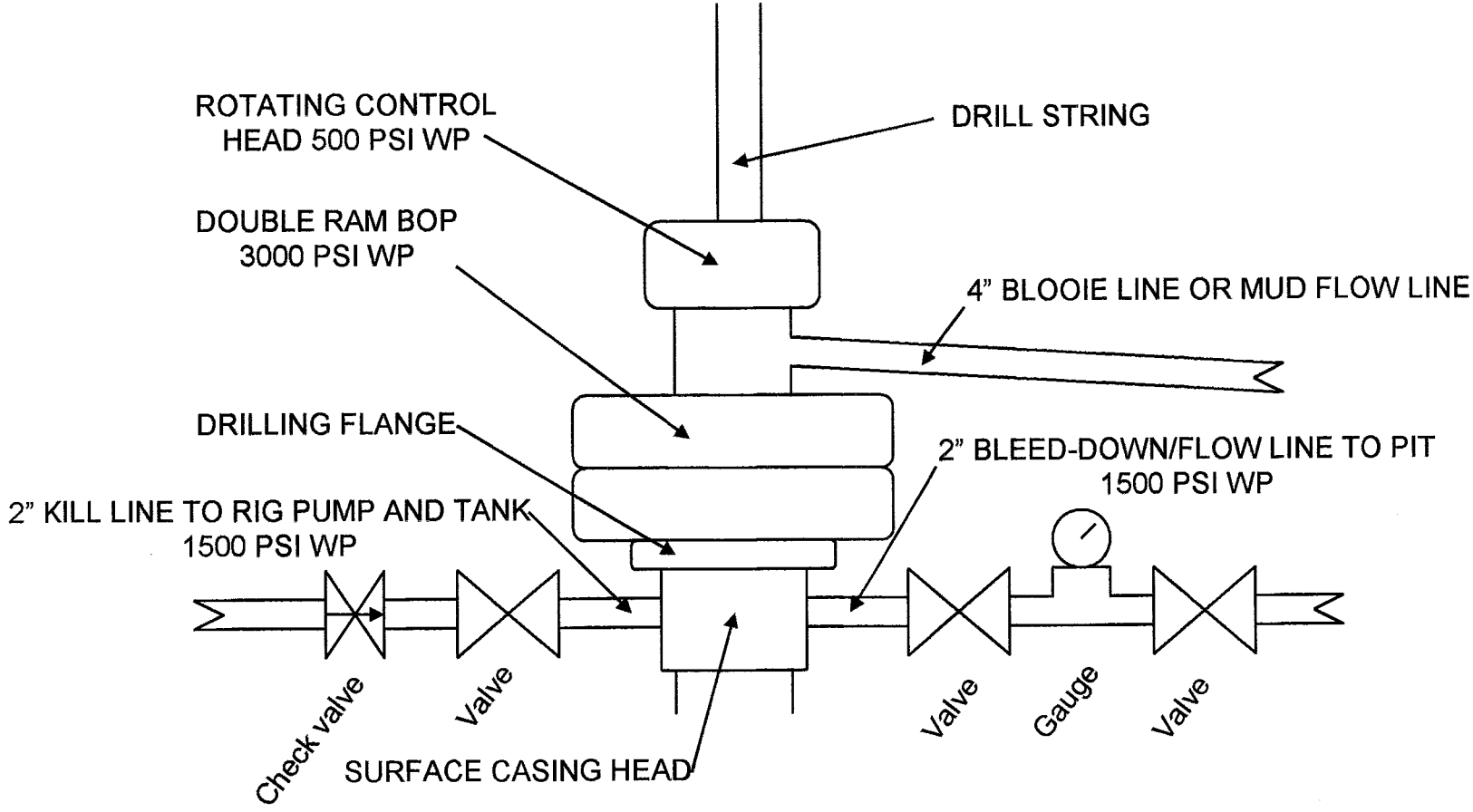
6. Catch leaks and drips contain spills and cleanup promptly;

7. Practice waste reduction and recycling in order to help reduce disposal volumes;

8. Dispose of produced water, tank bottoms and other miscellaneous waste in a manner that is in compliance with Division's Rules and other Utah State, Federal and Grand County regulations or ordinances; and

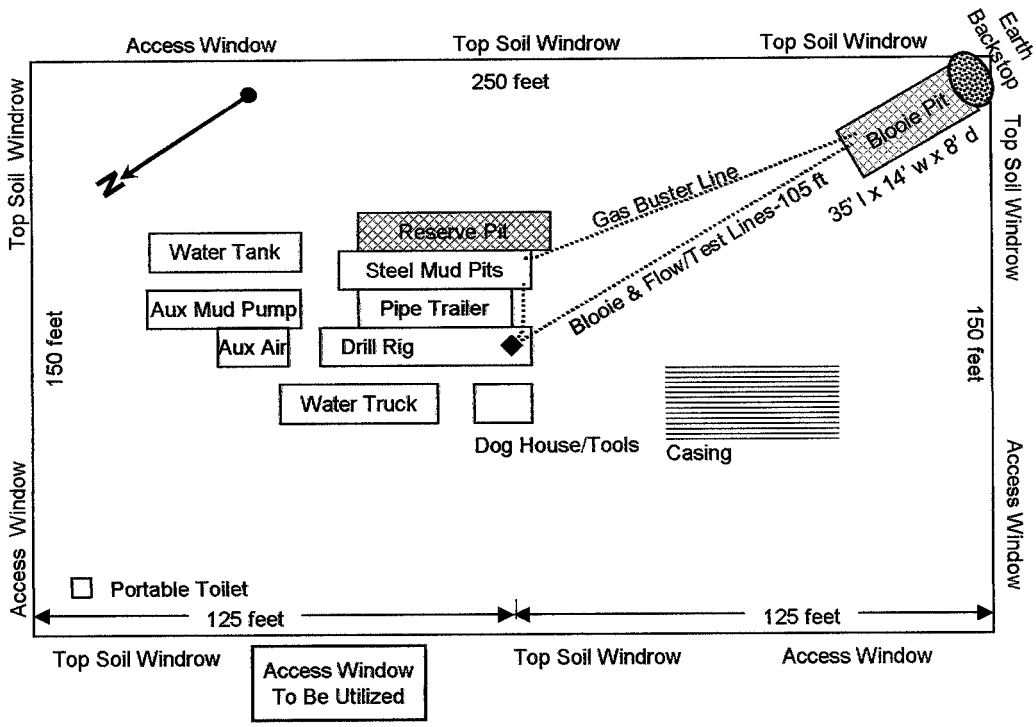
9. Use good housekeeping practices in general.

Attachment 2-A: Westwater Farms, LLC
Pressure Control System for Greater Cisco Field Operations
Not drawn to scale



Attachment 2-A

Westwater Farms, LLC Harley Dome Injection Well
Drilling Operation Pad & Equipment Layout
Propetroco, Inc. Number 1 Rig or Equivalent Mobile Drilling Rig
Scale: 1 Inch = 50 Feet

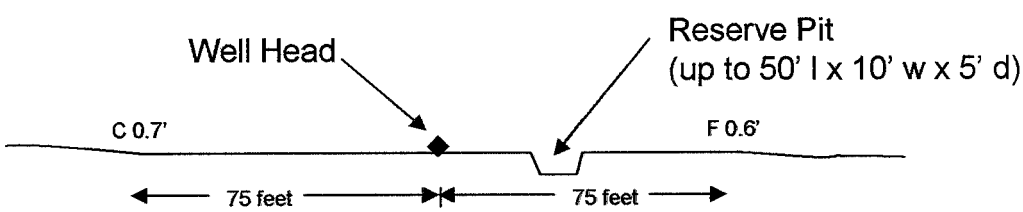


◆ Well Head

Gross possible disturbed area 170 x 270 feet

Access roads typically 16 feet to 18 feet wide with maximum disturbed width 30 feet

Cut and Fill Profile West-East Through Well Head



WORKSHEET
APPLICATION FOR PERMIT TO DRILL

APD RECEIVED: 06/01/2009

API NO. ASSIGNED: 43-019-31622

WELL NAME: HARLEY DOME 1
OPERATOR: WESTWATER FARMS LLC (N3525)
CONTACT: DAVID ALLIN

PHONE NUMBER: 970-254-3114

PROPOSED LOCATION:
NWNE 10 190S 250E
SURFACE: 0600 FNL 2139 FEL
BOTTOM: 0600 FNL 2139 FEL
COUNTY: GRAND
LATITUDE: 39.17458 LONGITUDE: -109.13330
UTM SURF EASTINGS: 661253 NORTHINGS: 4337601
FIELD NAME: GREATER CISCO (205)

INSPECT LOCATN BY: / /

Tech Review	Initials	Date
Engineering	DKD	8/10/09
Geology		
Surface		

LEASE TYPE: 1 - Federal
LEASE NUMBER: UTU-82619
SURFACE OWNER: 4 - Fee

PROPOSED FORMATION: CHIN
COALBED METHANE WELL? NO

RECEIVED AND/OR REVIEWED:

✓ Plat
✓ Bond: Fed[] Ind[] Sta[] Fee[]
(No. 8429377339)
N Potash (Y/N)
N Oil Shale 190-5 (B) or 190-3 or 190-13
✓ Water Permit
(No. MUNICIPAL)
N RDCC Review (Y/N)
(Date:)
Y Fee Surf Agreement (Y/N)
Westwater is Surface owner
NA Intent to Commingle (Y/N)

LOCATION AND SITING:

R649-2-3.

Unit:

R649-3-2. General
Siting: 460 From Qtr/Qtr & 920' Between Wells

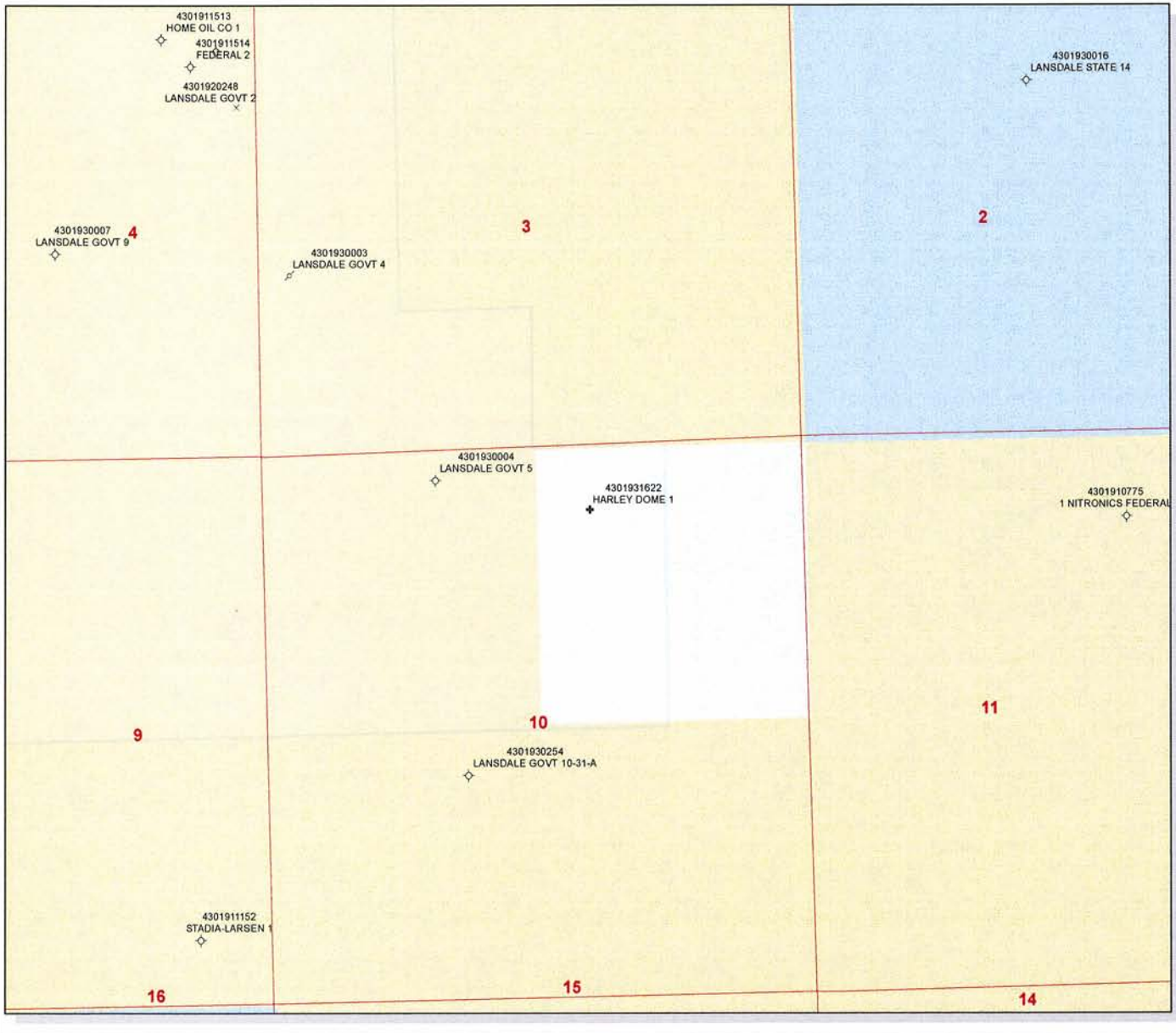
R649-3-3. Exception

✓ Drilling Unit
Board Cause No: 102-16(B)
Eff Date: 11-15-1979
Siting: 500' fr Property/lease line & 200' fr 1/4 1/4 lines

R649-3-11. Directional Drill

COMMENTS: Needs Presite (06-16-09)

STIPULATIONS: ~~1- Federal Approval~~
2- STATEMENT OF BASIS
3 - Cement Stip #4 (8 5/8" and 5 1/2")
4- If water is encountered in Entrada while drilling it should be sampled prior to continuing drilling into the Kayenta Fm - Kayenta Formation



API Number: 4301931622

Well Name: HARLEY DOME 1

Township 19.0 S Range 25.0 E Section 10

Meridian: SLBM

Operator: WESTWATER FARMS LLC

Map Prepared:
Map Produced by Diana Mason

Units
STATUS
- ACTIVE
- EXPLORATORY
- GAS STORAGE
- NF PP OIL
- NF SECONDARY
- PI OIL
- PP GAS
- PP GEOTHERM.
- PP OIL
- SECONDARY
- TERMINATED

Fields
STATUS
- ACTIVE
- COMBINED
- Sections

Wells Query Events
- <all other values>

GIS_STAT_TYPE
- <Null>
- APD
- DRL
- GI
- GS
- LA
- NEW
- OPS
- PA
- PGW
- POW
- RET
- SGW
- SOW
- TA
- TW
- WD
- WI
- WS

1,200 600 0 1,200 Feet

1:12,000

Application for Permit to Drill
Statement of Basis

APD No	API WellNo	Status	Well Type	Surf Ownr	CBM
1612	43-019-31622-00-00		WI	P	No

Operator WESTWATER FARMS LLC **Surface Owner-APD**
Well Name HARLEY DOME 1 **Unit**
Field GREATER CISCO **Type of Work**
Location NWNE 10 19S 25E S 600 FNL 2139 FEL GPS Coord (UTM) 661253E 4337601N

Geologic Statement of Basis

Significant volumes of high quality ground water are likely to be encountered in the bedrock at this location. A poorly permeable soil is likely to be developed on the thin cover of Lower Shale Member of the Mancos Shale that may overlie the Cretaceous age Dakota Sandstone. Good quality water is likely to be encountered in permeable Mesozoic sandstones found below the Mancos Shale. The well is likely to penetrate as many as four locally recognized aquifers. The proposed casing and cementing program and benign mud system should adequately isolate any zones of fresh water that may be penetrated. No underground water rights have been filed on any area within a mile of the proposed well site.

Chris Kierst 7/9/2009
APD Evaluator **Date / Time**

Surface Statement of Basis

Pre-site evaluation completed June 16, 2009. In attendance: Bart Kettle-DOGM, Wayne Downs-Grand County, Mark Wright-Grand County, Tom Warnes-Westwater Farms, LLC

As proposed the project falls within a previously disturbed site for the proposed Westwater Farms water treatment facility. Vegetation is dominated by weedy annual species and soils are actively eroding from spring winds at inspection. Drainage from tanks for water treatment facility into secondary containment flows through the proposed well pad. Additional culvert will be required for well pad access and work space.

Reserve pit is being permitted as 50' long x 10' wide x 5' deep. Pit shall be properly lined with a 12 mil liner. Reserve pit shall not be used for the storage of produced fluids, outside E&P waste or secondary containment for the proposed waste water treatment facility. Consistent with the Utah Oil and Gas Conservation General Rules R649-3 the reserve pit shall be reclaimed within one year following drilling of the well bore.

Grand County requires road encroachment permit for County Rd 193, building permit and compliance with land use code. In addition county is requesting funds for review to be placed on deposit.

Bart Kettle 6/16/2009
Onsite Evaluator **Date / Time**

Conditions of Approval / Application for Permit to Drill

Category	Condition
Pits	A synthetic liner with a minimum thickness of 12 mils shall be properly installed and maintained in the reserve pit.
Surface	Drainages adjacent to the proposed pad shall be diverted around the location.

ON-SITE PREDRILL EVALUATION
Utah Division of Oil, Gas and Mining

Operator WESTWATER FARMS LLC
Well Name HARLEY DOME 1
API Number 43-019-31622-0 **APD No** 1612 **Field/Unit** GREATER CISCO
Location: 1/4,1/4 NWNE **Sec** 10 **Tw** 19S **Rng** 25E 600 FNL 2139 FEL
GPS Coord (UTM) **Surface Owner**

Participants

Bart Kettle-DOGM, Wayne Downs-Grand County, Mark Wright-Grand County, Tom Warnes-Westwater Farms, LLC

Regional/Local Setting & Topography

Proposed project site is located at the former Harley Dome site, in Grand County Utah. Annual precipitation is 8-10", vegetation is sparse at the project site, but would be described as salt scrub and Wyoming sage rangelands. Topography immediately adjacent to the project site is gently rolling clay flats. Drainage is to the southeast entering the Colorado River within 5 miles. No perennial water was observed in close proximity to the proposed project site. Drainages in the immediate area are ephemeral in nature, being dry throughout a majority of the year. On a regional setting the project is located in the Cisco Desert on the toe of the Uncompadgree up lift, a region known for it's harsh growing conditions due to low precipitation, and poorly developed salty soils. I-70, Rabbit Valley rest area, and Union Pacific train tracks are all located in close proximity to the proposed project.

Surface Use Plan

Current Surface Use

Agricultural
Industrial

New Road Miles	Well Pad		Src Const Material	Surface Formation
0.1	**Width** 150	**Length** 250		DKMNC

Ancillary Facilities

Waste Management Plan Adequate?

Environmental Parameters

Affected Floodplains and/or Wetland N

Flora / Fauna

Grass: Annual wheat grass spp., curly gallata, Indian Rice grass.

Forbs: Red steam filaree, Russian thistle, sunflower, annual kochia, tumble mustard, scarlet globe mallow, purple mustard, aster spp., western salsify, prickly lettuce.

Shrubs: None

Trees: None

Soil Type and Characteristics

Pale orange sandy clay mixture.

Erosion Issues Y

Soils prone to wind erosion once disturbed

Sedimentation Issues N

Site Stability Issues N

Drainage Diverson Required N

Drainage will require a culvert to flow under proposed well pad.

Berm Required? N

Erosion Sedimentation Control Required? N

Recommend re-seeding and establishment of perennial vegetation as soon as practical following disturbance.

Paleo Survey Run? N **Paleo Potental Observed?** N **Cultural Survey Run?** N **Cultural Resources?** N

Reserve Pit

Site-Specific Factors		**Site Ranking**
Distance to Groundwater (feet)	>200	0
Distance to Surface Water (feet)	>1000	0
Dist. Nearest Municipal Well (ft)	>5280	0
Distance to Other Wells (feet)	>1320	0
Native Soil Type	Mod permeability	10
Fluid Type	Fresh Water	5
Drill Cuttings	Normal Rock	0
Annual Precipitation (inches)	10 to 20	5
Affected Populations	<10	0
Presence Nearby Utility Conduits	Unknown	10
	Final Score	30 1 **Sensitivity Level**

Characteristics / Requirements

Closed Loop Mud Required? N **Liner Required?** Y **Liner Thickness** 12 **Pit Underlayment Required?** N

Other Observations / Comments

Proposed project area is located on fee surface, held by Westwater Farms, LLC. Minerals at the site are federal. Moab BLM contacted and declined participation at the presite evaluation. Minerals group doesn't manage applications for injection, and as such are defaulting to the Divisions UIC program for well bore and surface evaluation.

Grand County inquired regarding public input regarding UIC permitting at the time of the presite evaluation. Division informed the county presite evaluations are set up and conducted to asses impacts to surface resources. Public comment regarding geology and ground water as they relate to UIC permitting would be heard at a later date. Grand County request to be included in the geologic review of the well bore.

Bart Kettle	6/16/2009
Evaluator	**Date / Time**

utah.gov

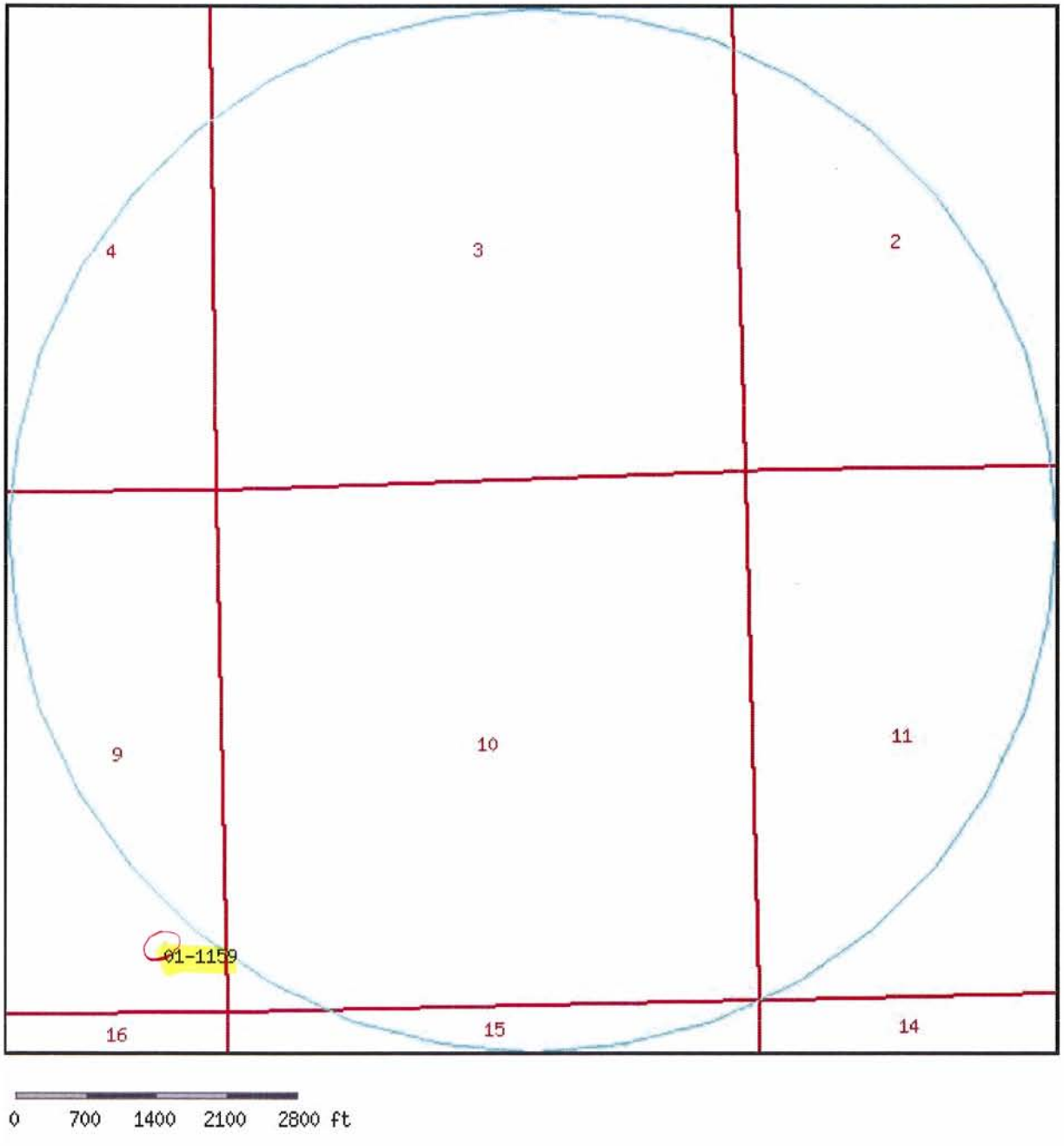
Search all of Utah.gov »

Utah Division of Water Rights

Output Listing

Version: 2009.05.06.00 Rundate: 07/09/2009 08:34 AM

Radius search of 5280 feet from a point S600.5 W2139 from the NE corner, section 10, Township 19S, Range 25E, SL b&m
Criteria:wrtypes=W,C,E podtypes=S,U,Sp status=U,A,P usetypes=all

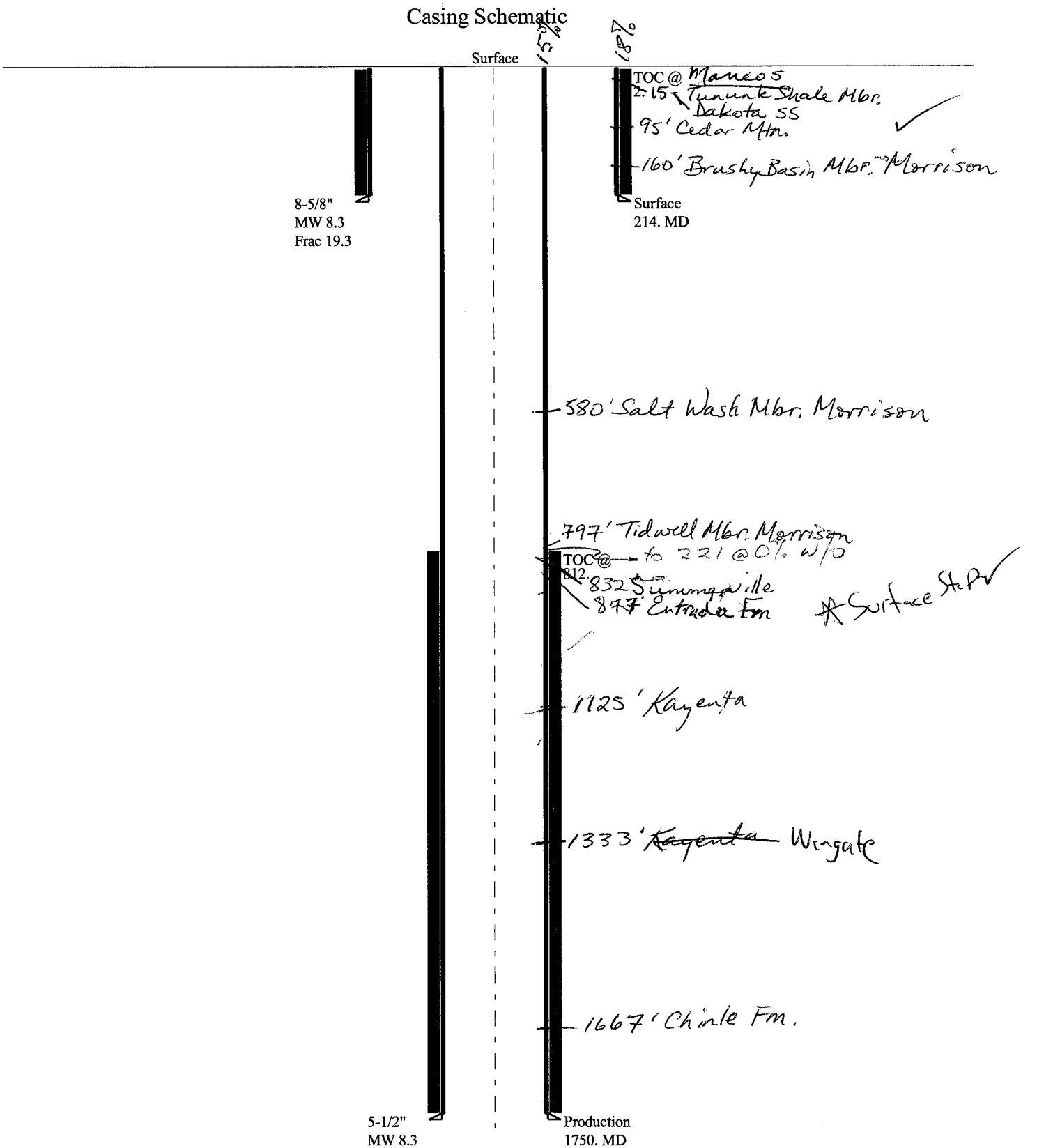


Water Rights

WR Number	Diversion Type/Location	Well Log	Status	Priority	Uses	CFS	ACFT	Owner Name
01-1159	Underground N673 W642 SE 09 19S 25E SL	well info	A	20070613	O	0.000	49.100	USA BUREAU OF LAND MANAGEMENT 82 EAST DOGWOOD

43019316220000 Westwater Harley Dome 1

Casing Schematic



Well name:	**43019316220000 Westwater Harley Dome 1**
Operator:	**Westwater Farms, LLC**
String type:	Surface
Project ID:	43-019-31622-0000
Location:	Grand County

Design parameters:

Collapse

Mud weight: 8.330 ppg
Design is based on evacuated pipe.

Burst

Max anticipated surface pressure: 188 psi
Internal gradient: 0.120 psi/ft
Calculated BHP 214 psi

No backup mud specified.

Minimum design factors:

Collapse:

Design factor 1.125

Burst:

Design factor 1.00

Tension:

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

Tension is based on air weight.
Neutral point: 187 ft

Environment:

H2S considered? No
Surface temperature: 65 °F
Bottom hole temperature: 68 °F
Temperature gradient: 1.40 °F/100ft
Minimum section length: 120 ft

Cement top: 2 ft

Non-directional string.

Re subsequent strings:

Next setting depth: 1,750 ft
Next mud weight: 8.330 ppg
Next setting BHP: 757 psi
Fracture mud wt: 19.250 ppg
Fracture depth: 214 ft
Injection pressure: 214 psi

Run Seq	Segment Length (ft)	Size (in)	Nominal Weight (lbs/ft)	Grade	End Finish	True Vert Depth (ft)	Measured Depth (ft)	Drift Diameter (in)	Internal Capacity (ft^3)
1	214	8.625	24.00	J-55	ST&C	214	214	7.972	76.5

Run Seq	Collapse Load (psi)	Collapse Strength (psi)	Collapse Design Factor	Burst Load (psi)	Burst Strength (psi)	Burst Design Factor	Tension Load (Kips)	Tension Strength (Kips)	Tension Design Factor
1	93	1370	14.794	214	2950	13.79	5	244	47.51 J

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

Phone: 810-538-5357

Date: August 5,2009
Salt Lake City, Utah

ENGINEERING STIPULATIONS: NONE
Collapse strength is based on the Westcott, Dunlop & Kemler method of biaxial correction for tension.
Collapse is based on a vertical depth of 214 ft, a mud weight of 8.33 ppg The casing is considered to be evacuated for collapse purposes.
Burst strength is not adjusted for tension.

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

Well name:	**43019316220000 Westwater Harley Dome 1**
Operator:	**Westwater Farms, LLC**
String type:	Production
Project ID:	43-019-31622-0000
Location:	Grand County

Design parameters:

Collapse

Mud weight: 8.330 ppg

Design is based on evacuated pipe.

Burst

Max anticipated surface pressure: 547 psi

Internal gradient: 0.120 psi/ft

Calculated BHP 757 psi

No backup mud specified.

Minimum design factors:

Collapse:

Design factor 1.125

Burst:

Design factor 1.00

Tension:

8 Round STC: 1.80 (J)

8 Round LTC: 1.80 (J)

Buttress: 1.60 (J)

Premium: 1.50 (J)

Body yield: 1.50 (B)

Tension is based on air weight.

Neutral point: 1,529 ft

Environment:

H2S considered? No

Surface temperature: 65 °F

Bottom hole temperature: 90 °F

Temperature gradient: 1.40 °F/100ft

Minimum section length: 368 ft

Cement top: 812 ft

Non-directional string.

Run Seq	Segment Length (ft)	Size (in)	Nominal Weight (lbs/ft)	Grade	End Finish	True Vert Depth (ft)	Measured Depth (ft)	Drift Diameter (in)	Internal Capacity (ft^3)
1	1750	5.5	15.50	J-55	ST&C	1750	1750	4.825	233.9

Run Seq	Collapse Load (psi)	Collapse Strength (psi)	Collapse Design Factor	Burst Load (psi)	Burst Strength (psi)	Burst Design Factor	Tension Load (Kips)	Tension Strength (Kips)	Tension Design Factor
1	757	4040	5.335	757	4810	6.35	27	202	7.45 J

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

Phone: 810-538-5357

Date: August 5,2009
Salt Lake City, Utah

ENGINEERING STIPULATIONS: NONE

Collapse strength is based on the Westcott, Dunlop & Kemler method of biaxial correction for tension.

Collapse is based on a vertical depth of 1750 ft, a mud weight of 8.33 ppg The casing is considered to be evacuated for collapse purposes.

Burst strength is not adjusted for tension.

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

BOPE REVIEW — Westwater Harley Dome 1 API 43-019-31622-0000

INPUT

Well Name	Westwater Harley Dome 1 API 43-019-31622-0000			
	String 1	String 2		
Casing Size (")	8 5/8	5 1/2		
Setting Depth (TVD)	214	1750		
Previous Shoe Setting Depth (TVD)	0	214		
Max Mud Weight (ppg)	8.33	8.33	✓	
BOPE Proposed (psi)	500	3000		
Casing Internal Yield (psi)	2950	4810		
Operators Max Anticipated Pressure (psi)	700	7.7 ppg	✓	

Calculations	String 1	8 5/8 "		
Max BHP [psi]	.052*Setting Depth*MW =	93		
			BOPE Adequate For Drilling And Setting Casing at Depth?	
MASP (Gas) [psi]	Max BHP-(0.12*Setting Depth) =	67	YES ✓	Air Drill
MASP (Gas/Mud) [psi]	Max BHP-(0.22*Setting Depth) =	46	YES	
			*Can Full Expected Pressure Be Held At Previous Shoe?	
Pressure At Previous Shoe	Max BHP-.22*(Setting Depth - Previous Shoe Depth) =	46	← NO OK	
Required Casing/BOPE Test Pressure		214	psi	
*Max Pressure Allowed @ Previous Casing Shoe =		0	psi	*Assumes 1psi/ft frac gradient

Calculations	String 2	5 1/2 "		
Max BHP [psi]	.052*Setting Depth*MW =	758		
			BOPE Adequate For Drilling And Setting Casing at Depth?	
MASP (Gas) [psi]	Max BHP-(0.12*Setting Depth) =	548	YES	
MASP (Gas/Mud) [psi]	Max BHP-(0.22*Setting Depth) =	373	YES ✓	
			*Can Full Expected Pressure Be Held At Previous Shoe?	
Pressure At Previous Shoe	Max BHP-.22*(Setting Depth - Previous Shoe Depth) =	420	← NO OK	
Required Casing/BOPE Test Pressure		1750	psi	
*Max Pressure Allowed @ Previous Casing Shoe =		214	psi	*Assumes 1psi/ft frac gradient

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

FORM 9

SUNDRY NOTICES AND REPORTS ON WELLS

Do not use this form for proposals to drill new wells, significantly deepen existing wells below current bottom-hole depth, reenter plugged wells, or to drill horizontal laterals. Use APPLICATION FOR PERMIT TO DRILL form for such proposals.

5. LEASE DESIGNATION AND SERIAL NUMBER: UTU-82619
6. IF INDIAN, ALLOTTEE OR TRIBE NAME: N/A
7. UNIT or CA AGREEMENT NAME: N/A
8. WELL NAME and NUMBER: Harley Dome 1
9. API NUMBER: 43-019-31622
10. FIELD AND POOL, OR WILDCAT: Greater Cisco

1. TYPE OF WELL: OIL WELL ☐ GAS WELL ☐ OTHER Injection
2. NAME OF OPERATOR: Westwater Farms, LLC (also land owner)
3. ADDRESS OF OPERATOR: P.O. Box 23358 CITY Silverthorne STATE CO ZIP 84078 PHONE NUMBER: 970-513-8034
4. LOCATION OF WELL
FOOTAGES AT SURFACE: 600.5 feet fnl and 2,139.0 feet fel COUNTY: Grand
QTR/QTR, SECTION, TOWNSHIP, RANGE, MERIDIAN: NWNE, Section 10, T19S, R 25E, SLM STATE: UTAH

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

TYPE OF SUBMISSION	TYPE OF ACTION		
☒ NOTICE OF INTENT (Submit in Duplicate)	☐ ACIDIZE	☐ DEEPEN	☐ REPERFORATE CURRENT FORMATION
Approximate date work will start:	☐ ALTER CASING	☐ FRACTURE TREAT	☐ SIDETRACK TO REPAIR WELL
October 7, 2009	☐ CASING REPAIR	☐ NEW CONSTRUCTION	☐ TEMPORARILY ABANDON
	☒ CHANGE TO PREVIOUS PLANS	☐ OPERATOR CHANGE	☐ TUBING REPAIR
	☐ CHANGE TUBING	☐ PLUG AND ABANDON	☐ VENT OR FLARE
☐ SUBSEQUENT REPORT (Submit Original Form Only)	☐ CHANGE WELL NAME	☐ PLUG BACK	☐ WATER DISPOSAL
Date of work completion:	☐ CHANGE WELL STATUS	☐ PRODUCTION (START/RESUME)	☐ WATER SHUT-OFF
	☐ COMMINGLE PRODUCING FORMATIONS	☐ RECLAMATION OF WELL SITE	☐ OTHER:
	☐ CONVERT WELL TYPE	☐ RECOMPLETE - DIFFERENT FORMATION	

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

Westwater Farms, LLC proposes to eliminate the blow-out preventer from the casing head, retain a rotating head mounted directly on the 8.625"surface casing drilling flange and add a valve to the flow line to drill this injection well. See the schematic diagram, Attachment 1, for further details of the drilling well head design to replace Attachment 2-A to the previously submitted Form 3 APD. Spudding is planned next week as stated above and the surface casing should be set, cemented and ready to continue the long string hole the following week pending approval of this change.

NAME (PLEASE PRINT) David L. Allin 970-254-3114 TITLE Permit Agent
SIGNATURE D L Allin allinpro@bresnan.net DATE October 2, 2009

(This space for State use only)

APPROVED BY THE STATE OF UTAH DIVISION OF OIL, GAS, AND MINING
DATE 12/11/09
BY: D. Hill
* max BHP = 758 psi, max Shoe press. = 214 psi

(See Instructions on Reverse Side)

(5/2000)

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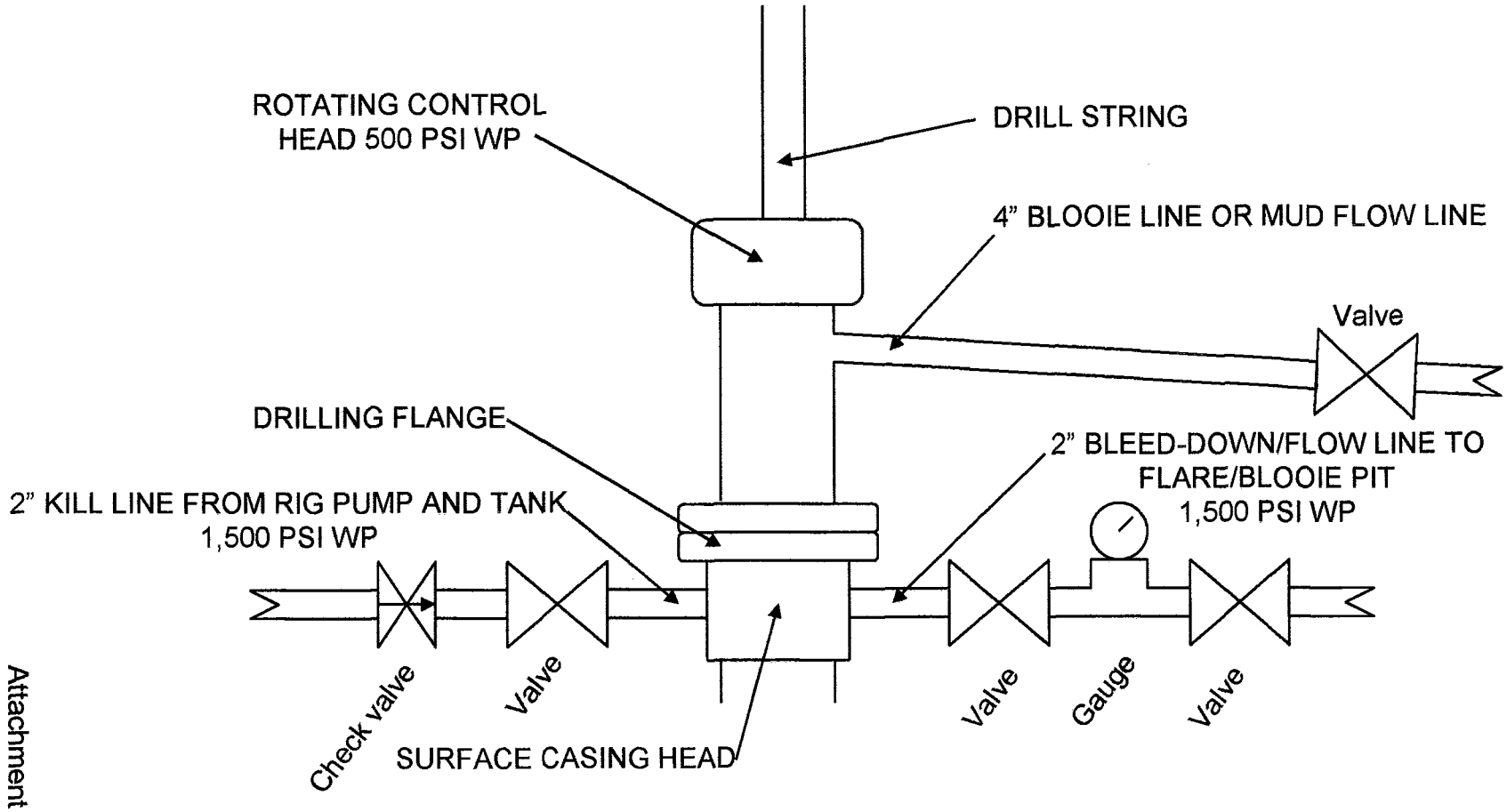
OCT 05 2009
DIV. OF OIL, GAS & MINING

October 2, 2009 Form 9 Attachment 1

Pressure Control System for Westwater Farms, LLC Harley Dome 1

Not drawn to scale



Attachment 1

Attachment 1

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OCT 0 5 2009
DIV. OF OIL, GAS & MINING

JON M. HUNTSMAN, JR.
Governor

GARY R. HERBERT
Lieutenant Governor

State of Utah
DEPARTMENT OF NATURAL RESOURCES

MICHAEL R. STYLER
Executive Director

Division of Oil Gas and Mining

JOHN R. BAZA
Division Director

December 1, 2009

Westwater Farms, LLC
P.O. Box 23358
Silverthorne, CO 80498

Re: Harley Dome 1 Well, 600' FNL, 2139' FEL, NWNE, Sec. 10, T. 19 South, R. 25 East, Grand 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.

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 43-019-31622.

Sincerely,

Gil Hunt
Associate Director

js
Enclosures

cc: Grand County Assessor
Bureau of Land Management – Moab Field Office

1594 West North Temple, Suite 1210, PO Box 145801, Salt Lake City, UT 84114-5801
telephone (801) 538-5340 • facsimile (801) 359-3940 • TTY (801) 538-7458 • *www.ogm.utah.gov*

UTAH DNR OIL, GAS & MINING

Operator: Westwater Farms, LLC

Well Name & Number Harley Dome 1

API Number: 43-019-31622

Lease: UTU-82619

Location: NWNE **Sec.** 10 **T.** 19 South **R.** 25 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. **Additional Approvals:**
   The operator is required to obtain approval from the Division of Oil, Gas and mining before performing any of the following actions during the drilling of this well:
   - Any changes to the approved drilling plan – contact Dustin Doucet
   - Significant plug back of the well – contact Dustin Doucet
   - Plug and abandonment of the well – contact Dustin Doucet

3. **Notification Requirements:**
   The operator is required to notify the Division of Oil, Gas and Mining of the following actions during drilling of this well:
   - 24 hours **PRIOR** to the spudding of the well – contact Dan Jarvis or Dustin Doucet
   - 24 hours prior to testing blowout prevention equipment – contact Dan Jarvis
   - 24 hours prior to cementing or testing casing – contact Dan Jarvis
   - Within 24 hours of making any emergency changes to the approved drilling program – contact Dustin Doucet
   - 24 hours prior to commencing operations to plug and abandon the well – contact Dan Jarvis

4. **Contact Information:**
   The following are Division of Oil, Gas and Mining contacts and their telephone numbers (please leave a voicemail message if the person is not available to take the call):
   - Carol Daniels 801-538-5284 - office
   - Dustin Doucet 801-538-5281 - office
     801-733-0983 - after office hours
   - Dan Jarvis 801-538-5338 - office
     801-231-8956 - after office hours

5. **Reporting Requirements**
   All reports, forms and submittals as required by the Utah Oil and Gas Conservation General Rules will be promptly filed with the Division of Oil, Gas and Mining, including but not limited to:
   - Entity Action Form (Form 6) – due within 5 days of spudding the well
   - Monthly Status Report (Form 9) – due by 5th day of the following calendar month
   - Request to Change Plans (Form 9) – due prior to implementation
   - Written Notice of Emergency Changes (Form 9) – due within 5 days
   - Notice of Operations Suspension or Resumption (Form 9) – due prior to implementation
   - Report of Water Encountered (Form 7) – due within 30 days after completion
   - Well Completion Report (Form 8) – due within 30 days after completion or plugging

6. Compliance with the Conditions of Approval/Application for Permit to Drill outlined in the Statement of Basis. (Copy Attached.)

7. Cement volumes for the 8 5/8" and 5 1/2" casing strings shall be determined from actual hole diameters in order to place cement from the pipe setting depths back to the surface.

8. If water is encountered in Entrada while drilling, it should be sampled prior to continuing drilling into the Kayenta Formation.

Daily Drilling Report Version 2010-05-15-11:45
Westwater Farms, LLC Harley Dome 1 Injection Well, API No. 43-019-31622
600.5' fnl and 2,139' fel (NWNE) Section 10, T19S, R25E, SLM, Greater Cisco Field, Grand County, Utah
Graded Ground Level (GL) Elevation 4,864' and Kelly Bushing (KB) Elevation 4,874'
All depths cited are drilling depths prior to open-hole logging
Submitted by David L. Allin, Well Construction Consultant to Westwater Farms, LLC

2010-05-12 Completed Propetroco, Inc. Rotary Rig 1 move in and rig-up; Westwater Farms support crew dug blooie pit.

2010-05-13 08:00 spudded well with Bit 1: 11" fixed tungsten carbide insert bit on air hammer; Possible top of Morrison Fm near 188' GL; 13:00 reached surface hole TD 218' GL circulating air; Blew hole clean; No shows of oil, gas or water; 14:00 completed TOH with Bit 1 and began to wait for cementing float collar (FC) to be delivered by Halliburton; 15:00 Halliburton dropped off FC and two centralizer stops; 15:15 Mark Wright, Grand County Engineer, on site to check on progress; 15:30 shut down for the day and Propetroco crew off location; Westwater Farms support crew dug reserve pit; TD 218' GL; SDFN

2010-05-14 08:00 strapped five joints of new (2008) 8.625" J-55 24.00 ppf casing at 217.2' plus 1.2' FC for a total surface casing string of 218.4'; 09:00 Bart Kettle, Utah DOGM Petroleum Operations Specialist, on site to observe surface casing setting and cementing ops; 09:30 PU shoe joint but had to lay back down to re-rig lifting gear under traveling block to accommodate 45' length of casing jt; **Note that Propetroco Rig 1 is designed to handle casing joints no longer than 42';** 10:20 TIH surface casing (SC) shoe jt with FC made up and tack welded on bottom with centralizer 2' above; 10:45 TIH SC Jt 2, made up and tack welded on shoe joint top collar; 11:30 TIH SC Jt 3 with centralizer over SC Jt 2 top collar; 11:45 TIH SC Jt 4; 12:00 TIH SC Jt 5 with centralizer 10' below top collar and tagged fill near 214' GL; 12:15 landed casing at TD 218' GL by attaching Kelly rod and circulating fill out of hole with air and reciprocating the SC string to clean hole prior to cementing; No shows of oil, gas or water; 13:30 after lunch break began mixing cmt but delayed to fix minor duplex pump leaks; 14:00 completed mixing first tub of cmt containing 30 sx Portland cmt to yield 1.18 cuft/sack of 15.6 ppg, Class A slurry and total batch volume of 35.4 cuft (6.30 bbls); 14:15 completed top filling of SC/hole annulus with first tub of cement and flushed pump and hoses; 14:40 completed mixing second tub of cmt containing 30 sx; 14:45 SC/hole annulus filled up with 12 cuft cmt left in mixing tub for a grand total net cmt volume of 58.8 cuft (10.47 bbls); 15:00 built dike around casing, topped off with cmt and flushed out pump and hoses; 15:15 safety discussion re long string hole drilling ops; 15:30 checked cmt and no significant fall back; WOC; SDFWE

2010-05-15 11:45 Compiled and filed weekly ops report to DOGM

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MAY 15 2010
DIV. OF OIL, GAS & MINING

Carol Daniels - Harley Dome 1, 43-019-31622 weekly rpt

From: "David L Allin"
To: "Carol Daniels"
Date: 5/15/2010 11:56 AM
Subject: Harley Dome 1, 43-019-31622 weekly rpt
CC: "Tom Warnes"
Attachments: "Tom Warnes"

Hi Carol,

My consulting client, Westwater Farms, LLC got started on the construction of their Harley Dome 1 injection well last week. Here is the first compilation of daily activities to serve as the weekly report from that project. More to come.

Dave

Westwater Farms, LLC Consultant

David L. Allin
Vice President, Exploration Manager
Del-Rio Resources, Inc.
AAPG DPA Certified Petroleum Geologist 2934
Professional Geologist Utah DOPL 5526699-2250
475 Seasons Drive
Grand Junction, CO 81507-8749
970-254-3114
allinpro@bresnan.net

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FORM 6

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

ENTITY ACTION FORM

Operator: Westwater Farms, LLC
Address: P.O. Box 23358
city Silverthorne
state CO zip 80498

Operator Account Number: N 3525

Phone Number: (970) 406-1466

Well 1

API Number	Well Name		QQ	Sec	Twp	Rng	County
43-0193162 2	Harley Dome 1		NWNE	10	19S	25E	Grand
Action Code	**Current Entity Number**	**New Entity Number**	**Spud Date**			**Entity Assignment Effective Date**	
A	99999	17631	5/13/2010			6/7/10	

Comments: This well is intended to be drilled and completed as a Class II water injection well
CHIN

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:

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)

David L. Allin
Name (Please Print)

Signature

Permit Agent/Consultant
Title

5/19/2010
Date

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(5/2000)

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DIV. OF OIL, GAS & MINING

Daily Drilling Report Version 2010-05-22-12:30
Westwater Farms, LLC Harley Dome 1 Injection Well, API No. 43-019-31622
600.5' fnl and 2,139' fel (NWNE) Section 10, T19S, R25E, SLM, Greater Cisco Field, Grand County, Utah
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2010-05-14 08:00 strapped five joints of new (2008) 8.625" J-55 24.00 ppf casing at 217.2' plus 1.2' FC for a total surface casing string of 218.4'; 09:00 Bart Kettle, Utah DOGM Petroleum Operations Specialist, on site to observe surface casing setting and cementing ops; 09:30 PU shoe joint but had to lay back down to re-rig lifting gear under traveling block to accommodate 45' length of casing jt; **Note that Propetroco Rig 1 is designed to handle casing joints no longer than 42';** 10:20 TIH surface casing (SC) shoe jt with FC made up and tack welded on bottom with centralizer 2' above; 10:45 TIH SC Jt 2, made up and tack welded on shoe joint top collar; 11:30 TIH SC Jt 3 with centralizer over SC Jt 2 top collar; 11:45 TIH SC Jt 4; 12:00 TIH SC Jt 5 with centralizer 10' below top collar and tagged fill near 214' GL; 12:15 landed casing at TD 218' GL by attaching Kelly rod and circulating fill out of hole with air and reciprocating the SC string to clean hole prior to cementing; No shows of oil, gas or water; 13:30 after lunch break began mixing cmt but delayed to fix minor duplex pump leaks; 14:00 completed mixing first tub of cmt containing 30 sx Portland cmt to yield 1.18 cuft/sack of 15.6 ppg, Class A slurry and total batch volume of 35.4 cuft (6.30 bbls); 14:15 completed top filling of SC/hole annulus with first tub of cement and flushed pump and hoses; 14:40 completed mixing second tub of cmt containing 30 sx; 14:45 SC/hole annulus filled up with 12 cuft cmt left in mixing tub for a grand total net cmt volume of 58.8 cuft (10.47 bbls); 15:00 built dike around casing, topped off with cmt and flushed out pump and hoses; Bart Kettle off location; 15:15 safety discussion re long string hole drilling ops; 15:30 checked cmt and no significant fall back; Propetroco crew off location; TD 218' GL; WOC; SDFWE

2010-05-15 11:45 Compiled and filed weekly ops report to DOGM; TD 218' GL; WOC; SDFWE

2010-05-16 TD 218' GL; WOC; SDFWE

2010-05-17 07:30 Propetroco crew on location; 07:45 pressure tested surface casing with rig compressor; Held 250 psi for 10 minutes without pressure loss; 08:00 disconnected Kelly rod from casing elevator crossover & cut off casing 1' above GL; 08:30 began to weld on Wellhead Inc. SOWO 8.625" casing head bowl; 08:45 hot shot service delivered Washington rotating head (WRH) and riser spools with seal rings, bolts and lubricator; 09:30 began to nipple up spools and WRH on Propetroco's 11" drilling flange; 13:00 David L. Allin (DLA) met w/Jared Lucador-Halliburton re open-hole swab testing, water sample lab analysis, open-hole logging, long string cementing & step-rate testing needs that Halliburton could help with & bid for; 15:30 Propetroco crew completed nippling up WRH, plumbing casing head, dropped off PDC drill bit & subs, fueled rig & left location; Westwater Farms (WF) support crew continued to fabricate parts to allow WRH to be connected to Propetroco's blooie line and the lower Kelly rod bushing nut to engage the WRH; TD 218' GL; SDFN

2010-05-18 07:30 Propetroco crew on location & began assembling blooie line; Telcon w/Travis Fihr-Halliburton re locating an inflatable earth packer to use to recover isolated sample of Wingate Ss water from open hole; 10:00 RIH w/Bit 2 & bit sub made up on first 6" drill collar; Bit 2: Rocky Mountain Bit 7.875" RMG M557X s/n 70324 five blade PDC; Delay to adjust rig air compressor clutch; 11:00 RIH

w/second 6" drill collar; 12:00 RIH w/all of bottom hole assembly (BHA) that would fit in the SC to 228" KB, stabbed the Kelly rod through the WRH rubber seal assembly & buttoned up WRH; 12:55 drilled through SC float collar (shoe) into upper part of Brushy Basin Mbr Morrison Fm circulating air; 13:20 encountered sandstone layers between 245' & 265' KB that were wet with no shows of oil or gas; 13:53 complete BHA composed of Bit 2, bit sub, 2 6" x 20' drill collars, 5 4.5" x 20' drill collars & 5 3.5" x 20' drill collars in hole to 270' KB; Began adding water with foaming agent to air flow to maintain circulation; 14:18 20' conn @ 290' KB **(note all depths from this point on are measured from KB)** no shows from variegated shale; 14:36 20' conn @ 310' **(note all drill pipe is composed of 20' joints)** no shows from variegated shale; 14:46 conn @ 330' no shows from variegated shale; 14:58 conn @ 350' no shows from variegated shale; 15:10 conn @ 370' no shows from variegated shale; 15:22 conn @ 390' no shows from variegated shale; 15:35 conn @ 410' no shows from variegated shale; 15:52 conn @ 430' no shows from variegated shale; 16:06 conn @ 450' no shows from variegated shale; 16:18 conn @ 470' no shows from variegated shale; 16:28 conn @ 490' no shows from variegated shale; 16:42 conn @ 510' no shows from variegated shale; 16:59 conn @ 530' no shows from variegated shale; 17:01 stopped drilling for the day after 300' run in about 4 hrs (avg 75 ft/hr); 17:08 completed TOH w/6 stds; TD 530'; SDNF

2010-05-19 07:30 Propetroco crew on location to begin rig service; 08:30 TIH 6 stds & found no significant fill; 08:50 circulated bottoms up with possible trace of gas (no flare from igniter) by building 180 psi on hole with rig compressor indicating 400' of fluid in hole (fluid level near 130' depth); 09:03 reconn @ 530' and commenced drilling; 09:16 conn @ 550' no shows from green shale; conn @ 570' no shows from green shale & fine grain ss below 565'; Top of Salt Wash Mbr Morrison Fm 565'; 09:45 telcon w/Bart Kettle-DOGM re projected schedule of proposed Entrada Ss and Wingate Ss water sampling; 09:52 conn @ 590' no shows from ss & variegated shale; 10:08 conn @ 610' no shows from variegated shale & fine grain ss; 10:24 conn @ 630' no shows from fine grain ss & variegated shale; 10:37 conn @ 650' no shows from fine grain ss & green shale; 10:55 conn @ 670' no shows from fine grain ss & green shale; 11:09 conn @ 690' no shows from ss & variegated shale; 11:33 conn @ 710' no shows from fine grain ss & variegated shale; 11:48 conn @ 730' no shows from variegated shale & fine grain ss; 12:01 conn @ 750' no shows from variegated shale; 12:19 conn @ 770' no shows from variegated shale; 12:32 conn @ 790' no shows from variegated shale & fine grain ss; 12:47 conn @ 810' no shows from variegated shale; 13:00 conn @ 830' no shows from variegated shale; 13:16 conn @ 850 no shows from variegated shale & gray ls; 13:35 conn @ 870' no shows from red brown shale; 13:50 conn @ 890' no shows from red brown shale & fine grain ss; Top of Summerville Fm 880'; 13:55 stopped drilling to repair rig motor fuel line leak; TOH 14 stds, shut down rig & began repair work; 16:15 Propetroco crew off location; Drilled 360' in about 5 hrs (avg 72 ft/hr); TD 890'; SDNF

2010-05-20 07:30 Propetroco crew on location to begin rig service & complete repair of fuel line & wiring; 09:00 lit igniter, TIH 7 stds & unloaded water in well from 520' by building 150 psi on hole with rig compressor indicating 330' of fluid above bit & fluid level near 190'; No shows; 09:15 caught water sample of overnight infill from Morrison Mbrs & Summerville Fm at TD 890' (Halliburton lab test May 22 SG at 60° F 1.013, pH 7.6, Rw 0.42 ohm-meter and calculated TDS 30,740 ppm); 09:30 TIH 7 stds, made up Kelly rod, went to bottom & found no significant fill; Unloaded lower part of well & circulated clean; No shows; 10:05 reconn @ 890'; Suspended drilling to adjust clutch on rig compressor; 10:25 commenced drilling; 10:36 conn @ 910' no shows from frosted white fine to medium grain ss; Top of Moab Tongue Mbr of Curtis Fm (Entrada Ss aquifer) at 892'; 10:40 water production increased from the background mist introduced by the rig injection pump of 2 bbls per hr to 4 or 5 bbls per hr; 10:46 conn @ 930' no shows from frosted white fine to medium grain ss; 10:57 conn @ 950' no shows from frosted white medium to fine grain ss; 11:08 conn @ 970' no shows from frosted white fine to medium grain ss; 11:17 conn @ 990' no shows from white to pink fine grain ss; Top of Slickrock Mbr Entrada Ss 975'; 11:22 collected water sample from 1000' (Halliburton lab test May 22 SG at 60° F 1.013, pH 7.6, Rw 0.41 ohm-meter and calculated TDS 36,186 ppm); 11:29 conn @ 1010' no shows from white & light red fine grain ss; 11:40 conn @ 1030' no shows from white & pink fine grain ss; 11:53 conn @ 1050' no shows from white & pink fine grain ss; 12:02 conn @ 1070' no shows from pink fine grain ss; 12:15 conn @ 1090' no shows from pink fine grain ss; 12:26 conn @ 1110' no shows from pink to red fine grain ss; 12:37 conn @ 1130' no shows from pink to red fine grain ss; 12:40 collected water sample from 1140' (Halliburton lab test May 22 SG at 60° F 1.012, pH

7.4, Rw 0.44 ohm-meter and calculated TDS 26,060 ppm); 12:49 conn @ 1150' no shows from red brown fine grain ss; Top of Kayenta Fm 1150'; 13:01 conn @ 1170' no shows from maroon to red medium grain low porosity ss; 13:17 conn @ 1190' no shows from maroon & white medium grain low porosity ss; 13:42 conn @ 1210' no shows from variegated medium grain low porosity ss; 14:02 conn @ 1230' no shows from variegated medium to fine grain low porosity ss; 14:23 conn @ 1250' no shows from white & maroon medium to fine grain low porosity ss; 14:45 conn @ 1270' no shows from white & maroon medium to fine grain low porosity ss; 15:12 conn @ 1290' missed sample due to discussion w/Halliburton rep & delivery of 3 water samples to be analyzed by Halliburton lab in Grand Junction; 15:36 conn @ 1310' no shows from maroon, green & white fine grain low porosity ss; 15:55 conn @ 1330' no shows from variegated fine grain low porosity ss; Significant water production increase to 8 bbls per hr and drilling break in last 5' from salmon fine grain porous ss; Top of Wingate Ss 1325'; 16:00 stopped drilling to allow well to fill with water and set up to unload and drill out to TD on May 21; TOH 26½ stds; 16:45 Propetroco crew off location; Drilled 440' in about 5 hrs (avg 80 ft/hr); TD 1330'; SDNF

2010-05-21 07:30 Propetroco crew on location to begin rig service; 08:45 lit igniter, TIH 12 stds & unloaded water in well from 720' by building 140 psi on hole with rig compressor indicating 310' of fluid above bit & fluid level near 410'; No shows; 09:15 TIH remaining stds plus single jt, made up Kelly rod, went to bottom & found 2' fill; Unloaded lower part of well & circulated clean; No shows; 09:25 caught water sample of overnight infill from Morrison Mbrs, Summerville Fm, Entrada Ss, Kayenta Fm & top few feet of Wingate Ss (Halliburton lab test May 22 SG at 60° F 1.020, pH 7.5, Rw 0.34 ohm-meter and calculated TDS 35,220 ppm); 19:35 reconn @ 1330' & commenced drilling; 10:01 conn @ 1350' no shows from variegated shale & salmon fine grain porous ss below 1340'; 10:16 conn @ 1370' no shows from salmon fine grain porous ss; 10:25 conn @ 1390' no shows from salmon fine grain porous ss; 10:41 conn @ 1410' no shows from salmon fine grain porous ss; 10:53 conn @ 1430' no shows from salmon fine grain porous ss; Water production increased from the 4 or 5 bbls per hr of previous day to 30 to 40 bbls per hr (720 to 960 bbls per day); 11:10 conn @ 1450' no shows from salmon fine grain porous ss; 11:26 conn @ 1470' no shows from salmon & less porous maroon fine grain ss; 11:40 conn @ 1490' no shows from salmon fine grain porous ss; 11:58 conn @ 1510' no shows from salmon fine grain porous ss; 12:20 conn @ 1530' no shows from salmon fine grain porous ss; 12:41 conn @ 1550' no shows from salmon & less porous maroon fine grain ss; 12:56 conn @ 1570' no shows from less porous maroon & salmon fine grain ss; 13:15 conn @ 1590' no shows from low porosity maroon fine grain ss & shale; 13:35 conn @ 1610' no shows from salmon & less porous maroon fine grain ss; 13:50 conn @ 1630' no shows from less porous maroon & salmon fine grain ss; 14:11 conn @ 1650' no shows from low porosity maroon fine grain ss & shale; 14:36 conn @ 1670' no shows from low porosity maroon fine grain ss & shale; 14:55 conn @ 1690' no shows from low porosity salmon & maroon fine grain ss & shale & dark red shale in lower 2'; Top of Chinle Fm 1688'; 15:16 conn @ 1710' no shows from maroon, dark red & green shale; 15:25 caught water sample while drilling 1705-15' in Chinle Fm (Halliburton lab test May 22 SG at 60° F 1.014, pH 7.6, Rw 0.38 ohm-meter and calculated TDS 52,763 ppm); Resistivity of water sample was 0.366 ohm-meters at 80° F similar to the resistivity of a 15,000 ppm pure NaCl solution; 15:30 reached TD @ 1730' no shows from dark red shale; 15:54 circulated hole clean & began TOH in preparation for logging on May 22; 17:30 Propetroco crew off location; Drilled 400' in about 6 hrs (avg 67 ft/hr); TD 1730'; SDNF

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Halliburton Energy Services
The Rockies NWA Regional Laboratory
Grand Junction, CO 970) 523-3692

Water Analysis Report

Contact Information

Company	West Water Farm	Date Received	5-20/21-10
Reported To	Davis Allin	Date Tested	May 22, 2010
Reported By	Ann Ekx	Tested By	Ann Ekx

Sample Physical Characteristics

Well Name	HD1		Temperature	69	°F
Location	Upper Jes		pH	7.6	
Specific Gravity	1.011		Color	Clear	
Corrected SG	1.013	at 60°F	Turbidity	None	
TDS (calculated)	36186	ppm	Resistivity	0.41	Ω·m

Sample Chemical Characteristics

Anions	Chloride	22400	mg/L	**Cations**	Total Iron	0.8	mg/L
	Sulfate	0	mg/L		Ferrous Iron	0.6	mg/L
	Bicarbonate	600	mg/L		Potassium	14	mg/L
	Carbonate	0	mg/L		Calcium	700	mg/L
	Hydroxide		mg/L		Magnesium	1200	mg/L
					Sodium (calculated)	11669	mg/L

General Comments

W175; 11:22 5-20-10 1000'

NOTICE: This report is for information only, and the content is limited to the sample described. Halliburton makes no warranties, expressed or implied, as to the accuracy of the contents or results. Any user of this report agrees Halliburton shall not be liable for any loss or damage, regardless of cause, resulting from the use hereof.

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The Rockies NWA Regional Laboratory
Grand Junction, CO 970) 523-3692

Water Analysis Report

Contact Information

Company	West Water Farm	Date Received	5-20/21-10
Reported To	Davis Allin	Date Tested	May 22, 2010
Reported By	Ann Ekx	Tested By	Ann Ekx

Sample Physical Characteristics

Well Name	HD1		Temperature	70	°F
Location	Lwr Jes		pH	7.4	
Specific Gravity	1.010		Color	Cloudy Pink	
Corrected SG	1.012	at 60°F	Turbidity	Severe	
TDS (calculated)	26060	ppm	Resistivity	0.44	Ω·m

Sample Chemical Characteristics

Anions	Chloride	16600	mg/L	**Cations**	Total Iron	1.4	mg/L
	Sulfate	280	mg/L		Ferrous Iron	1.0	mg/L
	Bicarbonate	280	mg/L		Potassium	387	mg/L
	Carbonate	0	mg/L		Calcium	900	mg/L
	Hydroxide		mg/L		Magnesium	2100	mg/L
					Sodium (calculated)	5771	mg/L

General Comments

W176; 5-20-10, 12:40 1140'

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Water Analysis Report

Contact Information

Company	West Water Farm	Date Received	5-20/21-10
Reported To	Davis Allin	Date Tested	May 22, 2010
Reported By	Ann Ekx	Tested By	Ann Ekx

Sample Physical Characteristics

Well Name	HD1		Temperature	70	°F
Location	JsJm		pH	7.6	
Specific Gravity	1.011		Color	Cloudy White	
Corrected SG	1.013	at 60°F	Turbidity	Severe	
TDS (calculated)	30740	ppm	Resistivity	0.42	Ω·m

Sample Chemical Characteristics

Anions	Chloride	19000	mg/L	**Cations**	Total Iron	2.8	mg/L
	Sulfate	400	mg/L		Ferrous Iron	1.8	mg/L
	Bicarbonate	390	mg/L		Potassium	55	mg/L
	Carbonate	0	mg/L		Calcium	1000	mg/L
	Hydroxide		mg/L		Magnesium	1400	mg/L
					Sodium (calculated)	8828	mg/L

General Comments

W177; 5-20-10, 9:15 Overnight fill

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The Rockies NWA Regional Laboratory
Grand Junction, CO 970) 523-3692

Water Analysis Report

Contact Information

Company	West Water Farm	Date Received	5-20/21-10
Reported To	Davis Allin	Date Tested	May 22, 2010
Reported By	Ann Ekx	Tested By	Ann Ekx

Sample Physical Characteristics

Well Name	HD1		Temperature	71	°F
Location	Jmthm		pH	7.5	
Specific Gravity	1.018		Color	Lt Yellow	
Corrected SG	1.020	at 60°F	Turbidity	None	
TDS (calculated)	35220	ppm	Resistivity	0.34	Ω·m

Sample Chemical Characteristics

Anions	Chloride	22000	mg/L	**Cations**	Total Iron	1.6	mg/L
	Sulfate	400	mg/L		Ferrous Iron	0.2	mg/L
	Bicarbonate	380	mg/L		Potassium	0	mg/L
	Carbonate	0	mg/L		Calcium	1400	mg/L
	Hydroxide		mg/L		Magnesium	1500	mg/L
					Sodium (calculated)	10155	mg/L

General Comments

W180; 5-21-10 5' into top Jes 9:25

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Halliburton Energy Services
The Rockies NWA Regional Laboratory
Grand Junction, CO 970) 523-3692

Water Analysis Report

Contact Information

Company	West Water Farm	Date Received	5-20/21-10
Reported To	Davis Allin	Date Tested	May 22, 2010
Reported By	Ann Ekx	Tested By	Ann Ekx

Sample Physical Characteristics

Well Name	HD1		Temperature	71	°F
Location	TAC 1720		pH	7.6	
Specific Gravity	1.012		Color	Orange	
Corrected SG	1.014	at 60°F	Turbidity	None	
TDS (calculated)	52763	ppm	Resistivity	0.38	Ω·m

Sample Chemical Characteristics

Anions	Chloride	32600	mg/L	**Cations**	Total Iron	0.2	mg/L
	Sulfate	360	mg/L		Ferrous Iron	0.6	mg/L
	Bicarbonate	290	mg/L		Potassium	510	mg/L
	Carbonate	0	mg/L		Calcium	1600	mg/L
	Hydroxide		mg/L		Magnesium	1400	mg/L
					Sodium (calculated)	16635	mg/L

General Comments

W181; TAC 1720 Contains foamer 15:25 5-21-10

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Daily Drilling Report Version 2010-05-23-12:00
Westwater Farms, LLC Harley Dome 1 Injection Well, API No. 43-019-31622
600.5' fnl and 2,139' fel (NWNE) Section 10, T19S, R25E, SLM, Greater Cisco Field, Grand County, Utah
Graded Ground Level (GL) Elevation 4,864' and Kelly Bushing (KB) Elevation 4,874'
All depths cited are drilling depths prior to open-hole logging
Submitted by David L. Allin, Well Construction Consultant to Westwater Farms, LLC

2010-05-12 Completed Propetroco, Inc. Rotary Rig 1 move in and rig-up; Westwater Farms support crew dug blooie pit.

2010-05-13 08:00 spudded well with Bit 1: 11" fixed tungsten carbide insert bit on air hammer; Possible top of Morrison Fm near 188' GL; 13:00 reached surface hole TD 218' GL circulating air; Blew hole clean; No shows of oil, gas or water; 14:00 completed TOH with Bit 1 and began to wait for cementing float collar (FC) to be delivered by Halliburton; 15:00 Halliburton dropped off FC and two centralizer stops; 15:15 Mark Wright, Grand County Engineer, on site to check on progress; 15:30 shut down for the day and Propetroco crew off location; Westwater Farms support crew dug reserve pit; TD 218' GL; SDFN

2010-05-14 08:00 strapped five joints of new (2008) 8.625" J-55 24.00 ppf casing at 217.2' plus 1.2' FC for a total surface casing string of 218.4'; 09:00 Bart Kettle, Utah DOGM Petroleum Operations Specialist, on site to observe surface casing setting and cementing ops; 09:30 PU shoe joint but had to lay back down to re-rig lifting gear under traveling block to accommodate 45' length of casing jt; **Note that Propetroco Rig 1 is designed to handle casing joints no longer than 42';** 10:20 TIH surface casing (SC) shoe jt with FC made up and tack welded on bottom with centralizer 2' above; 10:45 TIH SC Jt 2, made up and tack welded on shoe joint top collar; 11:30 TIH SC Jt 3 with centralizer over SC Jt 2 top collar; 11:45 TIH SC Jt 4; 12:00 TIH SC Jt 5 with centralizer 10' below top collar and tagged fill near 214' GL; 12:15 landed casing at TD 218' GL by attaching Kelly rod and circulating fill out of hole with air and reciprocating the SC string to clean hole prior to cementing; No shows of oil, gas or water; 13:30 after lunch break began mixing cmt but delayed to fix minor duplex pump leaks; 14:00 completed mixing first tub of cmt containing 30 sx Portland cmt to yield 1.18 cuft/sack of 15.6 ppg, Class A slurry and total batch volume of 35.4 cuft (6.30 bbls); 14:15 completed top filling of SC/hole annulus with first tub of cement and flushed pump and hoses; 14:40 completed mixing second tub of cmt containing 30 sx; 14:45 SC/hole annulus filled up with 12 cuft cmt left in mixing tub for a grand total net cmt volume of 58.8 cuft (10.47 bbls); 15:00 built dike around casing, topped off with cmt and flushed out pump and hoses; Bart Kettle off location; 15:15 safety discussion re long string hole drilling ops; 15:30 checked cmt and no significant fall back; Propetroco crew off location; TD 218' GL; WOC; SDFWE

2010-05-15 11:45 Compiled and filed weekly ops report to DOGM; TD 218' GL; WOC; SDFWE

2010-05-16 TD 218' GL; WOC; SDFWE

2010-05-17 07:30 Propetroco crew on location; 07:45 pressure tested surface casing with rig compressor; Held 250 psi for 10 minutes without pressure loss; 08:00 disconnected Kelly rod from casing elevator crossover & cut off casing 1' above GL; 08:30 began to weld on Wellhead Inc. SOWO 8.625" casing head bowl; 08:45 hot shot service delivered Washington rotating head (WRH) and riser spools with seal rings, bolts and lubricator; 09:30 began to nipple up spools and WRH on Propetroco's 11" drilling flange; 13:00 David L. Allin (DLA) met w/Jared Lucador-Halliburton re open-hole swab testing, water sample lab analysis, open-hole logging, long string cementing & step-rate testing needs that Halliburton could help with & bid for; 15:30 Propetroco crew completed nippling up WRH, plumbing casing head, dropped off PDC drill bit & subs, fueled rig & left location; Westwater Farms (WF) support crew continued to fabricate parts to allow WRH to be connected to Propetroco's blooie line and the lower Kelly rod bushing nut to engage the WRH; TD 218' GL; SDFN

2010-05-18 07:30 Propetroco crew on location & began assembling blooie line; Telcon w/Travis Fihr-Halliburton re locating an inflatable earth packer to use to recover isolated sample of Wingate Ss water from open hole; 10:00 RIH w/Bit 2 & bit sub made up on first 6" drill collar; Bit 2: Rocky Mountain Bit 7.875"

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MAY 26 2010
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RMG M557X s/n 70324 five blade PDC; Delay to adjust rig air compressor clutch; 11:00 RIH w/second 6" drill collar; 12:00 RIH w/all of bottom hole assembly (BHA) that would fit in the SC to 228" KB, stabbed the Kelly rod through the WRH rubber seal assembly & buttoned up WRH; 12:55 drilled through SC float collar (shoe) into upper part of Brushy Basin Mbr Morrison Fm circulating air; 13:20 encountered sandstone layers between 245' & 265' KB that were wet with no shows of oil or gas; 13:53 complete BHA composed of Bit 2, bit sub, 2 6" x 20' drill collars, 5 4.5" x 20' drill collars & 5 3.5" x 20' drill collars in hole to 270' KB; Began adding water with foaming agent to air flow to maintain circulation; 14:18 20' conn @ 290' KB **(note all depths from this point on are measured from KB)** no shows from variegated shale; 14:36 20' conn @ 310' **(note all drill pipe is composed of 20' joints)** no shows from variegated shale; 14:46 conn @ 330' no shows from variegated shale; 14:58 conn @ 350' no shows from variegated shale; 15:10 conn @ 370' no shows from variegated shale; 15:22 conn @ 390' no shows from variegated shale; 15:35 conn @ 410' no shows from variegated shale; 15:52 conn @ 430' no shows from variegated shale; 16:06 conn @ 450' no shows from variegated shale; 16:18 conn @ 470' no shows from variegated shale; 16:28 conn @ 490' no shows from variegated shale; 16:42 conn @ 510' no shows from variegated shale; 16:59 conn @ 530' no shows from variegated shale; 17:01 stopped drilling for the day after 300' run in about 4 hrs (avg 75 ft/hr); 17:08 completed TOH w/6 stds; TD 530'; SDFN

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2010-05-20 07:30 Propetroco crew on location to begin rig service & complete repair of fuel line & wiring; 09:00 lit igniter, TIH 7 stds & unloaded water in well from 520' by building 150 psi on hole with rig compressor indicating 330' of fluid above bit & fluid level near 190'; No shows; 09:15 caught water sample of overnight infill from Morrison Mbrs & Summerville Fm at TD 890' (Halliburton lab test May 22 SG at 60° F 1.013, pH 7.6, Rw 0.42 ohm-meter and calculated TDS 30,740 ppm); 09:30 TIH 7 stds, made up Kelly rod, went to bottom & found no significant fill; Unloaded lower part of well & circulated clean; No shows; 10:05 reconn @ 890'; Suspended drilling to adjust clutch on rig compressor; 10:25 commenced drilling; 10:36 conn @ 910' no shows from frosted white fine to medium grain ss; Top of Moab Tongue Mbr of Curtis Fm (Entrada Ss aquifer) at 892'; 10:40 water production increased from the background mist introduced by the rig injection pump of 2 bbls per hr to 4 or 5 bbls per hr; 10:46 conn @ 930' no shows from frosted white fine to medium grain ss; 10:57 conn @ 950' no shows from frosted white medium to fine grain ss; 11:08 conn @ 970' no shows from frosted white fine to medium grain ss; 11:17 conn @ 990' no shows from white to pink fine grain ss; Top of Slickrock Mbr Entrada Ss 975'; 11:22 collected water sample from 1000' (Halliburton lab test May 22 SG at 60° F 1.013, pH 7.6, Rw 0.41 ohm-meter and calculated TDS 36,186 ppm); 11:29 conn @ 1010' no shows from white & light red fine grain ss; 11:40 conn @ 1030' no shows from white & pink fine grain ss; 11:53 conn @ 1050' no shows from white & pink fine grain ss; 12:02 conn @ 1070' no shows from pink fine grain ss; 12:15 conn @ 1090' no shows from pink fine grain ss; 12:26 conn @

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2010-05-21 07:30 Propetroco crew on location to begin rig service; 08:45 lit igniter, TIH 12 stds & unloaded water in well from 720' by building 140 psi on hole with rig compressor indicating 310' of fluid above bit & fluid level near 410'; No shows; 09:15 TIH remaining stds plus single jt, made up Kelly rod, went to bottom & found 2' fill; Unloaded lower part of well & circulated clean; No shows; 09:25 caught water sample of overnight infill from Morrison Mbrs, Summerville Fm, Entrada Ss, Kayenta Fm & top few feet of Wingate Ss (Halliburton lab test May 22 SG at 60° F 1.020, pH 7.5, Rw 0.34 ohm-meter and calculated TDS 35,220 ppm); 19:35 reconn @ 1330' & commenced drilling; 10:01 conn @ 1350' no shows from variegated shale & salmon fine grain porous ss below 1340'; 10:16 conn @ 1370' no shows from salmon fine grain porous ss; 10:25 conn @ 1390' no shows from salmon fine grain porous ss; 10:41 conn @ 1410' no shows from salmon fine grain porous ss; 10:53 conn @ 1430' no shows from salmon fine grain porous ss; Water production increased from the 4 or 5 bbls per hr of previous day to 30 to 40 bbls per hr (720 to 960 bbls per day); 11:10 conn @ 1450' no shows from salmon fine grain porous ss; 11:26 conn @ 1470' no shows from salmon & less porous maroon fine grain ss; 11:40 conn @ 1490' no shows from salmon fine grain porous ss; 11:58 conn @ 1510' no shows from salmon fine grain porous ss; 12:20 conn @ 1530' no shows from salmon fine grain porous ss; 12:41 conn @ 1550' no shows from salmon & less porous maroon fine grain ss; 12:56 conn @ 1570' no shows from less porous maroon & salmon fine grain ss; 13:15 conn @ 1590' no shows from low porosity maroon fine grain ss & shale; 13:35 conn @ 1610' no shows from salmon & less porous maroon fine grain ss; 13:50 conn @ 1630' no shows from less porous maroon & salmon fine grain ss; 14:11 conn @ 1650' no shows from low porosity maroon fine grain ss & shale; 14:36 conn @ 1670' no shows from low porosity maroon fine grain ss & shale; 14:55 conn @ 1690' no shows from low porosity salmon & maroon fine grain ss & shale & dark red shale in lower 2'; Top of Chinle Fm 1688'; 15:16 conn @ 1710' no shows from maroon, dark red & green shale; 15:25 caught water sample while drilling 1705-15' in Chinle Fm (Halliburton lab test May 22 SG at 60° F 1.014, pH 7.6, Rw 0.38 ohm-meter and calculated TDS 52,763 ppm); Resistivity of water sample was 0.366 ohm-meters at 80° F similar to the resistivity of a 15,000 ppm pure NaCl solution; 15:30 reached TD @ 1730' no shows from dark red shale; 15:54 circulated hole clean & began TOH in preparation for logging on May 22; 17:30 Propetroco crew off location; Drilled 400' in about 6 hrs (avg 67 ft/hr); TD 1730'; SDFN

2010-05-22 18:00 Propetroco owner/driller Terry Leach on location to assist open hole logging operations by Halliburton; 19:30 Halliburton logging crew on site; Rigged up tools with minor problems due to shifted stds of racked drill pipe & collars in derrick; 20:30 measured 3' of fill in well with logging tools; 21:16 began logging triple combination True Resistivity, Spectral Density and Dual Spaced Neutron logs in formation water; 23:00 Halliburton tools laid down and Propetroco owner/driller off location; 23:30 Halliburton delivered 8 sets of triple logs and 6 sets of Borehole Volume Plot to Dave Allin and Tom Warnes plus digital files to Halliburton long string cementers & Dave Allin; TD 1730'; SDFWE

2010-05-23 01:00 Halliburton off location; 08:15 arrangements for open hole swab testing cancelled in favor of

running & cementing long string casing due to verification of brine water in the Wingate Ss proposed injection interval; Open hole log tops depths and elevations measured from 4874' KB elevation:

Dakota Sandstone (Kd)	11'	+4863'
Cedar Mountain Fm (Kcm [K-1])	109'	+4765'
Morrison Fm		
Brushy Basin Member (Jmbb [K-0])	180'	+4694'
Salt Wash Member (Jmsw)	552'	+4322'
Tidwell Member (Jmt)	826'	+4048'
Summerville Fm (Js [J-5])	850'	+4024'
Curtis Fm		
Moab Tongue Member (Jctm)	885'	+3989'
Entrada Sandstone		
Slick Rock Member (Jes [J-3])	992'	+3882'
Kayenta Fm (Jk [J-2])	1143'	+3731'
Wingate Sandstone (Jw)	1342'	+3532'
Chinle Fm (Trc [J-0])	1679'	+3195'

The static fluid level logged in the well was 525'; Formation water resistivity (Rw) calculations made from the open hole logs for a representative layer of the Entrada Ss aquifer in the Jctm 962-66' with 26% porosity & 3 ohm-meters deep resistivity at 81° F estimated formation temperature indicated an equivalent pure NaCl solution of 23,000 ppm; Rw calculations made from the open hole logs for a representative layer of the upper Wingate Ss aquifer (part of the proposed injection interval) 1346-94' with 22% porosity & 4 ohm-meters deep resistivity at 81° F estimated formation temperature indicated an equivalent pure NaCl solution of 22,500 ppm; These calculations conformed favorably with the analyses of water samples collected while drilling and from overnight fill up reported earlier. TD 1730' SDFWE

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Daily Drilling/Completion Report Version 2010-06-08-12:00
Westwater Farms, LLC Harley Dome 1 Injection Well, API No. 43-019-31622
600.5' fnl and 2,139' fel (NWNE) Section 10, T19S, R25E, SLM, Greater Cisco Field, Grand County, Utah
Graded Ground Level (GL and Permanent Datum) Elevation 4,864' and Kelly Bushing (KB) Elevation 4,874'
All depths cited are drilling depths prior to open-hole logging
Submitted by David L. Allin, Well Construction Consultant to Westwater Farms, LLC

2010-05-12 Completed Propetroco, Inc. Rotary Rig 1 move in and rig-up; Westwater Farms support crew dug blooie pit.

2010-05-13 08:00 spudded well with Bit 1: 11" fixed tungsten carbide insert bit on air hammer; Possible top of Morrison Fm near 188' GL; 13:00 reached surface hole TD 218' GL circulating air; Blew hole clean; No shows of oil, gas or water; 14:00 completed TOH with Bit 1 and began to wait for cementing float collar (FC) to be delivered by Halliburton; 15:00 Halliburton dropped off FC and two centralizer stops; 15:15 Mark Wright, Grand County Engineer, on site to check on progress; 15:30 shut down for the day and Propetroco crew off location; Westwater Farms support crew dug reserve pit; TD 218' GL; SDFN

2010-05-14 08:00 strapped five joints of new (2008) 8.625" J-55 24.00 ppf casing at 217.2' plus 1.2' FC for a total surface casing string of 218.4'; 09:00 Bart Kettle, Utah DOGM Petroleum Operations Specialist, on site to observe surface casing setting and cementing ops; 09:30 PU shoe joint but had to lay back down to re-rig lifting gear under traveling block to accommodate 45' length of casing jt; **Note that Propetroco Rig 1 is designed to handle casing joints no longer than 42';** 10:20 TIH surface casing (SC) shoe jt with FC made up and tack welded on bottom with centralizer 2' above; 10:45 TIH SC Jt 2, made up and tack welded on shoe joint top collar; 11:30 TIH SC Jt 3 with centralizer over SC Jt 2 top collar; 11:45 TIH SC Jt 4; 12:00 TIH SC Jt 5 with centralizer 10' below top collar and tagged fill near 214' GL; 12:15 landed casing at TD 218' GL by attaching Kelly rod and circulating fill out of hole with air and reciprocating the SC string to clean hole prior to cementing; No shows of oil, gas or water; 13:30 after lunch break began mixing cmt but delayed to fix minor duplex pump leaks; 14:00 completed mixing first tub of cmt containing 30 sx Portland cmt to yield 1.18 cuft/sack of 15.6 ppg, Class A slurry and total batch volume of 35.4 cuft (6.30 bbls); 14:15 completed top filling of SC/hole annulus with first tub of cement and flushed pump and hoses; 14:40 completed mixing second tub of cmt containing 30 sx; 14:45 SC/hole annulus filled up with 12 cuft cmt left in mixing tub for a grand total net cmt volume of 58.8 cuft (10.47 bbls); 15:00 built dike around casing, topped off with cmt and flushed out pump and hoses; Bart Kettle off location; 15:15 safety discussion re long string hole drilling ops; 15:30 checked cmt and no significant fall back; Propetroco crew off location; TD 218' GL; WOC; SDFWE

2010-05-15 11:45 Compiled and filed weekly ops report to DOGM; TD 218' GL; WOC; SDFWE

2010-05-16 TD 218' GL; WOC; SDFWE

2010-05-17 07:30 Propetroco crew on location; 07:45 pressure tested surface casing with rig compressor; Held 250 psi for 10 minutes without pressure loss; 08:00 disconnected Kelly rod from casing elevator crossover & cut off casing 1' above GL; 08:30 began to weld on Wellhead Inc. SOWO 8.625" casing head bowl; 08:45 hot shot service delivered Washington rotating head (WRH) and riser spools with seal rings, bolts and lubricator; 09:30 began to nipple up spools and WRH on Propetroco's 11" drilling flange; 13:00 David L. Allin (DLA) met w/Jared Lucador-Halliburton re open-hole swab testing, water sample lab analysis, open-hole logging, long string cementing & step-rate testing needs that Halliburton could help with & bid for; 15:30 Propetroco crew completed nippling up WRH, plumbing casing head, dropped off PDC drill bit & subs, fueled rig & left location; Westwater Farms (WF) support crew continued to fabricate parts to allow WRH to be connected to Propetroco's blooie line and the lower Kelly rod bushing nut to engage the WRH; TD 218' GL; SDFN

2010-05-18 07:30 Propetroco crew on location & began assembling blooie line; Telcon w/Travis Fihr-Halliburton re locating an inflatable earth packer to use to recover isolated sample of Wingate Ss water from open hole; 10:00 RIH w/Bit 2 & bit sub made up on first 6" drill collar; Bit 2: Rocky Mountain Bit 7.875"

RMG M557X s/n 70324 five blade PDC; Delay to adjust rig air compressor clutch; 11:00 RIH w/second 6" drill collar; 12:00 RIH w/all of bottom hole assembly (BHA) that would fit in the SC to 228" KB, stabbed the Kelly rod through the WRH rubber seal assembly & buttoned up WRH; 12:55 drilled through SC float collar (shoe) into upper part of Brushy Basin Mbr Morrison Fm circulating air; 13:20 encountered sandstone layers between 245' & 265' KB that were wet with no shows of oil or gas; 13:53 complete BHA composed of Bit 2, bit sub, 2 6" x 20' drill collars, 5 4.5" x 20' drill collars & 5 3.5" x 20' drill collars in hole to 270' KB; Began adding water with foaming agent to air flow to maintain circulation; 14:18 20' conn @ 290' KB (**note all depths from this point on are measured from KB**) no shows from variegated shale; 14:36 20' conn @ 310' (**note all drill pipe is composed of 20' joints**) no shows from variegated shale; 14:46 conn @ 330' no shows from variegated shale; 14:58 conn @ 350' no shows from variegated shale; 15:10 conn @ 370' no shows from variegated shale; 15:22 conn @ 390' no shows from variegated shale; 15:35 conn @ 410' no shows from variegated shale; 15:52 conn @ 430' no shows from variegated shale; 16:06 conn @ 450' no shows from variegated shale; 16:18 conn @ 470' no shows from variegated shale; 16:28 conn @ 490' no shows from variegated shale; 16:42 conn @ 510' no shows from variegated shale; 16:59 conn @ 530' no shows from variegated shale; 17:01 stopped drilling for the day after 300' run in about 4 hrs (avg 75 ft/hr); 17:08 completed TOH w/6 stds; TD 530'; SDFN

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The static fluid level logged in the well was 525'; Formation water resistivity (Rw) calculations made from the open hole logs for a representative layer of the Entrada Ss aquifer in the Jctm 962-66' with 26% porosity & 3 ohm-meters deep resistivity at 81° F estimated formation temperature indicated an equivalent pure NaCl solution of 23,000 ppm; **Rw calculations made from the open hole logs for a representative layer of the upper Wingate Ss aquifer (part of the proposed injection interval) 1346-94' with 22% porosity & 4 ohm-meters deep resistivity at 81° F estimated formation temperature indicated an equivalent pure NaCl solution of 22,500 ppm;** These calculations conformed favorably with the analyses of water samples collected while drilling and from overnight fill up reported earlier; TD 1730'; SDFWE

2010-05-24 08:00 High winds caused full day delay of laying down drill pipe; Casing crew and long string cementing ops schedule amended; Halliburton delivered DV tool and plug; TD 1730'; SDFWE

2010-05-25 07:30 Propetroco crew began laying down drill collars and drill pipe; 15:00 Weatherford casing crew on location; Preparations were begun to run casing but the power tongs deployed were too large to work safely on the rig; Work delayed until following day when more compact power tongs that have been used on Propetroco Rig 1 previously could be delivered; TD 1730'; 16:30 SDFN

2010-05-26 07:30 Began running 5.5" J-55 15.5 ppf long string with guide shoe on bottom, first centralizer clamped above the guide shoe, float collar on top of first jt (45'), second centralizer clamped above the float collar, additional centralizers on each following collar, DV tool 430' above guide shoe to land at 1300' KB and centralizers on every other collar until casing string was landed at 1730' KB; TD 1730'; 16:00 SDFN

2010-05-27 07:30 Began rigging up to pump Stage 1 of two stage cement job; Pumped 10 bbls water spacer, 17 bbls of 12.3 ppg 50-50 Pozmix cement slurry composed of 50 sks to yield 2.38 cuft/sk and 41 bbls water for displacement; Indications were that part of the flush had gone into the formation below the DV tool and Stage 2 was called off until mud could be circulated into the well to reduce fluid losses while that stage was pumped at a later date; Simple gel mud with polymer was mixed and used to fill the well; After a one hour wait 34 bbls of mud was used to break circulation and the well was left full; TD 1730'; 18:30 SDFN

2010-05-28 08:00 22 bbls of mud was used to break circulation and the well was left full; TD 1730'; 10:00 SDFWE

2010-05-29 Memorial Day weekend; TD 1730'; SDFWE

2010-05-30	Memorial Day weekend; TD 1730'; SDFWE
2010-05-31	Memorial Day weekend; TD 1730'; SDFWE
2010-06-01	08:00 8 bbls of mud was used to break circulation and the well was left full; Well appeared to be conditioned properly for further cementing operations & Halliburton was notified to pump Stage 2 on the following day; 1730' TD; 10:00 SDFN
2010-06-02	06:30 Halliburton cementers on location; 08:00 Propetroco crew on location to rig up cementers to pump Stage 2 of long string cement; 09:24 Began pumping 40 bbls water spacer & broke circulation after 4.5 bbls; 09:51 Dropped plug after pumping 7 bbls of 12.8 ppg 50-50 Pozmix cement slurry composed of 20 sks to yield 2.00 cuft/sk; 10:00; bumped plug in DV tool with 1380 psi after pumping 31 bbls water for displacement; Good circulation throughout job; 11:05 Halliburton crew left location; 12:00 Propetroco crew left location; 1730' TD; SDFN
2010-06-03	07:30 Propetroco crew on location; PU 4.75" rerun mill tooth bit, Bit 3, cleaned casing out through the DV tool & on down to 1680' & TOH; 1680' PBTD; SDFN
2010-06-04	07:30 Propetroco crew on location; Rigged up Rocky Mountain Wireline Service & recorded Sector Bond (CBL)/GR/CCL log; Verified excellent cement bond from PBTD to 1480' & good cement bond from 1480' to 1336' covering the Wingate Ss, little or no cement from 1336' to the DV tool at 1300' and fair to good cement bond from 1300' to 900' at the top of the Entrada Ss; 12:00 RMWS rigged down & left the location; 12:30 Propetroco crew left the location; 1680' PBTD; SDFWE
2010-06-05	1680' PBTD; SDFWE
2010-06-06	1680' PBTD; SDFWE
2010-06-07	08:00 Propetroco crew off while perforation plan was formalized and Utah DOGM was polled for guidance re additional cement work; 1680' PBTD; WOO
2010-06-08	08:00 Propetroco crew off while perforating contract was arranged; Updated Drilling/Completion report & transmitted to Utah DOGM; 1680' PBTD; WOO

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Daily Drilling/Completion Report Version 2010-06-08-12:00
Westwater Farms, LLC Harley Dome 1 Injection Well, API No. 43-019-31622
600.5' fnl and 2,139' fel (NWNE) Section 10, T19S, R25E, SLM, Greater Cisco Field, Grand County, Utah
Graded Ground Level (GL and Permanent Datum) Elevation 4,864' and Kelly Bushing (KB) Elevation 4,874'
All depths cited are drilling depths prior to open-hole logging
Submitted by David L. Allin, Well Construction Consultant to Westwater Farms, LLC

2010-05-12 Completed Propetroco, Inc. Rotary Rig 1 move in and rig-up; Westwater Farms support crew dug blooie pit.

2010-05-13 08:00 spudded well with Bit 1: 11" fixed tungsten carbide insert bit on air hammer; Possible top of Morrison Fm near 188' GL; 13:00 reached surface hole TD 218' GL circulating air; Blew hole clean; No shows of oil, gas or water; 14:00 completed TOH with Bit 1 and began to wait for cementing float collar (FC) to be delivered by Halliburton; 15:00 Halliburton dropped off FC and two centralizer stops; 15:15 Mark Wright, Grand County Engineer, on site to check on progress; 15:30 shut down for the day and Propetroco crew off location; Westwater Farms support crew dug reserve pit; TD 218' GL; SDFN

2010-05-14 08:00 strapped five joints of new (2008) 8.625" J-55 24.00 ppf casing at 217.2' plus 1.2' FC for a total surface casing string of 218.4'; 09:00 Bart Kettle, Utah DOGM Petroleum Operations Specialist, on site to observe surface casing setting and cementing ops; 09:30 PU shoe joint but had to lay back down to re-rig lifting gear under traveling block to accommodate 45' length of casing jt; **Note that Propetroco Rig 1 is designed to handle casing joints no longer than 42';** 10:20 TIH surface casing (SC) shoe jt with FC made up and tack welded on bottom with centralizer 2' above; 10:45 TIH SC Jt 2, made up and tack welded on shoe joint top collar; 11:30 TIH SC Jt 3 with centralizer over SC Jt 2 top collar; 11:45 TIH SC Jt 4; 12:00 TIH SC Jt 5 with centralizer 10' below top collar and tagged fill near 214' GL; 12:15 landed casing at TD 218' GL by attaching Kelly rod and circulating fill out of hole with air and reciprocating the SC string to clean hole prior to cementing; No shows of oil, gas or water; 13:30 after lunch break began mixing cmt but delayed to fix minor duplex pump leaks; 14:00 completed mixing first tub of cmt containing 30 sx Portland cmt to yield 1.18 cuft/sack of 15.6 ppg, Class A slurry and total batch volume of 35.4 cuft (6.30 bbls); 14:15 completed top filling of SC/hole annulus with first tub of cement and flushed pump and hoses; 14:40 completed mixing second tub of cmt containing 30 sx; 14:45 SC/hole annulus filled up with 12 cuft cmt left in mixing tub for a grand total net cmt volume of 58.8 cuft (10.47 bbls); 15:00 built dike around casing, topped off with cmt and flushed out pump and hoses; Bart Kettle off location; 15:15 safety discussion re long string hole drilling ops; 15:30 checked cmt and no significant fall back; Propetroco crew off location; TD 218' GL; WOC; SDFWE

2010-05-15 11:45 Compiled and filed weekly ops report to DOGM; TD 218' GL; WOC; SDFWE

2010-05-16 TD 218' GL; WOC; SDFWE

2010-05-17 07:30 Propetroco crew on location; 07:45 pressure tested surface casing with rig compressor; Held 250 psi for 10 minutes without pressure loss; 08:00 disconnected Kelly rod from casing elevator crossover & cut off casing 1' above GL; 08:30 began to weld on Wellhead Inc. SOWO 8.625" casing head bowl; 08:45 hot shot service delivered Washington rotating head (WRH) and riser spools with seal rings, bolts and lubricator; 09:30 began to nipple up spools and WRH on Propetroco's 11" drilling flange; 13:00 David L. Allin (DLA) met w/Jared Lucador-Halliburton re open-hole swab testing, water sample lab analysis, open-hole logging, long string cementing & step-rate testing needs that Halliburton could help with & bid for; 15:30 Propetroco crew completed nippling up WRH, plumbing casing head, dropped off PDC drill bit & subs, fueled rig & left location; Westwater Farms (WF) support crew continued to fabricate parts to allow WRH to be connected to Propetroco's blooie line and the lower Kelly rod bushing nut to engage the WRH; TD 218' GL; SDFN

2010-05-18 07:30 Propetroco crew on location & began assembling blooie line; Telcon w/Travis Fihr-Halliburton re locating an inflatable earth packer to use to recover isolated sample of Wingate Ss water from open hole; 10:00 RIH w/Bit 2 & bit sub made up on first 6" drill collar; Bit 2: Rocky Mountain Bit 7.875"

RMG M557X s/n 70324 five blade PDC; Delay to adjust rig air compressor clutch; 11:00 RIH w/second 6" drill collar; 12:00 RIH w/all of bottom hole assembly (BHA) that would fit in the SC to 228" KB, stabbed the Kelly rod through the WRH rubber seal assembly & buttoned up WRH; 12:55 drilled through SC float collar (shoe) into upper part of Brushy Basin Mbr Morrison Fm circulating air; 13:20 encountered sandstone layers between 245' & 265' KB that were wet with no shows of oil or gas; 13:53 complete BHA composed of Bit 2, bit sub, 2 6" x 20' drill collars, 5 4.5" x 20' drill collars & 5 3.5" x 20' drill collars in hole to 270' KB; Began adding water with foaming agent to air flow to maintain circulation; 14:18 20' conn @ 290' KB **(note all depths from this point on are measured from KB)** no shows from variegated shale; 14:36 20' conn @ 310' **(note all drill pipe is composed of 20' joints)** no shows from variegated shale; 14:46 conn @ 330' no shows from variegated shale; 14:58 conn @ 350' no shows from variegated shale; 15:10 conn @ 370' no shows from variegated shale; 15:22 conn @ 390' no shows from variegated shale; 15:35 conn @ 410' no shows from variegated shale; 15:52 conn @ 430' no shows from variegated shale; 16:06 conn @ 450' no shows from variegated shale; 16:18 conn @ 470' no shows from variegated shale; 16:28 conn @ 490' no shows from variegated shale; 16:42 conn @ 510' no shows from variegated shale; 16:59 conn @ 530' no shows from variegated shale; 17:01 stopped drilling for the day after 300' run in about 4 hrs (avg 75 ft/hr); 17:08 completed TOH w/6 stds; TD 530'; SDFN

2010-05-19 07:30 Propetroco crew on location to begin rig service; 08:30 TIH 6 stds & found no significant fill; 08:50 circulated bottoms up with possible trace of gas (no flare from igniter) by building 180 psi on hole with rig compressor indicating 400' of fluid in hole (fluid level near 130' depth); 09:03 reconn @ 530' and commenced drilling; 09:16 conn @ 550' no shows from green shale; conn @ 570' no shows from green shale & fine grain ss below 565'; Top of Salt Wash Mbr Morrison Fm 565'; 09:45 telcon w/Bart Kettle-DOGM re projected schedule of proposed Entrada Ss and Wingate Ss water sampling; 09:52 conn @ 590' no shows from ss & variegated shale; 10:08 conn @ 610' no shows from variegated shale & fine grain ss; 10:24 conn @ 630' no shows from fine grain ss & variegated shale; 10:37 conn @ 650' no shows from fine grain ss & green shale; 10:55 conn @ 670' no shows from fine grain ss & green shale; 11:09 conn @ 690' no shows from ss & variegated shale; 11:33 conn @ 710' no shows from fine grain ss & variegated shale; 11:48 conn @ 730' no shows from variegated shale & fine grain ss; 12:01 conn @ 750' no shows from variegated shale; 12:19 conn @ 770' no shows from variegated shale; 12:32 conn @ 790' no shows from variegated shale & fine grain ss; 12:47 conn @ 810' no shows from variegated shale; 13:00 conn @ 830' no shows from variegated shale; 13:16 conn @ 850 no shows from variegated shale & gray ls; 13:35 conn @ 870' no shows from red brown shale; 13:50 conn @ 890' no shows from red brown shale & fine grain ss; Top of Summerville Fm 880'; 13:55 stopped drilling to repair rig motor fuel line leak; TOH 14 stds, shut down rig & began repair work; 16:15 Propetroco crew off location; Drilled 360' in about 5 hrs (avg 72 ft/hr); TD 890'; SDFN

2010-05-20 07:30 Propetroco crew on location to begin rig service & complete repair of fuel line & wiring; 09:00 lit igniter, TIH 7 stds & unloaded water in well from 520' by building 150 psi on hole with rig compressor indicating 330' of fluid above bit & fluid level near 190'; No shows; **09:15 caught water sample of overnight infill from Morrison Mbrs & Summerville Fm at TD 890' (Halliburton lab test May 22 SG at 60° F 1.013, pH 7.6, Rw 0.42 ohm-meter and calculated TDS 30,740 ppm);** 09:30 TIH 7 stds, made up Kelly rod, went to bottom & found no significant fill; Unloaded lower part of well & circulated clean; No shows; 10:05 reconn @ 890'; Suspended drilling to adjust clutch on rig compressor; 10:25 commenced drilling; 10:36 conn @ 910' no shows from frosted white fine to medium grain ss; Top of Moab Tongue Mbr of Curtis Fm (Entrada Ss aquifer) at 892'; 10:40 water production increased from the background mist introduced by the rig injection pump of 2 bbls per hr to 4 or 5 bbls per hr; 10:46 conn @ 930' no shows from frosted white fine to medium grain ss; 10:57 conn @ 950' no shows from frosted white medium to fine grain ss; 11:08 conn @ 970' no shows from frosted white fine to medium grain ss; 11:17 conn @ 990' no shows from white to pink fine grain ss; Top of Slickrock Mbr Entrada Ss 975'; **11:22 collected water sample from 1000' (Halliburton lab test May 22 SG at 60° F 1.013, pH 7.6, Rw 0.41 ohm-meter and calculated TDS 36,186 ppm);** 11:29 conn @ 1010' no shows from white & light red fine grain ss; 11:40 conn @ 1030' no shows from white & pink fine grain ss; 11:53 conn @ 1050' no shows from white & pink fine grain ss; 12:02 conn @ 1070' no shows from pink fine grain ss; 12:15 conn @ 1090' no shows from pink fine grain ss;

12:26 conn @ 1110' no shows from pink to red fine grain ss; 12:37 conn @ 1130' no shows from pink to red fine grain ss; **12:40 collected water sample from 1140' (Halliburton lab test May 22 SG at 60° F 1.012, pH 7.4, Rw 0.44 ohm-meter and calculated TDS 26,060 ppm);** 12:49 conn @ 1150' no shows from red brown fine grain ss; Top of Kayenta Fm 1150'; 13:01 conn @ 1170' no shows from maroon to red medium grain low porosity ss; 13:17 conn @ 1190' no shows from maroon & white medium grain low porosity ss; 13:42 conn @ 1210' no shows from variegated medium grain low porosity ss; 14:02 conn @ 1230' no shows from variegated medium to fine grain low porosity ss; 14:23 conn @ 1250' no shows from white & maroon medium to fine grain low porosity ss; 14:45 conn @ 1270' no shows from white & maroon medium to fine grain low porosity ss; 15:12 conn @ 1290' missed sample due to discussion w/Halliburton rep & delivery of 3 water samples to be analyzed by Halliburton lab in Grand Junction; 15:36 conn @ 1310' no shows from maroon, green & white fine grain low porosity ss; 15:55 conn @ 1330' no shows from variegated fine grain low porosity ss; Significant water production increase to 8 bbls per hr and drilling break in last 5' from salmon fine grain porous ss; Top of Wingate Ss 1325'; 16:00 stopped drilling to allow well to fill with water and set up to unload and drill out to TD on May 21; TOH 26½ stds; 16:45 Propetroco crew off location; Drilled 440' in about 5 hrs (avg 80 ft/hr); TD 1330'; SDFN

2010-05-21 07:30 Propetroco crew on location to begin rig service; 08:45 lit igniter, TIH 12 stds & unloaded water in well from 720' by building 140 psi on hole with rig compressor indicating 310' of fluid above bit & fluid level near 410'; No shows; 09:15 TIH remaining stds plus single jt, made up Kelly rod, went to bottom & found 2' fill; Unloaded lower part of well & circulated clean; No shows; **09:25 caught water sample of overnight infill from Morrison Mbrs, Summerville Fm, Entrada Ss, Kayenta Fm & top few feet of Wingate Ss (Halliburton lab test May 22 SG at 60° F 1.020, pH 7.5, Rw 0.34 ohm-meter and calculated TDS 35,220 ppm);** 19:35 reconn @ 1330' & commenced drilling; 10:01 conn @ 1350' no shows from variegated shale & salmon fine grain porous ss below 1340'; 10:16 conn @ 1370' no shows from salmon fine grain porous ss; 10:25 conn @ 1390' no shows from salmon fine grain porous ss; 10:41 conn @ 1410' no shows from salmon fine grain porous ss; 10:53 conn @ 1430' no shows from salmon fine grain porous ss; Water production increased from the 4 or 5 bbls per hr of previous day to 30 to 40 bbls per hr (720 to 960 bbls per day); 11:10 conn @ 1450' no shows from salmon fine grain porous ss; 11:26 conn @ 1470' no shows from salmon & less porous maroon fine grain ss; 11:40 conn @ 1490' no shows from salmon fine grain porous ss; 11:58 conn @ 1510' no shows from salmon fine grain porous ss; 12:20 conn @ 1530' no shows from salmon fine grain porous ss; 12:41 conn @ 1550' no shows from salmon & less porous maroon fine grain ss; 12:56 conn @ 1570' no shows from less porous maroon & salmon fine grain ss; 13:15 conn @ 1590' no shows from low porosity maroon fine grain ss & shale; 13:35 conn @ 1610' no shows from salmon & less porous maroon fine grain ss; 13:50 conn @ 1630' no shows from less porous maroon & salmon fine grain ss; 14:11 conn @ 1650' no shows from low porosity maroon fine grain ss & shale; 14:36 conn @ 1670' no shows from low porosity maroon fine grain ss & shale; 14:55 conn @ 1690' no shows from low porosity salmon & maroon fine grain ss & shale & dark red shale in lower 2'; Top of Chinle Fm 1688'; 15:16 conn @ 1710' no shows from maroon, dark red & green shale; **15:25 caught water sample while drilling 1705-15' in Chinle Fm (Halliburton lab test May 22 SG at 60° F 1.014, pH 7.6, Rw 0.38 ohm-meter and calculated TDS 52,763 ppm);** Resistivity of water sample was 0.366 ohm-meters at 80° F similar to the resistivity of a 15,000 ppm pure NaCl solution; 15:30 reached TD @ 1730' no shows from dark red shale; 15:54 circulated hole clean & began TOH in preparation for logging on May 22; 17:30 Propetroco crew off location; Drilled 400' in about 6 hrs (avg 67 ft/hr); TD 1730'; SDFN

2010-05-22 18:00 Propetroco owner/driller Terry Leach on location to assist open hole logging operations by Halliburton; 19:30 Halliburton logging crew on site; Rigged up tools with minor problems due to shifted stds of racked drill pipe & collars in derrick; 20:30 measured 3' of fill in well with logging tools; 21:16 began logging triple combination True Resistivity, Spectral Density and Dual Spaced Neutron logs in formation water; 23:00 Halliburton tools laid down and Propetroco owner/driller off location; 23:30 Halliburton delivered 8 sets of triple logs and 6 sets of Borehole Volume Plot to Dave Allin and Tom Warnes plus digital files to Halliburton long string cementers & Dave Allin; TD 1730'; SDFWE

2010-05-23 01:00 Halliburton off location; 08:15 arrangements for open hole swab testing cancelled in favor of running & cementing long string casing due to verification of brine water in the Wingate Ss proposed injection interval; Open hole log tops depths and elevations measured from 4874' KB elevation:

Dakota Sandstone (Kd)	11'	+4863'
Cedar Mountain Fm (Kcm [K-1])	109'	+4765'
Morrison Fm		
Brushy Basin Member (Jmbb [K-0])	180'	+4694'
Salt Wash Member (Jmsw)	552'	+4322'
Tidwell Member (Jmt)	826'	+4048'
Summerville Fm (Js [J-5])	850'	+4024'
Curtis Fm		
Moab Tongue Member (Jctm)	885'	+3989'
Entrada Sandstone		
Slick Rock Member (Jes [J-3])	992'	+3882'
Kayenta Fm (Jk [J-2])	1143'	+3731'
Wingate Sandstone (Jw)	1342'	+3532'
Chinle Fm (Trc [J-0])	1679'	+3195'

The static fluid level logged in the well was 525'; Formation water resistivity (Rw) calculations made from the open hole logs for a representative layer of the Entrada Ss aquifer in the Jctm 962-66' with 26% porosity & 3 ohm-meters deep resistivity at 81° F estimated formation temperature indicated an equivalent pure NaCl solution of 23,000 ppm; **Rw calculations made from the open hole logs for a representative layer of the upper Wingate Ss aquifer (part of the proposed injection interval) 1346-94' with 22% porosity & 4 ohm-meters deep resistivity at 81° F estimated formation temperature indicated an equivalent pure NaCl solution of 22,500 ppm;** These calculations conformed favorably with the analyses of water samples collected while drilling and from overnight fill up reported earlier; TD 1730'; SDFWE

2010-05-24 08:00 High winds caused full day delay of laying down drill pipe; Casing crew and long string cementing ops schedule amended; Halliburton delivered DV tool and plug; TD 1730'; SDFWE

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Daily Drilling/Completion Report Version 2010-06-17-17:45
Westwater Farms, LLC Harley Dome 1 Injection Well, API No. 43-019-31622
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Graded Ground Level (GL and Permanent Datum) Elevation 4,864' and Kelly Bushing (KB) Elevation 4,874'
All depths cited are drilling depths prior to open-hole logging
Submitted by David L. Allin, Well Construction Consultant to Westwater Farms, LLC

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2010-05-15 11:45 Compiled and filed weekly ops report to DOGM; TD 218' GL; WOC; SDFWE

2010-05-16 TD 218' GL; WOC; SDFWE

2010-05-17 07:30 Propetroco crew on location; 07:45 pressure tested surface casing with rig compressor; Held 250 psi for 10 minutes without pressure loss; 08:00 disconnected Kelly rod from casing elevator crossover & cut off casing 1' above GL; 08:30 began to weld on Wellhead Inc. SOWO 8.625" casing head bowl; 08:45 hot shot service delivered Washington rotating head (WRH) and riser spools with seal rings, bolts and lubricator; 09:30 began to nipple up spools and WRH on Propetroco's 11" drilling flange; 13:00 David L. Allin (DLA) met w/Jared Lucador-Halliburton re open-hole swab testing, water sample lab analysis, open-hole logging, long string cementing & step-rate testing needs that Halliburton could help with & bid for; 15:30 Propetroco crew completed nippling up WRH, plumbing casing head, dropped off PDC drill bit & subs, fueled rig & left location; Westwater Farms (WF) support crew continued to fabricate parts to allow WRH to be connected to Propetroco's blooie line and the lower Kelly rod bushing nut to engage the WRH; TD 218' GL; SDFN

2010-05-18 07:30 Propetroco crew on location & began assembling blooie line; Telcon w/Travis Fihr-Halliburton re locating an inflatable earth packer to use to recover isolated sample of Wingate Ss water from open hole; 10:00 RIH w/Bit 2 & bit sub made up on first 6" drill collar; Bit 2: Rocky Mountain Bit 7.875"

RMG M557X s/n 70324 five blade PDC; Delay to adjust rig air compressor clutch; 11:00 RIH w/second 6" drill collar; 12:00 RIH w/all of bottom hole assembly (BHA) that would fit in the SC to 228" KB, stabbed the Kelly rod through the WRH rubber seal assembly & buttoned up WRH; 12:55 drilled through SC float collar (shoe) into upper part of Brushy Basin Mbr Morrison Fm circulating air; 13:20 encountered sandstone layers between 245' & 265' KB that were wet with no shows of oil or gas; 13:53 complete BHA composed of Bit 2, bit sub, 2 6" x 20' drill collars, 5 4.5" x 20' drill collars & 5 3.5" x 20' drill collars in hole to 270' KB; Began adding water with foaming agent to air flow to maintain circulation; 14:18 20' conn @ 290' KB **(note all depths from this point on are measured from KB)** no shows from variegated shale; 14:36 20' conn @ 310' **(note all drill pipe is composed of 20' joints)** no shows from variegated shale; 14:46 conn @ 330' no shows from variegated shale; 14:58 conn @ 350' no shows from variegated shale; 15:10 conn @ 370' no shows from variegated shale; 15:22 conn @ 390' no shows from variegated shale; 15:35 conn @ 410' no shows from variegated shale; 15:52 conn @ 430' no shows from variegated shale; 16:06 conn @ 450' no shows from variegated shale; 16:18 conn @ 470' no shows from variegated shale; 16:28 conn @ 490' no shows from variegated shale; 16:42 conn @ 510' no shows from variegated shale; 16:59 conn @ 530' no shows from variegated shale; 17:01 stopped drilling for the day after 300' run in about 4 hrs (avg 75 ft/hr); 17:08 completed TOH w/6 stds; TD 530'; SDFN

2010-05-19 07:30 Propetroco crew on location to begin rig service; 08:30 TIH 6 stds & found no significant fill; 08:50 circulated bottoms up with possible trace of gas (no flare from igniter) by building 180 psi on hole with rig compressor indicating 400' of fluid in hole (fluid level near 130' depth); 09:03 reconn @ 530' and commenced drilling; 09:16 conn @ 550' no shows from green shale; conn @ 570' no shows from green shale & fine grain ss below 565'; Top of Salt Wash Mbr Morrison Fm 565'; 09:45 telcon w/Bart Kettle-DOGM re projected schedule of proposed Entrada Ss and Wingate Ss water sampling; 09:52 conn @ 590' no shows from ss & variegated shale; 10:08 conn @ 610' no shows from variegated shale & fine grain ss; 10:24 conn @ 630' no shows from fine grain ss & variegated shale; 10:37 conn @ 650' no shows from fine grain ss & green shale; 10:55 conn @ 670' no shows from fine grain ss & green shale; 11:09 conn @ 690' no shows from ss & variegated shale; 11:33 conn @ 710' no shows from fine grain ss & variegated shale; 11:48 conn @ 730' no shows from variegated shale & fine grain ss; 12:01 conn @ 750' no shows from variegated shale; 12:19 conn @ 770' no shows from variegated shale; 12:32 conn @ 790' no shows from variegated shale & fine grain ss; 12:47 conn @ 810' no shows from variegated shale; 13:00 conn @ 830' no shows from variegated shale; 13:16 conn @ 850 no shows from variegated shale & gray ls; 13:35 conn @ 870' no shows from red brown shale; 13:50 conn @ 890' no shows from red brown shale & fine grain ss; Top of Summerville Fm 880'; 13:55 stopped drilling to repair rig motor fuel line leak; TOH 14 stds, shut down rig & began repair work; 16:15 Propetroco crew off location; Drilled 360' in about 5 hrs (avg 72 ft/hr); TD 890'; SDFN

2010-05-20 07:30 Propetroco crew on location to begin rig service & complete repair of fuel line & wiring; 09:00 lit igniter, TIH 7 stds & unloaded water in well from 520' by building 150 psi on hole with rig compressor indicating 330' of fluid above bit & fluid level near 190'; No shows; **09:15 caught water sample of overnight infill from Morrison Mbrs & Summerville Fm at TD 890' (Halliburton lab test May 22 SG at 60° F 1.013, pH 7.6, Rw 0.42 ohm-meter and calculated TDS 30,740 ppm);** 09:30 TIH 7 stds, made up Kelly rod, went to bottom & found no significant fill; Unloaded lower part of well & circulated clean; No shows; 10:05 reconn @ 890'; Suspended drilling to adjust clutch on rig compressor; 10:25 commenced drilling; 10:36 conn @ 910' no shows from frosted white fine to medium grain ss; Top of Moab Tongue Mbr of Curtis Fm (Entrada Ss aquifer) at 892'; 10:40 water production increased from the background mist introduced by the rig injection pump of 2 bbls per hr to 4 or 5 bbls per hr; 10:46 conn @ 930' no shows from frosted white fine to medium grain ss; 10:57 conn @ 950' no shows from frosted white medium to fine grain ss; 11:08 conn @ 970' no shows from frosted white fine to medium grain ss; 11:17 conn @ 990' no shows from white to pink fine grain ss; Top of Slickrock Mbr Entrada Ss 975'; **11:22 collected water sample from 1000' (Halliburton lab test May 22 SG at 60° F 1.013, pH 7.6, Rw 0.41 ohm-meter and calculated TDS 36,186 ppm);** 11:29 conn @ 1010' no shows from white & light red fine grain ss; 11:40 conn @ 1030' no shows from white & pink fine grain ss; 11:53 conn @ 1050' no shows from white & pink fine grain ss; 12:02 conn @ 1070' no shows from pink fine grain ss; 12:15 conn @ 1090' no shows from pink fine grain ss;

12:26 conn @ 1110' no shows from pink to red fine grain ss; 12:37 conn @ 1130' no shows from pink to red fine grain ss; **12:40 collected water sample from 1140' (Halliburton lab test May 22 SG at 60° F 1.012, pH 7.4, Rw 0.44 ohm-meter and calculated TDS 26,060 ppm);** 12:49 conn @ 1150' no shows from red brown fine grain ss; Top of Kayenta Fm 1150'; 13:01 conn @ 1170' no shows from maroon to red medium grain low porosity ss; 13:17 conn @ 1190' no shows from maroon & white medium grain low porosity ss; 13:42 conn @ 1210' no shows from variegated medium grain low porosity ss; 14:02 conn @ 1230' no shows from variegated medium to fine grain low porosity ss; 14:23 conn @ 1250' no shows from white & maroon medium to fine grain low porosity ss; 14:45 conn @ 1270' no shows from white & maroon medium to fine grain low porosity ss; 15:12 conn @ 1290' missed sample due to discussion w/Halliburton rep & delivery of 3 water samples to be analyzed by Halliburton lab in Grand Junction; 15:36 conn @ 1310' no shows from maroon, green & white fine grain low porosity ss; 15:55 conn @ 1330' no shows from variegated fine grain low porosity ss; Significant water production increase to 8 bbls per hr and drilling break in last 5' from salmon fine grain porous ss; Top of Wingate Ss 1325'; 16:00 stopped drilling to allow well to fill with water and set up to unload and drill out to TD on May 21; TOH 26½ stds; 16:45 Propetroco crew off location; Drilled 440' in about 5 hrs (avg 80 ft/hr); TD 1330'; SDFN

2010-05-21 07:30 Propetroco crew on location to begin rig service; 08:45 lit igniter, TIH 12 stds & unloaded water in well from 720' by building 140 psi on hole with rig compressor indicating 310' of fluid above bit & fluid level near 410'; No shows; 09:15 TIH remaining stds plus single jt, made up Kelly rod, went to bottom & found 2' fill; Unloaded lower part of well & circulated clean; No shows; **09:25 caught water sample of overnight infill from Morrison Mbrs, Summerville Fm, Entrada Ss, Kayenta Fm & top few feet of Wingate Ss (Halliburton lab test May 22 SG at 60° F 1.020, pH 7.5, Rw 0.34 ohm-meter and calculated TDS 35,220 ppm);** 19:35 reconn @ 1330' & commenced drilling; 10:01 conn @ 1350' no shows from variegated shale & salmon fine grain porous ss below 1340'; 10:16 conn @ 1370' no shows from salmon fine grain porous ss; 10:25 conn @ 1390' no shows from salmon fine grain porous ss; 10:41 conn @ 1410' no shows from salmon fine grain porous ss; 10:53 conn @ 1430' no shows from salmon fine grain porous ss; **Water production increased from the 4 or 5 bbls per hr of previous day to 30 to 40 bbls per hr (720 to 960 bbls per day);** 11:10 conn @ 1450' no shows from salmon fine grain porous ss; 11:26 conn @ 1470' no shows from salmon & less porous maroon fine grain ss; 11:40 conn @ 1490' no shows from salmon fine grain porous ss; 11:58 conn @ 1510' no shows from salmon fine grain porous ss; 12:20 conn @ 1530' no shows from salmon fine grain porous ss; **Water production surging up to 60 bbls per hr (1,440 bbls per day)** 12:41 conn @ 1550' no shows from salmon & less porous maroon fine grain ss; 12:56 conn @ 1570' no shows from less porous maroon & salmon fine grain ss; 13:15 conn @ 1590' no shows from low porosity maroon fine grain ss & shale; 13:35 conn @ 1610' no shows from salmon & less porous maroon fine grain ss; 13:50 conn @ 1630' no shows from less porous maroon & salmon fine grain ss; 14:11 conn @ 1650' no shows from low porosity maroon fine grain ss & shale; 14:36 conn @ 1670' no shows from low porosity maroon fine grain ss & shale; 14:55 conn @ 1690' no shows from low porosity salmon & maroon fine grain ss & shale & dark red shale in lower 2'; Top of Chinle Fm 1688'; 15:16 conn @ 1710' no shows from maroon, dark red & green shale; **15:25 caught water sample while drilling 1705-15' in Chinle Fm (Halliburton lab test May 22 SG at 60° F 1.014, pH 7.6, Rw 0.38 ohm-meter and calculated TDS 52,763 ppm);** Resistivity of water sample was 0.366 ohm-meters at 80° F similar to the resistivity of a 15,000 ppm pure NaCl solution; 15:30 reached TD @ 1730' no shows from dark red shale; 15:54 circulated hole clean & began TOH in preparation for logging on May 22; 17:30 Propetroco crew off location; Drilled 400' in about 6 hrs (avg 67 ft/hr); TD 1730'; SDFN

2010-05-22 18:00 Propetroco owner/driller Terry Leach on location to assist open hole logging operations by Halliburton; 19:30 Halliburton logging crew on site; Rigged up tools with minor problems due to shifted stds of racked drill pipe & collars in derrick; 20:30 measured 3' of fill in well with logging tools; 21:16 began logging triple combination True Resistivity, Spectral Density and Dual Spaced Neutron logs in formation water; 23:00 Halliburton tools laid down and Propetroco owner/driller off location; 23:30 Halliburton delivered 8 sets of triple logs and 6 sets of Borehole Volume Plot to Dave Allin and Tom Warnes plus digital files to Halliburton long string cementers & Dave Allin; TD 1730'; SDFWE

2010-05-23 01:00 Halliburton off location; 08:15 arrangements for open hole swab testing cancelled in favor of running & cementing long string casing due to verification of brine water in the Wingate Ss proposed injection interval; **Open hole log tops depths and elevations measured from 4874' KB elevation:**

Dakota Sandstone (Kd)	11'	+4863'
Cedar Mountain Fm (Kcm [K-1])	109'	+4765'
Morrison Fm		
Brushy Basin Member (Jmbb [K-0])	180'	+4694'
Salt Wash Member (Jmsw)	552'	+4322'
Tidwell Member (Jmt)	826'	+4048'
Summerville Fm (Js [J-5])	850'	+4024'
Curtis Fm		
Moab Tongue Member (Jctm)	885'	+3989'
Entrada Sandstone		
Slick Rock Member (Jes [J-3])	992'	+3882'
Kayenta Fm (Jk [J-2])	1143'	+3731'
Wingate Sandstone (Jw)	1342'	+3532'
Chinle Fm (Trc [J-0])	1679'	+3195'

The static fluid level logged in the well was 525'; Formation water resistivity (Rw) calculations made from the open hole logs for a representative layer of the Entrada Ss aquifer in the Jctm 962-66' with 26% porosity & 3 ohm-meters deep resistivity at 81° F estimated formation temperature indicated an equivalent pure NaCl solution of 23,000 ppm; **Rw calculations made from the open hole logs for a representative layer of the upper Wingate Ss aquifer (part of the proposed injection interval) 1346-94' with 22% porosity & 4 ohm-meters deep resistivity at 81° F estimated formation temperature indicated an equivalent pure NaCl solution of 22,500 ppm;** These calculations conformed favorably with the analyses of water samples collected while drilling and from overnight fill up reported earlier; TD 1730'; SDFWE

2010-05-24 08:00 High winds caused full day delay of laying down drill pipe; Casing crew and long string cementing ops schedule amended; Halliburton delivered DV tool and plug; TD 1730'; SDFWE

2010-05-25 07:30 Propetroco crew began laying down drill collars and drill pipe; 14:00 Weatherford casing crew on location; Preparations were begun to run casing but the power tongs deployed were too large to work safely on the rig; Work delayed until following day when more compact power tongs that have been previously used on Propetroco Rig 1 could be delivered; TD 1730'; 16:00 SDFN

2010-05-26 07:30 Began running 5.5" J-55 15.5 ppf long string with guide shoe on bottom, first centralizer clamped above the guide shoe, float collar on top of first jt (45'), second centralizer clamped above the float collar, additional centralizers on each following collar, DV tool 430' above guide shoe to land at 1300' KB and centralizers on every other collar until casing string was landed at 1730' KB; 10:00 Halliburton cementers on location; 14:50 Casing crew RD & began first stage LS cement operations; 14:58 Pumped 49 bbls water down the casing to ensure circulation; 15:17 Pumped 18.8 bbls first stage cement composed of 50 sks mixed to yield 2.11 cuft/sk Halliburton Versacem™ System 12.3 ppg slurry; 15:34 dropped first stage plug; 15:55 completed displacement of 42 bbls of water after some pump inlet blockage problems & bumped the plug in the float collar with 1,575 psi; 16:03 Bumped plug again with 1,610 psi after well went on vacuum & unknown volume of water was used to refill well; 16:20 Dropped DV tool opening device and opened the tool with 670 psi; 16:22 Circulated well with 60 bbls of water (broke circulation after first 10 bbls); 16:56 First stage completed & planned to pump second stage the following day; Cementers remained on location overnight; TD 1730'; 18:00 SDFN

2010-05-27 02:00(?) Cementers filled casing with 32 bbls water; 04:46 Cementers filled casing with 19 bbls water; 7:30 Propetroco crew on location; 09:00 Called off second stage cement operations to condition well with mud to minimize additional fluid losses; 11:00 Cementers RD & off location; Changed blooie line out & added flow line to steel mud pit & mixed mud; TD 1730'; 17:30 SDFN

2010-05-28 07:30 Propetroco crew on location; Mixed mud, filled casing with 21 bbls & circulated to condition formation for second stage cement; Casing was left full; TD 1730'; 14:00 SDFWE

2010-05-29 Memorial Day weekend; TD 1730'; SDFWE

2010-05-30 Memorial Day weekend; TD 1730'; SDFWE

2010-05-31 09:30 Conditioned mud (8.6 ppg with 48 viscosity) & circulated well through DV tool; 11:30 shut down pump to check on loss; Mud loss after was 1" from pit or about 8 bbls; TD 1730'; 12:30 SDFN

2010-06-01 Well appeared to be conditioned properly for further cementing operations & Halliburton was notified to pump second stage LS cement on the following day; No operations; 1730' TD; SDFN

2010-06-02 06:30 Halliburton cementers on location; 07:30 Propetroco crew on location to RU cementers to pump second stage of LS cement; 09:24 Began pumping 40 bbls water spacer & broke circulation after 4.5 bbls; 09:51 Dropped plug after pumping 7 bbls of 12.8 ppg Halliburton Versacem™ System slurry composed of 20 sks to yield 2.00 cuft/sk; 10:00; Landed plug at 75 psi & bumped plug in DV tool with 1,380 psi after pumping 31 bbls water for displacement; Good circulation throughout job; 11:05 Cementers left location; Propetroco crew nippled down 11" rotating head & blooie line & nippled up 7" rotating head; 1730' TD; 15:45 SDFN

2010-06-03 07:30 Propetroco crew on location; PU 4.75" PDC bit, Bit 3, cleaned casing out through the DV tool & on down to 1680' & TOH; 1680' PBTD; 15:45 SDFN

2010-06-04 07:30 Propetroco crew on location; Rigged up Rocky Mountain Wireline Service & recorded Sector Bond (CBL)/GR/CCL log; Verified excellent cement bond from PBTD to 1480' & good cement bond from 1480' to 1336' covering the Wingate Ss, little or no cement from 1336' to the DV tool at 1300' and fair to good cement bond from 1300' to 900' at the top of the Entrada Ss; 12:00 RMWS RD & left the location; 1680' PBTD; 12:00 SDFWE

2010-06-05 1680' PBTD; SDFWE

2010-06-06 1680' PBTD; SDFWE

2010-06-07 08:00 Propetroco crew off while perforation plan was formalized and Utah DOGM was polled for guidance re additional cement work; 1680' PBTD; WOO

2010-06-08 08:00 Propetroco crew off while perforating contract was arranged; Updated Drilling/Completion report & transmitted to Utah DOGM; 1680' PBTD; WOO

2010-06-09 07:30 Propetroco crew rigged a 2.375" x 5.5" J-Type tubing packer on a 10' long 2.375" pup jt with a tee for blow down valve & gauge point & set it in the top of the 5.5" casing; 09:00 Rocky Mountain Wireline Service on location to RU for perforating ops; 10:00 The rig pump was used to fill the pup jt & packer assembly and pressurize it and the casing to 300 psi; 10:05 Pressure test good for first five minutes and then packer began leaking; Scheduling constraints precluded an overhaul or replacement of the packer; 10:50 RU RMWS sheaves on rig; 11:15 RMWS began first perforating run; 13:00 RMWS completed perforating ops in 5 runs & began RD; **Perforations were made in 11 zones in the Wingate Ss over the gross interval 1344-1631' (per 5-22-10 Halliburton triple) with 21 gram Owen Superhero charges loaded in 3.125" expendable, scalloped casing guns 4 spf phased 90° for a total of 552 .37" holes & optimal 43" penetration as follows:**

1344-1418'
1422-26'
1451-59'

1478-82'
1486-90'
1498-1506'
1513-17'
1526-30'
1543-53'
1560-68'
1621-31'

12:15 The fluid level in the well retreated to 200' between the third and fourth runs; 13:45 unloaded fluid from csg w/285 psi air pressure after TIH w/bit and 27 stds of drill pipe with Kelly down to 1110' indicating that the fluid level in the csg was near 460'; 14:50 TIH 7 stds with Kelly down to 1360' & unloaded csg after 2 minutes of building air pressure; 15:07 TIH remaining 8 stds with bit set near 1660' or 20' above PBTD, unloaded csg & began circulation with air at 150 psi; Air circulation produced water from the perforations at a rate near 15 gpm; Fluid recovery included mud, mud filtrate, displacement water from cementing & some formation water; **16:00 Collected water sample from flow line** & ended circulation after recovering about 50 bbls of fluid from unloading the csg & circulating the csg with air; 17:00 Allin dropped off water sample at Halliburton lab for analysis **(W200 Halliburton lab report June 10 SG at 60° F 1.009, pH 8.0, Rw 0.65 ohm-meter and calculated TDS 10,155 ppm)**; 1680' PBTD; SDFN

2010-06-10 07:30 Propetroco crew on location; 08:55 Completed TOH 5 stds & unloaded csg from 1460' with 280 psi air pressure indicating the fluid level in csg was near 820'; 09:02 completed TIH 5 stds to reset bit at 1660' & unloaded csg then began circulation with air at 150 psi; Fluid recovery included mud, mud filtrate, displacement water & formation water; 3.5" tbg string delivered to the site; 09:40 fluid flow rate 13 gpm or 446 bpd from flow line; 10:40 fluid flow rate 13 gpm or 446 bpd; 11:40 fluid flow rate 11 gpm or 377 bpd; 12:40 fluid flow rate 12 gpm or 411 bpd; Fluid noticeably more saline; 13:40 fluid flow rate 12 gpm or 411 bpd; **14:40 fluid flow rate 11.5 gpm or 394 bpd & caught water sample in presence of Bart Kettle-Utah DOGM;** 14:45 shut down production testing operations; 15:40 Allin dropped off water sample at Halliburton lab for analysis **(W201 Halliburton lab report June 10 SG at 60° F 1.013, pH 7.8, Rw 0.36 ohm-meter and calculated TDS 34,378 ppm)**; 1680' PBTD; SDFN

2010-06-11 Operations suspended until information from testing could be analyzed & forwarded to Utah DOGM for consideration & a production packer could be lined up; 1680' PBTD; WOO

2010-06-12 1680' PBTD; SDFWE

2010-06-13 1680' PBTD; SDFWE

2010-06-14 07:30 Propetroco crew on site; TOH laying down drill pipe in preparation for setting permanent production packer; Fluid level appeared to be near 600'; Westwater Farms support crew prepared 3.5" tubing string; 15:00 shut down for day; 1680' PBTD; SDFN

2010-06-15 07:30 Propetroco crew on site; RU Rocky Mountain Wireline Service to position anchor & set permanent packer in the csg; Lance Messinger-DownholeTool Service on site with the permanent packer & setting instructions; The permanent packer was set with the hanger at 1272' and top of packer at 1269'; RD RMWS and SDFN; 1680' PBTD

2010-06-16 07:30 Propetroco crew on site; RU Weatherford crew to run tubing, but they had to delay to exchange tongs for more compact equipment suitable for use on the rig; Ran 3.5" EUE 9.3 ppf slightly used tbg with nipple on end to engage permanent packer to a point just above the packer; Circulated the formation water out of the csg and replaced it with water treated with corrosion inhibitors; Engaged the tbg into the packer, stretched out tbg & set the slips in the tbg head. Cut off the tbg & welded on a bell nipple; 1680' PBTD; SDFN

2010-06-17	Operations suspended pending issuance of an approval from Utah DOGM to convert the Harley Dome 1 for injection; Transmitted updated copy of daily reports to Utah DOGM

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JUN 2 7 2010
DIV. OF OIL, GAS & MINING

Daily Drilling/Completion Report Version 2010-06-27-08:30
Westwater Farms, LLC Harley Dome 1 Injection Well, API No. 43-019-31622
600.5' fnl and 2,139' fel (NWNE) Section 10, T19S, R25E, SLM, Greater Cisco Field, Grand County, Utah
Graded Ground Level (GL and Permanent Datum) Elevation 4,864' and Kelly Bushing (KB) Elevation 4,874'
All depths cited are drilling depths prior to open-hole logging
Submitted by David L. Allin, Well Construction Consultant to Westwater Farms, LLC

2010-05-12 Completed Propetroco, Inc. Rotary Rig 1 move in and rig-up; Westwater Farms support crew dug blooie pit.

2010-05-13 08:00 spudded well with Bit 1: 11" fixed tungsten carbide insert bit on air hammer; Possible top of Morrison Fm near 188' GL; 13:00 reached surface hole TD 218' GL circulating air; Blew hole clean; No shows of oil, gas or water; 14:00 completed TOH with Bit 1 and began to wait for cementing float collar (FC) to be delivered by Halliburton; 15:00 Halliburton dropped off FC and two centralizer stops; 15:15 Mark Wright, Grand County Engineer, on site to check on progress; 15:30 shut down for the day and Propetroco crew off location; Westwater Farms support crew dug reserve pit; TD 218' GL; SDFN

2010-05-14 08:00 strapped five joints of new (2008) 8.625" J-55 24.00 ppf casing at 217.2' plus 1.2' FC for a total surface casing string of 218.4'; 09:00 Bart Kettle, Utah DOGM Petroleum Operations Specialist, on site to observe surface casing setting and cementing ops; 09:30 PU shoe joint but had to lay back down to re-rig lifting gear under traveling block to accommodate 45' length of casing jt; **Note that Propetroco Rig 1 is designed to handle casing joints no longer than 42';** 10:20 TIH surface casing (SC) shoe jt with FC made up and tack welded on bottom with centralizer 2' above; 10:45 TIH SC Jt 2, made up and tack welded on shoe joint top collar; 11:30 TIH SC Jt 3 with centralizer over SC Jt 2 top collar; 11:45 TIH SC Jt 4; 12:00 TIH SC Jt 5 with centralizer 10' below top collar and tagged fill near 214' GL; 12:15 landed casing at TD 218' GL by attaching Kelly rod and circulating fill out of hole with air and reciprocating the SC string to clean hole prior to cementing; No shows of oil, gas or water; 13:30 after lunch break began mixing cmt but delayed to fix minor duplex pump leaks; 14:00 completed mixing first tub of cmt containing 30 sx Portland cmt to yield 1.18 cuft/sack of 15.6 ppg, Class A slurry and total batch volume of 35.4 cuft (6.30 bbls); 14:15 completed top filling of SC/hole annulus with first tub of cement and flushed pump and hoses; 14:40 completed mixing second tub of cmt containing 30 sx; 14:45 SC/hole annulus filled up with 12 cuft cmt left in mixing tub for a grand total net cmt volume of 58.8 cuft (10.47 bbls); 15:00 built dike around casing, topped off with cmt and flushed out pump and hoses; Bart Kettle off location; 15:15 safety discussion re long string hole drilling ops; 15:30 checked cmt and no significant fall back; Propetroco crew off location; TD 218' GL; WOC; SDFWE

2010-05-15 11:45 Compiled and filed weekly ops report to DOGM; TD 218' GL; WOC; SDFWE

2010-05-16 TD 218' GL; WOC; SDFWE

2010-05-17 07:30 Propetroco crew on location; 07:45 pressure tested surface casing with rig compressor; Held 250 psi for 10 minutes without pressure loss; 08:00 disconnected Kelly rod from casing elevator crossover & cut off casing 1' above GL; 08:30 began to weld on Wellhead Inc. SOWO 8.625" casing head bowl; 08:45 hot shot service delivered Washington rotating head (WRH) and riser spools with seal rings, bolts and lubricator; 09:30 began to nipple up spools and WRH on Propetroco's 11" drilling flange; 13:00 David L. Allin (DLA) met w/Jared Lucador-Halliburton re open-hole swab testing, water sample lab analysis, open-hole logging, long string cementing & step-rate testing needs that Halliburton could help with & bid for; 15:30 Propetroco crew completed nippling up WRH, plumbing casing head, dropped off PDC drill bit & subs, fueled rig & left location; Westwater Farms (WF) support crew continued to fabricate parts to allow WRH to be connected to Propetroco's blooie line and the lower Kelly rod bushing nut to engage the WRH; TD 218' GL; SDFN

2010-05-18 07:30 Propetroco crew on location & began assembling blooie line; Telcon w/Travis Fihr-Halliburton re locating an inflatable earth packer to use to recover isolated sample of Wingate Ss water from open hole; 10:00 RIH w/Bit 2 & bit sub made up on first 6" drill collar; Bit 2: Rocky Mountain Bit 7.875"

RMG M557X s/n 70324 five blade PDC; Delay to adjust rig air compressor clutch; 11:00 RIH w/second 6" drill collar; 12:00 RIH w/all of bottom hole assembly (BHA) that would fit in the SC to 228" KB, stabbed the Kelly rod through the WRH rubber seal assembly & buttoned up WRH; 12:55 drilled through SC float collar (shoe) into upper part of Brushy Basin Mbr Morrison Fm circulating air; 13:20 encountered sandstone layers between 245' & 265' KB that were wet with no shows of oil or gas; 13:53 complete BHA composed of Bit 2, bit sub, 2 6" x 20' drill collars, 5 4.5" x 20' drill collars & 5 3.5" x 20' drill collars in hole to 270' KB; Began adding water with foaming agent to air flow to maintain circulation; 14:18 20' conn @ 290' KB **(note all depths from this point on are measured from KB)** no shows from variegated shale; 14:36 20' conn @ 310' **(note all drill pipe is composed of 20' joints)** no shows from variegated shale; 14:46 conn @ 330' no shows from variegated shale; 14:58 conn @ 350' no shows from variegated shale; 15:10 conn @ 370' no shows from variegated shale; 15:22 conn @ 390' no shows from variegated shale; 15:35 conn @ 410' no shows from variegated shale; 15:52 conn @ 430' no shows from variegated shale; 16:06 conn @ 450' no shows from variegated shale; 16:18 conn @ 470' no shows from variegated shale; 16:28 conn @ 490' no shows from variegated shale; 16:42 conn @ 510' no shows from variegated shale; 16:59 conn @ 530' no shows from variegated shale; 17:01 stopped drilling for the day after 300' run in about 4 hrs (avg 75 ft/hr); 17:08 completed TOH w/6 stds; TD 530'; SDFN

2010-05-19 07:30 Propetroco crew on location to begin rig service; 08:30 TIH 6 stds & found no significant fill; 08:50 circulated bottoms up with possible trace of gas (no flare from igniter) by building 180 psi on hole with rig compressor indicating 400' of fluid in hole (fluid level near 130' depth); 09:03 reconn @ 530' and commenced drilling; 09:16 conn @ 550' no shows from green shale; conn @ 570' no shows from green shale & fine grain ss below 565'; Top of Salt Wash Mbr Morrison Fm 565'; 09:45 telcon w/Bart Kettle-DOGM re projected schedule of proposed Entrada Ss and Wingate Ss water sampling; 09:52 conn @ 590' no shows from ss & variegated shale; 10:08 conn @ 610' no shows from variegated shale & fine grain ss; 10:24 conn @ 630' no shows from fine grain ss & variegated shale; 10:37 conn @ 650' no shows from fine grain ss & green shale; 10:55 conn @ 670' no shows from fine grain ss & green shale; 11:09 conn @ 690' no shows from ss & variegated shale; 11:33 conn @ 710' no shows from fine grain ss & variegated shale; 11:48 conn @ 730' no shows from variegated shale & fine grain ss; 12:01 conn @ 750' no shows from variegated shale; 12:19 conn @ 770' no shows from variegated shale; 12:32 conn @ 790' no shows from variegated shale & fine grain ss; 12:47 conn @ 810' no shows from variegated shale; 13:00 conn @ 830' no shows from variegated shale; 13:16 conn @ 850 no shows from variegated shale & gray ls; 13:35 conn @ 870' no shows from red brown shale; 13:50 conn @ 890' no shows from red brown shale & fine grain ss; Top of Summerville Fm 880'; 13:55 stopped drilling to repair rig motor fuel line leak; TOH 14 stds, shut down rig & began repair work; 16:15 Propetroco crew off location; Drilled 360' in about 5 hrs (avg 72 ft/hr); TD 890'; SDFN

2010-05-20 07:30 Propetroco crew on location to begin rig service & complete repair of fuel line & wiring; 09:00 lit igniter, TIH 7 stds & unloaded water in well from 520' by building 150 psi on hole with rig compressor indicating 330' of fluid above bit & fluid level near 190'; No shows; **09:15 caught water sample of overnight infill from Morrison Mbrs & Summerville Fm at TD 890' (Halliburton lab test W177 May 22 SG at 60° F 1.013, pH 7.6, Rw 0.42 ohm-meter and calculated TDS 30,740 ppm);** 09:30 TIH 7 stds, made up Kelly rod, went to bottom & found no significant fill; Unloaded lower part of well & circulated clean; No shows; 10:05 reconn @ 890'; Suspended drilling to adjust clutch on rig compressor; 10:25 commenced drilling; 10:36 conn @ 910' no shows from frosted white fine to medium grain ss; Top of Moab Tongue Mbr of Curtis Fm (Entrada Ss aquifer) at 892'; 10:40 water production increased from the background mist introduced by the rig injection pump of 2 bbls per hr to 4 or 5 bbls per hr; 10:46 conn @ 930' no shows from frosted white fine to medium grain ss; 10:57 conn @ 950' no shows from frosted white medium to fine grain ss; 11:08 conn @ 970' no shows from frosted white fine to medium grain ss; 11:17 conn @ 990' no shows from white to pink fine grain ss; Top of Slickrock Mbr Entrada Ss 975'; **11:22 collected water sample from 1000' (Halliburton lab test W175 May 22 SG at 60° F 1.013, pH 7.6, Rw 0.41 ohm-meter and calculated TDS 36,186 ppm);** 11:29 conn @ 1010' no shows from white & light red fine grain ss; 11:40 conn @ 1030' no shows from white & pink fine grain ss; 11:53 conn @ 1050' no shows from white & pink fine grain ss; 12:02 conn @ 1070' no shows from pink fine grain ss; 12:15 conn @ 1090' no shows from pink fine

grain ss; 12:26 conn @ 1110' no shows from pink to red fine grain ss; 12:37 conn @ 1130' no shows from pink to red fine grain ss; **12:40 collected water sample from 1140' (Halliburton lab test W176 May 22 SG at 60° F 1.012, pH 7.4, Rw 0.44 ohm-meter and calculated TDS 26,060 ppm);** 12:49 conn @ 1150' no shows from red brown fine grain ss; Top of Kayenta Fm 1150'; 13:01 conn @ 1170' no shows from maroon to red medium grain low porosity ss; 13:17 conn @ 1190' no shows from maroon & white medium grain low porosity ss; 13:42 conn @ 1210' no shows from variegated medium grain low porosity ss; 14:02 conn @ 1230' no shows from variegated medium to fine grain low porosity ss; 14:23 conn @ 1250' no shows from white & maroon medium to fine grain low porosity ss; 14:45 conn @ 1270' no shows from white & maroon medium to fine grain low porosity ss; 15:12 conn @ 1290' missed sample due to discussion w/Halliburton rep & delivery of 3 water samples to be analyzed by Halliburton lab in Grand Junction; 15:36 conn @ 1310' no shows from maroon, green & white fine grain low porosity ss; 15:55 conn @ 1330' no shows from variegated fine grain low porosity ss; Significant water production increase to 8 bbls per hr and drilling break in last 5' from salmon fine grain porous ss; Top of Wingate Ss 1325'; 16:00 stopped drilling to allow well to fill with water and set up to unload and drill out to TD on May 21; TOH 26½ stds; 16:45 Propetroco crew off location; Drilled 440' in about 5 hrs (avg 80 ft/hr); TD 1330'; SDFN

2010-05-21 07:30 Propetroco crew on location to begin rig service; 08:45 lit igniter, TIH 12 stds & unloaded water in well from 720' by building 140 psi on hole with rig compressor indicating 310' of fluid above bit & fluid level near 410'; No shows; 09:15 TIH remaining stds plus single jt, made up Kelly rod, went to bottom & found 2' fill; Unloaded lower part of well & circulated clean; No shows; **09:25 caught water sample of overnight infill from Morrison Mbrs, Summerville Fm, Entrada Ss, Kayenta Fm & top few feet of Wingate Ss (Halliburton lab test W180 May 22 SG at 60° F 1.020, pH 7.5, Rw 0.34 ohm-meter and calculated TDS 35,220 ppm);** 19:35 reconn @ 1330' & commenced drilling; 10:01 conn @ 1350' no shows from variegated shale & salmon fine grain porous ss below 1340'; 10:16 conn @ 1370' no shows from salmon fine grain porous ss; 10:25 conn @ 1390' no shows from salmon fine grain porous ss; 10:41 conn @ 1410' no shows from salmon fine grain porous ss; 10:53 conn @ 1430' no shows from salmon fine grain porous ss; **Water production increased from the 4 or 5 bbls per hr of previous day to 30 to 40 bbls per hr (720 to 960 bbls per day);** 11:10 conn @ 1450' no shows from salmon fine grain porous ss; 11:26 conn @ 1470' no shows from salmon & less porous maroon fine grain ss; 11:40 conn @ 1490' no shows from salmon fine grain porous ss; 11:58 conn @ 1510' no shows from salmon fine grain porous ss; 12:20 conn @ 1530' no shows from salmon fine grain porous ss; **Water production surging up to 60 bbls per hr (1,440 bbls per day)** 12:41 conn @ 1550' no shows from salmon & less porous maroon fine grain ss; 12:56 conn @ 1570' no shows from less porous maroon & salmon fine grain ss; 13:15 conn @ 1590' no shows from low porosity maroon fine grain ss & shale; 13:35 conn @ 1610' no shows from salmon & less porous maroon fine grain ss; 13:50 conn @ 1630' no shows from less porous maroon & salmon fine grain ss; 14:11 conn @ 1650' no shows from low porosity maroon fine grain ss & shale; 14:36 conn @ 1670' no shows from low porosity maroon fine grain ss & shale; 14:55 conn @ 1690' no shows from low porosity salmon & maroon fine grain ss & shale & dark red shale in lower 2'; Top of Chinle Fm 1688'; 15:16 conn @ 1710' no shows from maroon, dark red & green shale; **15:25 caught water sample while drilling 1705-15' in Chinle Fm (Halliburton lab test W181 May 22 SG at 60° F 1.014, pH 7.6, Rw 0.38 ohm-meter and calculated TDS 52,763 ppm);** Resistivity of water sample was 0.366 ohm-meters at 80° F similar to the resistivity of a 15,000 ppm pure NaCl solution; 15:30 reached TD @ 1730' no shows from dark red shale; 15:54 circulated hole clean & began TOH in preparation for logging on May 22; 17:30 Propetroco crew off location; Drilled 400' in about 6 hrs (avg 67 ft/hr); TD 1730'; SDFN

2010-05-22 18:00 Propetroco owner/driller Terry Leach on location to assist open hole logging operations by Halliburton; 19:30 Halliburton logging crew on site; Rigged up tools with minor problems due to shifted stds of racked drill pipe & collars in derrick; 20:30 measured 3' of fill in well with logging tools; 21:16 began logging triple combination True Resistivity, Spectral Density and Dual Spaced Neutron logs in formation water; 23:00 Halliburton tools laid down and Propetroco owner/driller off location; 23:30 Halliburton delivered 8 sets of triple logs and 6 sets of Borehole Volume Plot to Dave Allin and Tom Warnes plus digital files to Halliburton long string cementers & Dave Allin; TD 1730'; SDFWE

2010-05-23 01:00 Halliburton off location; 08:15 arrangements for open hole swab testing cancelled in favor of running & cementing long string casing due to verification of brine water in the Wingate Ss proposed injection interval; **Open hole log tops depths and elevations measured from 4874' KB elevation:**

Dakota Sandstone (Kd)	11'	+4863'
Cedar Mountain Fm (Kcm [K-1])	109'	+4765'
Morrison Fm		
Brushy Basin Member (Jmbb [K-0])	180'	+4694'
Salt Wash Member (Jmsw)	552'	+4322'
Tidwell Member (Jmt)	826'	+4048'
Summerville Fm (Js [J-5])	850'	+4024'
Curtis Fm		
Moab Tongue Member (Jctm)	885'	+3989'
Entrada Sandstone		
Slick Rock Member (Jes [J-3])	992'	+3882'
Kayenta Fm (Jk [J-2])	1143'	+3731'
Wingate Sandstone (Jw)	1342'	+3532'
Chinle Fm (Trc [J-0])	1679'	+3195'

The static fluid level logged in the well was 525'; Formation water resistivity (Rw) calculations made from the open hole logs for a representative layer of the Entrada Ss aquifer in the Jctm 962-66' with 26% porosity & 3 ohm-meters deep resistivity at 81° F estimated formation temperature indicated an equivalent pure NaCl solution of 23,000 ppm; **Rw calculations made from the open hole logs for a representative layer of the upper Wingate Ss aquifer (part of the proposed injection interval) 1346-94' with 22% porosity & 4 ohm-meters deep resistivity at 81° F estimated formation temperature indicated an equivalent pure NaCl solution of 22,500 ppm;** These calculations conformed favorably with the analyses of water samples collected while drilling and from overnight fill up reported earlier; TD 1730'; SDFWE

2010-05-24 08:00 High winds caused full day delay of laying down drill pipe; Casing crew and long string cementing ops schedule amended; Halliburton delivered DV tool and plug; TD 1730'; SDFWE

2010-05-25 07:30 Propetroco crew began laying down drill collars and drill pipe; 14:00 Weatherford casing crew on location; Preparations were begun to run casing but the power tongs deployed were too large to work safely on the rig; Work delayed until following day when more compact power tongs that have been previously used on Propetroco Rig 1 could be delivered; TD 1730'; 16:00 SDFN

2010-05-26 07:30 Began running 5.5" J-55 15.5 ppf long string with guide shoe on bottom, first centralizer clamped above the guide shoe, float collar on top of first jt (45'), second centralizer clamped above the float collar, additional centralizers on each following collar, DV tool 430' above guide shoe to land at 1300' KB and centralizers on every other collar until casing string was landed at 1730' KB; 10:00 Halliburton cementers on location; 14:50 Casing crew RD & began first stage LS cement operations; 14:58 Pumped 49 bbls water down the casing to ensure circulation; 15:17 Pumped 18.8 bbls first stage cement composed of 50 sks mixed to yield 2.11 cuft/sk Halliburton Versacem™ System 12.3 ppg slurry; 15:34 dropped first stage plug; 15:55 completed displacement of 42 bbls of water after some pump inlet blockage problems & bumped the plug in the float collar with 1,575 psi; 16:03 Bumped plug again with 1,610 psi after well went on vacuum & unknown volume of water was used to refill well; 16:20 Dropped DV tool opening device and opened the tool with 670 psi; 16:22 Circulated well with 60 bbls of water (broke circulation after first 10 bbls); 16:56 First stage completed & planned to pump second stage the following day; Cementers remained on location overnight; TD 1730'; 18:00 SDFN

2010-05-27 02:00(?) Cementers filled casing with 32 bbls water; 04:46 Cementers filled casing with 19 bbls water; 7:30 Propetroco crew on location; 09:00 Called off second stage cement operations to condition well with mud to minimize additional fluid losses; 11:00 Cementers RD & off location; Changed blooie line out & added flow line to steel mud pit & mixed mud; TD 1730'; 17:30 SDFN

2010-05-28	07:30 Propetroco crew on location; Mixed mud, filled casing with 21 bbls & circulated to condition formation for second stage cement; Casing was left full; TD 1730'; 14:00 SDFWE
2010-05-29	Memorial Day weekend; TD 1730'; SDFWE
2010-05-30	Memorial Day weekend; TD 1730'; SDFWE
2010-05-31	09:30 Conditioned mud (8.6 ppg with 48 viscosity) & circulated well through DV tool; 11:30 shut down pump to check on loss; Mud loss after was 1" from pit or about 8 bbls; TD 1730'; 12:30 SDFN
2010-06-01	Well appeared to be conditioned properly for further cementing operations & Halliburton was notified to pump second stage LS cement on the following day; No operations; 1730' TD; SDFN
2010-06-02	06:30 Halliburton cementers on location; 07:30 Propetroco crew on location to RU cementers to pump second stage of LS cement; 09:24 Began pumping 40 bbls water spacer & broke circulation after 4.5 bbls; 09:51 Dropped plug after pumping 7 bbls of 12.8 ppg Halliburton Versacem™ System slurry composed of 20 sks to yield 2.00 cuft/sk; 10:00; Landed plug at 75 psi & bumped plug in DV tool with 1,380 psi after pumping 31 bbls water for displacement; Good circulation throughout job; 11:05 Cementers left location; Propetroco crew nippled down 11" rotating head & blooie line & nippled up 7" rotating head; 1730' TD; 15:45 SDFN
2010-06-03	07:30 Propetroco crew on location; PU 4.75" PDC bit, Bit 3, cleaned casing out through the DV tool & on down to 1680' & TOH; 1680' PBTD; 15:45 SDFN
2010-06-04	07:30 Propetroco crew on location; Rigged up Rocky Mountain Wireline Service & recorded Sector Bond (CBL)/GR/CCL log; Verified excellent cement bond from PBTD to 1480' & good cement bond from 1480' to 1336' covering the Wingate Ss, little or no cement from 1336' to the DV tool at 1300' and fair to good cement bond from 1300' to 900' at the top of the Entrada Ss; 12:00 RMWS RD & left the location; 1680' PBTD; 12:00 SDFWE
2010-06-05	1680' PBTD; SDFWE
2010-06-06	1680' PBTD; SDFWE
2010-06-07	08:00 Propetroco crew off while perforation plan was formalized and Utah DOGM was polled for guidance re additional cement work; 1680' PBTD; WOO
2010-06-08	08:00 Propetroco crew off while perforating contract was arranged; Updated Drilling/Completion report & transmitted to Utah DOGM; 1680' PBTD; WOO
2010-06-09	07:30 Propetroco crew rigged a 2.375" x 5.5" J-Type tubing packer on a 10' long 2.375" pup jt with a tee for blow down valve & gauge point & set it in the top of the 5.5" casing; 09:00 Rocky Mountain Wireline Service on location to RU for perforating ops; 10:00 The rig pump was used to fill the pup jt & packer assembly and pressurize it and the casing to 300 psi; 10:05 Pressure test good for first five minutes and then packer began leaking; Scheduling constraints precluded an overhaul or replacement of the packer; 10:50 RU RMWS sheaves on rig; 11:15 RMWS began first perforating run; 13:00 RMWS completed perforating ops in 5 runs & began RD; **Perforations were made in 11 zones in the Wingate Ss over the gross interval 1344-1631' (per 5-22-10 Halliburton triple) with 21 gram Owen Superhero charges loaded in 3.125" expendable, scalloped casing guns 4 spf phased 90° for a total of 552 .37" holes & optimal 43" penetration as follows:**

1344-1418'
1422-26'
1451-59'

1478-82'
1486-90'
1498-1506'
1513-17'
1526-30'
1543-53'
1560-68'
1621-31'

12:15 The fluid level in the well retreated to 200' between the third and fourth perforating runs; 13:45 unloaded fluid from csg w/285 psi air pressure after TIH w/bit and 27 stds of drill pipe with Kelly down to 1110' indicating that the fluid level in the csg was near 460'; 14:50 TIH 7 stds with Kelly down to 1360' & unloaded csg after 2 minutes of building air pressure; 15:07 TIH remaining 8 stds with bit set near 1660' or 20' above PBTD, unloaded csg & began circulation with air at 150 psi for production test; Air circulation produced water from the perforations at a rate near 15 gpm; Fluid recovery included mud, mud filtrate, displacement water from cementing & some formation water; **16:00 Collected water sample from flow line** & ended circulation after recovering about 50 bbls of fluid from unloading the csg & circulating the csg with air; 17:00 Allin dropped off water sample at Halliburton lab for analysis **(Halliburton lab report W200 June 10 SG at 60° F 1.009, pH 8.0, Rw 0.65 ohm-meter and calculated TDS 10,155 ppm)**; 1680' PBTD; SDFN

2010-06-10 07:30 Propetroco crew on location; 08:55 Completed TOH 5 stds & unloaded csg from 1460' with 280 psi air pressure indicating the fluid level in csg was near 820'; 09:02 completed TIH 5 stds to reset bit at 1660' & unloaded csg then began circulation with air at 150 psi to continue production test; Fluid recovery included mud, mud filtrate, displacement water & formation water; 3.5" tbg string delivered to the site; 09:40 fluid flow rate 13 gpm or 446 bpd from flow line; 10:40 fluid flow rate 13 gpm or 446 bpd; 11:40 fluid flow rate 11 gpm or 377 bpd; 12:40 fluid flow rate 12 gpm or 411 bpd; Fluid noticeably more saline; 13:40 fluid flow rate 12 gpm or 411 bpd; **14:40 fluid flow rate 11.5 gpm or 394 bpd & caught water sample in presence of Bart Kettle-Utah DOGM;** 14:45 shut down production testing operations; 15:40 Allin dropped off water sample at Halliburton lab for analysis **(Halliburton lab report W201 June 10 SG at 60° F 1.013, pH 7.8, Rw 0.36 ohm-meter and calculated TDS 34,378 ppm)**; 1680' PBTD; SDFN

2010-06-11 Operations suspended until information from testing could be analyzed & forwarded to Utah DOGM for consideration & a production packer could be lined up; 1680' PBTD; WOO

2010-06-12 1680' PBTD; SDFWE

2010-06-13 1680' PBTD; SDFWE

2010-06-14 07:30 Propetroco crew on site; TOH laying down drill pipe in preparation for setting permanent production packer; Fluid level appeared to be near 600'; Westwater Farms support crew prepared 3.5" tubing string; 15:00 shut down for day; 1680' PBTD; SDFN

2010-06-15 07:30 Propetroco crew on site; RU Rocky Mountain Wireline Service to position anchor & set permanent packer in the csg; Lance Messinger-DownholeTool Service on site with the permanent packer & setting instructions; The permanent packer was set with the hanger at 1272' and top of packer at 1269'; RD RMWS and SDFN; 1680' PBTD

2010-06-16 07:30 Propetroco crew on site; RU Weatherford crew to run tubing, but they had to delay to exchange tongs for more compact equipment suitable for use on the rig; Ran 3.5" EUE 9.3 ppf slightly used tbg with nipple on end to engage permanent packer to a point just above the packer; Circulated the formation water out of the csg and replaced it with water treated with corrosion inhibitors; Engaged the tbg into the packer, stretched out tbg & set the slips in the tbg head. Cut off the tbg & welded on a bell nipple; 1680' PBTD; SDFN

2010-06-17	Operations suspended pending issuance of an approval from Utah DOGM to convert the Harley Dome 1 for injection; Transmitted updated copy of daily reports to Utah DOGM; 1680' PBTD; WOO
2010-06-18	07:30 Propetroco crew on site; Rigged down, moved rig off substructure & hauled drill pipe to yard; Operations suspended pending issuance of an approval from Utah DOGM to convert the Harley Dome 1 for injection; 1680' PBTD; WOO
2010-06-19	Operations suspended pending issuance of an approval from Utah DOGM to convert the Harley Dome 1 for injection; 1680' PBTD; WOO
2010-06-20	Operations suspended pending issuance of an approval from Utah DOGM to convert the Harley Dome 1 for injection; 1680' PBTD; WOO
2010-06-21	Allin met with Chris Kierst, Dustin Doucet & Clint Dworshak at Utah DOGM office to obtain guidance on steps necessary to obtain approval for conversion for injection; Operations suspended pending issuance of an approval from Utah DOGM to convert the Harley Dome 1 for injection; 1680' PBTD; WOO
2010-06-22	Solicited proposals from contractors to perform remedial cement work on Harley Dome 1 to bring cement to the surface behind 5.5" LS csg; Operations suspended until remedial cement work is organized; 1680' PBTD; WOO
2010-06-23	Evaluated & corrected proposals from contractors to perform remedial cement work on Harley Dome 1 to bring cement to the surface behind 5.5" LS csg; Operations suspended until remedial cement work is organized; 1680' PBTD; WOO
2010-06-24	Evaluated & corrected proposals from contractors to perform remedial cement work on Harley Dome 1 to bring cement to the surface behind 5.5" LS csg; Operations suspended until remedial cement work is organized; 1680' PBTD; WOO
2010-06-25	Evaluated & corrected proposals from contractors to perform remedial cement work on Harley Dome 1 to bring cement to the surface behind 5.5" LS csg; Operations suspended until remedial cement work is organized; 1680' PBTD; WOO
2010-06-26	Evaluated & corrected proposals from contractors to perform remedial cement work on Harley Dome 1 to bring cement to the surface behind 5.5" LS csg; Operations suspended until remedial cement work is organized; 1680' PBTD; WOO
2010-06-27	Evaluated & corrected proposals from contractors to perform remedial cement work on Harley Dome 1 to bring cement to the surface behind 5.5" LS csg; Operations suspended until remedial cement work is organized; 1680' PBTD; WOO

Carol Daniels - Completion ops supplement Harley Dome 1; 43-019-31622

19S 25E 10

From: "David L Allin"
To: "Carol Daniels"
Date: 7/5/2010 8:34 PM
Subject: Completion ops supplement Harley Dome 1; 43-019-31622
CC: "Tom Warnes" , "James Patterson" , "Wayne Stout" , "Terry Leach"
Attachments: "Tom Warnes" , "James Patterson" , "Wayne Stout" , "Terry Leach"

Carol,

I hope you had a wonderful weekend, although the big summer holiday over there is still a couple weeks away. I mailed a copy of the supplemental CBL for this well to your attention last Friday so it should show up tomorrow on Tuesday. The supplement to the completion ops report is attached hereto.

Best wishes,

Dave
Consultant to Westwater Farms, LLC

David L. Allin
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Daily Completion Report Supplement 2010-07-05-20:15
Westwater Farms, LLC Harley Dome 1 Injection Well, API No. 43-019-31622
600.5' fnl and 2,139' fel (NWNE) Section 10, T19S, R25E, SLM, Greater Cisco Field, Grand County, Utah
Graded Ground Level (GL and Permanent Datum) Elevation 4,864' and Kelly Bushing (KB) Elevation 4,874'
All depths cited are drilling depths prior to open-hole logging
Submitted by David L. Allin, Well Construction Consultant to Westwater Farms, LLC

2010-06-28 07:30 Propetroco crew on site; Worked on site to be ready to lay down 3.5" tbg string; 13:30 completed fabrication of 3.5" lifting sub, removed slips from tubing head & backed out of permanent packer; 16:30 RMWS on site to RU to perf for cmt squeeze; 17:05 completed laying down 40.5 3.5" tbg jts; 17:25 TIH w/perf gun; 17:30 found fluid level near 600'; 17:42 perfed 5.5" J-55 15.5 ppf csg 858-62' 1 spf w/12 gram charges & TOH; 18:05 began 4.767" gauge ring run; 18:13 completed gauge ring run without incident & found fluid level near 500' on trip out; 18:30 Propetroco crew off location; 18:45 RMWS crew off location; 19:05 Allin notified Bart Kettle-Utah DOGM of possible cmt squeeze operations scheduled for following day if retrievable bridge plug (RBP) & squeeze packer could be delivered & positioned in a timely manner; TD 1680' PBTD; SDFN

2010-06-29 09:00 Allin on location & removed valves & nipples from surface csg head to be moved up to tbg head following cmt squeeze work; 11:10 Propetroco crew on site with equipment to run cmt squeeze tools on drill pipe; Completed adjustment to primary clutch on rig; 13:00 repositioned rig over wellhead; 13:30 Halliburton tool hand on site with RBP, squeeze (RTTS) packer, crossovers, running tools & spares for each; 14:30 began running RBP but lack of weight to push it into csg required pulling drill pipe into csg with rig pulldown chains; 15:00 fifth jt of drill pipe added enough weight to move RBP down csg; 17:00 RBP set with drill pipe at 940' (near 945' KB with rig off substructure); 17:25 completed TOH w/drill pipe; 17:40 poured 170 lbs of 20/40 frac sand in csg to cover RBP w/12' of sand; 18:00 PU squeeze packer & began TIH; 18:54 completed setting packer w/drill pipe at 780' (near 785' KB); 19:00 Propetroco crew off location; Allin notified Bart Kettle-Utah DOGM of cmt squeeze ops scheduled for following day; TD 1680' PBTD; SDFN

2010-06-30 08:05 Allin on location & found Propetroco crew, water transport & Halliburton cmt pump crew already on site; Hunted for crossover to drill pipe from 2" NPT to connect Halliburton pump; 09:00 Bart Kettle-Utah DOGM on site; RU Halliburton & make final adjustments to cmt squeeze plan to correctly account for use of drill pipe & include 5 bbls of 17 ppg slurry to be pumped to set behind perfs; 10:30 held pre-job safety meeting; 10:59 Halliburton began pressure test of their equipment; 11:03 began injection test w/fresh water @ 2 bpm & injected a total of 7 bbls; 11:11 began pumping squeeze cmt composed of 140 sks to yield 21 bbls of 15.8 ppg slurry w/volume of 1.16 cuft/sk & 5 bbls of 17 ppg slurry; 11:23 began to pump 4.5 bbls fresh water displacement to follow the 26 bbls of squeeze cmt slurry; 11:26 shut in well with 2" valve mounted on top of drill pipe; Good returns throughout all pumping stages accomplished at 2 bpm; Returns included brine water from the Morrison Fm introduced by overnight fill after squeeze perfs were made followed by drilling mud & ending with injection test water with slight signs of cmt; Losses to the formation appeared to be minimal; 14:00 Halliburton crew RD and off location; 15:45 following 4.25 hrs to allow cmt to cure began ops to unset and remove packer; 16:35 after adjustment to rig hoist clutch & adding supplemental air pressure supply, squeeze packer was freed and began TOH after a tight pull for 12'; 18:00 completed TOH & laid down squeeze packer; Tight conditions appeared to be caused by rough rusty casing & shredded rubber packing elements from the squeeze packer; TD 1680' PBTD; WOC

2010-07-01 No operations; TD 1680' PBTD; WOC

2010-07-02 07:30 Propetroco crew on site; RU to drill out perf/squeeze site above 862' KB; 08:45 PU 4.75" rerun PDC bit & began TIH; 09:40 after TIH to 580' made up Kelly rod & unloaded displacement water from csg with rig compressor; 09:45 TIH to 780' made up Kelly rod & unloaded water from csg; 09:54 began drilling out cmt by picking up first single jt of drill pipe; 10:15 contacted cmt top near 830' KB & began drilling out cmt; 10:30 drilled through cmt near 864' KB; Found some cmt in csg below

perf/squeeze site to drill then TIH w/two drill pipe stds to tag up on top of sand over RBP at 936' KB; 11:05 began TOH with bit; 11:30 laid down bit; 11:35 began refilling csg w/fresh water for pressure test; 12:20 RU for pressure test using rig pump; Pumped up to 250 psi & held for 12 minutes; 12:42 attempted to increase pressure to 300 psi but leak began in rig plumbing downstream from pump outlet before Kelly hose; 13:00 RU RMWS to acquire supplemental CBL over cmt squeeze area; 14:00 completed acquisition of log & RD RMWS; Log tied at the top of the Entrada SS by Gamma Ray curve & indicated good cement from squeeze perfs over the entire Morrison Fm from 864' KB, across the 9.625" surface csg shoe at 224' KB & on up to 98' KB; 14:20 RMWS & Propetroco off site; 16:30 Allin picked up final copies of supplemental CBL & mailed one to Utah-DOGM; TD 1680' PBTD; SDFWE

2010-07-03 No operations over Independence Day holiday weekend; TD 1680' PBTD; SDFWE

2010-07-04 No operations over Independence Day holiday weekend; TD 1680' PBTD; SDFWE

2010-07-05 No operations over Independence Day holiday weekend; Updated completion operations report & transmitted copy to Utah DOGM; TD 1680' PBTD; SDFWE

Carol Daniels - Harley Dome 1; 43-019-31622 ops rpt 19S 25E 10

From: "David L Allin"
To: "Carol Daniels"
Date: 7/17/2010 2:54 PM
Subject: Harley Dome 1; 43-019-31622 ops rpt
CC: "Tom Warnes" , "James Patterson" , "Wayne Stout" , "Terry Leach"
Attachments: "Tom Warnes" , "James Patterson" , "Wayne Stout" , "Terry Leach"

Carol,

I have attached an updated daily operations report supplement and annotated report of the step-rate injection and internal mechanical integrity tests that was performed on the well earlier this week. Enjoy the big weekend coming up.

Dave
Consultant to Westwater Farms, LLC

David L. Allin
Vice President, Exploration Manager
Del-Rio Resources, Inc.
AAPG DPA Certified Petroleum Geologist 2934
Professional Geologist Utah DOPL 5526699-2250
475 Seasons Drive
Grand Junction, CO 81507-8749
970-254-3114
allinpro@bresnan.net

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Daily Completion Report Supplement 2010-07-17-15:00
Westwater Farms, LLC Harley Dome 1 Injection Well, API No. 43-019-31622
600.5' fnl and 2,139' fel (NWNE) Section 10, T19S, R25E, SLM, Greater Cisco Field, Grand County, Utah
Graded Ground Level (GL and Permanent Datum) Elevation 4,864' and Kelly Bushing (KB) Elevation 4,874'
All depths cited are drilling depths prior to open-hole logging
Submitted by David L. Allin, Well Construction Consultant to Westwater Farms, LLC

2010-07-06 07:30 Propetroco crew on site; 09:00 began TIH w/retrievable bridge plug (RBP) retriever on drill pipe & tagged up on fill at 898' KB that was presumed to be sand over the RBP at 936' KB during previous operations on July 2; Bridge could not be circulated out & was presumed to be cement in the casing; 10:44 began TOH to lay down RBP retriever & pick up 4.75" rerun PDC bit; 11:20 made up bit on sub & began TIH; 11:35 drilled about 15' of cement in two bridges & began circulating sand from 936' KB; 12:00 tagged up on RBP at 945' KB & continued circulation to remove sand; 12:50 began TOH w/bit; 13:00 spotted first 500 bbl frac tank for step-rate testing water supply & began filling same; 13:20 broke off bit & made up RBP retriever on drill pipe; 13:25 began TIH w/RBP retriever; 14:07 tagged up on RBP & began circulation; 14:30 latched into RBP, reciprocated up & down & began TOH w/RBP; 15:45 returned RBP to Halliburton; 16:00 Propetroco crew off site; 16:30 Allin off site after telcon w/Tom Warnes re plans to schedule step-rate injection (SRI) & internal mechanical integrity (IMI) tests; TD 1680'PBTD; SDFN

2010-07-07 07:30 Propetroco crew on location; 08:00 began laying down drill pipe; 14:30 made preparations to run 3.5" tbg; 15:00 second 500 bbl frac tank delivered & filling with fresh water began; 16:00 Propetroco crew off location; TD 1680' PBTD; SDFN

2010-07-08 07:30 Propetroco crew on location; Ran 3.5" tbg & tagged up on permanent packer at 1270' KB; Filled casing with 30 bbls of fresh water treated with corrosion inhibitor to flush formation water down through packer site into perfs; Stabbed tbg into permanent packer & topped off backside with treated water; 16:30 Propetroco crew off site; Arrangements made to stand by for next available pumping equipment from BJ Services to perform SRI & IMI tests; Bart Kettle-Utah DOGM notified of first possible test on July 13; TD 1680' PBTD; WOE

2010-07-09 No well operations; Continued water deliveries to frac tanks; TD 1680' PBTD; WOE

2010-07-10 No operations; TD 1680' PBTD; WOE

2010-07-11 No operations; TD 1680' PBTD; WOE

2010-07-12 No operations; Bart Kettle-Utah DOGM notified that testing was scheduled; TD 1680' PBTD; WOE

2010-07-13 07:30 Propetroco crew on site; Bart Kettle-Utah DOGM on site; RU BJ Services to pump SRI & IMI tests; 10:57 began pumping fresh water down the tbg for Stage 1 of SRI at 1 bpm; 12:29 started Stage 8 **pumping at 7 bpm & induced a formation breakdown at 400 psi**; 13:10 completed 11 minutes of pumping Stage 11 at 13 bpm with pressure leveled off at 477 psi; Instantaneous shutdown pressure was 250 psi; 13:47 remaining pressure of 122 psi was bled off the tbg; 14:14 pressured up tbg x csg annulus above permanent packer to 449 psi for IMI test but pressure slowly leaked off to 420 psi; 14:42 after isolating the pump truck from the test the annulus was pressured to 439 psi; **15:08 pressure held for 26 minutes indicating good IMI;** 16:25 RD BJ Services & its pumping equipment & crew left location; 16:30 Propetroco crew off location; Considering the top perf at 1344' KB & fresh water column of that height **the pressure gradient to induce a fracture appears to be 0.73 psi/ft**; The pumping rate to induce a formation breakdown in the well appears to be between 6 and 7 bpm; The instantaneous shutdown pressure of 250 psi indicates the pressure gradient to maintain an open fracture is 0.62 psi/ft; The return to a level pumping pressure of 477 psi while pumping Stage 11 at 13 bpm is curious and may indicate participation of additional perfs that did not initially take fluid; Refer to the copy of the 3 page report from BJ Services dated July 13, 2010 with annotations by Allin; Operations suspended until

approval for conversion to injection is obtained from Utah DOGM and all UIC permit requirements are fulfilled; TD 1680' PBTD; SI

2010-07-14	Operations suspended; TD 1680' PBTD; SI
2010-07-15	Operations suspended; TD 1680' PBTD; SI
2010-07-16	Operations suspended; TD 1680' PBTD; SI
2010-07-17	Operations suspended; Updated completion operations report & transmitted copy to Utah DOGM; TD 1680' PBTD; SI

Notes by David L. Allin
7-17-2010

STIMULATION TREATMENT REPORT

Date 13-JUL-10 District Grand Junction F.Receipt 1001649220 Customer Westwater Farms
Lease Harley Dome #1 Well Name Harley Dome #1
Field Location
County Grand State Utah Stage No 1 Well API 43-019-31622

WELL DATA Well Type: OLD Well Class: DISPOSAL Depth TD/PB: 1360 Formation:

Geometry Type	Tubular Type	OD	Weight	ID	Grade	Top	Bottom
TUBULAR	CSG	5.5	15.5	4.95	J-55	0	1764
	TBG	3.5	9.3	2.99	J-55	0	1272

Perf Intervals

Top	Bottom	SPF	Diameter
0	0	0	0
1344	1631	4	0.37"
552 holes			

Packer Type Packer Depth 1260 FT

TREATMENT DATA

Fluid Type	Fluid Desc	Pumped Volume(Gals)	Prop. Description	Volume Pumped(Lbs)
TREATMENT FLUID	Water	1000 bbls on hand 80	NO PROPPANT	

Total Prop Qty:

Previous Treatment Previous Production
Hole Loaded With Water Treat Via: Tubing ☒ ~~Casing~~ ☒ Anul. ☐ Tubing & Anul. ☐
Ball Sealers: In Stages Type
Auxiliary Materials

LIQUID PUMPED AND CAPACITIES IN BBLS.

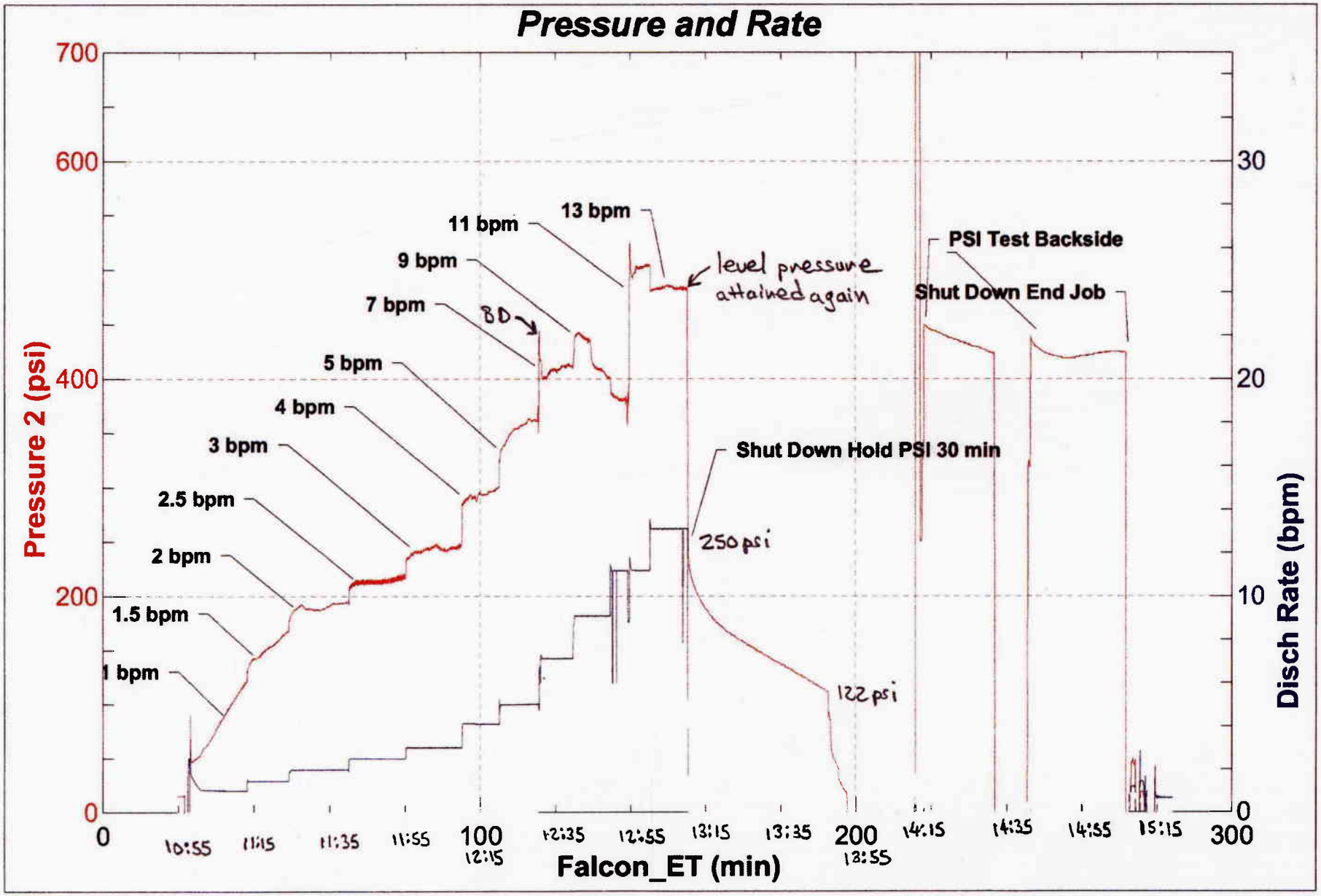
Tubing Cap.	11.5
Casing Cap.	2.38
Annular Cap.	15.24
Open Hole Cap.	5
Fluid to Load	11.5
Pad Volume	80
Treating Fluid	80
Flush	0
Overflush	0
Fluid to Recover	0

PROCEDURE SUMMARY

Time AM/PM	Treating Pressure-Psi STP	Annulus	Surface Slurry BBLS. Pumped Stage	Total		Slurry Rate BPM	Comments
10:32		Duration					start job
10:35	2600	(min)			?		pressure test lines
10:57	120	15	1	15	17	1	pump water
11:12	169	12	2	18	23	1.5	pump water
11:24	193	15	3	30	30	2	pump water
11:39	218	15	4	38	35	2.5	pump water
11:54	245	15	5	45	45	3	pump water
12:09	298	10	6	40	45	4	pump water
12:19	360	10	7	50	40	5	pump water
12:29	412	10	8	70	65	7	pump water
12:39	441	10	9	90	60	9	pump water
12:49	503	10	10	110	60	11	pump water
12:~~49~~ 59	504	11	11	143	80	13 ~~11~~	pump water
13:10	477				?		shut down hold pressure for 30min ISDP ± 250 psi
13:47	122			659			bleed off pressure
14:14	449						pressure up back side IMI first attempt
14:24							isolate pump truck , try to pressure again.
14:42	439						pressure test back again IMI OK
15:08							pressure held .
15:38							end job
16:00							post safety meeting
16:25							convoy safety meeting, depart location

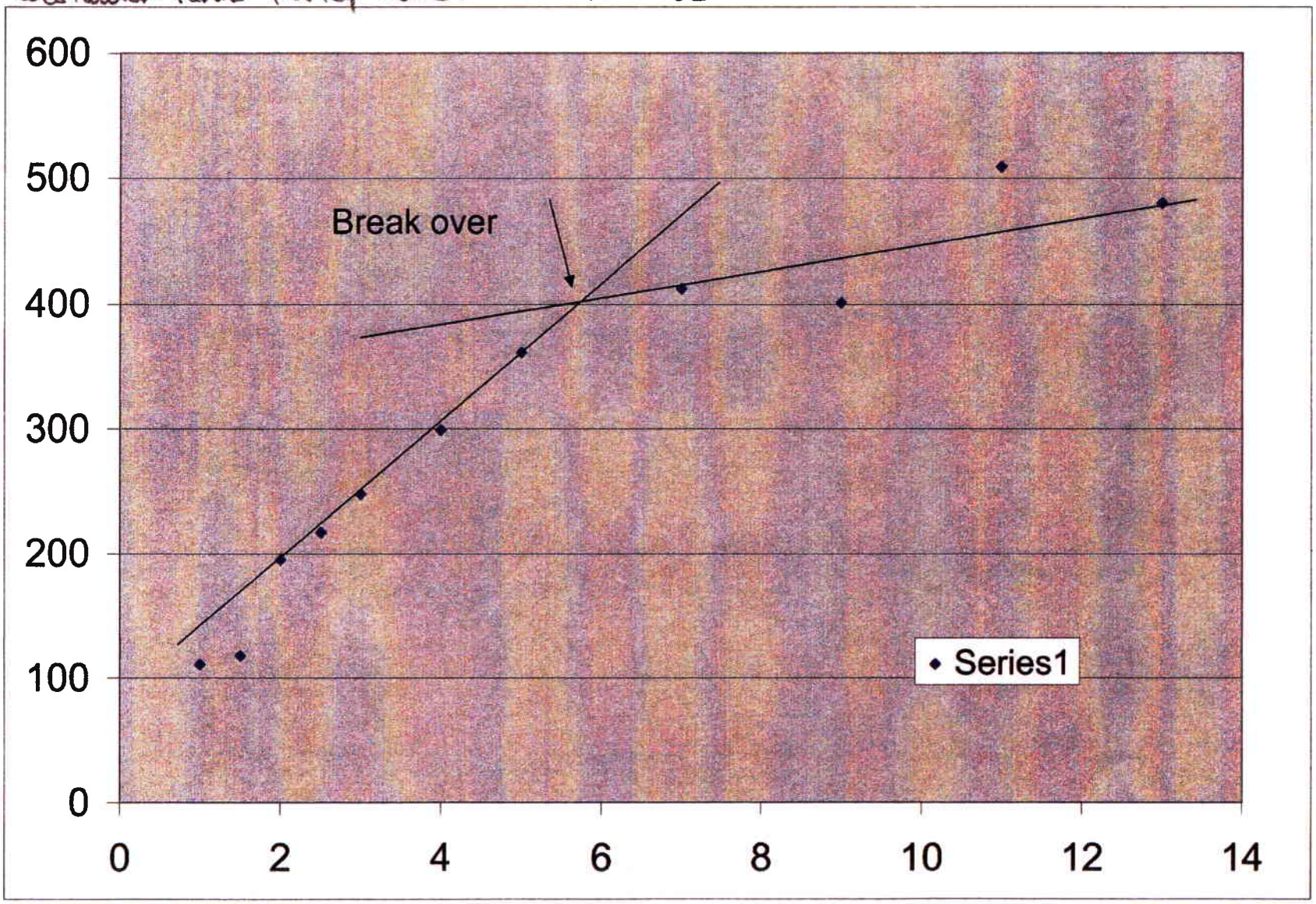
Treating Pressure		Injection Rates		Shut In Pressures		Customer Rep.	Tom Warns
Minimum	70	Treating Fluid	11	ISDP ±250	122	BJ Rep.	JOSE E CARCAMO
Maximum	449 504	Flush	80	5 Min.	0	Job Number	1001649220
Average	360	Average	6	10 Min.	0	Rec. ID No.	
Operators Max. Pressure				15 Min.	0	Distribution	
504 / 477				Final 122 In 30 Min.			
				Flush Dens. lb./gal.	8.34		

BJ Services JobMaster Program Version 3.20
Job Number: 1001649220
Customer: WestWater
Well Name: Harley Dome #1



2 of 3

Westwater Farms Harley Dome 1 43-019-31622



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AMENDED REPORT ☐ (Highlight changes) FORM 8

WELL COMPLETION OR RECOMPLETION REPORT AND LOG

5. LEASE DESIGNATION AND SERIAL NUMBER: UTU-82619
6. IF INDIAN, ALLOTTEE OR TRIBE NAME:
7. UNIT or CA AGREEMENT NAME:
8. WELL NAME and NUMBER: Harley Dome 1
9. API NUMBER: 4301931622
10 FIELD AND POOL, OR WILDCAT: Greater Cisco

1a. TYPE OF WELL: OIL WELL ☐ GAS WELL ☐ DRY ☐ OTHER Injection/Disposal

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

2. NAME OF OPERATOR: Westwater Farms, LLC

3. ADDRESS OF OPERATOR: P.O. Box 324 CITY Cisco STATE UT ZIP 84515 PHONE NUMBER: (970) 406-1466

4. LOCATION OF WELL (FOOTAGES)
AT SURFACE: 600.5' fnl, 2139' fel
AT TOP PRODUCING INTERVAL REPORTED BELOW: Vertical well below surface location
AT TOTAL DEPTH: Vertical well below surface location

11. QTR/QTR, SECTION, TOWNSHIP, RANGE, MERIDIAN: NWNE 10 19S 25E S
12. COUNTY: Grand
13. STATE: UTAH

14. DATE SPUDDED: 5/13/2010
15. DATE T.D. REACHED: 5/21/2010
16. DATE COMPLETED: 7/13/2010 ABANDONED ☐ READY TO PRODUCE ☑
17. ELEVATIONS (DF, RKB, RT, GL): 4874' RKB, 4864 GL

18. TOTAL DEPTH: MD 1,730 TVD 1,730
19. PLUG BACK T.D.: MD 1,680 TVD 1,680
20. IF MULTIPLE COMPLETIONS, HOW MANY? *
21. DEPTH BRIDGE PLUG SET: MD TVD

22. TYPE ELECTRIC AND OTHER MECHANICAL LOGS RUN (Submit copy of each)
GR, SP, Resistivity, Density-Neutron (OH combo) 5/22/2010, CBL 6-4-2010 and CBL 7-2-2010 (all filed)

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

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

HOLE SIZE	SIZE/GRADE	WEIGHT (#/ft.)	TOP (MD)	BOTTOM (MD)	STAGE CEMENTER DEPTH	CEMENT TYPE & NO. OF SACKS	SLURRY VOLUME (BBL)	CEMENT TOP **	AMOUNT PULLED
11"	8.625" J-55	24.00	0	224		A 50	10	0' circ	
7.875"	5.5" J-55	15.50	0	1,730	1,227	G 210	52	96' CBL	

25. TUBING RECORD

SIZE	DEPTH SET (MD)	PACKER SET (MD)	SIZE	DEPTH SET (MD)	PACKER SET (MD)	SIZE	DEPTH SET (MD)	PACKER SET (MD)
3.5"	1,270	1,270						

26. PRODUCING INTERVALS

FORMATION NAME	TOP (MD)	BOTTOM (MD)	TOP (TVD)	BOTTOM (TVD)
(A) Wingate Ss	1,342	1,679	1,342	1,679
(B)				
(C)				
(D)				

27. PERFORATION RECORD

INTERVAL (Top/Bot - MD)	SIZE	NO. HOLES	PERFORATION STATUS
1,344 1,631	0.37	552	Open ☑ Squeezed ☐
			Open ☐ Squeezed ☐
			Open ☐ Squeezed ☐
			Open ☐ Squeezed ☐

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

DEPTH INTERVAL	AMOUNT AND TYPE OF MATERIAL

29. ENCLOSED ATTACHMENTS:
☐ ELECTRICAL/MECHANICAL LOGS ☐ GEOLOGIC REPORT ☐ DST REPORT ☐ DIRECTIONAL SURVEY
☐ SUNDRY NOTICE FOR PLUGGING AND CEMENT VERIFICATION ☐ CORE ANALYSIS ☐ OTHER:

30. WELL STATUS: SI

(5/2000)

(CONTINUED ON BACK)

31. INITIAL PRODUCTION

INTERVAL A (As shown in Item #26)

DATE FIRST PRODUCED:		TEST DATE: 6/10/2010		HOURS TESTED: 5.7		TEST PRODUCTION RATES: →	OIL – BBL: 0	GAS – MCF: 0	WATER – BBL: 105	PROD. METHOD: Circ w/air
CHOKE SIZE:	TBG. PRESS. 150	CSG. PRESS. 0	API GRAVITY	BTU – GAS	GAS/OIL RATIO	24 HR PRODUCTION RATES: →	OIL – BBL: 0	GAS – MCF: 0	WATER – BBL: 442	INTERVAL STATUS: Open

INTERVAL B (As shown in Item #26)

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

INTERVAL C (As shown in Item #26)

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

INTERVAL D (As shown in Item #26)

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

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

33. SUMMARY OF POROUS ZONES (Include Aquifers):

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

Formation	Top (MD)	Bottom (MD)	Descriptions, Contents, etc.
Morrison Fm	240	268	Ss bearing 31,000 ppm TDS water
Curtis Moab Mbr	885	992	Ss bearing 31,000 ppm TDS water
Entrada SR Mbr	992	1,143	Ss bearing 26-36,000 ppm TDS water
Wingate Ss	1,342	1,679	Ss bearing 53,000 ppm TDS water

34. FORMATION (Log) MARKERS:

Name	Top (Measured Depth)
Mancos Sh (Tununk Mbr)	0
Dakota Ss	11
Cedar Mountain Fm	109
Morrison Fm	180
Summerville Fm	850
Curtis Fm (Moab Mbr)	885
Entrada Ss (Slick Rock Mbr)	992
Kayenta Fm	1,143
Wingate Ss	1,342
Chinle Fm	1,679

35. ADDITIONAL REMARKS (Include plugging procedure)

Daily drilling and completion reports, produced water analysis reports and logs previously filed. Drilled for water inj/disposal.

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

NAME (PLEASE PRINT) David L Allin allinpro@bresnan.net 970-254-3114 TITLE Utah Prof Geologist 5526699-2250, Consultant

SIGNATURE D L Allin DATE 7/26/2010

This report must be submitted within 30 days of

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

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

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

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

Phone: 801-538-5340

Fax: 801-359-3940

(5/2000)

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

UIC FORM 1

APPLICATION FOR INJECTION WELL

Name of Operator: Westwater Farms, LLC	Utah Account Number: N	Well Name and Number: Harley Dome 1
Address of Operator: P.O. Box 23358 CITY Silverthorne STATE CO ZIP 80498	Phone Number: 970-513-8034	API Number: 43-019-31622
Location of Well: Footage: 600.5' fnl and 2,139.0' fel County: Uintah; QQ, Section, Township, Range: NWNE 10, T19S, R25E, SLM State: UTAH		Field or Unit Name: Greater Cisco; Lease Designation and Number: Westwater Farms

Is this application for expansion of an existing project?	Yes ☐	No ☒
Will the proposed well be used for: Enhanced Recovery?	Yes ☐	No ☒
Disposal?	Yes ☒	No ☐
Storage?	Yes ☐	No ☒
Is this application for a new well to be drilled?	Yes ☒	No ☐
If this application is for an existing well, has a casing test been performed?	Yes ☐	No ☐
Date of test: _____		

Proposed injection interval: from 870' to 1,670'

Proposed maximum injection: rate 10,000 bpd pressure 260 psig

Proposed injection zone contains oil ☐, gas ☐, and / or fresh water ☐ within ½ mile of the well.

List of attachments: Attachment 1: Plat showing wells & ownership; Att. 2: Well log excerpts and geological data; Att. 3: Submissions to comply with R649-5-2 including casing plan, casing test plan, operating limits and zonal confinement data, geological data on injection interval and confining layers and position of nearest USDW's; Att. 4: Water analyses;

ATTACH ADDITIONAL INFORMATION AS REQUIRED BY CURRENT UTAH OIL AND GAS CONSERVATION GENERAL RULES

Att. 5: Affidavit certifying that copies of this application were mailed to operators and owners within one-half mile radius of the proposed injection well.

I hereby certify that this report is true and complete to the best of my knowledge.

Name (Please Print) David L. Allin (970) 254-3114 Title Permit Agent allinpro@bresnan.net

Signature D L Allin Date May 21, 2009

(5/2002)

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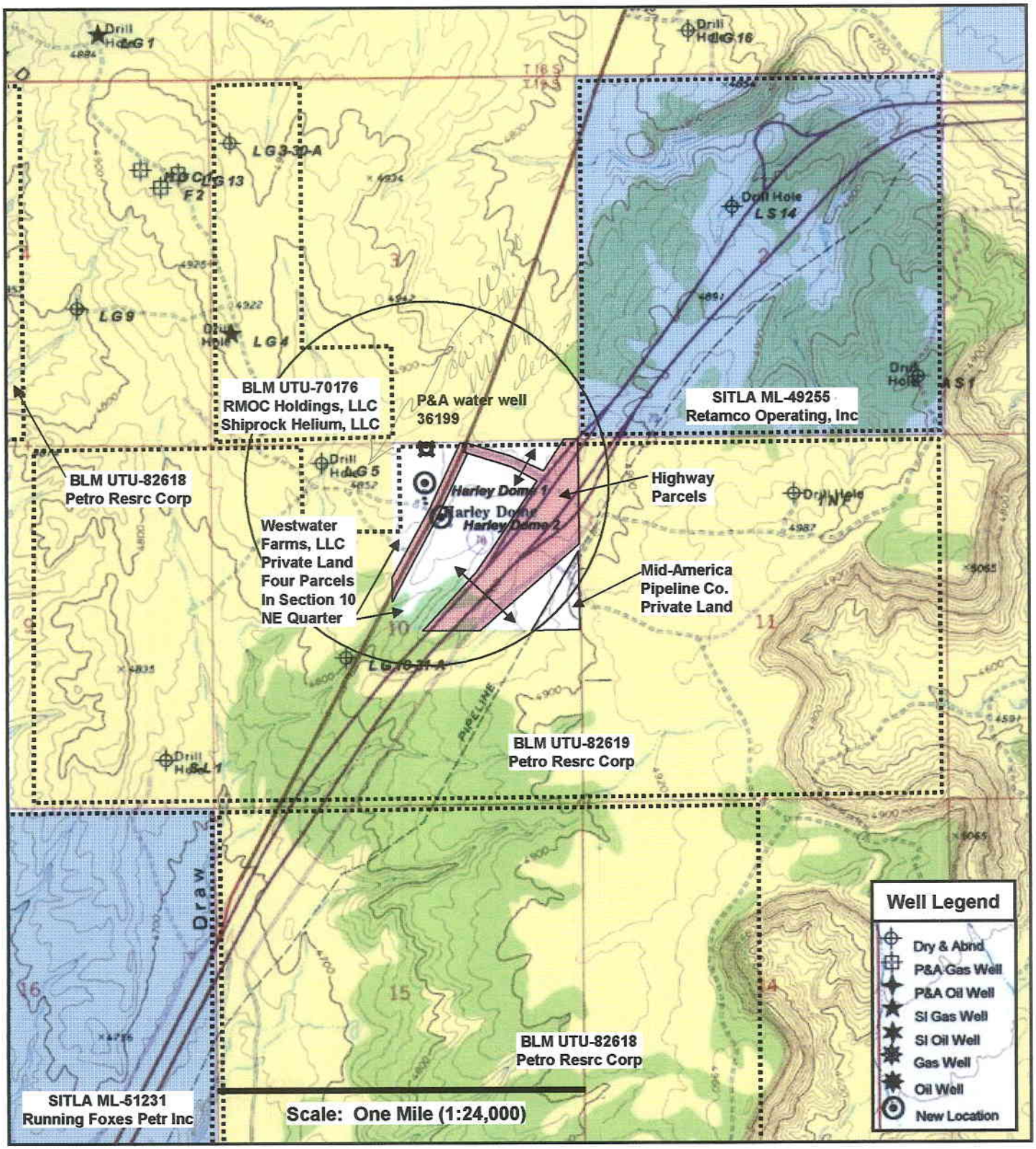
Attachment 1: Plat showing location of proposed Harley Dome 1 injection well in NWNE Section 10, T19S, R25E, SLM, Grand County, Utah, all abandoned or active wells, surface owners and O&G lessees and/or operators in the area and within a one-half mile radius area of review pertinent to this application submitted by Westwater Farms, LLC



U.S. managed by BLM | Utah managed by SITLA | U.S./Utah/County roads | Private

Oil & Gas Lease Issued by BLM or SITLA

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Attachment 1

Attachments 2-A-1 through 2-A-10: Offset Well Log Segments
UIC Permit Application for Harley Dome Produced Water Disposal Facility
Proposed by Westwater Farms, LLC, Box 23358, Silverthorne, CO 80498 (970) 513-8034

(Reduced) 5-17-68 Schlumberger SP & DIL and GR, Caliper & Density 2"=100' passes
Lansdale Government 13 SENE Section 4, T19S, R25E, SLM
Greater Cisco Field, Grand County, Utah

SCHLUMBERGER INDUCTION - ELECTRICAL LOG

COUNTY GRAND
FIELD or LOCATION LANSDALE
WELL LANSDALE NO. 13
COMPANY LANSDALE

ORIGINAL FORWARDED TO CASPER
COMPANY A. LANSDALE
43-019-30008
WELL LANSDALE NO. 13
FIELD LANSDALE
COUNTY GRAND STATE UTAH

LOCATION 1404' FNL & 407' FEL
Sec. 4 Twp. 19S Rge. 25E

Other Services: FDC-GR

Permanent Datum: GL, Elev. 4955
Log Measured From GL, Ft. Above Perm. Datum
Drilling Measured From GL

Elev.: K.B. ----
D.F. ----
G.L. 4955'

Date	5-17-68			
Run No.	ONE			
Depth—Driller	1820			
Depth—Logger	1814			
Btm. Log Interval	1813			
Top Log Interval	100			
Casing—Driller	7" @ 93'	@	@	@
Casing—Logger	---			
Bit Size	6 1/8			
Type Fluid in Hole	FGM			
Dens. / Visc.	-- / --			
pH / Fluid Loss	-- / -- ml	ml	ml	ml
Source of Sample	FLOW LINE			
R_m @ Meas. Temp.	1.25 @ 72 °F	@ °F	@ °F	@ °F
R_{mf} @ Meas. Temp.	1.05 @ 72 °F	@ °F	@ °F	@ °F
R_{mc} @ Meas. Temp.	---- @ -- °F	@	@	@
Source: R_{mf} / R_{mc}	M / C			
R_m @ BHT	--- @ -- °F	@ °F	@ °F	@ °F
Time Since Circ.	2 HOURS			
Max. Rec. Temp.	---- °F	°F	°F	°F
Equip. / Location	5602 / VERNAL			
Recorded By	PROBST			
Witnessed By	HELMKE - LANSDALE			

The well name, location and header information were furnished by the customer.

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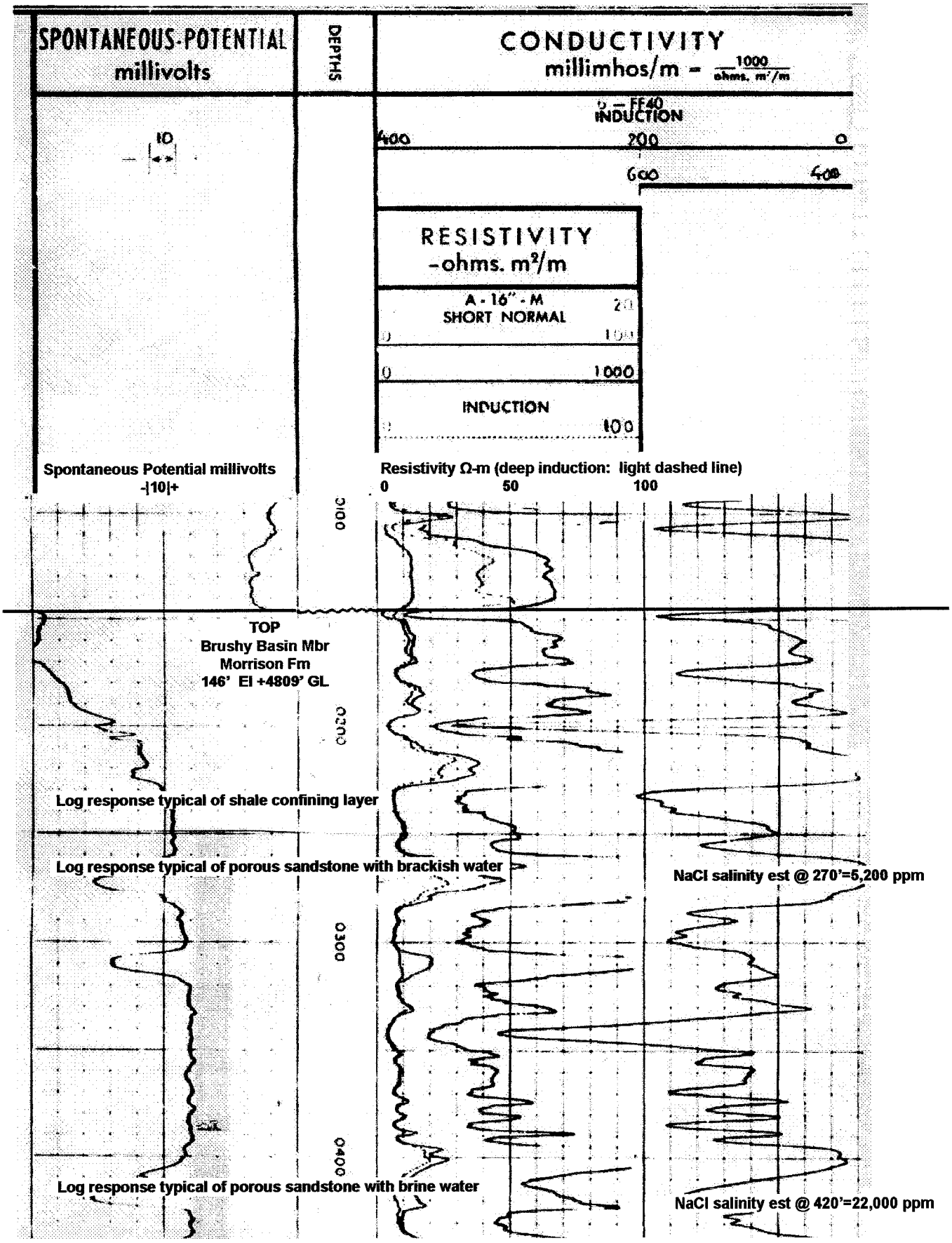
Attachment 2-A-1



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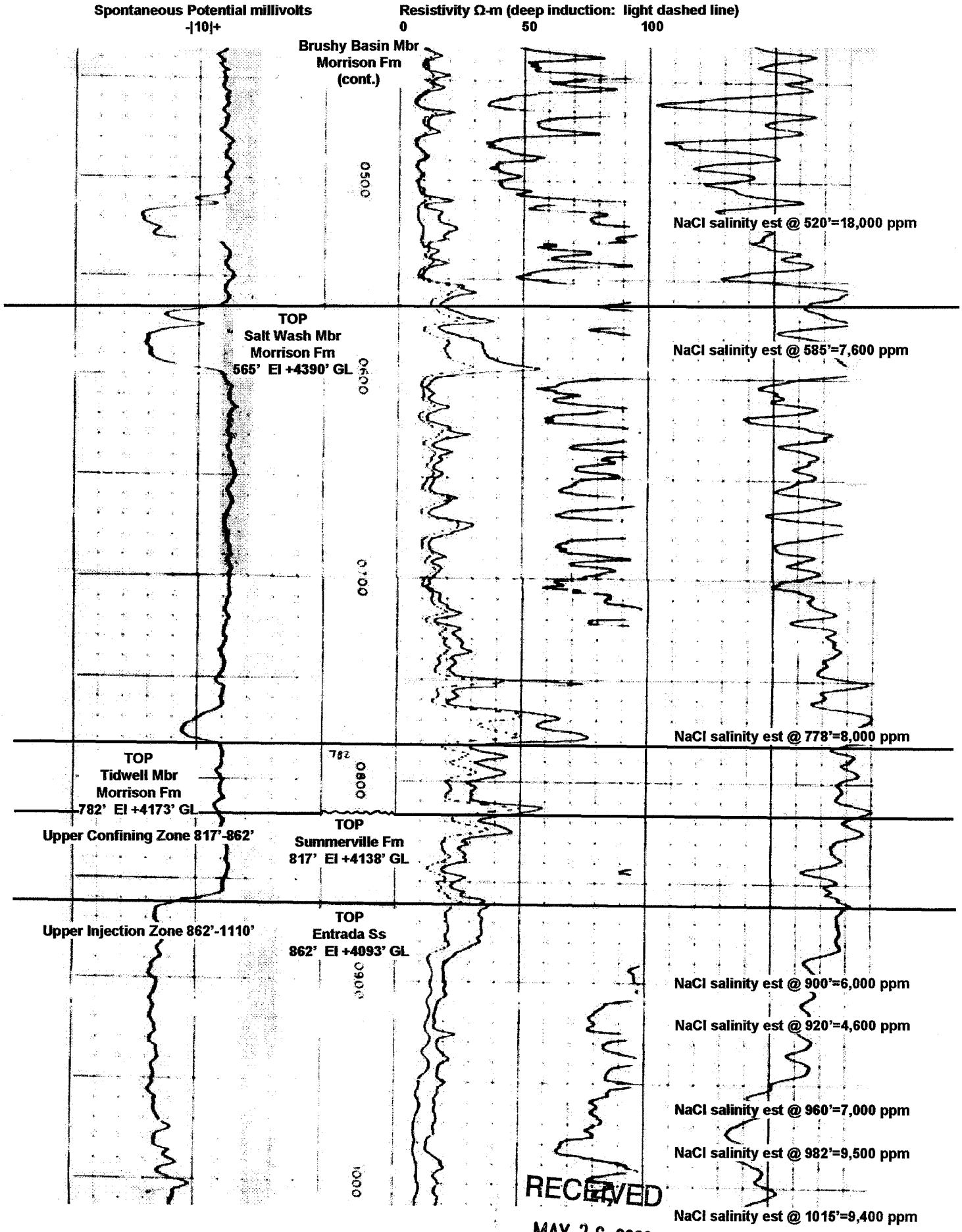

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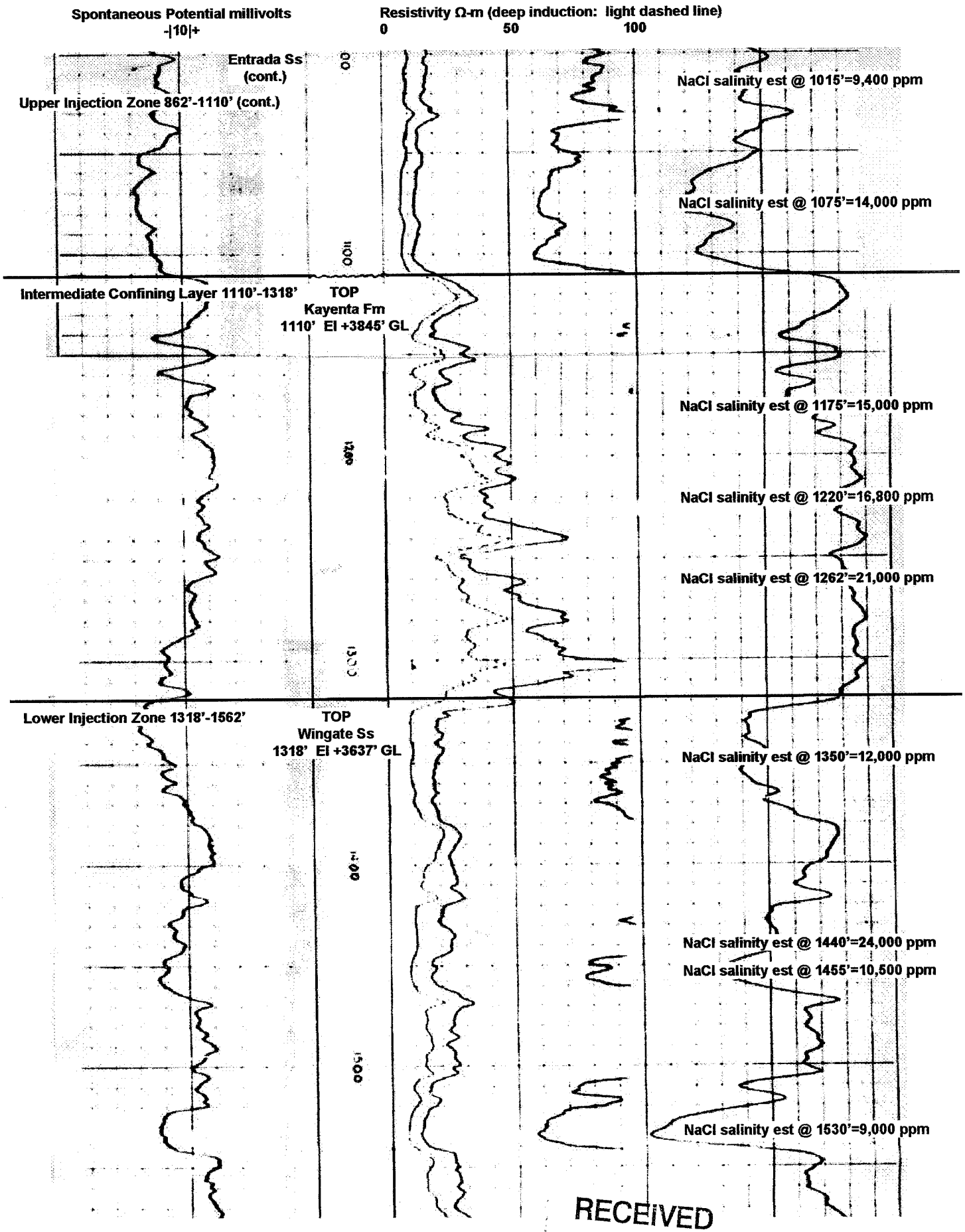

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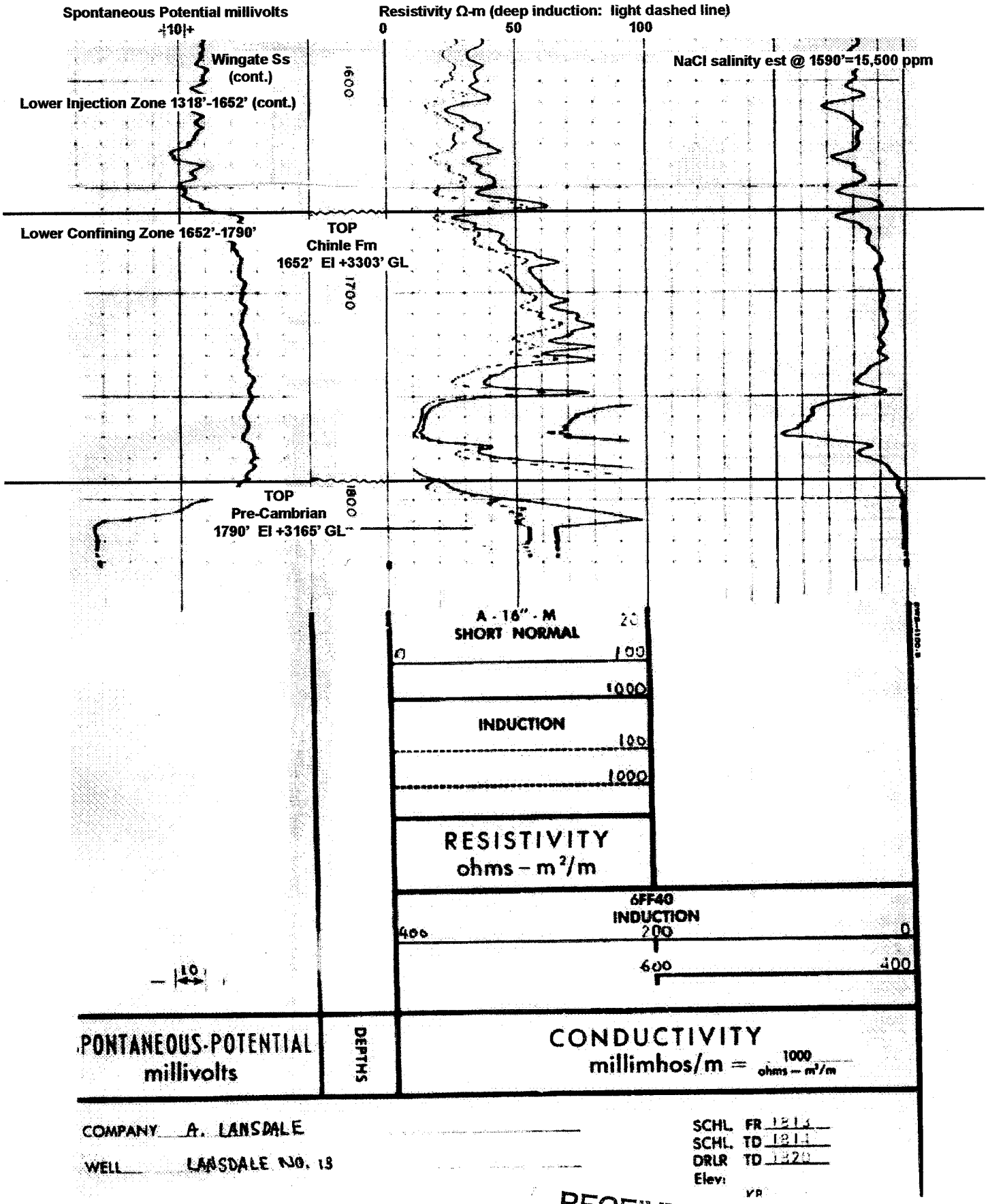

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SCHLUMBERGER

COMPENSATED FORMATION DENSITY LOG

Gamma-Gamma

COUNTY GRAND
FIELD or LOCATION LANSDALE
WELL LANSDALE NO. 13
COMPANY A. LANSDALE

ORIGINAL FORWARDED TO CASPER
COMPANY A. LANSDALE
43-019-30008
WELL LANSDALE NO. 13
FIELD LANSDALE
COUNTY GRAND STATE UTAH

Location: 1404' FNL 407' FEL
Sec. 4 Twp. 19S Rge. 25E

Other Services: IES

Permanent Datum: GL ; Elev.: 4955
Log Measured From GL , Ft. Above Perm. Datum
Drilling Measured From GL

Elev.: K.B. ----
D.F. ----
G.L. ----

Date	5-17-68		
Run No.	ONE		
Type Log	GAMMA GAMMA		
Depth—Driller	1820		
Depth—Logger	1814		
Bottom logged interval	1813		
Top logged interval	100		
Type fluid in hole	FGM		
Salinity, PPM Cl.	----		
Density	----		
Level	FULL		
Max rec. temp., deg F.	----		
Operating rig time	2 HOURS		
Recorded by	PROBST		
Witnessed by	HELENE LAMBERT		

RUN No.	BORE-HOLE RECORD Bit	From	To	CASING RECORD Size	Wgt.	From	To
ONE	6 1/8"	93'	1820'	7"	23#	SURFACE	93'

The well name, location and borehole reference data were furnished by the customer.

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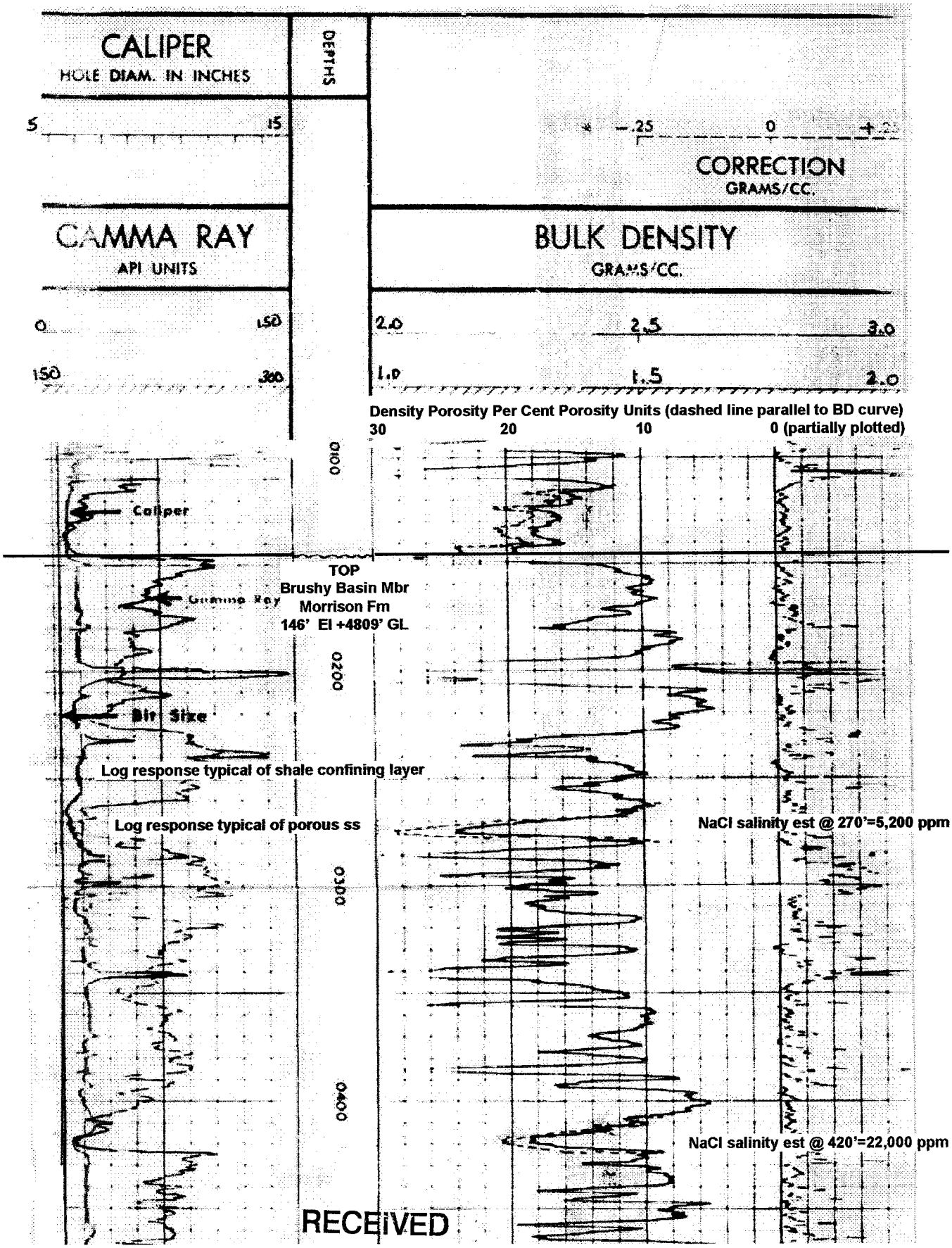

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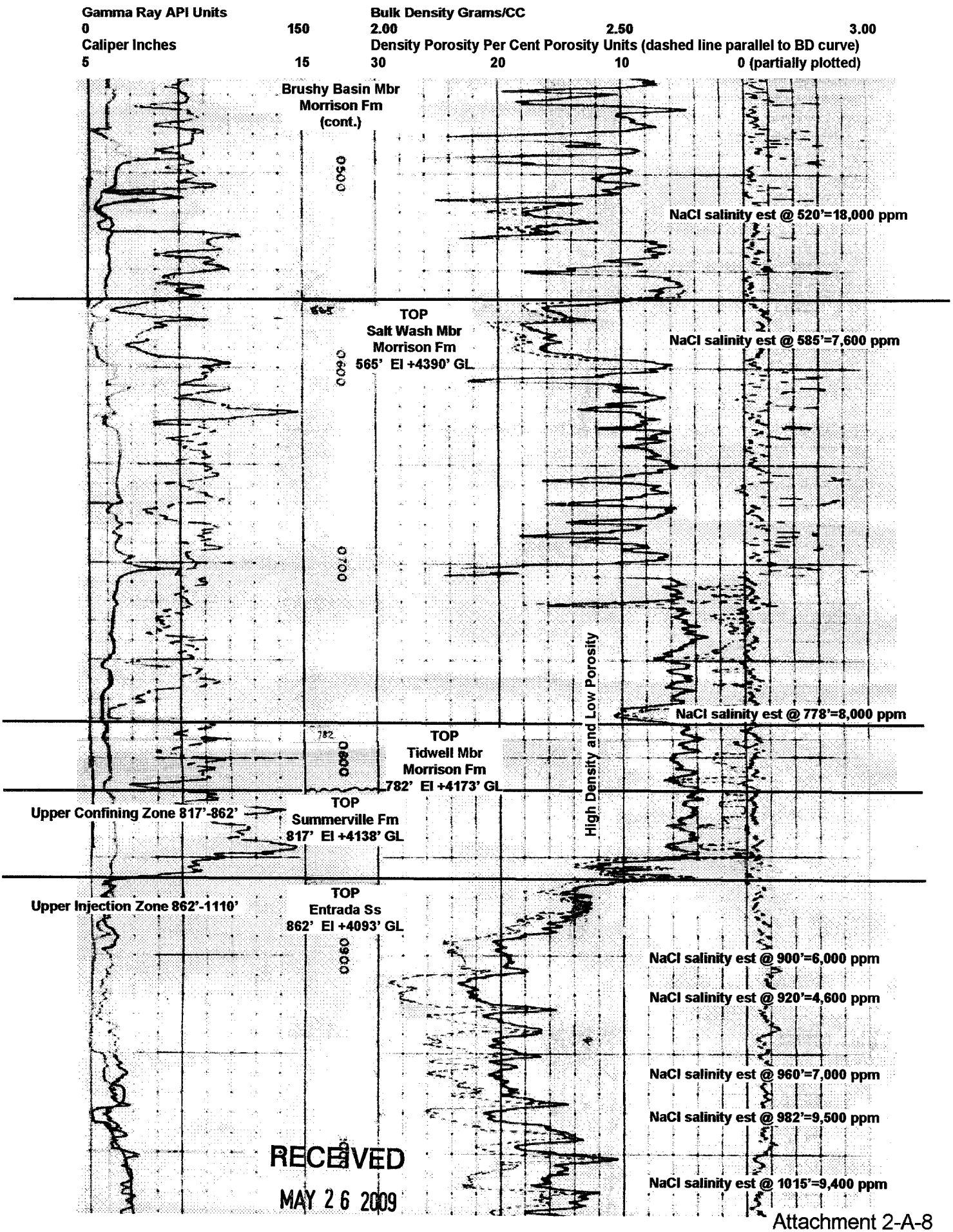

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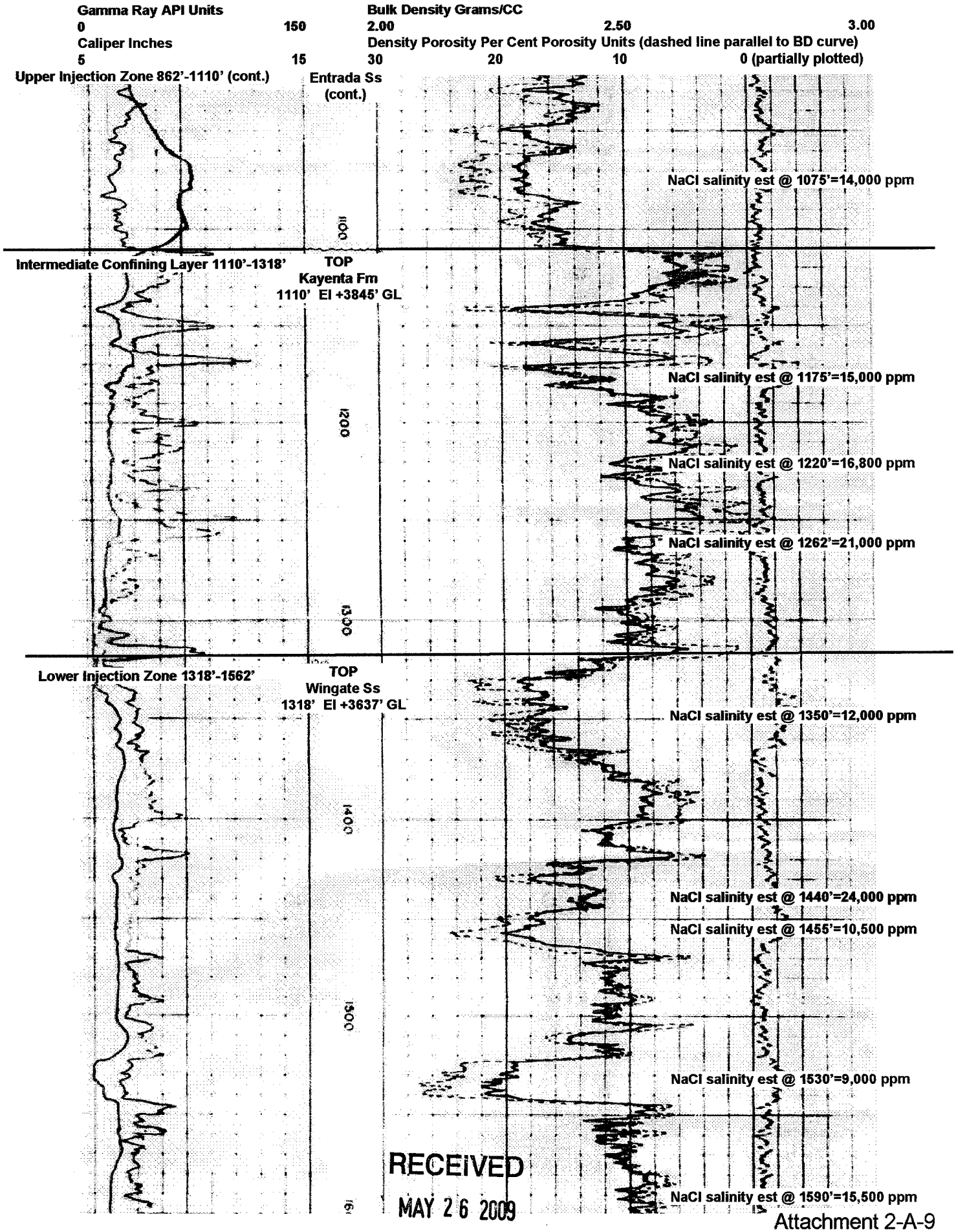

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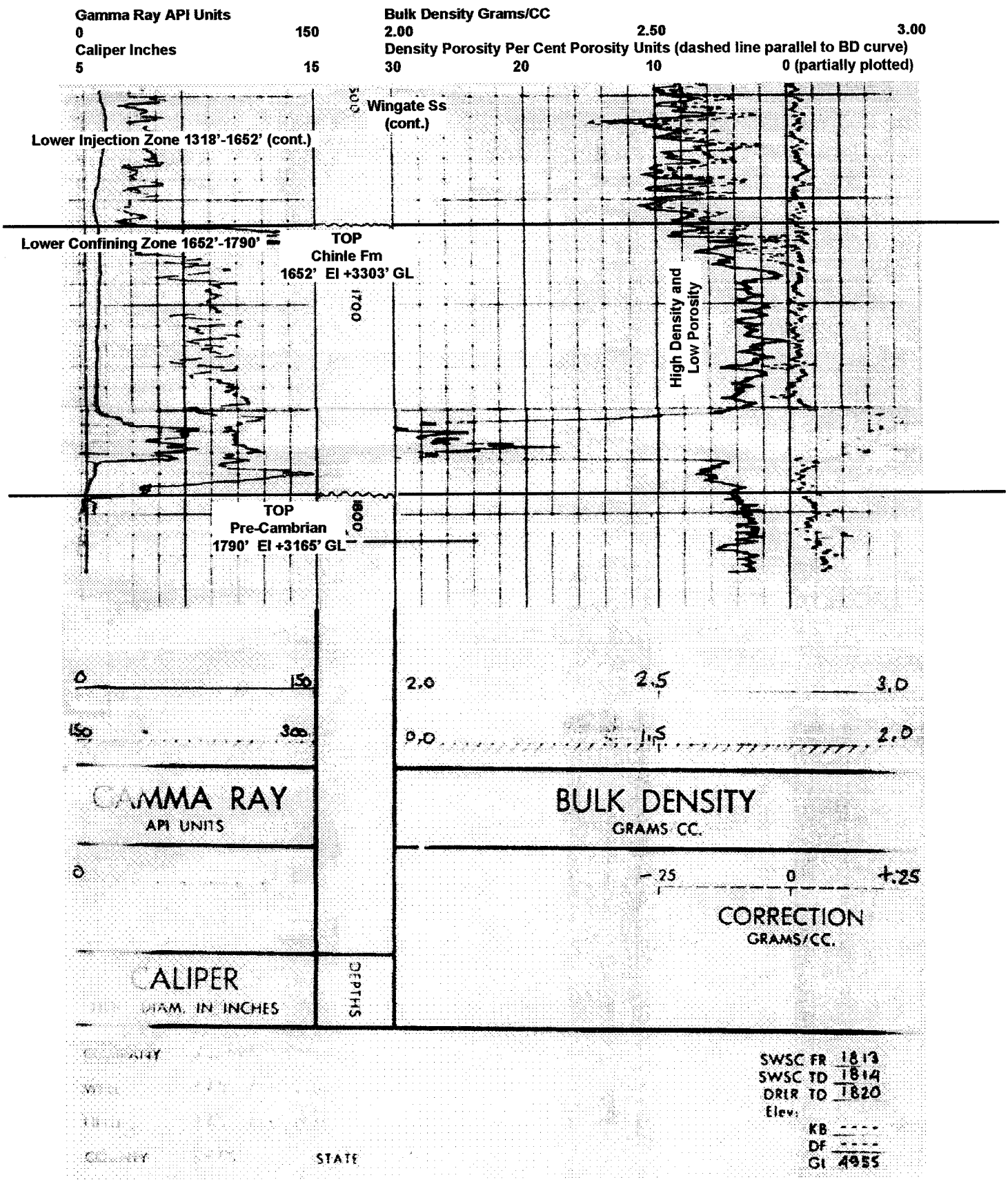
Attachment 2-A-10



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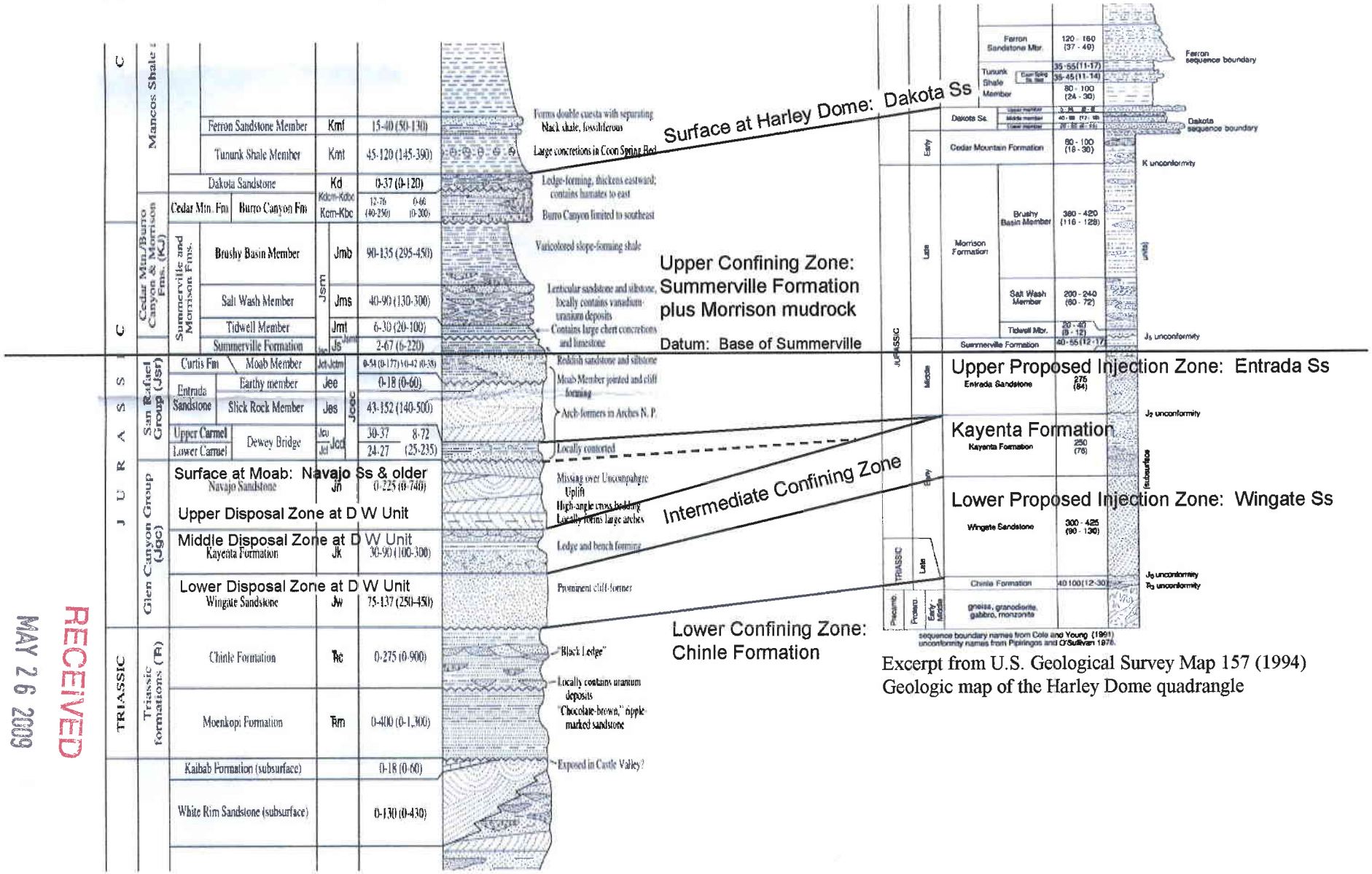
Attachment 2-A-10

Attachment 2-B: Correlation of Stratigraphic Columns in Grand County, Utah

Southwest
Southern Grand County including Arches NP and Moab

Northeast
Harley Dome, Eastern Grand County



Excerpt from U.S. Geological Survey Map 157 (1994)
Geologic map of the Harley Dome quadrangle

Excerpt form Utah Geological Survey Geologic Map 180 (2001)
Geologic Map of the Moab and eastern part of the San Rafael Desert 30' x 60' quadrangles

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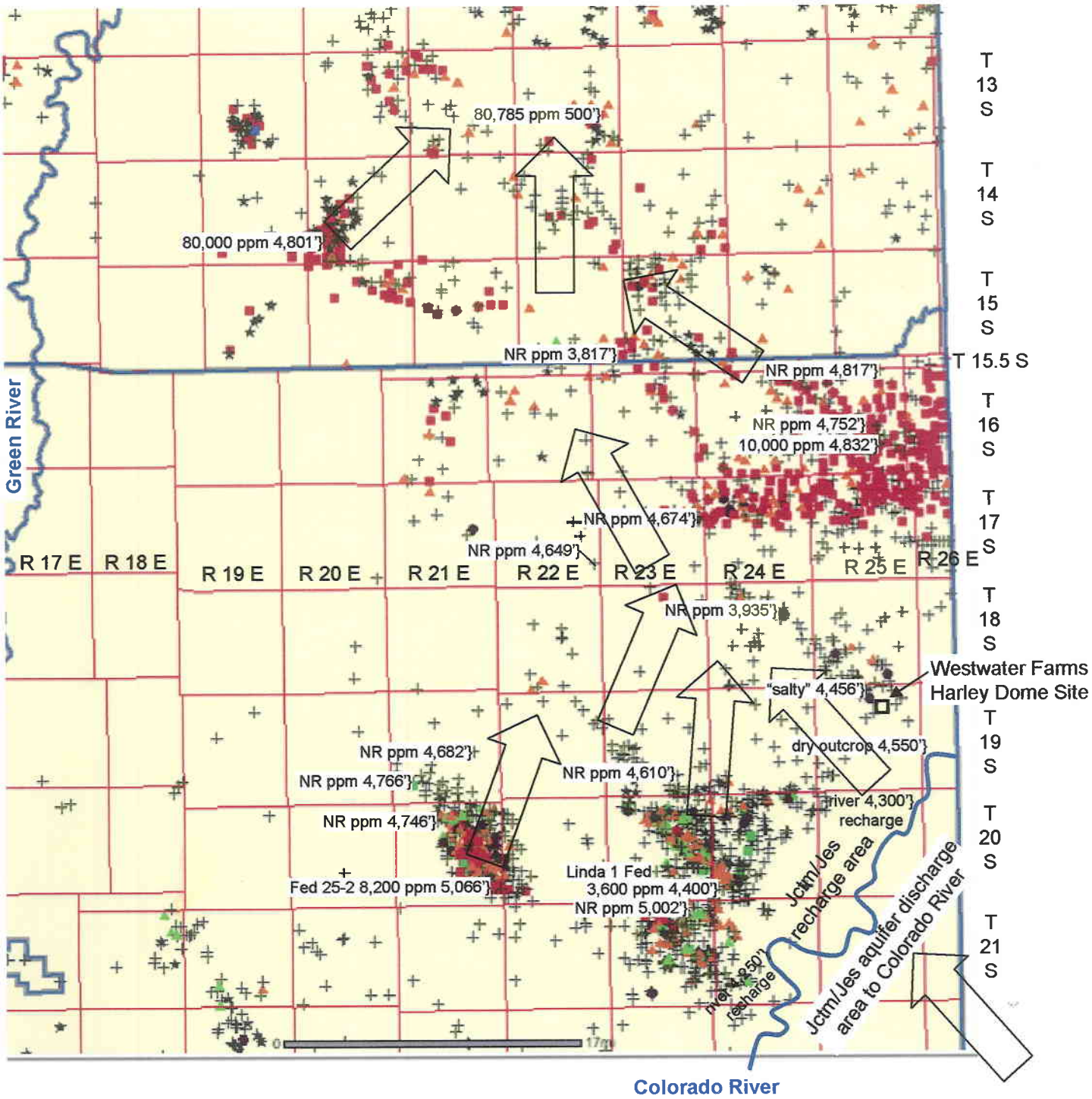
Attachment 2-C: Salinity Information and Head (Potentiometric Surface) Values Reported from Wells in Moab Member Curtis Formation (Jctm) and Slick Rock Member Entrada Sandstone (Jes) in Southern Uintah County and Northern Grand County, Utah
Oil and Gas Well Map Base from Utah DOGM Web Site Map Server
Data from U.S. Geological Survey Open-File Report 87-397 and David L. Allin Files

Block arrows depict probable water movement within confined Jctm/Jes aquifer.



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Attachment 2-C

Attachment 2-D: Geologic Structure Map of Southern Grand County, Utah Depicting the Setting of the Harley Dome Facility Proposed by Westwater Farms, LLC on the Uncompahgre Uplift/Entrada & Wingate Watershed and Moab on the LaSal/Glen Canyon Watershed

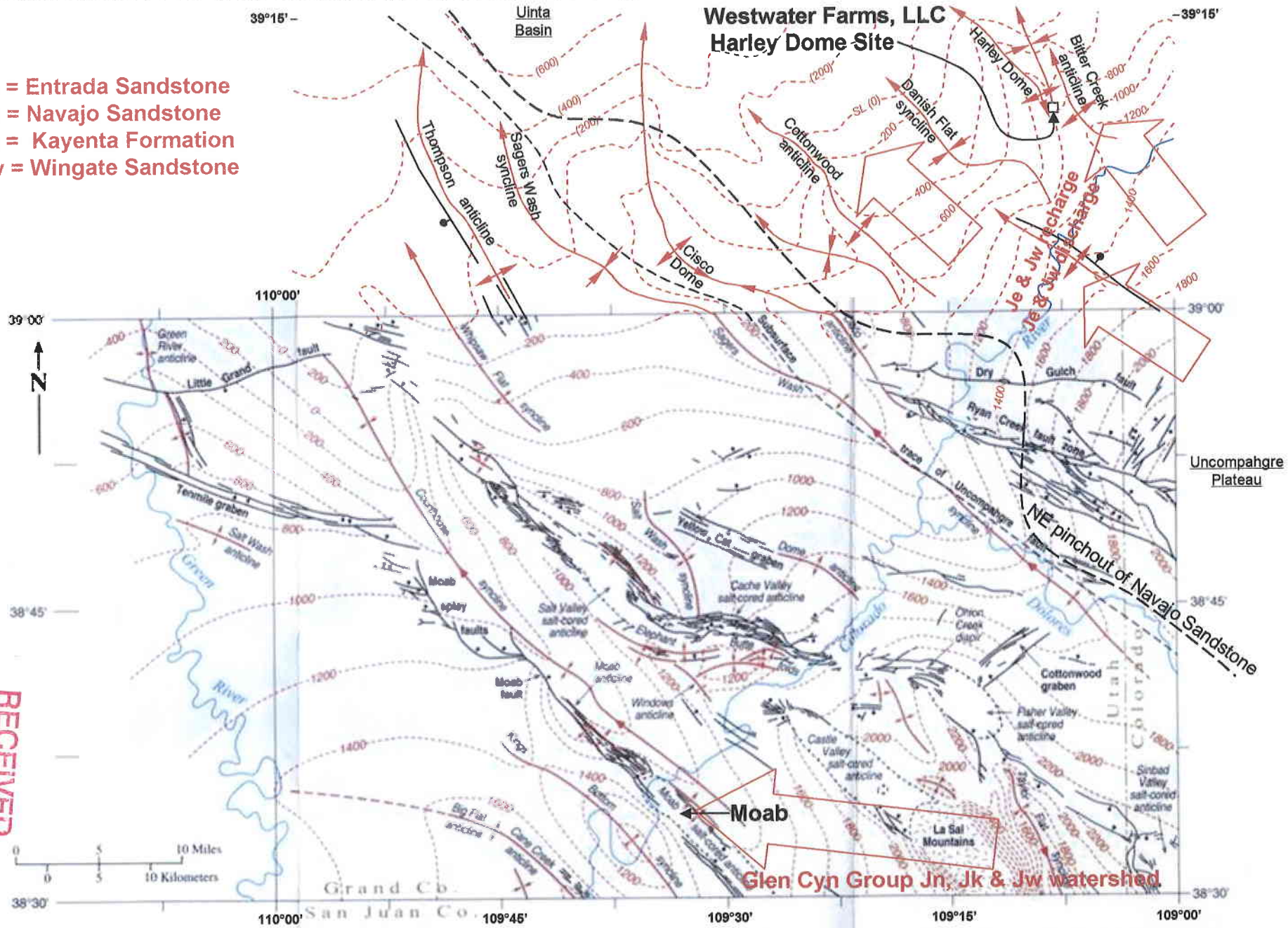

FIGURE 1. Principal structural features of the map area. Form contours (dashed) have a 200-meter interval. Datum is top of Chinle Formation.
Excerpt from Utah Geologic Survey Geologic Map 180 (2001) Geologic map of the Moab and eastern part of the San Rafael Desert 30' x 60' quadrangles

Att. 2-D

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Attachment 2-E-1: Schematic Diagram of Elizondo Water Well, P&A June 25,1965
60' fnl & 2,180' fel NWNE Section 10, T19S, R25E, SLM
Harley Dome, Greater Cisco Field, Grand County, Utah

Surface

"Hole filled with mud and surface cemented down 10 feet"

Quotes from Well Completion Report dated June 25, 1965
John W. Moore, License 250

10.75"? conductor pipe set at 40'
Unknown hole size
No cement volume reported

Brushy Basin Mbr Morrison Fm
Top near 140' ?

Salt Wash Mbr water zone "cemented off"

"Hole filled with mud between each zone"

"Salt water" in gray ss 595-603'
Salt Wash Mbr Morrison Fm
8.625" intermediate casing set at 625'
Unknown hole size (9.875" ?)
Pulled prior to plugging operations

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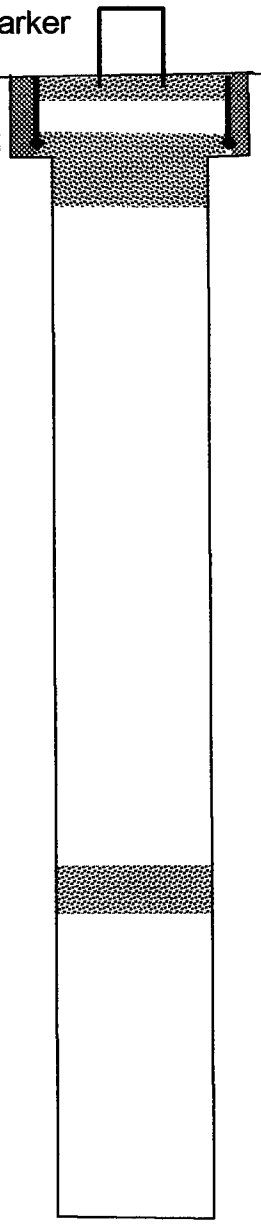
Entrada Ss water zone "cemented off"

Entrada Ss top 875', Elev. +3,990'
"Salt water"
TD 905' in Entrada Ss
Unknown hole size (7.875" ?)

Scale:
Vertical 1"=100' below surface
No horizontal or above ground scale

Attachment 2-E-1

Attachment 2-E-2: Schematic Diagram of Lansdale Government 5, P&A March,1968
330' fnl & 1,650' fwl NENW Section 10, T19S, R25E, SLM
Harley Dome, Greater Cisco Field, Grand County, Utah



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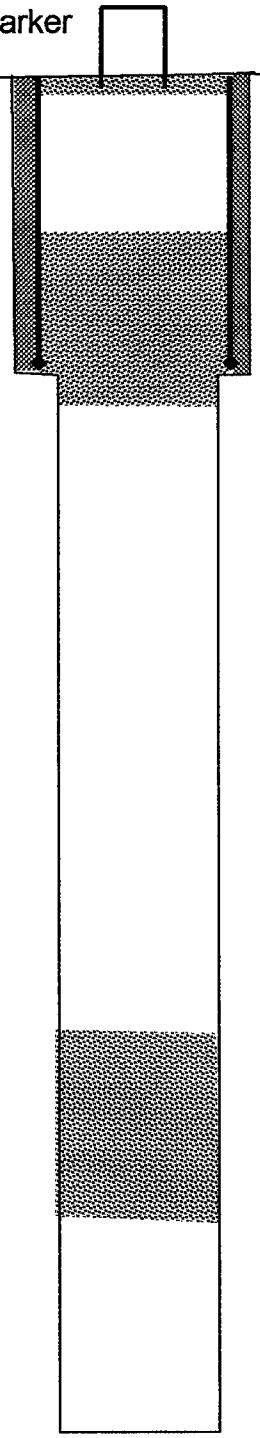
Scale:
Vertical 1"=200' below surface
No horizontal or above ground scale

Attachment 2-E-2

Attachment 2-E-3: Schematic Diagram of Lansdale Government 10-31-A, P&A August,1975
2,140' fsl & 1,980' fwl NESW Section 10, T19S, R25E, SLM
Harley Dome, Greater Cisco Field, Grand County, Utah



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Scale:
Vertical 1"=100' below surface
No horizontal or above ground scale

UTAH DIVISION OF OIL, GAS AND MINING
UIC (Permit Application) Form 1
Attachment 3
Application for New Injection Well: Harley Dome 1
NWNE Section 10, T19S, R25E, SLM, Grand County, Utah
Submitted by Westwater Farms, LLC

R649-5-2 Submissions to Satisfy Requirements for Class II Injection Wells:

R649-5-2.1 Westwater Farms, LLC ("Applicant") shall complete, equip, operate and maintain the Class II produced water disposal injection well proposed herein in a manner that will prevent pollution and damage to any USDW, or other resources and will confine injected fluids to the interval approved.

R649-5-2.2 This application for the Harley Dome 1 injection well ("H D 1" or "proposed well") includes a properly completed UIC Form 1 and Attachments 1 through 5 including this compliance narrative for R649-5-2, R649-5-4 and R649-5-5 identified as Attachment 3.

R649-5-2.2.1 Attachment 1 to UIC Form 1 is a plat showing the location of H D 1, all abandoned or active wells within a one-half mile radius of the proposed well, and the surface owner and the operator of any lands or producing leases, respectively, within a one-half mile radius of the proposed injection well.

R649-5-2.2.2 Attachment 2-A (2-A-1 through 2-A-10) to UIC Form 1 is composed of segments of copies of logs run in the nearest well ("offset well") that was drilled and logged through all of the proposed injection zones and the confining layers. The proposed well will intersect the same geologic formations and very similar thicknesses as those encountered during 1968 in the Lansdale Government 13 ("L G 13") offset well. Westwater Farms, LLC will provide the Utah Division of Oil, Gas and Mining ("Division") with copies of mechanical logs planned to be acquired in the proposed well prior to installation of the long string casing that will indicate the resistivity, spontaneous potential, caliper and porosity of all zones of interest. Attachment 2-B to UIC Form 1 is a presentation of the relationship of the proposed injection formations and the enclosing confining formations beneath the surface of Harley Dome and a wider area of Grand County including the more populated area near the community of Moab. Attachment 2-B further identifies the Navajo Sandstone and Wingate Sandstone as the injection disposal zones in use in the Drunkards Wash Unit ("D W Unit") near Price, Utah in Carbon County.

R649-5-2.2.3 Westwater Farms, LLC will provide the Division with a copy of a cement bond log planned to be acquired in the proposed well after the long string casing is set and cemented.

R649-5-2.2.4 It is noted that a copy of the logs acquired in the offset well were not available from the Division requiring submission of copies of those logs as Attachments 2-A-1 through 2-A-10. Copies of logs planned to be acquired in the H D 1 will be provided when they become available as cited above.

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R649-5.2.2.5 Two strings of casing are planned to be run to complete the construction of the H D 1. Five joints of 8.625" 24.0 ppf, J-55, 8 rd ST&C casing will be set in 11.0" diameter hole with a cement float shoe on bottom at a depth of approximately 214' below the surface of the ground. The surface casing string will be cemented from the float shoe to the surface with 92 sacks (including 100% excess) Class A cement mixed to yield 1.18 cubic ft/sack with 15.6 lbs/gallon slurry weight. The gross slurry volume available will be 19.3 barrels to allow topping off the annulus if the cement sinks. The injection casing or long string will be composed of 5.5" 15.5 ppf, J-55, 8 rd ST&C casing that will be set in 7.875" hole with a guide shoe on bottom near 1,750' and a cement float collar one joint up. The injection casing will be cemented from the guide shoe to approximately 100' over the top of the Summerville formation near 735' with 144 sacks (with 50% excess) of Class H (50-50 Pozmix) cement containing 4.0 lbs/sk gel, 8.0 lbs/sk Silicalite, 4.0 lbs/sk Granulite, 0.5 lb/sk Halad-344, 0.5 lb/sk Versaset and 0.25 lb/sk Poly-E-Flake to yield 1.84 cubic ft/sack with 12.5 lbs/gallon slurry weight. The gross slurry volume available will be 47.0 barrels.

The surface casing string will be tested to 1,000 psi prior to drilling through the casing shoe. The injection casing will be tested to 1,000 psi while running the cement bond log prior to any perforating work.

R649-5.2.2.6 The fluid to be used for injection will be RCRA-exempt produced water from oil and gas wells with densities typically ranging from 1.005 to 1.020 but possibly as high as 1.230. Water will be solicited for disposal by injection from the Uinta Basin, Paradox Basin, San Rafael Swell and Book Cliff areas including the local Greater Cisco Field in Utah and sources in the Piceance Basin in western Colorado. It is expected that more produced water will be available for injection than the injection well will be capable of accepting within normal operating limits. Depending upon the completed configuration of the well and evaluation by a step-rate injection test, it estimated that the daily fluid injection rate could be as high as 10,000 barrels.

R649-5-2.2.7 The applicant submits Attachment 4 in subparts to satisfy the requirements for laboratory analyses of:

R649-5-2.2.7.1 *The fluid proposed to be injected.* A selection of analyses of produced water from representative wells in the San Rafael Swell coal bed methane development area and Uinta, Paradox and Piceance basins known to require disposal services at the time of preparation of this application appear in Attachment 4-A (4-A-1 through 4-A-15).

R649-5-2.2.7.2 *The fluid in the formations into which the fluid is proposed to be injected.* Complete analyses of the fluid in the Entrada Sandstone and Wingate Sandstone at the proposed injection site will not be available until water samples can be recovered from the proposed well. Multiple reports of shows of water and non-flammable gas in some cases from the Entrada Sandstone and the relative salinity of the water appear in the records of wells drilled for oil and gas in the vicinity. Examples of water reports are presented in Attachment 4-B (4-B-1 through 4-B-9). The typical description of the water in the Entrada is "salty" in the water reports. Entrada water carries more dissolved compounds with distance northward toward the Uinta Basin. A report of resistivity of the produced water from the Entrada in the San Arroyo Field in T16S, R25E indicated that the equivalent NaCl salinity was at least 10,000 ppm. Water recovered from the Entrada during production testing of a well in SWSW Section 24, T13S, R22E was analyzed and found to contain average TDS of 80,785 ppm (see

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Attachment 4-A-8). These two data points are plotted on the regional Entrada salinity and measured head map presented in Attachment 2-C.

A water well was drilled into the top of the Entrada Sandstone on the Westwater Farms, LLC property and abandoned during 1965 by a previous owner because the only water that was encountered was too salty to be useful. The Report of Well Driller that was issued upon abandonment of the Elizondo water well appears in Attachment 4-C (4-C-1 through 4-C-3). The Wingate Sandstone was intersected in the L G 13 offset well in SENE Section 4, T19S, R25E, but was rarely drilled elsewhere in the vicinity. Refer to Attachment 4-D for a presentation of the estimated salinity of the water in the porous zones throughout the stratigraphic column including the proposed injection formations that was based on the logs from the offset well.

R649-5-2.2.7.3 *The compatibility of the fluids.* Scale formation and other compatibility issues were investigated by employees of the Multi-Chem Analytical Laboratory in Vernal, Utah and Grand Junction, Colorado on a preliminary basis. Scale formation potential was found to be minimal between a sample of Entrada Sandstone water from an oil well in the Cisco Dome area of the Greater Cisco Field at a location 24 miles southwest of Harley Dome and the most abundantly available injectate composed of solutions of sodium chloride and sodium bicarbonate with lesser concentrations of calcium bicarbonate water with 12,000 to 14,000 ppm TDS. Formation fluid and injectate compatibility testing and possible treatment will be ongoing activities once fluid samples from the proposed H D 1 well injection zones are recovered and analyzed and the injectate sources are identified and analyses made available for compatibility prediction.

R649-5-2.2.8 The proposed average injection pressure is 240 psi and the maximum injection pressure is 260 psi injecting into 3.5" tubing and assuming that the shallowest perforation is near the top of the Entrada Sandstone at a depth of 885'. The final injection pressure limit will be governed by step rate testing the proposed well mechanically configured ready for injection.

R649-5-2.2.9 Evidence and data to support a finding that the proposed injection well will not initiate fractures through the overlying strata or a confining interval that could enable the injected fluid or formation fluid to enter any fresh water strata. The injection pressure limit is governed by the fracture gradients of the injection and confining zones, average density of injectate and the pressure loss to the injection tubing string due to friction at the average injection rate. There is little or no data on record about breakdown treatments or fracs of the Entrada Sandstone and Wingate Sandstone in the depth range existing at the H D 1 site that would produce information about the fracture gradients of these formations. A wide range of fracture gradient estimates have been reported from pumping operations to these formations at depths greater than 10,000' in areas of the southern Uinta Basin (Tavaputs Plateau) in the Flat Rock and Seep Ridge fields. The burial history of the Jurassic section including lithostatic and hydrostatic pressure ranges and past and present thermal gradients are substantially different in those areas as compared with the vicinity of Harley Dome.

It was determined that a better analog with more pertinent data points could be found near Price, Utah where River Gas Corporation constructed 12 injection wells in the Drunkards Wash Unit ("D W Unit") in T14-16S, R9-10E between 1996 and 2000. Although this area is 90 miles west-northwest of Harley Dome, the active injection zones in the D W Unit are composed of the same lithology or rock type and one of the proposed injection zones and the lower confining zone in the

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proposed H D 1 are the same formations. The injection zones approved for use by River Gas were Wingate Sandstone, Kayenta Formation and Navajo Sandstone from the bottom up. The proposed lower injection zone in the H D 1 is the same Wingate Sandstone formation but instead of Navajo which is not present in the subsurface of Harley Dome, Entrada Sandstone is proposed for the upper injection zone herein since it occupies the same position just above the Kayenta. Although the Kayenta has been completed for injection in the D W Unit, it does not contain much rock that qualifies it as an aquifer or injection zone at Harley Dome. Refer to Attachment 2-A for the petrophysical representation of the injection and confining formations as logged in the offset well and Attachment 2-B to see how these formations are related laterally. The lower confining zones are the same Chinle Formation. The upper confining zone for the D W Unit disposal wells is the Carmel Formation which is also absent or possibly represented by a few feet of rock at Harley Dome. The proposed Entrada upper injection zone at Harley Dome is capped by the Summerville and Morrison formations. The environments of deposition of both the Carmel and Summerville are similar. They are marine tidal flat deposits composed of very fine grained, dense, laminated rock with gypsum veins. They are competent confining layers. The Summerville is 40' thick at Harley Dome and is backed up by hundreds of net feet of impermeable mudrock in the three overlying members of the Morrison Formation. The entire stratigraphic section related to this UIC application is examined in more detail under the heading R649-5-2.2.10.

There are physical differences in the two localities, but the geologic parallels are compelling. In the D W Unit area the top of the Navajo (upper injection zone) appears at depths ranging from 4,560' to 7,150'. The formation is saturated with heavy brine water that is under slightly subnormal pressure conditions (0.388 psi/ft to 0.415 psi/ft). At the H D 1 site, the Entrada (upper injection zone) is predicted to be near 880' and bearing brackish water at significantly subnormal pressure (0.191 psi/ft). The nearest pressure measurement available on this zone is from the L G 13 offset well 1.1 miles to the northwest of the H D 1 site where the surface shut-in pressure of a gas column composed mostly of nitrogen (83.78%) was measured during 1968 drilling operations at 155 psi from a presumably dry open hole with the Entrada top at 862' and a contemporary total depth ("TD") of 946'. It is important to note that the environment of deposition of the Navajo and Entrada is similar and resulted in large-scale cross-bedded eolian sandstone deposits with high porosity and permeability as a function of the variable cementation, so the geologic attributes and rock properties are similar. The Wingate Sandstone is the same at both the D W Unit and Harley Dome locations.

River Gas conducted a step rate test on July 10, 2000 in the last injection well constructed on the D W Unit and filed a report of the results with the Division that resides in the file for the Sampinos D-14 well (API No. 43-007-30567). This step rate test is a model to be emulated and provided useful information on the injection zones in the well in a commingled completion that included gross perforated intervals of 4,558' to 4,878' in the Navajo, 4,883' to 4,942' in the Kayenta and 5,026' to 5,281' in the Wingate. Following a ball-diverted, 2,500 gallons acid treatment pumped at 6 barrels per minute ("bpm"), the perforations were flushed with water at 10 bpm and then step rate tested at rates from 1 bpm to 16 bpm. A clear pressure break at 3,990 psi measured by a gauge set at a depth of 5,300' in the well at a pumping rate of 4.9 bpm indicated a fracture gradient of 0.753 psi/ft.

The combined Entrada-Kayenta-Wingate zones at Harley Dome are expected to have a similar fracture gradient reduced by the low pore pressure to 0.75 psi/ft or possibly less. If produced water of average density to yield a pressure gradient of 0.45 psi/ft in the proposed injection well is

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being pumped it will allow for a 0.30 psi/ft limit for surface pressure that would equal 265 psi if the top perforation was at 885' and pressure loss due to pipe friction is ignored. Post-breakdown step rate testing of the proposed H D 1 well will be used to determine the actual fracture gradient of the formations in the completed well. There is no data on the fracture extension pressure in the Summerville Formation or the mudrock intervals of the overlying members of the Morrison Formation. It can be assumed that due to the presence of shale layers in the Summerville and the high clay content due to volcanic ash in the overlying Morrison mudrock that some significant portion of the lithostatic stress has been converted to elevated horizontal stress due to permanent deformation of these plastic layers. Such conditions will prevent upward fracture growth through these higher stress barriers.

The backup upper confining zone in the Harley Dome area is the Morrison Formation. Some empirical conclusions about the sealing capacity of this formation can be made from the distribution of water and hydrocarbon-bearing zones within the two upper members of the Morrison. The only viable reservoir rock in the Morrison is composed of fluvial channel sandstone encased in high-clay content mudrock. The Morrison has frustrated oil and gas resource development in the Greater Cisco Field that includes the Harley Dome locality, by having unpredictable fluid content in zones that are stacked over presumably fractured structural features such as, from east to west, the Bitter Creek, Harley Dome, Seiber Nose and Cottonwood anticlines. There are examples of hydrocarbon-bearing sandstone zones occurring both above and below sandstone zones that contain brine water. The existing reservoirs when found are near normal pressure and the production drive is by solution gas pressure rather than water encroachment. Upon depletion by production many Morrison oil and gas wells never produce water indicating effective hydraulic isolation. The more laterally extensive sandstone layers in the upper part of the Salt Wash Member typically contain brine water with natural gas with a high nitrogen fraction that does not match the chemistry of natural gas in overlying sandstone layers of the Brushy Basin Member. These observations lead to the conclusion that the Morrison does not support open fractures even in the axial and asymmetrically folded areas of structures.

The upper confining zones at Harley Dome composed of the Summerville and Morrison formations are expected to prevent migration of injectate into fresh water strata. There are no bedrock aquifers currently being utilized from any formation within T18-19S, R25E according to the records of the Utah Division of Water Rights.

R649-5-2.2.10, 10.1, 10.2 and 10.3 Appropriate geological data on the injection intervals with confining beds clearly labeled appears on Attachment 2-B. That information is supplemented below with a discussion of the nearby Underground Sources of Drinking Water including their geologic formation names, lithologic descriptions, thicknesses, depths, water quality and lateral extent and an examination of information relative to geologic structure and its effect on the conveyance and storage of injected fluids.

This discussion of the geology, hydrology and exploration history of the proposed injection site relied upon several references produced by the Utah Geological Survey ("UGS") and the United States Geological Survey ("USGS"). Specifically, the most important were the Geologic Map of the Harley Dome Quadrangle by Grant C. Willis, UGS Map 157 (1994), Petroleum Geology of the Harley Dome Field by Roger L. Bon, UGS Oil and Gas Field Study 21 (1999), Geologic Map of the

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Agate Quadrangle by Grant C. Willis, Hellmut H. Doelling and Michael L. Ross, UGS Map 168 (1996), Geologic Map of the Westwater 30' x 60' Quadrangle by J. L. Gualtieri, USGS Map I-1765 (1988), Geologic Map of the Moab and Eastern Part of the San Rafael Desert 30' x 60' Quadrangles by Hellmut H. Doelling, UGS Map 180 (2001) and A Summary of the Ground-Water Resources and Geohydrology of Grand county, Utah by Chris Eisinger and Mike Lowe, UGS Circular 99 (May 1999). Table 1 in the latter publication is a particularly good hydrology reference for Grand County, Utah including the Harley Dome locality. In addition, the internet-hosted records of the United States Bureau of Land Management, the Division, Utah School and Institutional Trust Lands Administration and Utah Division of Water Rights provided information about mineral ownership and wells.

The proposed injection well will intersect formations from the Cretaceous and Jurassic geologic age periods and likely reach TD in the Chinle Formation of Triassic age. Refer to Attachment 2-B for a depiction of the stratigraphic column (rock layers) beneath Harley Dome and their lateral equivalents to the southwest in the Moab area. The proposed site is referred to herein as "Harley Dome" although it is actually situated on the axis of the Bryson Wash Syncline which separates the southern plunge of the Harley Dome Anticline to the west and the axis of the Bitter Creek Anticline to the east. Although not presented as an attachment to this UIC application, UGS Map 157 and Oil and Gas Field Study 21 cited above present a detailed picture of the local structural geology and stratigraphy. The host syncline, two adjacent anticlines and the Westwater Farms, LLC Harley Dome proposed injection site are labeled on Attachment 2-D. This attachment depicts the local and regional structural setting in the form of a structural contour map drawn on the top of the Chinle Formation which is the base of the proposed lower injection formation and top of the lower confining formation. Large arrows on Attachment 2-D depict the predicted movement of water in the proposed injection formations downdip generally to the northwest in the plunge of the Uncompahgre Uplift into the Uinta Basin from recharge areas on the Uncompahgre Plateau. The fluid movement within the area of review in the proposed injection formations will be radial from the proposed well bore with a glacially slow shift of the injectate down the axis of the Bryson Wash Syncline.

The Wingate Sandstone, Kayenta Formation and Entrada Sandstone are known to be saturated with water or "wet" under the Westwater Farms, LLC property and the area of review from wells drilled on and adjacent to the tracts in question. A water well was drilled on the property during 1965 and was plugged and abandoned at 905'after finding water too salty to be useful in the both the Morrison Formation and the Entrada Sandstone. The top of the Entrada was intersected at 875' and elevation +3,990'. A well drilled during March of 1968 for oil and gas just west of the Applicant's property in NENW Section 10, T19S, R25E reached TD of 1,190' presumably in the Kayenta without finding any traces of oil or gas although it was drilled with air. The top of the Entrada was intersected at 852' or elevation +3,990' in this well known as the Lansdale Government 5 ("L G 5") and although no influx of water was reported upon drilling with air, it is assumed the primary constituent of the pore space was salty water. The L G 5 well was plugged and abandoned as a dry hole immediately after drilling was completed. The maximum Entrada elevation expected anywhere on the Applicant's property is about +3,990'. See Attachment 1 for the location of the wells mentioned in this part of the narrative.

There was a gas cap in the Entrada Sandstone composed of 84% to 86% nitrogen, 7% to 8% methane and 6% to 7% helium in the "attic" of the Harley Dome Anticline that was discovered originally in 1925 under SENE Section 4, T19S, R25E by a well named the Federal 1 ("F 1"). The

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original shut-in pressure of the gas reservoir was reported to be 155 psi. Due to concerns for conserving resources of the strategic gas helium, the F 1 and a confirmation well known as the Federal 2 were plugged and abandoned with cement plugs during 1944 presumably to insure the helium would not leak off. Harley Dome was designated Helium Reserve No. 2. The most recent pressure measurement of the non-flammable gas reservoir in the Entrada was reported in 1993. The current height of the non-flammable gas cap is unknown, but there is ample data to estimate its original height and areal extent. The crest area of the anticline also forms a topographic hill of similar dimensions on a dip slope surface near the top of the Dakota Sandstone recognizable in Attachment 1 and is located 1.1 miles northwest of the proposed site of the H D 1 well. A significant review of information not normally required to be submitted with a UIC permit application is presented herein below to address potential concerns from the oil and gas owners and lessees of the crest of the Harley Dome Anticline and flank areas.

Between 1967 and 1975, an operator from California named Arlyne Lansdale drilled a series of wells that defined the limits of the Harley Dome Entrada non-flammable gas reservoir and found sub-commercial shows of flammable methane gas in the overlying Morrison Formation. The first well in the drilling program was the Lansdale Government 1 ("L G 1") drilled in SWSE Section 33, T18S, R25E during June of 1967 on the northwest plunge of the structure. The L G 1 intersected the Entrada at 836' (+4,053'), was drilled on to TD 944', cased and completed as a shut-in Morrison flammable gas well from perforations 543' to 549' and 595' to 606'. The well was never produced and the underlying lease terminated sometime in the early1980's but for some reason the L G 1 was never plugged and abandoned. A new lease was issued under the well and during May of 1993, the new lessee perforated the Entrada 862' to 872', 876' to 890' and 894' to 898' and flow tested non-flammable gas at a stabilized rate of 200 Mcf per day. The shut-in pressure of the Entrada perforations was reported to be 160 psi when isolated with a packer and the same as the pressure from the pre-existing Morrison perforations made in 1968. When the packer was removed after the flow testing operations in 1993, the two zones were left open and commingled. The deepest perforation at 898' was made near the original gas/water contact in the Entrada indicated by a water show that began while drilling with air below 900' at an elevation of +3,989'. The L G 1 has never been produced. An inspection of the site on April 27, 2009 revealed that well has remained shut-in with a single gate valve mounted on the casing. The current casing pressure is unknown.

The next well drilled to delineate the Harley Dome gas reservoir was the Lansdale Government 4 ("L G 4") in NWSW Section 3, T19S, R25E at a point about midway between the old F 1 discovery well site and the Applicant's property and 0.65 mile northwest of the proposed H D 1 site. The L G 4 confirmed the presence of non-flammable gas in the top of the Entrada which was intersected at 836' (+4,079') on the south plunge of the structure. The well completion report on file for the L G 4 that was dated October 30, 1968 erroneously cited that the well was drilled during June of 1968. In reality, a gas sample from the L G 4 was collected and analyzed on March 21, 1968 that confirmed and extended the F 1 non-flammable gas discovery in the Entrada indicating that the well had been drilled by the third week in March of 1968. The L G 4 well completion report cited the TD at 972', the top of the Entrada at 836' (+4,079') and gas saturation (producing interval) down to 920' (+ 3,995'). The gas sample pressure was reported as 80 psi, and, unless the gas sample bottle leaked, may indicate that there was fluid in the well when the sample was collected. It may be possible that the gas/water contact is slightly tilted to the northwest in the crest of the Harley Dome Anticline and its elevation in the L G 4 is nearer to +4,010' or higher. The well has never been produced and has

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remained shut-in. It shares a similar history with the L G 1 in that the underlying lease was terminated at some point in the 1980's, and a new lease was issued in the early 1990's. When inspected on April 27, 2009, the well had a gate valve with a plug mounted on the casing. The current casing pressure is unknown.

It appeared from the well files that the drilling rig used to drill the L G 4 was moved next to test a site farther down dip on the southern plunge of the Harley Dome structure in NENW Section 10, T19S, R25E where the previously mentioned offset to the Applicant's property known as the L G 5 was drilled and immediately plugged and abandoned by late March of 1968. To review, the top of the Entrada was intersected at 852' or elevation +3,990' in the L G 5 and no gas shows were reported. The elevation of the top of the Entrada in the L G 5 was at least 5' and possibly up to 15' below the non-flammable gas/water contact.

The Lansdale Government 9 ("L G 9") was drilled during April of 1968 on the southwest flank of the Harley Dome Anticline in NWSE Section 4, T19S, R25E. This well was drilled to 1,200' TD in upper Kayenta after intersecting the Entrada at 868' (+3,920'). No oil, gas or water shows were reported, no logs were run and the well was plugged and abandoned immediately upon completion of drilling operations. The elevation of the top of the Entrada in the L G 9 was at least 75' and possibly up to 90' below the non-flammable gas/water contact.

Following the abandonment of the L G 9, a well named the Lansdale Government 13 ("L G 13") was programmed at a location accurately situated on the highest possible structural point on the anticline and top of the ridge a few hundred feet east of the F 1 discovery well. Not surprisingly, non-flammable gas was flow tested from the L G 13 after air drilling operations were suspended at a depth of 946' where it is assumed that the well began producing mist. No mention of fluid production was made in the existing file on the well at this point indicating a gas column of at least 84' beneath the top of the Entrada at 862' (+4,093') down to an elevation of +4,009'. The pressure of the gas sample that was taken was reported at 155 psi which was identical to the maximum shut-in pressure reported during 1925 from the F 1 discovery well and in line with the 160 psi reported from testing the L G 1 well later during 1993. The L G 13 well was ultimately continued with mud through the Entrada and subjacent formations to TD 1,815' in pre-Cambrian rock without reporting any more shows of any kind. Logs were acquired over the entire interval from TD up to the surface casing shoe at 93'. Attachment 2-A is a complete copy of the 2" per 100' prints of those logs with the addition of a calculated density porosity curve through the proposed injection and confining formations plus other porosity zones of interest in the Morrison. The L G 13 well was never produced and was plugged and abandoned with a sand soft plug and surface cement plug during 1989.

Lansdale drilled two more wells of interest in the vicinity several years later during the summer of 1975. The first well was designated the Lansdale Government 10-31-A ("L G 10-31-A") and was located in NESW Section 10, T19S, R25E offsetting the southwest corner of the Applicant's property at a distance of 0.5 mile from the proposed H D 1 well. A show of flammable gas was reported from a layer in the Morrison from the interval 580' to 605'. TD was called at 706' without drilling out of the Morrison because the Entrada at that location would have been intersected at an elevation below the known non-flammable gas/water contact in the Harley Dome Anticline. The geological consultant working on the well had originally concluded that the well had reached the

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Summerville Formation at 625', but it must have become apparent that the Summerville was not going to be reached until at least 827' putting the Entrada near 872' (+3,957') and beyond the southern plunge of the Harley Dome Anticline. The L G 10-31-A was not logged and was plugged and abandoned immediately following cessation of the drilling operation. If reached, the elevation of the top of the Entrada in the L G 10-31-A would have been at least 38' and possibly up to 53' below the non-flammable gas/water contact.

The second well drilled during the summer of 1975 was the Lansdale Government 3-30-A ("L G 3-30-A"). This well was drilled in NWNW Section 3, T19S, R25E to test the northeast flank of the Harley Dome Anticline at a point 900' from the L G 13 crest well and 1.05 miles northwest of the proposed H D 1 well. The well intersected the top of the Entrada at 899' (+3,990') and was drilled on to TD 1,000' still in the Entrada. No oil and gas shows were reported, but production of salty water while air drilling below 923' and on to 946' was noted. The well was logged and plugged and abandoned immediately thereafter. The elevation of the top of the Entrada in the L G 3-30-A was at least 5' and possibly up to 20' below the non-flammable gas/water contact.

The preceding, lengthy review of the oil and gas exploration operations in the vicinity of Harley Dome leads to the conclusion that the limits of the non-flammable gas cap in the attic of the Harley Dome Anticline have been adequately defined and lie outside of the area of review related to the proposed H D 1 injection well. The western edge of the area of review includes the lowermost part of the southern plunge of the Harley Dome Anticline where it was unsuccessfully tested by the L G 5 dry hole. No shows of oil or gases of any type have been discovered in the stratigraphic section below the upper 84' of the Entrada within an area of several square miles around the proposed H D 1 well. Furthermore, the proposed location for the H D 1 well lies in the uppermost expression of the Bryson Wash Syncline where all intersections of the Entrada will be below the non-flammable gas/water contact in the top of the Harley Dome Anticline. Injectate introduced to the Entrada and Wingate formations will move in a radial pattern away from the proposed well bore and slowly but simultaneously shift along with the natural flow of formation water northward down the axis of the Bryson Wash Syncline adjacent to the northeast flank of the Harley Dome Anticline.

Some notes on the area of influence and capacity of the proposed H D 1 injection well are important to consider here. The capacity of a 40 acre area under the proposed injection well is the sum of the net volume of porosity in the proposed Entrada and Wingate injection zones. Estimating that the average porosity of the Entrada over its predicted 248' thickness is 20% based upon the Density log of the L G 13 offset well, the volume of that reservoir in 40 acres is 15,391,872 barrels. Similarly, estimating average porosity of 15% in the Wingate through its upper 227' where the best porosity was measured on the same log, the capacity of that reservoir is 10,566,396 barrels. The total capacity of the combined reservoirs in a 40 acre tract is 25,958,268 barrels. The 40 acres considered is about 8% of the 502 acres encompassed by the area of review. If the capacity of 20% of the area of review or about 100 acres is considered, the Entrada and Wingate formations have an estimated combined capacity of 64,895,670 barrels. If the proposed well is operated at an average injection rate of 8,000 barrels per day it would take 22 years to displace the existing formation fluid.

The USGS published hydraulic conductivity measurements derived from drill-stem tests performed in wells throughout the region of the upper Colorado River basin in Water-Resources Investigation Report 86-4170. The entries for the wells nearest Harley Dome are 0.00068 feet/day

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for the Entrada in a well in Section 8, T17S, R24E, 14 miles northwest of the proposed H D 1 site and 0.00030 feet/day for the Wingate in a well in Section 12, T21S, R18E, 42 miles west-southwest of the proposed H D 1 site. The natural water recharge influx to the Entrada is very low from limited areas submerged by the Colorado River and adjacent outcrops exposed to a desert climate. The water recharge rate in the Wingate from the upland areas of the Uncompahgre Plateau is likely to be more robust, but the lateral pressure differences that govern water flow in both of these regional aquifers are subtle. Water is moving through these aquifers under natural conditions at a very slow rate that is governed by the minimal head or pressure differences from point to point, the massive cross-sectional area of the formations that is many miles in width and gross height of 582' locally and a weighted average hydraulic conductivity value of 0.00050 feet/day. The water now present in the Entrada and Wingate aquifers and any injectate added to that water will move about 4' over the 22 year period estimated in the previous paragraph that will elapse while the fluid in 100 acres is displaced. This means that the injectate will stay in place beneath the Applicant's property with a slight shift predicted to the north down the axis of the Bryson Wash Syncline.

The H D 1 will be spudded at the surface in the lower few feet of the Tununk Shale Member of the Mancos Shale of upper Cretaceous age. Most of the Tununk Shale Member and the rest of the Mancos Shale section have been removed from the vicinity of Harley Dome and all of the terrain to the east due to the presence of the Uncompahgre Uplift and erosional effects of the Colorado River. The Tununk Shale Member is composed of medium-gray to dark-gray, brownish-gray, or black mudstone, siltstone and shale with 0.5 to 2" thick layers of white to light-gray bentonite. The Tununk was deposited in a muddy, shallow marine environment that was periodically showered with unusually high volumes of volcanic ash that formed the bentonite beds. The resulting rock is saline, self-sealing and virtually impermeable and although it can store water, it will not yield water to wells unless it contains open fractures between bentonite layers. The Tununk Shale Member and the rest of the Mancos Shale are considered a regional confining unit of vast areal extent. The Tununk is not an Underground Source of Drinking Water ("USDW") due to the relict salinity of the ancient sea water which is well above the 10,000 ppm total dissolved solids ("TDS") arbitrary limit defining USDW's. USDW's must contain water with less than 10,000 ppm TDS in solution which is the upper limit of salinity for "moderately saline" water.

At 10 to 15' depth, the next formation that will be encountered in the H D 1 will be the upper Cretaceous Dakota Sandstone. The Dakota is composed of three members that are collectively expected to be about 80' in thickness. The upper member is composed of pale-yellowish-orange to yellowish-gray, fine-grained to medium-grained sandstone that can contain quartzite cobbles. The middle member contains medium-gray to dark-gray carbonaceous shale and mudstone with inter-layered lenses of black coal and fine-grained to medium-grained, thin-bedded to thick-bedded, cross-bedded, channel sandstone deposits. The lower member is composed of sandstone similar to the upper member. The Dakota was deposited on a coastal plain near an ancient, marine shoreline by rivers flowing through brackish swamps. In some places the uppermost sandstone in the upper member was a marine beach deposit, near-shore barrier island or sand shoal. While the Dakota is present throughout the region where not eroded, its porous sandstone layers are lenticular and do not form a blanket-type hydraulic unit.

The Dakota Sandstone is unconfined at Harley Dome and has been drained of its connate (original) marine brine and coastal plain brackish water due to erosion down into the upper member

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over most of the immediate section (10) excepting the N2NE and through all three members within 2 miles of the proposed injection site in a lengthy, northerly trending outcrop band related to the adjacent Bitter Creek Anticline. The sandstone layers within the Dakota can contain water at and near Harley Dome, but there is insufficient recharge area due to the proximity of the outcrop band to make it an effective or exploitable aquifer. Where the Dakota is buried to depths where it is confined a few hundred feet from the surface within 3 to 4 miles to the west and north of Harley Dome it contains natural gas and brine water. The resistivity of the water ("Rw") in the Dakota where it is confined in the Greater Cisco Field is typically 0.25 ohm-m at 75° F indicative of salinity near 25,000 ppm. The Dakota is not utilized as an aquifer in Grand County and does not qualify as a USDW except in areas near its outcrop band where its water production capacity is insufficient to be used reliably.

The H D 1 will intersect the Early Cretaceous Cedar Mountain Formation below 95' and traverse up to 65' of the formation. The Cedar Mountain contains pale-green mudstone and pale-greenish-gray, thin-bedded to medium-bedded sandstone with local channel deposits of medium-grained to coarse-grained sandstone. The formation is continental meaning non-marine in origin with a significant fraction of volcanic ash that is the source of potentially problematic clay minerals. The channel sandstone deposits are lenticular, compartmentalized and poorly connected from a hydraulic standpoint which renders the formation more of a confining layer than an aquifer. The Cedar Mountain and its equivalent south of the Colorado River known as the Burro Canyon Formation are present throughout the region except where eroded locally on structural uplifts. Similar to the overlying Dakota, the porous parts of the Cedar Mountain contain natural gas and brackish water. The resistivity of Cedar Mountain water encountered in oil and gas wells in the Greater Cisco Field at depths greater than a few hundred feet is usually slightly more resistive than Dakota water, near 0.30 ohm-m at 75° F, indicative of salinity up to 20,000 ppm. The Cedar Mountain is not utilized as an aquifer in Grand County and similar to the Dakota will yield fresh water only in areas near its outcrop band from discontinuous sandstone deposits making it a limited USDW.

The Brushy Basin Member of Morrison Formation is the youngest Jurassic formation, and will be encountered below 160'. The H D 1 well construction plan calls for setting the surface casing string in the upper part of the Brushy Basin at 214' to avoid hydrating fresh water-sensitive clay minerals in the overlying Cedar Mountain mudstone layers that can cause excessive caving and wellbore washout. This first casing string will be cemented all the way back up to the surface. The Brushy Basin is composed of variegated, red, maroon, light-green, gray and white shale and mudstone interbedded with varying amounts of argillaceous (clay-rich) sandstone, conglomeratic grit, thin lenses of dense, gray limestone and nodular limestone. The formation is locally 420' in thickness, present throughout a multi-state area and continental in origin. It is rich in volcanic ash which is the source of the clay minerals throughout the member. The mudstone layers are less sensitive to fresh water than those in the overlying Cedar Mountain but have similar self-sealing, plastic properties that limit the vertical extent of open fractures. The sandstone layers present in the Brushy Basin are lenticular, poorly connected and at Harley Dome can contain natural gas and brackish water. Porous sandstone pods within the Brushy Basin in the Greater Cisco Field contain water with Rw near 0.35 ohm-m at 75° F or salinity as high as 17,000 ppm. As a whole, the Brushy Basin is an effective regional confining unit and does not qualify as a USDW.

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The Salt Wash Member of Morrison Formation will be intersected below 580' in the H D 1. The formation will be 217' thick and is composed of continental, interbedded sandstone and mudstone with lesser volcanic ash compared with the overlying Brushy Basin. Like the Brushy Basin, the Salt Wash Member is present throughout a multi-state area. The sandstone is light to yellow gray, medium-grained to coarse-grained, cross bedded in lenticular beds as much as 20' thick. The mudstone is generally red with less common green horizons. The sandstone layers in the Salt Wash contain brackish water throughout and natural gas in axial structural positions in the Greater Cisco Field similar to Harley Dome. Natural gas was reported from one of the fourteen oil and gas test wells and the deep water test well that were drilled within two miles of the proposed injection well site. The Rw typical of the Salt Wash in the Greater Cisco Field is around 0.40 ohm-m at 75° F indicating salinity as high as 15,000 ppm. The Salt Wash is not utilized as an aquifer in Grand County and does not qualify as a USDW.

The lowermost member of the Morrison Formation is the Tidwell. It will be reached in the H D 1 near 797'. The Tidwell Member is composed of lavender and brown continental mudstone containing nodular, gray, hard limestone horizons and local large concretions of white chalcedony and quartz and will be 35' in thickness. The Tidwell is moderately permeable and yields water to springs in places in its outcrop belt but is not currently used as an aquifer in Grand County. Oil and gas well logs recorded in the Greater Cisco Field do not indicate that the Rw in the Tidwell is significantly different from that in the Salt Wash but the member contains few sandstone layers that are thick enough to provide reliable log analysis points. At any distance greater than a mile from its outcrop or deeper than a few hundred feet, the water quality is not likely to qualify the formation as a USDW. The mudrock layers of the three members of the Morrison Formation are confining layers and act as a backup to the primary, upper confining layer in the proposed H D 1 well identified as the Summerville Formation.

Beneath a regional unconformity known as the J-5, the H D 1 will intersect the Summerville Formation near 832'. The Summerville will be 45' in thickness. It was deposited on a large, marine tidal flat and is composed of gray, tan and brown sandstone, mostly fine grained, thin bedded with increasing claystone in the lower part. The formation is present through much of eastern Utah and as a whole has very low permeability. It is a regional confining unit, and since it is not known to yield water, the quality of the fluid in the formation is unknown. The Summerville is the upper confining unit for the proposed injection zones in the H D 1. The formation does not qualify as a USDW.

The H D 1 will intersect the top of the proposed upper injection zone in the Entrada Sandstone near 877'. The Entrada will be 248' thick and is composed of light-brown or buff, light-reddish brown or salmon-colored pinkish-orange sandstone that is chiefly very fine-grained to fine-grained, rounded to well-rounded, moderately well-sorted sub-arkosic arenite. The formation is calcareous, poorly cemented with some horizontal bedding, but is more commonly known for its large-scale eolian cross-bedding. The Entrada was deposited in a coastal sand dune field that covered parts of Utah, Wyoming, Colorado and New Mexico. The ancient coastal dune fields of the Entrada were periodically flooded with brackish water behind the beach and possibly also flooded with seawater directly in local areas. The entire formation was buried under the marine sediments of the Summerville Formation and its lateral equivalents following a regional unconformity or non-depositional period known as the J-3. The Entrada is a regional blanket aquifer that locally discharges water to the Colorado River from an outcrop band located 5 to 6 miles southeast of Harley

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Dome that is recharged in updip areas on the Uncompahgre Plateau. This regional aquifer appears to host slightly dynamic water conditions that recharge partly from the Colorado River and the outcrop belt 5.5 miles south of Harley Dome in Section 1, T20S, R25E. The outcrop band northwest of the river is plumbed into continuous northwesterly dip into the Uinta Basin and should recharge the formation with water that is moving slowly downdip. The probable water movement is illustrated by Attachments 2-C and 2-D and involves both discharge and recharge due to the deep incisement of the stratigraphic section by the Colorado River in Ruby and Westwater canyons across the Uncompahgre Uplift.

Attachment 2-C, a map of southern Uintah County and northern Grand County, depicts oil and gas well or test well locations that reported equivalent fresh water head data from the Entrada and an overlying member of the Curtis Formation known as the Moab Member that is in contact with the top of the Entrada west of Harley Dome. The map indicates some Entrada head data points from well testing that are below normal for their depth. The areas of subnormal pressure within the Entrada set up a flow regime in the Danish Flat Syncline which plunges into the Uinta Basin from a point 4 miles southwest of Harley Dome that is recharging slowly from the Colorado River. This flow regime is a weak remnant of more dynamic conditions in effect during the melt-water crests at the conclusion of the Pleistocene glacial epochs. The Pleistocene pulses of flooding could explain the large fraction of nitrogen gas present in the Entrada in the small structural closure or dome centered 1.1 mile northwest of the proposed H D 1 injection site and a lesser but still large fraction of nitrogen gas in the San Arroyo Field Entrada gas reservoir in T16S, R25E, 15 miles north of Harley Dome.

Attachment 2-C also illustrates that the salinity of the water in the Entrada increases downdip, northward, but is also under 10,000 ppm TDS in updip areas. The Entrada is exposed to submersion by the Colorado River in outcrop bands in Ruby Canyon near Loma, Colorado and downriver near Harley Dome in Section 1, T20S, R25E where the river crosses the Entrada outcrop band for the second time 5.5 miles south of the proposed H D 1 site and 2 miles upriver from the Westwater BLM Ranger Station. Near the BLM Ranger Station, the Entrada outcrops at the level of the Colorado River for a 3 mile stretch down to the entrance to Westwater Canyon where pre-Cambrian rock is exposed. Between Loma, Colorado and the Westwater, Utah areas the Entrada outcrop band is continuously exposed on both sides of the river. Downriver from Westwater Canyon, the Entrada is submerged by the Colorado River again near Cisco Landing and again above Dewey Bridge. Presumably, the water quality in the Entrada along its outcrop band near the river is the about the same as the river water.

The water quality in the Entrada is deteriorated at short distances from the outcrop band due to the dissolution of chemicals in the aquifer itself. A water sample collected by David L. Allin after swabbing operations from Entrada perforations below 1,623' (elevation +2,885') in the Linda 1 Federal well in Section 31, T20S, R24E (13.5 miles to the southwest of Harley Dome) over several weeks during 2005 was not fully analyzed but was tested for resistivity. The Rw reading was 1.45 ohm-m at 80° F and indicated equivalent NaCl salinity near 3,600 ppm. The Linda 1 Federal well is located 4.5 miles northwest of the nearest Entrada outcrop which is also submerged by the Colorado River near Cisco Landing in Section 15, T21S, R24E. Another water sample collected by David L. Allin during 2005 from the stock tank of the Federal 25-2 well in Section 25, T20S, R21E (25 miles SW of Harley Dome) had an Rw reading of 0.63 ohm-m at 82° F that indicated equivalent NaCl salinity near 8,200 ppm. The top of the Entrada zone perforations in the Federal 25-2 well are below

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2,606' (elevation +2,459'), and the well is located 13 miles west of the Linda 1 Federal well and 17 miles west-northwest of the nearest point on the Colorado River also at Cisco Landing. See Attachment 2-C for a mapped presentation of the Linda 1 Federal and Federal 25-2 data points.

The water well drilled into the top of the Entrada on the Westwater Farms, LLC property and abandoned during 1965 by a previous owner named Elizondo probably found the Entrada water to have TDS content greater than 5,000 ppm although the driller's report was not specific. See Attachment 4-C, the Report of Well Driller filed following the abandonment of the Elizondo well. The copies of the logs from the L G 13 offset well drilled during 1968 at the top of the Harley Dome structure 1.1 miles northwest of the proposed H D 1 site were analyzed and found the Rw in porous zones of the Entrada ranged from 0.37 to 1.26 at 84 to 87° F. Depending upon the formation factor used the results indicated equivalent NaCl concentrations of 3,900 to 14,000 ppm. See Attachment 2-A and Attachment 4-D Rw and salinity estimation table. This means that this proposed UIC permit will require an aquifer exemption for the Entrada based upon the information in hand despite the fact that parts of the porosity contain water with equivalent NaCl concentrations in excess of 10,000 ppm. Research using the Utah water well information data base indicated that no water wells are completed in any formation in T18S, R25E or T19S, R25E and multiple reports of water encountered while drilling oil and gas test wells in these two surrounding townships described the Entrada water as "salty." See Attachment 4-B for examples of water reports. Water samples recovered from the proposed H D 1 well will be analyzed to determine the exact chemistry of the Entrada water to determine the compatibility of injectate from various sources.

The next deeper formation that will be encountered in the H D 1 will be the Kayenta Formation and it should be intersected near 1,125'. Note that the regional unconformity known as the J-2 rests on the top of the Kayenta in the vicinity of Harley Dome and the Carmel Formation and Navajo Sandstone are absent. Attachment 2-B illustrates this relationship and Attachment 2-D contains a dashed line illustrating the northeast pinchout of the Navajo Sandstone in map view. The Navajo is an important aquifer in Grand County, and will not be affected in any way by the operations proposed by the Applicant. The Kayenta Formation will be 208' thick and composed of grayish-red-purple, pale-reddish-brown sandstone, intraformational conglomerate, and siltstone interbedded with bluish-white to very light gray sandstone. This formation with heterogeneous sedimentary features was deposited on top of the Wingate Sandstone by relatively high-energy rivers on an alluvial plain producing moderately-sorted to well-sorted feldspathic to lithic arenite along with thinly laminated mudstone. The Kayenta was deposited over a multi-state area and has relatively low permeability and generally acts as a barrier to water movement. The water is more saline than in the overlying Entrada from the analysis of the offset well logs appearing in Attachment 4-D. The Kayenta is expected to act as an intermediate confining zone between the two proposed injection zones. The Kayenta is not a USDW.

The Wingate Sandstone will be intersected by the H D 1 below 1,333'. This formation will be 334' thick in the subsurface of Harley Dome and is proposed to be the lower injection zone. Like the Entrada, the Wingate is a preserved deposit of sand dunes, except that is of even larger areal extent and thickness. The formation is composed of grayish-orange-pink and light brown quartz sandstone which is very fine-grained to fine-grained, with rounded grains that are well-sorted, frosted, calcareous, and well-cemented in horizontal bedding to large-scale eolian cross-bedding. Interbedded ripple-laminated sandstone and thinly laminated siltstone occur at the base. The Wingate is a regional aquifer, but has fairly low permeability except where fractured. The Bryson Wash Syncline

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location selected for injection should provide some fracturing that will improve the performance of this proposed injection zone since it is not self-sealing. As is the case with the Entrada Sandstone, the Wingate Sandstone is assumed to be transmitting water slowly northward from its outcrop band on the northwest rim of Westwater Canyon and the points at each end of that canyon where the Colorado River crosses the Wingate outcrop band. The Wingate does not qualify as a USDW from the analysis of the logs from the L G 13 well that appear in Attachment 4-D since water with equivalent NaCl salinity values from 9,000 to 22,550 ppm can be inferred from Rw values within the aquifer depending upon the formation factor utilized. Water samples recovered from the proposed H D 1 well will be analyzed to determine the exact chemistry of the Wingate water to determine the compatibility of injectate from various sources.

The water within the Wingate northwest of Harley Dome should be under slightly hydrodynamic conditions as is suspected of the Entrada aquifer. Attachment 2-D presents a structure contour map drawn on the top of the Chinle Formation that acts as the lower confining zone to the Wingate aquifer. The map contains arrows depicting water flow in two important watersheds. In the southern area of the map the Glen Canyon Group (Navajo/Kayenta/Wingate) aquifer that underlies Moab, Utah and adjacent Spanish Valley is illustrated conducting fresh water from its recharge area in the La Sal Mountains to its discharge area in the valley fill sediments down gradient where wells serve the needs of the local population. Similarly, at Harley Dome, the Entrada and Wingate aquifers conduct water from the Uncompahgre Plateau down the northwest plunge of the Uncompahgre Uplift where fresh water is discharged into the Colorado River. From that point, some water is suspected to continue toward a lower pressure regime in the Danish Flat Syncline at the edge of the Uinta Basin beneath the Book Cliffs and move northward. It is known that the Wingate is not currently utilized as an aquifer in the area of Harley Dome and very few wells have penetrated the formation within a twenty mile radius except the Federal 2 and L G 13 wells previously described which are situated a few hundred feet apart.

The formation that will be reached at the TD of the H D 1 near 1,740'will be the Triassic Chinle Formation. The Chinle top will be near 1,667'and is at least 138' thick at Harley Dome. The formation will not be drilled through to the subjacent pre-Cambrian crystalline basement rock, but will be drilled for up to 70' to insure that the well is deep enough to allow recording the top of the Chinle on the mechanical logs. The Chinle is composed of reddish-brown, grayish-red, pale-brown and pale-red siltstone, sandstone, mudstone, limestone and pebble conglomerate and sparse pale-green limestone and mudstone, but predominantly siltstone and fine-grained sandstone. The siltstone is calcareous, indurated, and structureless to horizontally laminated. The formation rests unconformably on pre-Cambrian aged metamorphic and igneous rock. The Chinle has very low permeability and is a regional confining unit. The Chinle does is not a USDW.

R649-5-2.2.11 A review was made of the files of all of the wells mapped and labeled within the area of Attachment 1 as part of the research for this submittal. The file review and a field inspection conducted on April 27, 2009 were combined to verify the current status of the wells and their mechanical condition. Three wells are located within or near a one-half mile radius of the proposed injection well. All three of these wells were plugged and abandoned immediately following drilling operations and no mechanical logs were run. Attachment 2-E (2-E-1 through 2-E-3) is a summary in the form of a schematic diagram of the mechanical condition of each of the three abandoned wells.

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Additional notes about these wells that evaluate assurances that they do not provide conduits for fluid migration follow below.

A well was drilled on the Applicant's property in search of fresh water during 1965 at a location 540' north of the proposed H D 1 well. It was drilled under Application Number 36199 as labeled on Attachment 1 and has been referred to herein above as the Elizondo well. The Report of Well Driller issued following abandonment (Attachment 4-C) lacked some specific information on the construction and abandonment details such as bit sizes and the volume of cement used for the plugging operations, but the locations of three key cement plugs were given. See Attachment 2-E-1. John W. Moore, the driller based in Cisco, Utah, had significant experience in the Greater Cisco Field using his cable tool rig to perform contract drilling operations for oil and gas exploration operators such as Raphael Pumpelly and U-Tex Oil Company most notably in the area of Pumpelly's 1962 Agate oil and gas discovery in Section 8, T20S, R24E, 10 miles southwest of Harley Dome. Moore's level of expertise is relied upon to assume that his report that he "cemented off" the Salt Wash Mbr of Morrison water zone encountered from 595' to 602' and Entrada water zone from 875' to 905' at TD plus "surface cemented down 10 feet" in a hole filled with drilling mud adequately insured that fluid will not migrate between formations in the old well bore and that injectate proposed to be pumped to the Entrada and subjacent Wingate will not find a conduit to shallower formations via this well.

One of the wells drilled to delineate the non-flammable gas cap in the Entrada Sandstone within the attic of the Harley Dome Anticline known as the L G 5, discussed in previous sections, lies 1,500' west-southwest of the proposed injection well site and within the area of review. This well was drilled to 1,190' TD through the Entrada proposed upper injection zone and part way into the Kayenta Formation intermediate confining layer that separates the Entrada from the Wingate proposed lower injection zone. See Attachment 2-E-2. Conflicting information about the length of the surface casing and volume of cement used on that string appears in the reports from this well, but it is a matter of whether 2 or 3 joints of casing were set and cemented to surface. The volume of abandonment cement was not reported except for the surface plug, but plugs were balanced in gel mud at important points in the well over the top of the Entrada at 852' with a plug from 825' to 875' and over the top of the Morrison at 132' and surface casing shoe at either 70' or 90' from 60' to 140'. A surface plug reported to be composed of 5 sacks of cement would have filled at least 25' of the 7" surface casing depending upon how much water was used to make the slurry. This configuration insures that fluid will not migrate between formations in the L G 5 well bore and that injectate proposed to be pumped to the Entrada and subjacent Wingate at the H D 1 will not find a conduit to shallower formations.

The third well is the L G 10-31-A and it lies 2,750' south-southwest of the proposed injection well. This well was drilled in 1975 as previously discussed and was abandoned at TD 706' before drilling out of the Salt Wash Mbr Morrison Formation. Cement plugs composed of a total of 38 sacks were balanced in 9.75 ppg mud across the top of the Salt Wash at 575' from 500' to 600', over the top of the Brushy Basin Mbr at 156' and across the surface casing shoe at 150' from 85' to 160' and in the upper 10' of 7" surface casing. See Attachment 2-E-3. Fluid will not migrate between formations in the well, and it never penetrated the mudrock confining zones in the lower part of the Morrison or the primary, upper confining zone, the Summerville Formation. The L G 10-32-A will not act as a conduit for injectate to reach formations above the Entrada.

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R649-5-2.2.12 An affidavit certifying that a copy of the application has been provided to all operators, owners and surface owners within a one-half mile radius of the proposed injection well is appended hereto as Attachment 5.
R649-5-2.213 The Applicant is prepared to provide any other information that the Board or Division may determine is necessary to adequately review this application.

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R649-5-4 Aquifer Exemption Request for Entrada Sandstone within the Area of Review. Note that it is expected that the Kayenta Formation and Wingate Sandstone that underlie the Entrada will contain water with more than 10,000 ppm TDS from all of the evidence examined for this project. In the event that those deeper formations produce water which tests below the 10,000 ppm level, this request for aquifer exemption is extended to those formations for the same reasons stated below.

R649-5-4.1.1 A review of the records of the Utah Division of Water Rights showed that there were no water wells completed in Entrada Sandstone or any other bedrock formation in T 18-19S, R25E.

R649-5-4.1.2 The Entrada Sandstone cannot now and will not in the future serve as a source of drinking water for any of the following reasons:

R649-5-4.1.2.1 The Entrada is the host of a known non-flammable gas reserve that includes a fraction of helium adjacent to the northwest boundary of the area of review. The resource was most recently evaluated by a flow test from a well during 1993 and may be commercially producible if it is still present. Refer to the oil and gas exploratory drilling review under R649-5-2.10 beginning with the last paragraph on page 6 herein.

R649-5-4.1.2.2 The depth to the Entrada within the area of review is greater than 800' and is expected to contain water with greater than 3,000 ppm but less than 10,000 ppm TDS. There is a total of 1,000 acres of private land in the entirety of T18-19S, R25E comprising 46,080 gross acres. There will never be a population base located in the vicinity that will need to be served with water. The depth to access the aquifer and its location remote to population and agricultural land use areas preclude the need to develop an aquifer with impaired water quality.

R649-5-4.1.2.3 The water quality in the Entrada within the area of review has not been fully analyzed and may or may not be contaminated. The water is estimated to be brackish to salty as indicated by the qualitative descriptions of water shows in oil and gas exploratory wells drilled in the vicinity (Attachment 4-B), the completion report from the abandoned Elizondo water well (Attachment 4-C) and the analysis of the log responses from the Entrada intersection in the L G 13 offset well (Attachment 4-D). Desalination is not economically considering the lack of demand.

R649-5-4.1.2.4 Not applicable since the Entrada aquifer within the area of review does not overlie a Class III mining area subject to subsidence or catastrophic collapse.

R649-5-4.1.3 The evidence cited above under R649-5-4.1.2.2 and 3 indicate that the total dissolved solids content of the water from the Entrada aquifer is probably much more than 3,000 and less than 10,000 mg/l or ppm, and it is not reasonably expected to be used as a source of fresh or potable water.

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R649-5-4.2 The Applicant desires to have the Entrada Sandstone aquifer exempted from classification as a USDW and submits its request to the Division for that exemption for the reasons given herein and prays that the data is sufficient to justify the proposal.

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R649-5-5 Testing and Monitoring of the Proposed H D 1 Injection Well

R649-5-5.1 Before operating the H D 1 well for injection, the casing-tubing annulus shall be tested to a pressure not less than the maximum authorized injection pressure, or to a pressure of 300 psi, whichever is greater.

R649-5-5.2 Not applicable since the H D 1 will be a new well constructed specifically for injection purposes.

R649-5-5.3 In order to demonstrate continuing mechanical integrity after commencement of injection operations, the H D 1 shall be pressure tested or monitored as follows:

R649-5-5.3.1 *Pressure Test.* The H D 1 casing-tubing annulus above the packer shall be pressure tested not less than once each five years to a pressure equal to the maximum authorized injection pressure or to a pressure of 1,000 psi, whichever is lesser, provided that no test pressure shall be less than 300 psi. A report documenting the test results shall be submitted to the Division.

R649-5-5.3.2 *Monitoring.* If approved by the Director, and in lieu of the pressure testing requirement, the operator, Westwater Farms, LLC, may monitor the pressure of the casing-tubing annulus monthly during actual injection operations and report the results to the Division.

R649-5-5.3.3 It is acknowledged that other test procedures or devices such as tracer surveys, temperature logs or noise logs may be require by the Division on a case-by-case basis.

R649-5-5.3.4 The operator, Westwater Farms, LLC, shall sample and analyze the fluids injected in the H D 1 well at sufficiently frequent time intervals to yield data representative of fluid characteristics, and no less frequently than every year.

R649-5-5.3.5 The operator, Westwater Farms, LLC, shall submit a copy of the fluid analysis to the Division with the Annual Fluid Injection Report, UIC Form 4.

Westwater Farms, LLC
May 21, 2009
David L. Allin
Permit Agent/Author
475 Seasons Drive
Grand Junction, CO 81507-8749
(970) 254-3114
allinpro@bresnan.net

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Attachment 4-A-1: Water Analysis of Typical Injectate Source in the Greater Altamont-Bluebell Field. Green River-Wasatch Fms Commingled. NESW 21-1N-1W, USM, API No. 43-013-30707. Northern Uinta Basin, Duchesne County, UT

UNICHEM

A Division of BJ Services

P.O. Box 217
Roosevelt, Utah 84066

Office (435) 722-5066
Fax (435) 722-5727

WATER ANALYSIS REPORT

Company: Flying J Address: _____ Date: 1/15/01

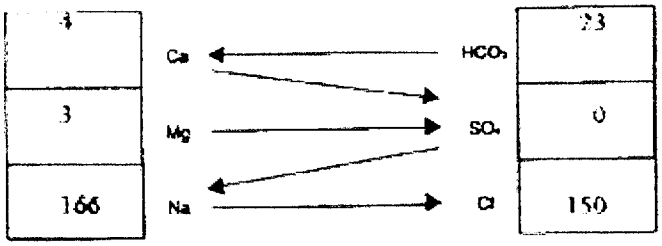
Source: H. Martin 1-21Z1 Date Sampled: 1/15/01 Analysis No. _____

Tgr-Tw

	Analysis		mg/l(ppm)			*Meq/l	
1. PH	8.0						
2. H_2S (Qualitative)	1.0						
3. Specific Gravity	1.010						
4. Dissolved Solids			10,634				
5. Alkalinity ($CaCO_3$)		CO_3	0	÷ 30		0	CO_3
6. Bicarbonate (HCO_3)		HCO_3	1,400	÷ 61		23	HCO_3
7. Hydroxyl (OH)		OH	0	÷ 17		0	OH
8. Chlorides (Cl)		Cl	5,300	÷ 35.5		150	Cl
9. Sulfates (SO_4)		SO_4	0	÷ 48		0	SO_4
10. Calcium (Ca)		Ca	80	÷ 20		4	Ca
11. Magnesium (Mg)		MG	36	÷ 12.2		3	Mg
12. Total Hardness ($CaCO_3$)			350				
13. Total Iron (Fe)			3.2				
14. Manganese			0.1				
15. Phosphate Residuals			46				

*Milli equivalents per liter

PROBABLE MINERAL COMPOSITION



Compound	Equiv. Wt.	X	Meq/l	=	Mg/l
$Ca(HCO_3)_2$	81.04		4		243
$CaSO_4$	68.07				
$CaCl_2$	55.50				
$Mg(HCO_3)_2$	73.17		3		220
$MgSO_4$	60.19				
$MgCl_2$	47.62				
$NaHCO_3$	84.00		16		1,344
Na_2SO_4	71.03				
NaCl	58.46		150		8,769

Saturation Values	Distilled Water 20°C
$CaCO_3$	13 Mg/l
$CaSO_4 \cdot 2H_2O$	2,090 Mg/l
$MgCO_3$	103 Mg/l

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Attachment 4-A-2: Water Analysis of Typical Injectate Source in the Greater Altamont-Bluebell Field. Green River-Wasatch Fms Commingled. SENW 23-1S-1E, USM, API No. 43-047-30279. Uinta Basin, Uintah County, UT

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Roosevelt, Utah 84066

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Fax (435) 722-5727

WATER ANALYSIS REPORT

Company: Flying J Address: _____ Date: 1/11/01

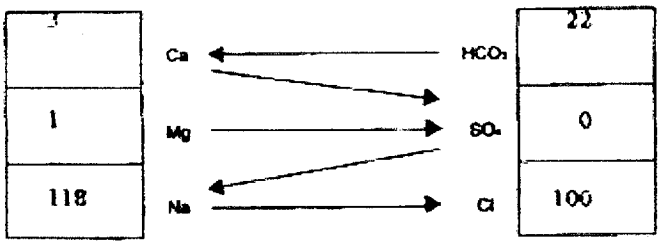
Source: Hackford 1-23AIE Date Sampled: _____ Analysis No. _____

Tgr-Tw

	Analysis		mg/l(ppm)		*Meq/l	
1. PH	8.9					
2. H_2S (Qualitative)	0.5					
3. Specific Gravity	1.009					
4. Dissolved Solids			7,683			
5. Alkalinity ($CaCO_3$)		CO_3	0	÷ 30	0	CO_3
6. Bicarbonate (HCO_3)		HCO_3	1,342	÷ 61	22	HCO_3
7. Hydroxyl (OH)		OH	0	÷ 17	0	OH
8. Chlorides (Cl)		Cl	3,540	÷ 35.5	100	Cl
9. Sulfates (SO_4)		SO_4	15	÷ 48	0	SO_4
10. Calcium (Ca)		Ca	60	÷ 20	3	Ca
11. Magnesium (Mg)		MG	12	÷ 12.2	1	Mg
12. Total Hardness ($CaCO_3$)			200			
13. Total Iron (Fe)			4.1			
14. Manganese			0.1			
15. Phosphate Residuals			21			

*Milli equivalents per liter

PROBABLE MINERAL COMPOSITION



Compound	Equiv. Wt.	X	Meq/l	=	Mg/l
$Ca(HCO_3)_2$	81.04		3		243
$CaSO_4$	68.07				
$CaCl_2$	55.50				
$Mg(HCO_3)_2$	73.17		1		73
$MgSO_4$	60.19				
$MgCl_2$	47.62				
$NaHCO_3$	84.00		18		1,512
Na_2SO_4	71.03				
NaCl	58.46		100		5,846

Saturation Values	Distilled Water 20°C
$CaCO_3$	13 Mg/l
$CaSO_4 \cdot 2H_2O$	2,090 Mg/l
$MgCO_3$	103 Mg/l

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Attachment 4-A-3: Water Analysis of Typical Injectate Source in the Greater Altamont-Bluebell Field. Green River-Wasatch Fms Commingled. NESW 21-2S-1W, USM, API No. 43-013-30621. Uinta Basin, Duchesne County, UT

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P.O. Box 217
Roosevelt, Utah 84066

Office (435) 722-5068
Fax (435) 722-5727

WATER ANALYSIS REPORT

Company Flying J Address _____ Date 1/25/01

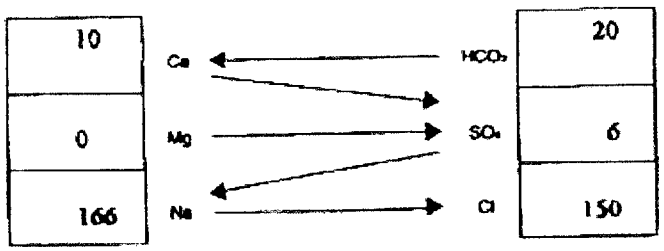
Source Powell 1-21B1 Date Sampled _____ Analysis No. _____

Tgr - Tw

	Analysis		mg/l(ppm)		*Meg/l	
1. PH	8.7					
2. H_2S (Qualitative)	2.5					
3. Specific Gravity	1.010					
4. Dissolved Solids			10,838			
5. Alkalinity ($CaCO_3$)		CO_3	0	÷ 30	0	CO_3
6. Bicarbonate (HCO_3)		HCO_3	1,220	÷ 61	20	HCO_3
7. Hydroxyl (OH)		OH	0	÷ 17	0	OH
8. Chlorides (Cl)		Cl	5,300	÷ 35.5	150	Cl
9. Sulfates (SO_4)		SO_4	300	÷ 48	6	SO_4
10. Calcium (Ca)		Ca	200	÷ 20	10	Ca
11. Magnesium (Mg)		MG	0	÷ 12.2	0	Mg
12. Total Hardness ($CaCO_3$)			500			
13. Total Iron (Fe)			1.0			
14. Manganese			0.1			
15. Phosphate Residuals			30			

*Milli equivalents per liter

PROBABLE MINERAL COMPOSITION



Compound	Equiv. Wt.	X	Meq/l	=	Mg/l
$Ca(HCO_3)_2$	81.04		10		810
$CaSO_4$	68.07				
$CaCl_2$	55.50				
$Mg(HCO_3)_2$	73.17				
$MgSO_4$	60.19				
$MgCl_2$	47.62				
$NaHCO_3$	84.00		10		840
Na_2SO_4	71.03		6		426
NaCl	58.46		150		8,769

Saturation Values	Distilled Water 20°C
$CaCO_3$	13 Mg/l
$CaSO_4 \cdot 2H_2O$	2,090 Mg/l
$MgCO_3$	103 Mg/l

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Attachment 4-A-4: Water Analysis of Typical Injectate Source in the Greater Natural Buttes Field. Wasatch-Mesaverde Fms Commingled. SWSW 25-9S-21E, SLM, API No. 43-047-31745. Uinta Basin, Uintah County, UT

JOHN C. ARPHART & CO.

GRAND JUNCTION LABORATORIES

435 NORTH AVENUE • PHONE 242-7618 • GRAND JUNCTION, COLORADO 81501

ANALYTICAL REPORT

Received from: Coastal Oil and Gas, Dave Dillon
Vernal, UT 84078

Customer No. _____ Laboratory No. 2743 Sample water

Date Received 9/5/91 Date Reported 9/24/91

Lab number	2743	
Sample ID	NB 99 NBU 099 E	SWSW 25-9S-21E
Tw-Kmv		43-047-31745
Sodium(Na)	6580 mg/l	
Calcium(Ca)	144 mg/l	
Magnesium(Mg)	60 mg/l	
Potassium(K)	524 mg/l	
Chloride(Cl)	9900 mg/l	
Sulfate(SO4)	455 mg/l	
Phenol. Alkalinity(CaCO3)	0 mg/l	
Total Alkalinity(CaCO3)	736 mg/l	
Dissolved Solids	19000 mg/l	
Specific Gravity	1.015	
pH	7.5	
Conductivity@25 deg. C	26400 umhos/cm	
Resistivity@25C	0.379 ohm-m	
Bicarbonate	891 mg/l	
Carbonate	0 mg/l	
Total Iron(Fe)	0.16 mg/l	
Petroleum Hydrocarbons	3.12 mg/l	

Lab Dir.: Brian S. Bauer

MAY 26 2009

Attachment 4-A-5: Water Analysis of Typical Injectate Source in the Greater Natural Buttes Field. Wasatch-Mesaverde Fms Commingled. SESE 26-9S-22E, SLM, API No. 43-047-32002. Uinta Basin, Uintah County, UT

DOWELL SCHLUMBERGER INCORPORATED

SESE 26-9S-22E 43-047-32002

LABORATORY LOCATION Vernal, Utah

API WATER ANALYSIS REPORT FORM

DATE 8-16 91

LAB NO. 1503-00458

Company Enron Oil and Gas		Sample No. 1	Date Sampled 8-14-91
Field Chapita Wells	Legal Description Sec. 26, T9S, R22E	County or Parish Uintah	State Utah
Lease or Unit Chapita Wells	Well 301-26	Depth ±6000'	Formation Wasatch	Water, B/D
Type of Water (Produced, Supply, etc.) Produced	Sampling Point Well head	Sampled By JG	

DISSOLVED SOLIDS

CATIONS

	mg/L	me/L
Sodium, Na (calc.)	6325	272
Calcium, Ca	940	47
Magnesium, Mg	132	11
Barium, Ba	—	—

ANIONS

Chloride, Cl	8600	241
Sulfate, SO_4	4000	83
Carbonate, CO_3	0	0
Bicarbonate, HCO_3	549	9

Total Dissolved Solids (calc.) 20546

Iron, Fe (total) 3mg/l

Sulfide, as H_2S —

OTHER PROPERTIES

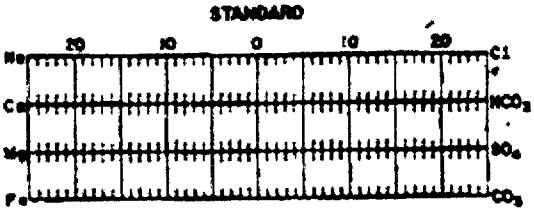
pH 7.0

Specific Gravity, 60/60 F. 1.010

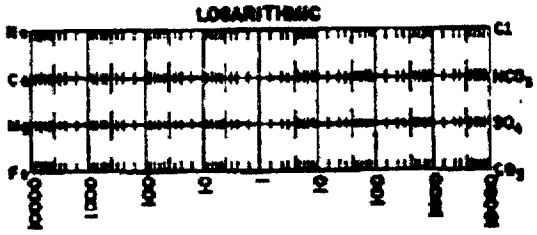
Resistivity (ohm-meters) ____ F.

WATER PATTERNS -- me/L

STANDARD



LOGARITHMIC



REMARKS & RECOMMENDATIONS:

MAY 26 2009

Attachment 4-A-6: Water Analysis of Typical Injectate Source in the Greater Natural Buttes Field. Wasatch-Mesaverde Fms Commingled. SENW 14-10S-22E, SLM, API No. 43-047-30491. Uinta Basin, Uintah County, UT

SMITH ENERGY SERVICES
A DIVISION OF ALLIED PRODUCTS CORPORATION

1435 South 1200 East
Vernal, Utah 84078
Phone (801) 789-9590

COMPANY: Coastal Oil & Gas

ADDRESS:

ATTENTION:

DATE SAMPLED:

REPORT DATE: 8/31/91

COUNTY: Uintah

FIELD: Natural Buttes

FORMATION: Tw - Kmv

LEASE:

WELL: CIGE 43

SENW 14-10S-22E
43-047-30491

WATER ANALYSIS

SPECIFIC GRAVITY:	1.020	pH:	7.0
CHLORIDE:	11,000 ppm	CALCIUM:	600 ppm
BICARBONATE:	1,100 ppm	MAGNESIUM:	100 ppm
SULFIDE:	n/a	TOTAL IRON:	0 ppm
SULFATE:	900 ppm	SODIUM:	400 ppm
TOTAL HARDNESS: (AS CaC03)	1000 ppm	TOTAL DISSOLVED SOLIDS:	14,225 ppm
RESISTIVITY:	n/a	OHM METERS @:	
POTASSIUM:	125 ppm		

SAMPLE SOURCE: pit water

REMARKS:

SMITH REPRESENTATIVE: Mike Hill

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DIV. OF OIL, GAS & MINING

Attachment 4-A-7: Water Analysis of Typical Injectate Source in the Seep Ridge Field.
Cedar Mountain Fm. SENW 2-14S-22E, SLM, API No. 43-047-37336.
Southern Uinta Basin, Uintah County, UT

HALLIBURTON

1085 E. Main/ Vernal, Utah 84078 / Telephone: 435-789-2550 Lab Ext. 552 / Fax: 435-781-7576

WATER ANALYSIS

Date Tested:	June 28, 2006	Project #	V06-W191_192
Date Received:	June 27, 2006		

Company:	Summit Operating	Lower Cedar Mtn.
Lease/ Well #:	Seep Ridge Unit 6-2	Perf's. @ 9625-43'

Sample 6-27-06 Formation/ Date:		Morning	Evening
Specific Gravity		1.022	1.021
Temperature	°F	72.6	72.3
pH		5.53	5.62
Resistivity	Ω*m	0.309	0.312 .11 @ 210°F
Iron	mg/L	1200	1500
Potassium	mg/L	3250	3250
Chlorides	mg/L	16965	15625
Calcium	mg/L	4235	3935
Magnesium	mg/L	830	850
Sulfates	mg/L	200	315
Carbonates	mg/L	0	0
Bicarbonates	mg/L	285	305
Sodium (calculated)	mg/L	2860	2360
TDS	mg/L	29825	28135
Comments			

Respectfully Submitted By:

Lori Vian

Lab Technician

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Attachment 4-A-8: Water Analysis of Typical Injectate Source in the Seep Ridge Field.
Slickrock Mbr Entrada Ss. SWSW 24-13S-22E, SLM, API No. 43-047-36730.
Southern Uinta Basin, Uintah County, UT

HALLIBURTON

1085 E. Main/ Vernal, Utah 84078 / Telephone: 435-789-2550 Lab Ext. 552 / Fax: 435-781-7576

WATER ANALYSIS

Date Tested:	Mar. 27, 2006	Project #:	V06-W081 082
Date Received:	Mar. 26, 2006		

Company:	Summit Operating	
Lease/ Well #:	Seep Ridge U. # 7	Entrada 11052-62' 11051-64 gross

Sample Formation/ Date:		1st sample	~~9-26-06~~ 1-31-06 Unmarked sample	avgs
Specific Gravity		1.056	1.054	1.055
Temperature	°F	74.3	73.2	
pH		5.53	5.09	5.31
Resistivity	Ω*m	0.095 .035@200°F	0.095 .035@200°F	
Iron	mg/L	500	250	
Potassium	mg/L	5000	3500	
Chlorides	mg/L	47615	47420	47,518
Calcium	mg/L	1135	1175	
Magnesium	mg/L	95	95	
Sulfates	mg/L	125	190	
Carbonates	mg/L	0	0	
Bicarbonates	mg/L	390	155	
Sodium (calculated)	mg/L	26640	27295	
TDS	mg/L	81500	80070	80,785
Comments:				

Respectfully Submitted By,

Lori Vian

Lab Technician

400 bbls apart from sucking 1-30-06 & 1-31-06

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NOTICE: This report is limited to the described sample tested. Any user of this report agrees that Halliburton shall not be liable for any loss or damage, whether due to act or omission, resulting from such report or its use.

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Attachment 4-A-9: Water Analysis of Typical Injectate Source in the Drunkards Wash Unit (CBM). Ferron Ss Mbr Mancos Sh. Sample of mixed production water from storage at injection well site. SESW 31-14S-10E, SLM, API No. 43-047-30440. San Rafael Swell, Carbon County, UT

UNICHEM

A Division of BJ Services

P.O. Box 217
Roosevelt, Utah 84066

Office (801) 722-5066
Fax (801) 722-5727

WATER ANALYSIS REPORT

RIVER GAS

COMPANY D-1 PAQ 31-01-DT ADDRESS _____ DATE 01-30-96

SOURCE RGC WATER SAMPLES DATE SAMPLED 01-22-96 ANALYSIS NO. _____

	Analysis	Milligrams/l			*Meq/l
1. PH	8.6				
2. H_2S (Qualitative)	0				
3. Specific Gravity	1.007				
4. Dissolved Solids		19,889			
5. Suspended Solids					
6. Anaerobic Bacterial Count	_____ C/ml				
7. Methyl Orange Alkalinity ($CaCO_3$)					
8. Bicarbonate (HCO_3)	HCO_3	3,660	÷61	60	HCO_3
9. Chlorides (Cl)	Cl	9,000	÷35.5	254	Cl
10. Sulfates (SO_4)	SO_4	0	÷48	0	SO_4
11. Calcium (Ca)	Ca	2	÷20	0	Ca
12. Magnesium (Mg)	Mg	0	÷12.2	0	Mg
13. Total Hardness ($CaCO_3$)		5			
14. Total Iron (Fe)		0.6			
15. Barium (Qualitative)					
16. Phosphate Residuals					

*Milli equivalents per liter

PROBABLE MINERAL COMPOSITION

0	Ca	HCO_3	60
0	Mg	SO_4	0
314	Na	Cl	254

Compound	Equiv. Wt.	X Meq/l	= Mg/l
$Ca(HCO_3)_2$	81.04		
$CaSO_4$	68.07		
$CaCl_2$	55.50		
$Mg(HCO_3)_2$	73.17		
$MgSO_4$	60.19		
$MgCl_2$	47.62		
$NaHCO_3$	84.00	60	5,040
Na_2SO_4	71.03		
NaCl	58.46	254	14,849

Saturation Values	Distilled Water 20°C
$CaCO_3$	13 Mg/l
$CaSO_4 \cdot 2H_2O$	2,090 Mg/l
$MgCO_3$	103 Mg/l

REMARKS RESISTIVITY = .56 OHMS/CM @ 70°F

(Resistivity would indicate equivalent NaCl salinity of 11,000 ppm-D.L. Allin, May 2009)

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Attachment 4-A-9

Attachment 4-A-10: Water Analysis of Typical Injectate Source in the Kane Springs Unit. Cane Creek zone Paradox Fm. Sample of possibly mixed production water that would include: NWSE 10-25S-18E, SLM, API No. 43-019-31331. Northern Paradox Basin, Grand County, UT

Champion Technologies

Production water

2060 SOUTH 1800 EAST
VERNAL, UTAH 84078

Telephone (435) 789-4327

Water Analysis Report

Customer :	Aviara Energy Corp.	Date Sampled :	21-Dec-00
		Date Reported :	08-Jan-01
Address :		Date Received :	02-Jan-01
City :	Moab		
State :	UT Postal Code :	Field :	Kane Springs Unit
		Lease :	Kane Springs Unit
Attention :	Mark Swisher	Location :	Commingled Water
cc1 :	Charlie Harrison	Sample Point :	wellhead
cc2 :			
cc3 :		Salesman :	Clay Bingham
Comments :		Analyst :	Karen Hawkins Allen

CATIONS

Calcium :	10,200	mg/l
Magnesium :	267	mg/l
Barium :	0	mg/l
Strontium :	0	mg/l
Iron :	85.0	mg/l
Sodium :	77478	mg/l

ANIONS

Chloride :	138,000	mg/l
Carbonate :	0	mg/l
Bicarbonate :	146	mg/l
Sulfate :	280	mg/l

pH (field) :	6.20		Specific Gravity :	1.2300	grams/ml
Temperature :	85	degrees F	Total Dissolved Solids :	226,456	ppm
Ionic Strength :	3.90		CO2 in Water :	97	mg/l
			CO2 in Gas :	0.03	mole %
Resistivity :		ohm/meters	H2S in Water :	75.0	mg/l
Ammonia :		ppm	Dissolved Oxygen :		ppm

SI calculations based on Tomson-Oddo parameters

Calcite (CaCO3) SI :	-0.36	Calcite PTB :	N/A
Calcite (CaCO3) SI @ 100 F :	-0.01	Calcite PTB @ 100 F :	N/A
Calcite (CaCO3) SI @ 120 F :	0.20	Calcite PTB @ 120 F :	17.0
Calcite (CaCO3) SI @ 140 F :	0.42	Calcite PTB @ 140 F :	32.1
Calcite (CaCO3) SI @ 160 F :	0.65	Calcite PTB @ 160 F :	43.9
Gypsum (CaSO4) SI :	-0.62	Gypsum PTB :	N/A
Barite (BaSO4) SI :	N/A	Barite PTB :	N/A
Celestite (SrSO4) SI :	N/A	Celestite PTB :	N/A

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Champion Technologies, Inc.
Vernal District Technical Services

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Attachment 4-A-10

Attachment 4-A-11: Water Analysis of Typical Injectate Source in the Rulison Field. Mesaverde Group. SENE 8-7S-94W, 6th PM, API No. 05-045-05059, 12-28-76. Southern Piceance Basin, Garfield County, CO

Analyte	Results		Units	Type Sample
BA	78		MG/L	PRD
CA	232		MG/L	PRD
CL	13494		MG/L	PRD
FE	7.8		MG/L	PRD
H2S		ND	MG/L	PRD
HARD, TOTAL AS CACO3	640		MG/L	PRD
HCO3	1190		MG/L	PRD
MG	15		MG/L	PRD
Na + K	8879		MG/L	PRD
PH	7.9		su	PRD
RESISTIVITY	0.311		OHM/M@77F	PRD
SOLIDS, TOTAL CALC	23888		MG/L	PRD
SpGrav	1.0174		NA	PRD
Sulfate		ND	MG/L	PRD

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Attachment 4-A-12: Water Analysis of Typical Injectate Source in the Timberline Field. Williams Fork Fm (Kmv). SESW 8-6S-91W, 6th PM, API No. 05-045-06355, 9-11-96. Eastern Piceance Basin, Garfield County, CO

Analyte	Results		Units	Type Sample
CA	381		MG/L	PRD
CL	3960		MG/L	PRD
COND	1.01		uS/cm	PRD
FE	0		MG/L	PRD
Hard	1030		MG/L	PRD
HCO3	616		MG/L	PRD
MG	19		MG/L	PRD
NA	3141		MG/L	PRD
RESISTIVITY	0.495		OHM-M@75F	PRD
Sulfate	0		MG/L	PRD
TDS	8747		MG/L	PRD

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Attachment 4-A-13: Water Analysis of Typical Injectate Source in the Soldier Canyon Field.
Dakota Ss. NWSW 30-5S-100W, 6th PM, API No. 05-045-06092, 8-16-78.
Western Piceance Basin, Garfield County, CO

Analyte	Results		Units	Type Sample
CA	3930		MG/L	PRD
CL	34449		MG/L	PRD
HCO3	310		MG/L	PRD
MG	480		MG/L	PRD
NA, CALC	17549		MG/L	PRD
PH	5.9		su	PRD
RESISTIVITY	0.18		OHM-M@60F	PRD
SpGrav	1.045		NA	PRD
Sulfate	979		MG/L	PRD
TDS, CALC	57697		MG/L	PRD

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Attachment 4-A-14: Water Analysis of Typical Injectate Source in the Mamm Creek Field. Mesaverde Group. CSW 34-6S-93W, 6th PM, API No. 05-045-06377, 11-11-81. Piceance Basin, Garfield County, CO

Analyte	Results	Units	Type Sample
CA	34	MG/L	DST
CL	530	MG/L	DST
CO3	36	MG/L	DST
HCO3	280	MG/L	DST
K	6	MG/L	DST
MG	1	MG/L	DST
NA	738	MG/L	DST
NITRATE	149	MG/L	DST
PH, LAB	8.4	su	DST
Resistivity	3.5	OHM-M@68F	DST
Sulfate	640	MG/L	DST
TDS	2123	MG/L	DST

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Attachment 4-A-15: Water Analysis of Typical Injectate Source in the Grand Valley Field.
Williams Fork & Cameo Fms. SENW 20-6S-96W, 6th PM, API No. 05-045-06578, 3-10-91.
Piceance Basin, Garfield County, CO

Analyte	Results		Units	Type Sample
Ca	103		mg/L	
CL	7036		mg/L	
FE	0		mg/L	
HARD, AS CACO3	476		mg/L	
HCO3	1691		mg/L	
K	0		mg/L	
MG	53		mg/L	
NA	4976		mg/L	
NACL	11582		ppm	
RESISTIVITY	0.48		OHM-M	
SPGRAV	1.01		NA	
Sulfate	10		mg/L	
TDS	14179		mg/L	

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Attachments 4-B-1 through 4-B-9: Water reports from wells in T18-19S, R24-25E, Grand County, Utah

Attachment 4-B-1: L G 18 in SESE Section 27, T18S, R25E, P&A 1968

FORM OGC-8-X

FILE IN QUADRUPLICATE

STATE OF UTAH
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL & GAS CONSERVATION
1588 West North Temple
Salt Lake City, Utah 84116

REPORT OF WATER ENCOUNTERED DURING DRILLING

Well Name & Number A. Lanedale #18

Operator A. Lanedale Address _____ Phone _____

Contractor Bush Drilling Address Grand Junction Phone 243-0493

Location SE ¼ SE ¼ Sec. 27 T. 18 N/S R. 25 E/W Grand County, Utah

Water Sands:

	Depth From	Depth To	Volume Flow Rate or Head	Quality Fresh or Salty
1.	380	410	2-3 Bbls Per Hr	Brackish
2.	1151	1155' TD	If drilling was stopped when first water was encountered	
3.				
4.				
5.				

Probably Cedar Mountain Fm

Entrada Ss

(Continue on reverse side if necessary)

Formation Tops:
0-260 Mancos
260-390 Dakota
390-1112 Morrison
1112-1155 Entrada

Remarks:

NOTE:
(a) Upon diminishing supply forms, please inform this office.
(b) Report on this form as provided for in Rule C-20, General Rules and Regulations and Rules of Practice and Procedure, (See Back of form).
(c) If a water analysis has been made of the above reported zone, please forward a copy along with this form.

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Attachment 4-B-1

FILE IN QUADRUPLICATE

STATE OF UTAH
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL & GAS CONSERVATION
1588 West North Temple

SALT LAKE CITY, UTAH 8411

REPORT OF WATER ENCOUNTERED DURING DRILLING

Well Name & Number _____

Operator LANDDLA 17 Address _____ Phone _____

Contractor A. Lanndale Address _____ Phone _____

Location Rush Drilling T. ____ N/S R. Grand Junction W County 343-2493

Water Sands: SW 26 18 25 Grand

Depth From	Depth To	Volume Flow Rate or Head	Quality Fresh or Salty
1.			
2. Ferron Ss Mbr Mancos Sh 140-150		Some	
3. Dakota Ss 460-460		5-7 gals Pr. Hr.	Brackish
4. Entrada Ss 1470-1470		Slight increase in Brackish Water	
5.			

Test was drilled to total depth with air

(Continued on reverse side if necessary)

Formation Tops:

Remarks:
Dakota 450 ; Morrison 580; Entrada 1375

NOTE: (a) Upon diminishing supply forms, please inform this office,
(b) Report on this form as provided for in Rule C-20, General Rules and Regulations and Rules of Practice and Procedure, (See back of form)
(c) If a water analysis has been made of the above reported zone, please forward a copy along with this form.

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Attachment 4-B-3: L G 3 in NESW Section 29, T18S, R25E, P&A 1967

FORM OGCC-8-X
FILE IN QUADRUPLICATE

RECEIVED AUG 29 1967 STATE ENGINEER'S OFFICE

STATE OF UTAH
OIL & GAS CONSERVATION COMMISSION
348 EAST SOUTH TEMPLE
SUITE 301
SALT LAKE CITY, UTAH

REPORT OF WATER ENCOUNTERED DURING DRILLING

Well Name & Number [illegible]

Operator [illegible] Address P.O. Box 68 Phone
Garden Grove, Calif.

Contractor [illegible] Address [illegible] Phone

Location NE ¼ SW ¼ Sec. 29 T. 18 S R. 25 E Grand County, Utah.

Water Sands:

	Depth From	Depth To	Volume Flow Rate or Head	Quality Fresh or Salty
1. Entrada Ss	1360	1390	20 bbls/hr	Salty
2.				
3.				
4.				
5.				

(Continued on reverse side if necessary)

Formation Tops:

Entrada 1240
Navajo 520

Remarks:

NOTE: (a) Upon diminishing supply of forms, please inform the Commission.
(b) Report on this form as provided for in Rule C-20, General Rules and Regulations and Rules of Practice and Procedure, (See back of form).
(c) If a water analysis has been made of the above reported zone, please forward a copy along with this form.

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DIV. OF OIL, GAS & MINING

Attachment 4-B-3

Attachment 4-B-4: L G 1 in SWSE Section 33, T18S, R25E, Shut-in gas well 1967

FORM OGC-8-X

FILE IN QUADRUPLICATE

STATE OF UTAH
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL & GAS CONSERVATION
1588 West North Temple

SALT LAKE CITY, UTAH 8411

REPORT OF WATER ENCOUNTERED DURING DRILLING

Well Name & Number # 1 A. Lansdale

Operator A. Lansdale Address P.O. Box 68 Phone 874-3482

Contractor Gunnison Drl. Co. Address Delta Colorado Phone 874-3482

Location SW ¼ SE ¼ Sec. 33 T. 18 N/S R. 25 E/W Grand County, Utah

Water Sands:

Depth From	Depth To	Volume Flow Rate or Head	Quality Fresh or Salty
1. Brushy Basin Mbr Morrison Fm 200-220		Approx 1bbl. Per hour	Brackish
2. Entrada Ss Test was air drilled and a slight increase of salty water in			
3. the Entrada from 900-944		1-2 bbls. Per hour	
4.			
5.			

(Continued on reverse side if necessary)

Formation Tops:

Remarks:

NOTE: (a) Upon diminishing supply forms, please inform this office,
(b) Report on this form as provided for in Rule C-20, General Rules and Regulations and Rules of Practice and Procedure, (See back of form)
(c) If a water analysis has been made of the above reported zone, please forward a copy along with this form.

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DIV. OF OIL, GAS & MINING

Attachment 4-B-4

FORM OGC-8-X

FILE IN QUADRUPLICATE

STATE OF UTAH
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL & GAS CONSERVATION
1588 West North Temple

SALT LAKE CITY, UTAH 8411

REPORT OF WATER ENCOUNTERED DURING DRILLING

Well Name & Number A. Lansdale #16 Govt.

Operator A Lansdale Address PO 68 Garden Grove, Calif. 92642 Phone

Contractor Gunnison Drlg Co Address Delta, Colo. Phone 874-3482

Location SE¼ SW¼ Sec. 35 T. 18 S R. 25 E Grand County, Utah

Water Sands:

	Depth From	Depth To	Volume Flow Rate or Head	Quality Fresh or Salty
1.	220	225	2-3 BBls per hr.	Brackish
2.	910	1070	1-2 "	" Salty
3.	This test was drilled with air only a			
4.	slight increase in water was Noted			
5.	in the Entrada 857-1070 T.D.			

Brushy Basin Mbr Morrison Fm

Entrada Ss

(Continued on reverse side if necessary)

Formation Tops:

Remarks:

NOTE: (a) Upon diminishing supply forms, please inform this office.
(b) Report on this form as provided for in Rule C-20, General Rules and Regulations and Rules of Practice and Procedure, (See back of form)
(c) If a water analysis has been made of the above reported zone, please forward a copy along with this form.

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MAY 26 2009
DIV. OF OIL, GAS & MINING

FORM OGC-8-X

FILE IN QUADRUPLICATE

RECEIVED
MAY 5 1969
STATE ENGINEER'S OFFICE

STATE OF UTAH
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL & GAS CONSERVATION
1588 West North Temple
Salt Lake City, Utah 84116

REPORT OF WATER ENCOUNTERED DURING DRILLING

Well Name & Number ~~Government # 1~~ ~~Permit # 43-019-30030~~

Operator ~~Beehive Uranium Corp.~~ Address ~~Grand Junction, Colo.~~ Phone ~~242-0113~~

Contractor Gunnison Drilling Co. Address P.O. Box 683 ~~Delta, Colo.~~ Phone

Location SE ¼ NW ¼ Sec. 11 T. 18 ~~N~~ S R. 24 ~~E~~ E ~~W~~ Grand County, Utah

Water Sands:

Depth From	Depth To	Volume Flow Rate or Head	Quality Fresh or Salty
1. 2470' Dakota Ss	2500'	Estimated fillup of 950' in an 8-¾" air drilled hole.	salty
2.			
3.			
4.			
5.			

(Continue on reverse side if necessary)

Formation Tops:

Top of Dakota Sand (basal SS member) 2470'

1St Red Shale of Morrison Fm. 2600'

Remarks:

NOTE: (a) Upon diminishing supply forms, please inform this office.
(b) Report on this form as provided for in Rule C-20, General Rules and Regulations and Rules of Practice and Procedure, (See Back of form).
(c) If a water analysis has been made of the above reported zone, please forward a copy along with this form.

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Orig + 2 copies

FORM OGCC-8-X

RECEIVED
APR 27 1965
STATE ENGINEER'S OFFICE

STATE OF UTAH
OIL & GAS CONSERVATION COMMISSION
348 EAST SOUTH TEMPLE
SUITE 301
SALT LAKE CITY, UTAH

REPORT OF WATER ENCOUNTERED DURING DRILLING

Well Name & Number: Federal A-1

Operator Big Mama-Rendez River Corp. Address Denver, Colorado Phone 534-3535

Contractor Carmack Drilling Co. Address Grand Junction, Colo. Phone

Location SW ¼ NE ¼ Sec. 21 T. 18 S R. 24 E Grand County, Utah.

Water Sands:

	Depth From	Depth To	Volume Flow Rate or Head	Quality Fresh or Salty
1.	2886	2890	110' Head after 4 hours	Salty
2.				
3.				
4.				
5.				

Brushy Basin Mbr Morrison Fm

(Continued on reverse side if necessary)

Formation Tops:

Depth	Formation
Surface of Ground	Mancos Shale
2760'	Dakota Sandstone
2844'	Morrison shale

Remarks:

The well was plugged and abandoned on April 19, 1965

NOTE: (a) Upon diminishing supply of forms, please inform the Commission
(b) Report on this form as provided for in Rule C-20, General Rules and Regulations and Rules of Practice and Procedure, (See back of form)
(c) If a water analysis has been made of the above reported zone, please forward a copy along with this form.

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FORM OGCC-8-X
FILE IN QUADRUPLICATE

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NOV 6 1967
STATE ENGINEER'S OFFICE

STATE OF UTAH
OIL & GAS CONSERVATION COMMISSION
348 EAST SOUTH TEMPLE
SUITE 301
SALT LAKE CITY, UTAH

REPORT OF WATER ENCOUNTERED DURING DRILLING

Well Name & Number STATE 32-1

Operator Stava Oil Company Operator Address Box 1743 Phone 243-1440

Contractor Rush Drilling Co Address 190 Hall Ave Grand Junction Phone 243-0493

Location 1483 FSL 820 FEL Sec. 32 T. 19 S N R. 24 E W Grand County, Utah.

Water Sands:

	Depth From	Depth To	Volume Flow Rate or Head	Quality Fresh or Salty
1.	Mancos Sh 50	52	No appreciably amount	brackish
2.	Dakota Ss 1624	1690	No measurable amount	Salty
3.				
4.				
5.				

(Continued on reverse side if necessary)

Formation Tops:

Dakota 1638
Morrison 1730
Brushy Basin 1890

Remarks:

NOTE: (a) Upon diminishing supply of forms, please inform the Commission.
(b) Report on this form as provided for in Rule C-20, General Rules and Regulations and Rules of Practice and Procedure, (See back of form).
(c) If a water analysis has been made of the above reported zone, please forward a copy along with this form.

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DIV. OF OIL, GAS & MINING

FORM OGC-8-X

FILE IN QUADRUPLICATE

STATE OF UTAH
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL & GAS CONSERVATION
1588 West North Temple

SALT LAKE CITY, UTAH 8411

RECEIVED OCT 29 1968 STATE ENGINEER'S OFFICE

REPORT OF WATER ENCOUNTERED DURING DRILLING

Well Name & Number Huskey State #1

Operator Gundacon Drilling Co. Address Box 643, Delta, Colo Phone 874-3182

Contractor Gundacon Drilling Co. Address same Phone same

Location NE ¼ NW ¼ Sec. 36 T. 19 S R. 24 E Grand County, Utah

Water Sands:

	Depth From	Depth To	Volume Flow Rate or Head	Quality Fresh or Salty
1.	1130	1170	25bbl/hr.	salty
2.				
3.				
4.				
5.				

Dakota Ss or possibly Cedar Mountain Fm

(Continued on reverse side if necessary)

Formation Tops:

1068'-Dakota 1255-Morrison 1320-Buckhorn
1192-Brushy Basin sand (shale out)

Remarks:

NOTE: (a) Upon diminishing supply forms, please inform this office,
(b) Report on this form as provided for in Rule C-20, General Rules and Regulations and Rules of Practice and Procedure, (See back of form)
(c) If a water analysis has been made of the above reported zone, please forward a copy along with this form.

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Attachments 4-C-1 through 4-C-3: Report after abandonment of Elizondo water well
GL elevation estimated to be +4,865' with Entrada top 875' (+3,990') and contents "salt water"

01-52

Form 113-DM-11-60

Standard: Sept 4, 1945 Act

Recorded: 9-1-65 AT 1 Act

Inspection Sheet: 9-3-65 B.M.

Copied: 9-16-65 (H)

REPORT OF WELL DRILLER
STATE OF UTAH

Application No. 36199

Claim No.

Coordinate No. (D-19-25)10abd

GENERAL STATEMENT: Report of well driller is hereby made and filed with the State Engineer, in accordance with the laws of Utah. (This report shall be filed with the State Engineer within 30 days after the completion or abandonment of the well. Failure to file such reports constitutes a misdemeanor.)

(1) WELL OWNER:
Name: Emmett Elizondo
Address: Fruita Colorado

(2) LOCATION OF WELL:
County: Grand Ground Water Basin (leave blank)
Depth: 60' Diam. 2 1/8" Date Drilled NE Center
North West
of Section 10, T 19 S, R 25 E SLBM (indicate not words not needed)

(3) NATURE OF WORK (check): New Well ☒
Replacement Well ☐ Deepening ☐ Repair ☐ Abandon ☐
If abandonment, describe material and procedure:

(4) NATURE OF USE (check):
Domestic ☐ Industrial ☐ Municipal ☐ Stockwater ☐
Irrigation ☐ Mining ☐ Other ☐ Test Well ☐

(5) TYPE OF CONSTRUCTION (check):
Rotary ☐ Dug ☐ Jetted ☐
Cable ☒ Driven ☐ Bored ☐

(6) CASING SCHEDULE: Threaded ☒ Welded ☐
10 3/4" Diam. from 0 feet to 40 feet Gage
8 5/8" Diam. from 0 feet to 625 feet Gage
" Diam. from feet to feet Gage
New ☐ Reject ☐ Used ☒

(7) PERFORATIONS: Perforated? Yes ☐ No ☐
Type of perforator used
Size of perforations inches by inches
perforations from feet to feet
perforations from feet to feet
perforations from feet to feet
perforations from feet to feet
perforations from feet to feet

(8) SCREENS: Well screen installed? Yes ☐ No ☐
Manufacturer's Name
Type Model No.
Diam. Slot size Set from ft. to
Diam. Slot size Set from ft. to

(9) CONSTRUCTION:
Was well gravel packed? Yes ☐ No ☐ Size of gravel:
Gravel placed from feet to feet
Was a surface seal provided? Yes ☐ No ☐
To what depth? feet
Material used to seal:
Did any strata contain unusable water? Yes ☒ No ☐
Type of water: Salt Depth of strata 602 875
Method of sealing strata off: Ran 8 5/8" pipe to 625

Was surface casing used? Yes ☒ No ☐
Was it cemented in place? Yes ☒ No ☐

(10) WATER LEVELS:
Static level feet below land surface Date
Artesian feet above land surface Date

(11) FLOWING WELL:
Controlled by (check) Valve ☐
Cap ☐ Plug ☐ No Control ☐
Does well leak around casing? Yes ☐
No ☐

(12) WELL TESTS: Drawdown is the distance in feet the water level is lowered below static level.
Was a pump test made? Yes ☐ No ☐ If so, by whom?
Yield: gal./min. with feet drawdown after hours
" " " " " "
Bailer test gal./min. with feet drawdown after hours
Artesian flow g.p.m. Date
Temperature of water Was a chemical analysis made? No ☐ Yes ☐

(13) WELL LOG: Diameter of well 8 5/8 inches
Depth drilled 905 feet. Depth of completed well 905 feet.

NOTE: Place an "X" in the space or combination of spaces needed to indicate the material or combination of materials encountered in each depth interval. Under REMARKS make any desirable notes as to occurrence of water and the color, size, nature, etc., of material encountered in each depth interval. Use additional sheet if needed.

DEPTHS From	DEPTHS To	Clay	Silt	Sand	Gravel	Cobbles	Boulders	Hardpan	Conglomerate	Bedrock	Other	REMARKS
												This well was abandoned as there zones had salt water one at 595 to 602 feet
												one from 875 to 905.
												See attached Sheet
												These zones were cemented off and hole filled with mud between each zone. Hole filled with mud and surface cemented down 10 feet
												attached is log of well.
												Pulled 8 5/8" pipe

Work started Jan. 16, 1965. Completed June 25, 1965

(14) PUMP:
Manufacturer's Name
Type: H. P.
Depth to pump or bowls feet

Well Driller's Statement:
This well was drilled under my supervision, and this report is true to the best of my knowledge and belief.
Name JOHN W. MOORE (Person, firm, or corporation) (Type or print)
Address Cisco Utah
(Signed) John W. Moore (Well Driller)
License No. 250 Date June 25, 1965

USE OTHER SIDE FOR ADDITIONAL REMARKS

LOG RECEIVED SEP 1 1965 STATE ENGINEER OFFICE

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Attachment 4-C-1

Water well, Hanley Dome A36199

0-15 yelow sand & shale
15-32 sand gray (Dakota sand)
32-36 Coal
36-105 gray & brown shale
05-127 gray shale & lime
27-138 Hard lime shell
38-236 light gray shale
36-245 purple shale
45-280 light gray & purple shale
80-295 purple shale
95-315 red shale
5-345 gray shale
5-348 Hard lime shell
8-350 red shale
-355 gray shale
-510 Red shale
-539 gray shale
-565 gray sand (Hard)
-568 Hard lime shell

Photo Copy Both Sides

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Photo copy both sides

568 - 595	red shale
595 - 603	gray sand (60 gal per hr. saltwater)
603 - 608	red shale
608 - 610	Hard lime shell
610 - 625	red shale
625 - 633	Hard lime & sand
633 - 640	red shale
640 - 647	Hard red sand
647 - 665	red shale (Hard)
665 - 680	Hard red sand & shale
680 - 685	Hard gray sand
685 - 695	gray shale
695 - 722	gray shale
722 - 725	Hard lime shell
725 - 763	Hard gray sand & shale
763 - 790	Hard lime & red shale
790 - 797	Hard sandy red lime
797 - 850	Hard sandy red lime & shale
850 - 872	Hard red sand & shale
872 - 875	red shale
875 - 905	White sand (salt water) Contrada sand

Total depth 905

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Attachment 4-D: Rw and water salinity estimates in offset well porous zones
Westwater Farms, LLC Harley Dome Produced Water Project
Rw Estimations from Resistivity-Porosity Method using Rw=1/F(Rt)
Well (Landsdale) Govt 13 SENE Section 4, T19S, 25E, SLM 43-019-30008 Fm temp (est) 65 to 95° F
Elevation 4955' GL

Depth Feet	Density Φ P.U./100	Rt (Ro) Ohm-m	F Cons Ss	F Calc Ss	Fm temp (estimate)	Rw @ fm temp F Cons Ss	Rw @ fm temp F Calc Ss	Salinity (NaCl) F Cons Ss	Salinity (NaCl) F Calc Ss	Comment
Brushy Basin Member Morrison Formation-brackish to saline aquitard										
270	0.24	20	14.1	16.4	65	1.42	1.22	4,500	5,200	8'
420	0.20	7	20.2	22.4	67	0.35	0.31	18,000	22,000	10'
520	0.20	8	20.2	22.4	70	0.40	0.36	16,000	18,000	6'
Salt Wash Member Morrison Formation-brackish to saline aquifer and aquitard										
585	0.19	19	22.4	24.4	72	0.85	0.78	7,000	7,600	16'
778	0.10	48	81.0	72.7	82	0.59	0.66	9,000	8,000	6'
Slick Rock Member Entrada Sandstone-brackish to saline aquifer										
900	0.23	15	15.3	17.6	84	0.98	0.85	5,100	6,000	20'
920	0.28	13	10.3	12.6	84	1.26	1.03	3,900	4,600	20'
960	0.26	10	12.0	14.3	85	0.83	0.70	6,000	7,000	20'
982	0.25	8	13.0	15.3	85	0.62	0.52	8,000	9,500	8'
1015	0.22	10	16.7	19.0	86	0.60	0.53	8,100	9,400	10'
1075	0.22	7	16.7	19.0	87	0.42	0.37	12,000	14,000	25'
Kayenta Formation-brackish to saline aquitard										
1175	0.15	12	36.0	36.5	89	0.33	0.33	15,000	15,000	8'
1220	0.10	24	81.0	72.7	90	0.30	0.33	16,800	15,500	6'
1262	0.08	30	126.6	106.2	90	0.24	0.28	21,000	18,000	7'
Wingate Sandstone-brackish to saline aquifer										
1350	0.19	9	22.4	24.4	93	0.40	0.37	12,000	12,500	35'
1440	0.13	10	47.9	46.5	94	0.21	0.22	24,000	22,500	12'
1455	0.21	8	18.4	20.6	94	0.43	0.39	10,500	12,000	20'
1530	0.24	7	14.1	16.4	95	0.50	0.43	9,000	10,400	20'
1590	0.10	25	81.0	72.7	95	0.31	0.34	15,500	13,800	10'

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MAY 26 2009
DIV. OF OIL, GAS & MINING

UTAH DIVISION OF OIL, GAS AND MINING
UIC (Permit Application) Form 1
Attachment 5: Affidavit of Mailing
Application for New Injection Well: Harley Dome 1
NWNE Section 10, T19S, R25E, SLM, Grand County, Utah
Submitted by Westwater Farms, LLC

AFFIDAVIT

State of Colorado)
:ss
County of Mesa)

David L. Allin being duly sworn upon his oath, deposes and states:

1. I am of the age of majority.

2. I am engaged by Westwater Farms, LLC as Agent to file an application for a UIC Permit to construct the proposed Harley Dome 1 Class II injection well on behalf of that entity.

3. I provided a copy of the application for a UIC Permit to construct the proposed Harley Dome 1 Class II injection well by First Class United States Mail to the parties that were identified from public records as "owners", "operators" and/or "surface owners" as defined by Utah Admin. Code Rule R649-1 within a one-half mile radius of the proposed Harley Dome 1 well site. A list of those owners is attached hereto as Exhibit "A".

4. The matters stated herein are true of my own knowledge.

Dated this 21st day of May, 2009.

David L. Allin

Subscribed, sworn and acknowledged to and by David L. Allin before me this 21st day of May, 2009.

Notary Public

My Commission Expires
07/28/2012

NOTARY PUBLIC
AL P. FORMICOLA
STATE OF COLORADO

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MAY 26 2009
DIV. OF OIL, GAS & MINING

Exhibit "A"
List of Owners, Operators and Surface Owners within a One-Half Mile Radius of
Harley Dome 1 Class II Injection Well
NWNE Section 10, T19S, R25E, SLM, Grand County, Utah
Proposed by Westwater Farms, LLC
(addresses used appear on most recent public records)

Westwater Farms, LLC c/o Tom Warnes P.O. Box 23358 Silverthorne, CO 80498	Surface owner and Applicant
Grand County Road Department 125 East Center Moab, UT 84532	Surface owner old highway 6 & 50
United States Bureau of Land Management Moab Field Office 82 East Dogwood Moab, UT 84532	Surface owner and mineral/OG owner
Federal Highway Administration 2520 West 4700 South, Suite 9-A Salt Lake City, UT 84118-1847	Surface owner I-70
Mid-America Pipeline Company 1717 South Boulder Avenue Tulsa, OK 74121-1628	Surface owner
Utah School and Institutional Trust Lands Administration 675 East 500 South, Suite 500 Salt Lake City, UT 84102-2818	Surface owner and mineral owner
Petro Resrc Corp. 777 Post Oak Blvd, Suite 910 Houston, TX 77056	Operator BLM O & G (lessee UTU-82619)
RMOC Holdings, LLC 921 East Belleview Avenue Littleton, CO 80121	Shiprock Helium, LLC P.O. Box 51166 Amarillo, TX 79159 Operators BLM O & G (lessees UTU-70176)
Retamco Operating, Inc. Attn: Joe Glennon P.O. Box 790 Red Lodge, MT 59068-0790	Operator SITLA O & G (lessee ML-49255)

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HALLIBURTON

Halliburton Energy Services
The Rockies NWA Regional Laboratory
Grand Junction, CO 970) 523-3692

Water Analysis Report

Contact Information

Company	Westwater Frams	Date Received	June 9, 2010
Reported To	Engineers/ David Allin	Date Tested	June 10, 2010
Reported By	Lucas Daniel	Tested By	Lucas Daniel

Sample Physical Characteristics

Well Name	Harley Dome 1		Temperature	65	°F
Location	1344-1641		pH	8.0	
Specific Gravity	1.008		Color	Black	
Corrected SG	1.009	at 60°F	Turbidity	Sevier	
TDS (calculated)	10155	ppm	Resistivity	0.65	Ω·m

Sample Chemical Characteristics

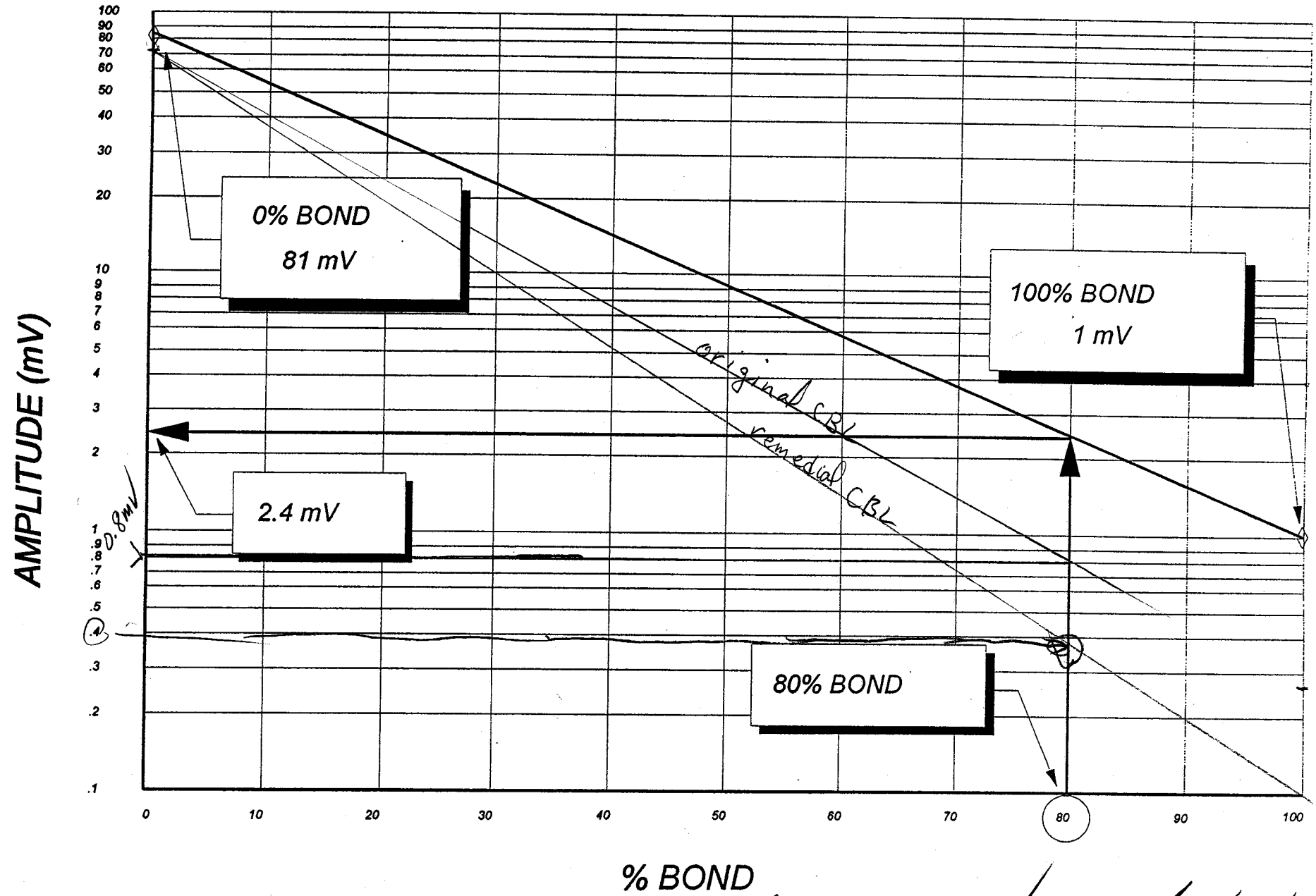
Anions	Chloride	5750	mg/L	**Cations**	Total Iron	0.5	mg/L
	Sulfate	430	mg/L		Ferrous Iron	0.1	mg/L
	Bicarbonate	168	mg/L		Potassium	136	mg/L
	Carbonate	56	mg/L		Calcium	580	mg/L
	Hydroxide		mg/L		Magnesium	200	mg/L
					Sodium (calculated)	2916	mg/L

General Comments

W200

NOTICE: This report is for information only, and the content is limited to the sample described. Halliburton makes no warranties, expressed or implied, as to the accuracy of the contents or results. Any user of this report agrees Halliburton shall not be liable for any loss or damage, regardless of cause, resulting from the use hereof.

Westwater Farms LLC Harley Dome #1 (43019 31622) T19S, R25E, S.10 Grand Co.



80% Bond Index Bond @ 0.8 mV CK 6/7/2010

Remedial 80% Bond Index Bond @ ~0.4 mV. There is sufficient thickness of 80% Bond Index Bond after remedial cement job.

TABLE 2 - TRAVEL TIMES AND AMPLITUDES FOR FREE PIPE
(3 FT RECEIVER)

CASING SIZE (in)	CASING WEIGHT (lb/ft)	TRAVEL TIME (µs)		AMPLITUDE (mV)
		1-11/16" TOOL	3-5/8" TOOL	
4-1/2	9.5	252	233	81
	11.6	250	232	81
	13.5	249	230	81
5	15.0	257	238	76
	18.0	255	236	76
	20.3	253	235	76
5-1/2	15.5	266	248	72
	17.0	265	247	72
	20.0	264	245	72
	23.0	262	243	72
7	23.0	291	271	62
	26.0	289	270	62
	29.0	288	268	62
	32.0	286	267	62
	35.0	284	265	62
	38.0	283	264	62
7-5/8	26.4	301	281	59
	29.7	299	280	59
	33.7	297	278	59
	39.0	295	276	59
9-5/8	40.0	333	313	51
	43.5	332	311	51
	47.0	330	310	51
	53.5	328	309	51
10-3/4	40.5	354	333	48
	45.5	352	332	48
	51.0	350	330	48
	55.5	349	328	48

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HALLIBURTON

Halliburton Energy Services
The Rockies NWA Regional Laboratory
Grand Junction, CO 970) 523-3692

Water Analysis Report

Contact Information

Company	West Water Farms LLC	Date Received	June 10, 2010
Reported To	Engineers David Allin	Date Tested	June 10, 2010
Reported By	Ann Ekx	Tested By	Ann Ekx

Sample Physical Characteristics

Well Name	Harley Dome 1		Temperature	64	°F
Location	JW Perfs 1344-1631'		pH	7.8	
Specific Gravity	1.013		Color	Clear	
Corrected SG	1.013	at 60°F	Turbidity	None	
TDS (calculated)	34378	ppm	Resistivity	0.36	Ω·m

Sample Chemical Characteristics

Anions	Chloride	20600	mg/L	**Cations**	Total Iron	3.0	mg/L
	Sulfate	580	mg/L		Ferrous Iron	0.6	mg/L
	Bicarbonate	400	mg/L		Potassium	0	mg/L
	Carbonate	0	mg/L		Calcium	1780	mg/L
	Hydroxide		mg/L		Magnesium	330	mg/L
					Sodium (calculated)	11114	mg/L

General Comments

W201; 6-10-10 14:40

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From: Dan Jarvis
To: Brad Hill; Chris Kierst; Mark Reinbold
Date: 6/14/2010 10:42 AM
Subject: Fwd: Westwater Farms, LLC Harley Dome 1 production testing
Attachments: W200 Westwater Farms HD 1 Jw perfs 1344-1631 1600-6-9-10.xls; W201 West Water Farns HD 1 Jw perfs 1344-1631 1440-6-10-10.pdf; W181 Westwater Farms HD1 drlg Trc 1720' with foam 5-22-10.pdf

Chris

What do you make of this?

>>> "David L Allin" <allinpro@bresnan.net> 6/11/2010 3:03 PM >>>

Bart & Dustin,

Bart asked that I forward the water analysis reports from the Halliburton lab here in Grand Junction as soon as I had them. The report (Halliburton W200) from the first sample recovered following perfing June 9 was received June 10 while I was in the field production testing the well. The sample that I collected from the end of the blooie line while Bart was present yesterday was also tested late yesterday, and I got the report (Halliburton W201) earlier today. The two reports are attached for your review.

I will be compiling the daily reports later today for my weekly filing with DOGM, but I wanted to synopsize the completion information and final water production testing in a more concise form herewith. The 5.5" casing was run to TD 1730' with a DV tool in the string at 1300' to enable a two stage cement job. The effort to protect the under-pressured Wingate Ss proposed injection zone below 1342' (with static fluid level at 525' when OH logged) by pumping a short first stage failed when pumping fresh water to flush the DV tool caused possibly up to half the cement slurry and up to 200 bbls of fresh flush water to be lost into some of the most porous layers of the Wingate Ss on May 27. The second stage was called off until the driller could mix more mud and place it in the hole over several days until it would hold a full column. It is possible that another 60 bbls of mud filtrate composed of fresh water was lost during the mud-up procedure. A shortened second stage was pumped from the long string June 2 which went as planned.

The cased well was cleaned out to 1680' PBTD with a bit June 3. The June 4 CBL indicated good cement over the Wingate Ss and overlying confining zone, so the original perf plan focused in the best porosity layers was implemented despite some squeeze damage. On June 9, after a casing pressure test to 300 psi, perfs at 4 spf phased 90° were made in 138' net (11 zones) of the Wingate Ss over the gross interval 1344-1631' (May 22 triple log). The hole was full to begin with and by the time the fifth casing gun run was made in the well two hours later the fluid level had retreated to 200'. Once the perforators were rigged down, the bit and drill pipe were run back in the well and the rig compressor was used to unload the casing in stages from 1110', 1360' and 1660' as the bit was tripped in the well. At the first unloading point there was about 650'of fluid above the bit at a depth near 460'. After unloading the casing, air circulation at 150 psi surface pressure was continued for one hour for a total water recovery for the day of about 50 bbls from unloading 1200'of water and mud from the casing plus an hour circulating up about 15 gpm with air. At 16:00 the 1600-6-9-10 water sample was collected which resulted in Halliburton report W200. This sample contained a significant cut of fresh water that had been introduced during the long string cementing operations. The SG at 60°F was 1.009, pH 8.0 and TDS 10,155 ppm.

The well was shut-in overnight and unloaded with 280 psi air pressure from 1460' indicating a fluid level near 820'. The bit was reset to 1660' and the casing was unloaded again. After that, air was circulated at 150 psi surface pressure for 6.5 hours producing water from the Wingate Ss perforations at rates between 11 and 13 gpm. The total water recovery for June 10 was about 131 bbls. At 14:40 the 1440-

6-10-10 water sample was collected which resulted in Halliburton report W201. This sample contained much smaller fraction fresh water. The SG at 60°F was 1.013, pH 7.8 and TDS 34,378 ppm. This report was more in line with the numbers derived from testing water samples collected while drilling (W181 SG at 60°F of 1.014, pH 7.6 and TDS 52,763 ppm). See the copy of W181 attached hereto.

The driller was off today, but the plan is to unload the casing one more time on Monday, collect one more water sample then lay down the drill pipe and bit so that the permanent packer and 3.5" tubing string can be run in the well. The next steps will be to pressure test the tubing-casing annulus and determine a frac gradient for the injection zone as equipped for use. **Please let me or Tom Warnes know if step-rate testing with a Halliburton breakdown (acid) pump and charted real-time surface measurements <u>without the use of a down-hole pressure bomb</u> will be acceptable proof of the frac gradient.**

Have a great weekend,

Dave
Consultant to Westwater Farms, LLC

David L. Allin
Vice President, Exploration Manager
Del-Rio Resources, Inc.
AAPG DPA Certified Petroleum Geologist 2934
Professional Geologist Utah DOPL 5526699-2250
475 Seasons Drive
Grand Junction, CO 81507-8749
970-254-3114
allinpro@bresnan.net

UIC INJECTION PERMIT ANALYSIS FORM
WELL NAME: Harley Dome #1 SWD (4301931622)

iR649-5-2. Requirements For Class II Injection Wells Including Water Disposal, Storage And Enhanced Recovery Wells.	**Completed Items, Needed Items, & Comments**
1. Injection wells shall be completed, equipped, operated, and maintained in a manner that will prevent pollution and damage to any USDW, or other resources and will confine injected fluids to the interval approved.	1. OK
2. The application for an injection well shall include a properly completed UIC Form 1 and the following:	2. OK
2.1. A plat showing the location of the injection well, all abandoned or active wells within a one-half mile radius of the proposed well, and the surface owner and the operator of any lands or producing leases, respectively, within a one-half mile radius of the proposed injection well.	2.1 OK
2.2. Copies of electrical or radioactive logs, including gamma ray logs, for the proposed well run prior to the installation of casing and indicating resistivity, spontaneous potential, caliper, and porosity.	2.2 OK
2.3. A copy of a cement bond or comparable log run for the proposed injection well after casing was set and cemented.	2.3 Original CBL inadequate for lack of sufficient 80% bonded interval. Remedial cement job. New CBL indicates acceptable cement bonding although it is not ideal for insufficient travel time curve backup or attenuation.
2.4. Copies of logs already on file with the division should be referenced, but need not be refiled.	2.4 OK
2.5. A description of the casing or proposed casing program of the injection well and of the proposed method for testing the casing before use of the well.	2.5 OK
2.6. A statement as to the type of fluid to be used for injection. its source and estimated amounts to be injected daily.	2.6 OK
2.7. Standard laboratory analyses of (1) the fluid to be injected, (2) the fluid in the formation into which the fluid is being injected, and (3) the compatibility of the fluids.	2.7 Need results from an analysis of injection interval water and the compatibility test. Need Wingate H2O sample.
2.8. The proposed average and maximum injection pressures.	2.8 OK
2.9. Evidence and data to support a finding that the proposed injection well will not initiate fractures through the overlying strata or a confining interval that could enable the injected fluid or formation fluid to enter the fresh water strata.	2.9 SRT will be run after Wingate perfs, acid, swabbing & sampling.
2.10. Appropriate geological data on the injection interval and confining beds, and nearby Underground Sources of Drinking Water, including the geologic name, lithologic description, thickness, depth, water quality, and lateral extent; also information relative to geologic structure near the proposed well which may effect the conveyance and/or storage of the injected fluids.	2.10 OK
2.11. A review of the mechanical condition of each well within a one-half mile radius of the proposed injection well to assure that no conduit exists that could enable fluids to migrate up or down the wellbore and enter improper intervals.	2.11 None but subject well.
2.12. An affidavit certifying that a copy of the application has been provided to all operators, owners and surface owners within a one-half mile radius of the proposed injection well.	2.12 OK
2.13. Any other additional information that the board or division may determine is necessary to adequately review the application.	2.13 OK

OTHER COMMENTS AND OBSERVATIONS: Status of informational submission as of 11/16/09

Reviewed by: Christopher J. Kierst Date: 6/16/2009

Mark Reinbold - Westwater Farms LLC Harley Dome #1 well

From: Bart Kettle
To: Chris Kierst
Date: 6/30/2010 3:17 PM
Subject: Westwater Farms LLC Harley Dome #1 well
CC: Brad Hill; Dan Jarvis; Dustin Doucet; Mark Reinbold

Pumped 15 lb cement through perfs in 5 1/2" casing @ 858-862 today. 140 sx calculated to return roughly 8 sx by my math. No returns seen, but fluid circulation seen through entire job, I would expect cement at least into the surface casing. I don't know why the job was cut so close to calculated volumes as it was, seem like it would have been worth their time to pump an extra 20 sx once you pay to set bridge plug, packer and drive pump trucks out to the site. Cement bond log is scheduled for Friday.

If and when Approval to Convert is issue can you let me know.

Bart Kettle
Environmental Scientist
Office 435-613-3734
Cellular 435-820-0862

BEFORE THE DIVISION OF OIL, GAS AND MINING
DEPARTMENT OF NATURAL RESOURCES
STATE OF UTAH
NOTICE OF AGENCY ACTION
CAUSE NO. UIC-358.1

IN THE MATTER OF THE APPLICATION OF WESTWATER FARMS, LLC FOR ADMINISTRATIVE APPROVAL OF THE HARLEY DOME 1 SWD WELL LOCATED IN SECTION 10, TOWNSHIP 19S, RANGE 25E, GRAND COUNTY, UTAH, AS A CLASS II INJECTION WELL.

THE STATE OF UTAH TO ALL PERSONS INTERESTED IN THE ABOVE ENTITLED MATTER.

Notice is hereby given that the Division of Oil, Gas and Mining (the "Division") is commencing an informal adjudicative proceeding to consider the application of Westwater Farms, LLC for administrative approval of the Harley Dome 1 SWD well, located in NW/4 NE/4, Section 10, Township 19S, Range 25E, Salt Lake Meridian, Grand County, Utah, for conversion to a Class II injection well. The adjudicative proceedings will be conducted informally according to Utah Admin. Rule R649-10, Administrative Procedures.

Selected zones in the Wingate Sandstone will be used for water injection. The maximum requested injection pressure and rate will be determined based on fracture gradient information submitted by Westwater Farms, LLC.

Any person desiring to object to the application or otherwise intervene in the proceeding, must file a written protest or notice of intervention with the Division within fifteen days following publication of this notice. The Division's Presiding Officer for the proceeding is Brad Hill, Permitting Manager, at P.O. Box 145801, Salt Lake City, Utah 84114-5801, phone number (801) 538-5340. If such a protest or notice of intervention is received, a hearing will be scheduled in accordance with the aforementioned administrative procedure rule. Protestants and/or interveners should be prepared to demonstrate at the hearing how this matter affects their interests.

Dated this 18th day of August, 2010.

STATE OF UTAH
DIVISION OF OIL, GAS & MINING

Brad Hill
Permitting Manager

Westwater Farms, LLC
Harley Dome 1 SWD
Cause No. UIC-358.1

Publication Notices were sent to the following:

Westwater Farms, LLC
P.O. Box 324
Cisco, UT 84515

Moab Times
P.O. Box 129
Moab, UT 84532-0129
Via E-mail legal@moabtimes.com

The Salt Lake Tribune
PO Box 45838
Salt Lake City, UT 84145
Via E-mail naclegal@mediaoneutah.com

Moab Field Office
Bureau of Land Management
82 East Dogwood
Moab, UT 84532

Grand County Planning
125 East Center Street
Moab, UT 84532

Bruce Suchomel
US EPA Region 8
MS 8-P-W-GW
1595 Wynkoop St
Denver, CO 80202-1129

SITLA
675 East 500 South
Salt Lake City, UT 84102-2818

Jean Sweet

Jean Sweet

GARY R. HERBERT
Governor

GREGORY S. BELL
Lieutenant Governor

State of Utah
DEPARTMENT OF NATURAL RESOURCES

MICHAEL R. STYLER
Executive Director

Division of Oil, Gas and Mining

JOHN R. BAZA
Division Director

August 18, 2010

SENT VIA E-MAIL naclegal@mediaoneutah.com

Salt Lake Tribune
PO Box 45838
Salt Lake City, UT 84145

Subject: Notice of Agency Action – Westwater Farms, Harley Dome 1 SWD, Cause No. UIC-358.1

To Whom it May Concern:

Enclosed is a copy of the referenced Notice of Agency Action. Please publish the Notice, once only, as soon as possible. Please notify me via e-mail of the date it will be published. My e-mail address is: jsweet@utah.gov .

Please send proof of publication and billing for **account #9001402352** to:

Division of Oil, Gas and Mining
PO Box 145801
Salt Lake City, UT 84114-5801

Sincerely,

Jean Sweet

Jean Sweet
Executive Secretary

Enclosure

1594 West North Temple, Suite 1210, PO Box 145801, Salt Lake City, UT 84114 -5801
telephone (801) 538-5340 • facsimile (801) 359-3940 • TTY (801) 538-7458 • *www.ogm.utah.gov*

UTAH DNR OIL, GAS & MINING

Jean Sweet - FW: Notice of Agency Action - Westwater Farms, Harley Dome 1 SWD, Cause No. UIC-358.1

From: "NAC Legal" <naclegal@mediaoneutah.com>
To: "'Jean Sweet'" <jsweet@utah.gov>
Date: 8/18/2010 4:50 PM
Subject: FW: Notice of Agency Action - Westwater Farms, Harley Dome 1 SWD, Cause No. UIC-358.1
Attachments: 20100816 Westwater Farms Harley Dome 1 SWD Notice of Agency Action Newspaper.DOC; 20100816 Westwater Farms Harley Dome 1 SWD Notice of Agency Action SL Newspaper.PDF

Ad #609963 is scheduled to run August 23rd in Salt Lake Tribune, Deseret News and on the website utahlegals.com .

Total charge is $169.64. Please check the ad in the papers.

Thank you,

Lynn Valdez
MediaOne of Utah,
a Newspaper Agency Company
4770 South 5600 West
West Valley City, Utah 84118
Ph.: 801-204-6245
Email: naclegal@mediaoneutah.com

From: Jean Sweet [mailto:jsweet@utah.gov]
Sent: Wednesday, August 18, 2010 2:11 PM
To: naclegal@mediaoneutah.com
Subject: Notice of Agency Action – Westwater Farms, Harley Dome 1 SWD, Cause No. UIC-358.1

To Whom it May Concern:

Enclosed is a copy of the referenced Notice of Agency Action. Please publish the Notice, once only, as soon as possible. Please notify me via e-mail of the date it will be published. My e-mail address is: jsweet@utah.gov .

Please send proof of publication and billing for **account #9001402352** to:

Division of Oil, Gas and Mining
PO Box 145801
Salt Lake City, UT 84114-5801

Sincerely,

Jean Sweet, Executive Secretary
Utah Div. of Oil, Gas & Mining
1594 West Temple, Suite 1210
Salt Lake City, UT
801-538-5329
jsweet@utah.gov

GARY R. HERBERT
Governor

GREGORY S. BELL
Lieutenant Governor

State of Utah
DEPARTMENT OF NATURAL RESOURCES
MICHAEL R. STYLER
Executive Director

Division of Oil, Gas and Mining
JOHN R. BAZA
Division Director

August 18, 2010

SENT VIA E-MAIL legal@moabtimes.com

Moab Times
P.O. Box 129
Moab, UT 84532-0129

Subject: Notice of Agency Action – Westwater Farms, Harley Dome 1 SWD, Cause No. UIC-358.1

To Whom it May Concern:

Enclosed is a copy of the referenced Notice of Agency Action. Please publish the Notice, once only, as soon as possible. Please notify me via e-mail of the date it will be published. My e-mail address is: jsweet@utah.gov .

Please send proof of publication and billing to:

Division of Oil, Gas and Mining
PO Box 145801
Salt Lake City, UT 84114-5801

Sincerely,

Jean Sweet

Jean Sweet
Executive Secretary

Enclosure

1594 West North Temple, Suite 1210, PO Box 145801, Salt Lake City, UT 84114 -5801
telephone (801) 538-5340 • facsimile (801) 359-3940 • TTY (801) 538-7458 • *www.ogm.utah.gov*

UTAH DNR OIL, GAS & MINING

Jean Sweet - Notice of agency action UIC-358.1

From: Zane Taylor <zane@moabtimes.com>
To: <jsweet@utah.gov>
Date: 8/18/2010 4:17 PM
Subject: Notice of agency action UIC-358.1 West Water Farms Harley Dome 1

Jean,

Sadie forwarded to me your notice. We will publish this next week. The date of publication will be 8/26/10. Please send these directly to me if possible, at this e-mail address or at the alias legals@moabtimes.com

Thank you!

Zane W. Taylor
Publisher
The Times-Independent
Moab, Utah
435-259-7525

Chris Kierst - Harley Dome UIC permit(s)

From: "David L Allin" <allinpro@bresnan.net>
To: "Chris Kierst" <chriskierst@utah.gov>
Date: 8/19/2010 7:59 AM
Subject: Harley Dome UIC permit(s)

Good Morning Chris,

You are probably nearing the production of a UIC draft permit for the Harley Dome 1 at this point. I filed documents to comply for an application for a second well designated the Harley Dome 2 and noticed all parties. After that filing, Dan Jarvis called me to tell me that because of the exploratory nature of the project, until the data from the Harley Dome 1 was acquired and digested, the UIC permit processing would be suspended.

Now that we are past that point, I wanted to coordinate with you how to best accomplish the Westwater Farms, LLC plan for an injection field that will include up to four wells on their property in the NE of Section 10. My recommendation was to move the Harley Dome 2 location from where it was originally staked at a point in S2S2NWNE Section 10 across the old highway from the office building on the property. The wells should be spaced near the center of 40 acre tracts to minimize interference over time. The Greater Cisco Field well spacing order (Cause No. 102-16B) affecting all wells in the field drilled to depths less than 3,500' allows oil wells to be spaced on 10 acre tracts (at least 400' apart) and gas wells to be spaced on 40 acre tracts (at least 1,320'apart).

The question is should the current UIC application include four possible locations on the Westwater property or focus on the Harley Dome 1 well and its conversion to injection? If that is the case, should my submission for the Harley Dome 2 well be revised to include the Harley Dome 3 and Harley Dome 4 wells sites?

A final question is will the Division arrange for publication of the required notices in the newspapers in Salt Lake City and Moab or should Westwater Farms be working on that?

Thanks,

Dave

David L. Allin
Consultant to Westwater Farms, LLC
Vice President, Exploration Manager
Del-Rio Resources, Inc.
AAPG DPA Certified Petroleum Geologist 2934
Professional Geologist Utah DOPL 5526699-2250
475 Seasons Drive
Grand Junction, CO 81507-8749
970-254-3114
allinpro@bresnan.net

4770 S. 5600 W.
P.O. BOX 704005
WEST VALLEY CITY, UTAH 84170
FED.TAX I.D.# 87-0217663

The Salt Lake Tribune — WWW.SLTRIB.COM
MEDIA One OF UTAH — A NEWSPAPER AGENCY COMPANY — WWW.MEDIAONEUTAH.COM
Deseret News — WWW.DESERETNEWS.COM

PROOF OF PUBLICATION

CUSTOMER'S COPY

CUSTOMER NAME AND ADDRESS	ACCOUNT NUMBER	DATE
DIV OF OIL-GAS & MINING, 1594 W NORTH TEMP #1210 P.O. BOX 145801 SALT LAKE CITY, UT 84114	9001402352	8/24/2010

Copy

RECEIVED
SEP 07 2010
DIV. OF OIL, GAS & MINING

ACCOUNT NAME	
DIV OF OIL-GAS & MINING,	
TELEPHONE	ADORDER# / INVOICE NUMBER
8015385340	0000609963 /
SCHEDULE	
Start 08/23/2010	End 08/23/2010
CUST. REF. NO.	
UIC-358.1	
CAPTION	
BEFORE THE DIVISION OF OIL, GAS AND MINI	
SIZE	
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TIMES	RATE
4	
MISC. CHARGES	AD CHARGES
	TOTAL COST
	169.64

BEFORE THE DIVISION OF OIL, GAS AND MINING
DEPARTMENT OF NATURAL RESOURCES
STATE OF UTAH
NOTICE OF AGENCY ACTION
CAUSE NO. UIC-358.1

IN THE MATTER OF THE APPLICATION OF WESTWATER FARMS, LLC FOR ADMINISTRATIVE APPROVAL OF THE HARLEY DOME 1 SWD WELL LOCATED IN SECTION 10, TOWNSHIP 19S, RANGE 25E, GRAND COUNTY, UTAH, AS A CLASS II INJECTION WELL.

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Dated this 18th day of August, 2010.

STATE OF UTAH
DIVISION OF OIL, GAS & MINING
/s/ Brad Hill
Brad Hill
Permitting Manager

609963 UPAXLP

AFFIDAVIT OF PUBLICATION

AS NEWSPAPER AGENCY CORPORATION LEGAL BOOKER, I CERTIFY THAT THE ATTACHED ADVERTISEMENT OF **BEFORE THE DIVISION OF OIL, GAS AND MINI** FOR **DIV OF OIL-GAS & MINING,** WAS PUBLISHED BY THE NEWSPAPER AGENCY CORPORATION, AGENT FOR THE SALT LAKE TRIBUNE AND DESERET NEWS, DAILY NEWSPAPERS PRINTED IN THE ENGLISH LANGUAGE WITH GENERAL CIRCULATION IN UTAH, AND PUBLISHED IN SALT LAKE CITY, SALT LAKE COUNTY IN THE STATE OF UTAH. NOTICE IS ALSO POSTED ON UTAHLEGALS.COM ON THE SAME DAY AS THE FIRST NEWSPAPER PUBLICATION DATE AND REMAINS ON UTAHLEGALS.COM INDEFINATELY.

PUBLISHED ON Start 08/23/2010 End 08/23/2010

SIGNATURE Sally Taylor

DATE 8/24/2010

VIRGINIA CRAFT
Notary Public, State of Utah
Commission # 581469
My Commission Expires
January 12, 2014

Virginia Craft

THIS IS NOT A STATEMENT BUT A "PROOF OF PUBLICATION"
PLEASE PAY FROM BILLING STATEMENT

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Moab Field Office
82 East Dogwood
Moab, Utah 84532

TAKE PRIDE® IN AMERICA

3100
UTU82619
(UTY012)

Mr. Brad Hill
Utah Division of Oil, Gas and Mining
P.O. Box 145801
Salt Lake City, Utah 84114-5801

AUG 27 2010

Re: Protest of an Informal Adjudicative Proceeding
Cause No. UIC-358.1
Application for Class II Injection Well
Westwater Farms, LLC
Harley Dome 1 SWD
Section 10, T19S, R25E
Grand County, Utah

Dear Mr. Hill:

The Moab Field Office of the Bureau of Land Management (BLM) has reviewed the above referenced application and would like to advise the Division of some concerns relative to the conversion of the subject well to a Class II injection well.

The Federal government owns the oil and gas estate on the privately owned parcel (NE Section 10, T19S, R25E) on which the subject well is located, and has issued a lease for the rights to the oil and gas, and has reserved the helium. The surface and mineral estate of the lands surrounding this parcel are federally owned and are administered by the Moab Field Office of the BLM, with the exception of the northeastern corner of the parcel which abuts State of Utah land in section two.

Helium and low Btu gas are known to exist in the Entrada Sandstone in this area. The interest of the Moab Field Office in this proposal is to ensure that Federal oil and gas resources, including helium, will not be adversely affected, and adjacent Federal lands would not be degraded. For the following reasons, we are concerned that the proposal could adversely affect the helium resource:

- The proposal does not address the possibility of hydrogen sulfide generation which commonly results from the injection of produced water into subsurface formations.

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AUG 31 2010
DIV. OF OIL, GAS & MINING

- The proposal does not provide evidence that the Kayenta Formation would act as a confining layer between the proposed injection zone in the Wingate Sandstone, and the gas/helium reservoir in the Entrada Sandstone.

Should hydrogen sulfide be generated from water injection, it does not appear that the Kayenta Formation would prevent migration of the gas into the Entrada Sandstone, which would degrade the gas/helium resource. Further, if hydrogen sulfide were generated, it is not certain that its migration would be limited to the Harley Dome Anticline due to the subject well's location at the southeastern margin of the structure. Gas which is not contained in the structure would tend to migrate up-dip toward the southeast. The Entrada, Kayenta and Wingate Formations crop-out in the Colorado River canyon approximately five miles southeast of the subject well. Although this is a substantial distance in terms of reservoir volume and the pace of subsurface fluid migration, there is no barrier to prevent that migration.

We respectfully submit these concerns and ask that you give them further consideration in your evaluation of this proposal. We would like to participate in a hearing on the matter should one be scheduled. Should you have any questions regarding this matter, please call Eric Jones of this office at 435-259-2117.

Sincerely,

Field Manager

cc: UT922, Utah State Office

TIMES-INDEPENDENT

35 East Center
P.O. Box 129
Moab, UT 84532

Invoice

Date	Invoice #
8/25/2010	11629

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SEP 02 2010
DIV. OF OIL, GAS & MINING

COPY

Bill To
Ut. Div. Oil-Gas-Mining Attn: Julie Ann Carter PO Box 145801 Salt Lake City, UT 84114-5801

P.O. No.	Terms	Project
	Net 30	

Quantity	Description	Rate	Amount
119	Public Notice - Notice of agency action cause #UIC-358.1 8/26	0.65	77.35
		7.85%	0.00
		Total	$77.35

Proof of Publication

STATE OF UTAH,)
) ss.
County of Grand,)

Zane W. Taylor, being first duly sworn according to law, deposes and says: That he is the pubisher of The Times-Independent, a weekly newspaper of general circulation, published every Thursday at Moab, Grand County, State of Utah; that the notice

Utah Division of Oil, Gas, and Mining
Cause #UIC-358.1

hereto attached, and which is made a part of this Affidavit of Publication, was published in said newspaper for a period of 1 consecutive issues, the first publication date having been made August 26, 2010

; and the last on

; and the said notice was published in each and every copy of said newspaper during the period and time of publication, and that it was published in the newspaper proper and not in a supplement thereof.

Publisher

Subscribed and sworn before me this

Notary Public
Residing in Moab, Utah

My Commission Expires

SADIE WARNER
Notary Public State of Utah
My Commission Expires on:
November 7, 2013
Comm. Number: 581356

BEFORE THE DIVISION OF OIL, GAS AND MINING DEPARTMENT OF NATURAL RESOURCES STATE OF UTAH NOTICE OF AGENCY ACTION CAUSE NO. UIC-358.1

IN THE MATTER OF THE APPLICATION OF WESTWATER FARMS, LLC FOR ADMINISTRATIVE APPROVAL OF THE HARLEY DOME 1 SWD WELL LOCATED IN SECTION 10, TOWNSHIP 19S, RANGE 25E, GRAND COUNTY, UTAH, AS A CLASS II INJECTION WELL.

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Selected zones in the Wingate Sand-

2250/REB/GGUICADMIN/GF10/6131

Brad Hill - Protesting Westwater Farms application

From: John Weisheit <john@livingrivers.org>
To: <bradhill@utah.gov>
Date: 9/3/2010 2:08 PM
Subject: Protesting Westwater Farms application

Brad Hill
Utah Division of Oil, Gas and Mining
Permitting Manager
P.O. Box 145801
Salt Lake City, Utah 84114-5801
(801) 538-5340

RE: Application of Westwater Farms, LLC for administrative approval of the Harley Dome 1 SWD well, located in NW/4 NE/4, Section 10, Township 19S, Range 25E, Salt Lake Meridian, Grand County, Utah, for conversion to a Class II injection well.

Dear Mr. Hill

According to the public notice of August 26, 2010 in Moab's newspaper, *The Times-Independent*, the public has 15 days to provide a written notice to Utah Division of Oil, Gas and Mining (UDOGM) to protest the application of Westwater Farms to inject waste water from the oil and gas industry into an aquifer five to six miles from the Colorado River.

With this letter Living Rivers is filing such a protest with UDOGM and requesting a hearing date.

Is there a good time for you and I to have a phone conversation about scheduling this hearing and to discuss questions I have about the project?

Thank you for your considerations.

John Weisheit
Living Rivers
435-259-1063

Brad Hill Permit Manager
PO box 145801
Salt Lake city , Utah, 8414-5801
Subject: Notice of Intervention Westwater Farms

RECEIVED
SEP 07 2010
DIV. OF OIL, GAS & MINING

I request a hearing in Moab, Utah, for the Westwater Farms Injection Well in Grand County, Utah. I request that the hearing be held in Grand County, Utah since I am over 70 years old and cannot easily travel to Salt Lake City. I use the Colorado River for recreation, and any waste that moves up through natural breaks in the Kayenta layer (which is between the Wingate and Entrada layers) has the possibility of moving under pressure through the entrada layer into the Colorado River and affect myself and over 20 million other users.

Sincerely:
Bill Love Bill Love
2871 E Bench Rd.
Moab, Utah 84532

W. Love
2871 E. Bench Rd.
Moab, Ut 84532

SALT LAKE PROVO UTE 845
STATEMENT BYCE 09/08/2010 04:22 PM
STATE MAIL BYCE 09/08/2010 04:22 PM

Brad Hill Permit Manager
PO Box 145801
Salt Lake City, Utah 84114-5801

United States Department of the Interior
FISH AND WILDLIFE SERVICE
UTAH FIELD OFFICE
2369 WEST ORTON CIRCLE, SUITE 50
WEST VALLEY CITY, UTAH 84119

September 15, 2010

In Reply Refer To
FWS/R6
ES/UT
10-TA-0338

Mr. Brad Hill, Permitting Manager
Utah Division of Oil, Gas, and Mining
Box 145801
Salt Lake City, Utah 84114-5801

RE: Cause No. UIC-358.1; Westwater Farms LLC; Harley Dome #1SWD Well

Dear Mr. Hill:

We have reviewed the referenced Underground Injection Control (UIC) Permit Application. The proposed project involves the operation of the Harley Dome #1 well as a salt water injection well (Class II) in Section 10, Township 19 South, Range 25 East, Grand County, Utah. The well will inject fluids into the Wingate formation at approximately 1,750 feet below the surface. We are providing the following comments for your consideration.

The Colorado pikeminnow (*Ptychocheilus lucius*), razorback sucker (*Xyrauchen texanus*), humpback chub (*Gila cypha*), and bonytail (*Gila elegans*) are federally listed endangered fishes endemic to the Colorado Basin. The location of the injection well is approximately five miles from the Colorado River, which is designated critical habitat for all four of the endangered fish species. We are concerned with possible seepage of injected liquids from the referenced project into the nearby Colorado River.

Last week Christopher Kierst of your staff explained in detail to Jana Mohrman from the Upper Colorado River Recovery Program that the receiving aquifer (in the Wingate formation) dipped northeast, away from the Colorado River. We understand that because of this orientation, there is only a remote chance that injected liquids could back up and seep into the Colorado River. Despite this low probability of seepage, we wish to make you aware of the importance of the nearby Westwater Canyon of the Colorado River for recovery of endangered fish species.

Westwater canyon is designated critical habitat for all four species of endangered fish (59 FR 13374). In particular, a large population of humpback chub inhabits this reach. This population is essential to species recovery. The Wingate/Chinle formations are exposed in the cliffs above this reach, creating a possible connection between the injection well receiving site and critical

habitat. We wish to prevent any negative impacts to the water quality in Westwater Canyon from the referenced project.

The Service requests that a water quality analysis and monitoring program be initiated if after the injection period begins, the Upper Colorado River Recovery Program observes contaminated water seeping down the canyon walls.

This response has been prepared under the authority of and in accordance with the provisions of the Fish and Wildlife Coordination Act (16 U.S.C. 661 et seq.) and the Endangered Species Act (16 U.S.C. 1531 et seq.). Thank you for description of the geology and operation of this injection well. We appreciate the opportunity to comment on this application. If you have any questions or need further information, please contact Jana Mohrman, hydrologist, at (303) 236-4486 or Kevin McAbee, ecologist, at (801) 975-3330 ext. 143.

Sincerely,

Larry Crist

cc: Paul Badame, Native Aquatics Project Leader
Moab Field Station
Utah Division of Wildlife
1165 So Hwy 191, Suite 4
Moab, UT 84532

Tom Chart, Director
Upper Colorado Recovery Program
44 Union Blvd, Suite 120
Lakewood, Colorado 80228

Michelle Shaughnessy, Project Leader
Colorado River Fishery Project
764 Horizon Drive, Building B
Grand Junction, Colorado 81506

United States Department of the Interior
FISH AND WILDLIFE SERVICE
UTAH FIELD OFFICE
2369 WEST ORTON CIRCLE, SUITE 50
WEST VALLEY CITY, UTAH 84119

September 15, 2010

RECEIVED
SEP 20 2010
DIV. OF OIL, GAS & MINING

In Reply Refer To
FWS/R6
ES/UT
10-TA-0338

Mr. Brad Hill, Permitting Manager
Utah Division of Oil, Gas, and Mining
Box 145801
Salt Lake City, Utah 84114-5801

RE: Cause No. UIC-358.1; Westwater Farms LLC; Harley Dome #1SWD Well

Dear Mr. Hill:

We have reviewed the referenced Underground Injection Control (UIC) Permit Application. The proposed project involves the operation of the Harley Dome #1 well as a salt water injection well (Class II) in Section 10, Township 19 South, Range 25 East, Grand County, Utah. The well will inject fluids into the Wingate formation at approximately 1,750 feet below the surface. We are providing the following comments for your consideration.

The Colorado pikeminnow (*Ptychocheilus lucius*), razorback sucker (*Xyrauchen texanus*), humpback chub (*Gila cypha*), and bonytail (*Gila elegans*) are federally listed endangered fishes endemic to the Colorado Basin. The location of the injection well is approximately five miles from the Colorado River, which is designated critical habitat for all four of the endangered fish species. We are concerned with possible seepage of injected liquids from the referenced project into the nearby Colorado River.

Last week Christopher Kierst of your staff explained in detail to Jana Mohrman from the Upper Colorado River Recovery Program that the receiving aquifer (in the Wingate formation) dipped northeast, away from the Colorado River. We understand that because of this orientation, there is only a remote chance that injected liquids could back up and seep into the Colorado River. Despite this low probability of seepage, we wish to make you aware of the importance of the nearby Westwater Canyon of the Colorado River for recovery of endangered fish species.

Westwater canyon is designated critical habitat for all four species of endangered fish (59 FR 13374). In particular, a large population of humpback chub inhabits this reach. This population is essential to species recovery. The Wingate/Chinle formations are exposed in the cliffs above this reach, creating a possible connection between the injection well receiving site and critical

habitat. We wish to prevent any negative impacts to the water quality in Westwater Canyon from the referenced project.

The Service requests that a water quality analysis and monitoring program be initiated if after the injection period begins, the Upper Colorado River Recovery Program observes contaminated water seeping down the canyon walls.

This response has been prepared under the authority of and in accordance with the provisions of the Fish and Wildlife Coordination Act (16 U.S.C. 661 et seq.) and the Endangered Species Act (16 U.S.C. 1531 et seq.). Thank you for description of the geology and operation of this injection well. We appreciate the opportunity to comment on this application. If you have any questions or need further information, please contact Jana Mohrman, hydrologist, at (303) 236-4486 or Kevin McAbee, ecologist, at (801) 975-3330 ext. 143.

Sincerely,

Larry Crist

cc: Paul Badame, Native Aquatics Project Leader
Moab Field Station
Utah Division of Wildlife
1165 So Hwy 191, Suite 4
Moab, UT 84532

Tom Chart, Director
Upper Colorado Recovery Program
44 Union Blvd, Suite 120
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Department of the Interior
U. S. Fish & Wildlife Service
2369 West Orton Circle
Suite 50
West Valley City, Utah 84119

SALT LAKE CITY UT 841

17 SEP 2010

STATEMAIL SVCS 09/20/2010 04:3

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PENALTY FOR PRIVATE USE $300
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Mr. Brad Hill, Permitting Manager
Utah Division of Oil, Gas, and Mining
Box 145801
Salt Lake City, Utah 84114-5801

84114+5801

Chris Kierst - Westwater Farms Harley Dome 1 UIC permit

From: "David L Allin" <allinpro@bresnan.net>
To: "Eric Jones" <eric_jones@blm.gov>
Date: 9/23/2010 9:50 AM
Subject: Westwater Farms Harley Dome 1 UIC permit
CC: "Chris Kierst" <chriskierst@utah.gov>
Attachments: Wingate elevations-Harley Dome and Westwater areas.pptx

Eric,

I have drafted a PowerPoint slide to answer the question on the Wingate Sandstone structure in the Harley Dome-Westwater area you posed yesterday. I think that if the other comment authors understood what this map means, they Would be at ease with the proposed project also (for Chris).

The Westwater geologic quad map published in 1988 depicts the outcrop pattern of the Wingate and overlying Kayenta Formation in Ruby Canyon where the Colorado River has eroded down into those formations on the northwesterly trending plunge of the Uncompahgre Uplift. The nearest outcrop to the Harley Dome 1 is 5.8 miles to the southeast with other outcrops more distant up the plunge of the uplift. The map bears both surface elevation contours and structural contours in meters. The red structural contours were drawn on top of the Dakota Sandstone or projected 350 meters (1,148 feet) above the Wingate where the Dakota is absent.

I have plotted the locations of the Harley Dome 1 well at the head of the Bryson Wash Syncline, the Lansdale Government 13 well on the crest of the Harley Dome Anticline (low-Btu gas reservoir) and the nearest Wingate outcrop under the Union Pacific Railroad tracks at the foot of Ruby Canyon above the Westwater BLM ranger station and May Flat. This presentation indicates that the elevation of the top of the Wingate in the HD 1 (3,532') is 105 feet lower than in the LG 13 (3,637') and 1,061 feet lower than the nearest outcrop (4,593') 5.8 miles to the southeast.

The structural picture happens to be ideal for safe injection that cannot back up the Uncompahgre Uplift plunge to the Colorado River and will not affect the low-Btu gas reservoir in the crest of the Harley Dome Anticline. As I have stated before, in conjunction with the planned recycling of produced water proposed by Westwater Farms, LLC this project should be a model to be emulated.

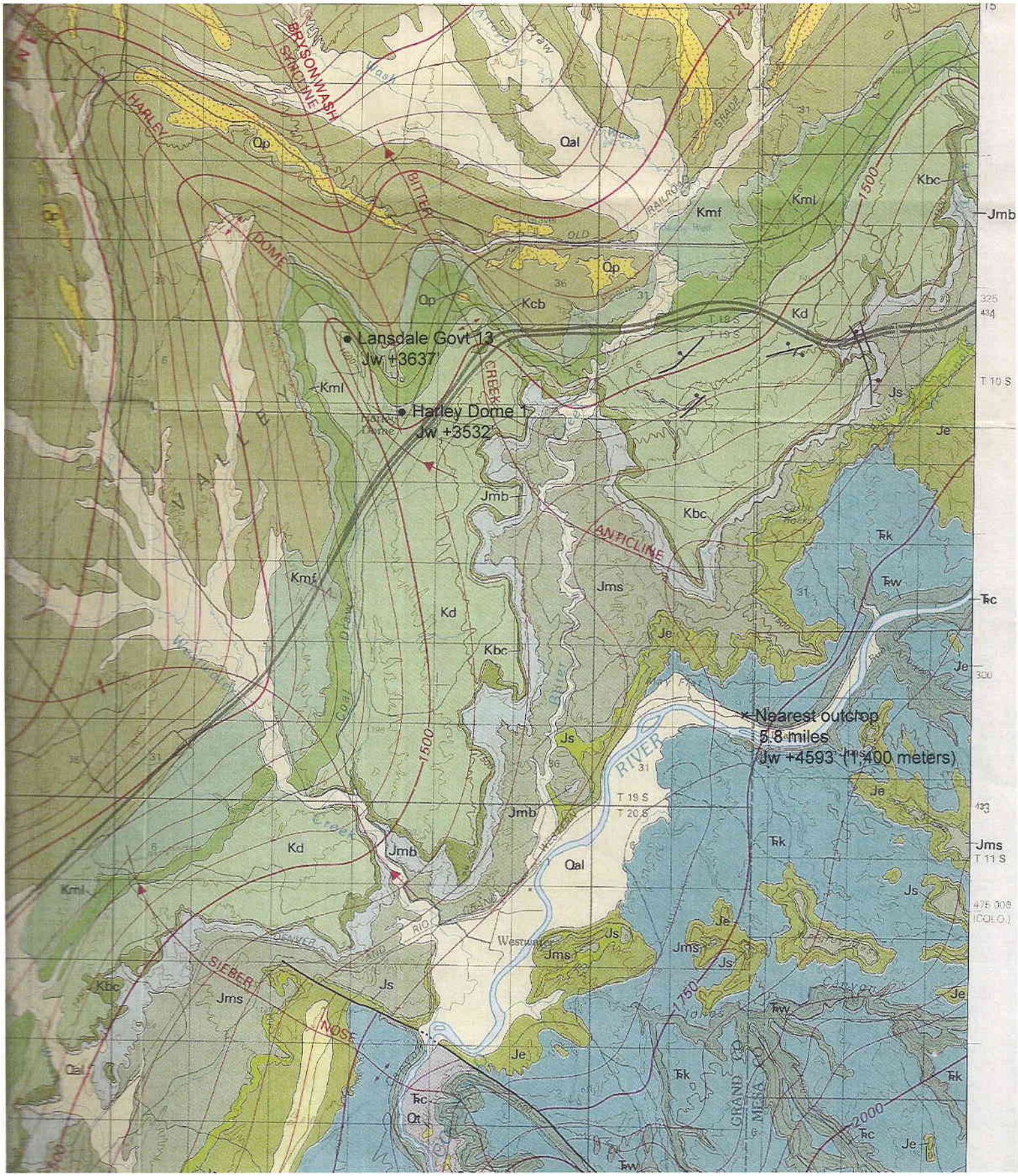
If you have any other questions, please let me know. If you can speak with Chris sometime today, you can catch him before he begins a regular three-day weekend.

Best wishes,

Dave

David L. Allin
Consultant to Westwater Farms, LLC
Vice President, Exploration Manager
Del-Rio Resources, Inc.
AAPG DPA Certified Petroleum Geologist 2934
Professional Geologist Utah DOPL 5526699-2250
475 Seasons Drive
Grand Junction, CO 81507-8749
970-254-3114
allinpro@bresnan.net

Relative Elevations of the Top of the Wingate Sandstone and Distance to Nearest Outcrop
Harley Dome Anticline, Harley Dome 1 UIC Permit Site (Bryson Wash Syncline) and Westwater Canyon Area
Map Base: Westwater 30' x 60' Geologic Quad Map, USGS Map I-1765 (1988), Scale 1:100,000
Structure contours drawn on top of Dakota Ss & projected 1,148' (350 m) above Wingate Ss where Dakota is absent



One Mile

STEWART ENVIRONMENTAL CONSULTANTS, LLC
ENGINEERING FOR LIFE

ACEC MEMBER

October 4, 2010

Mr. Brad Hill
Utah Division of Oil, Gas, and Mining
P.O. Box 145801
Salt Lake City, Utah 84114-5801

Re: Cause No. UIC 358.1
Application for Class II Injection Well
Westwater Farms, LLC
Harley Dome 1 SWD
Section 10, T19S, R25E
Grand County, Utah
FWS/R6, ES/UT, 10-TA-0338
Project No.: 5001.010(4)

Dear Mr. Hill:

We are responding to a request by Westwater Farms, LLC to provide a monitoring program for the injection well to ensure that produced water does not seep from the Wingate formation into Westwater Canyon, to the south of the project. This concern was raised by the U.S. Fish and Wildlife Service on September 15, 2010. In their letter (attached), they are asking for a monitoring program that will provide for a baseline of the overall seeps in the area and if there are additional seeps found after the injection of produced water into the Wingate formation, that these will be monitored for any potential contamination.

It is the opinion of our hydrogeologist that the likelihood of this occurring is very remote. However, in the interest of cooperation, we are proposing the following activities:

1. We will have our professional geologist, Mr. Paul Stone, survey the applicable reach of Westwater Canyon and follow the Wingate formation to observe any current seeps. These seeps will be noted in a background document.
2. We will then observe the Wingate formation every six months for a period of three years. If we do not observe additional seeps that are the result of the injection well activity, we will then begin monitoring the formation on a yearly basis.
3. We will keep a log of the pressures on the injection well. We understand that the underground injection control (UIC) permit will set a limit on the injection pressures. We will stay below that pressure. However, on a monthly basis, we will turn off the injection well to observe the pressure drop with time. This will allow us to understand if there is any unexpected buildup of pressures within the formation.

All of this information will be kept on site for inspection by regulatory agencies. It is our understanding that this will satisfy the U.S. Fish and Wildlife Service as to their recommendation for a monitoring program.

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DIV. OF OIL, GAS & MINING

3801 AUTOMATION WAY, SUITE 200 | FORT COLLINS, COLORADO 80525 | T: 970.226.5500 | F: 970.226.4946 | WWW.STEWARTENV.COM
CONSULTING ENGINEERS AND SCIENTISTS

Please contact us with any further questions.

Sincerely,

STEWART ENVIRONMENTAL CONSULTANTS, LLC

David R. Stewart, PhD, PE
President and CEO

Enc.

cc: Mr. Larry Crist, U.S. Fish and Wildlife Service
Ms. Jana Mohrman, U.S. Fish and Wildlife Service
Mr. Eric Jones, U.S. Bureau of Land Management
Mr. Tom Warnes, WestWater Farms, LLC
Mr. David Allin, Del-Rio Resources, Inc.

5001.010(4)\westwater monitoring program 04oct10.ltr

United States Department of the Interior
FISH AND WILDLIFE SERVICE
UTAH FIELD OFFICE
2369 WEST ORTON CIRCLE, SUITE 50
WEST VALLEY CITY, UTAH 84119

September 15, 2010

In Reply Refer To
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10-TA-0338

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Utah Division of Oil, Gas, and Mining
Box 145801
Salt Lake City, Utah 84114-5801

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This response has been prepared under the authority of and in accordance with the provisions of the Fish and Wildlife Coordination Act (16 U.S.C. 661 et seq.) and the Endangered Species Act (16 U.S.C. 1531 et seq.). Thank you for description of the geology and operation of this injection well. We appreciate the opportunity to comment on this application. If you have any questions or need further information, please contact Jana Mohrman, hydrologist, at (303) 236-4486 or Kevin McAbee, ecologist, at (801) 975-3330 ext. 143.

Sincerely,

Larry Crist

cc: Paul Badame, Native Aquatics Project Leader
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1165 So Hwy 191, Suite 4
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Upper Colorado Recovery Program
44 Union Blvd, Suite 120
Lakewood, Colorado 80228

Michelle Shaughnessy, Project Leader
Colorado River Fishery Project
764 Horizon Drive, Building B
Grand Junction, Colorado 81506

Chris Kierst - Westwater Class II Injection Well

From: <jjdyke@comcast.net>
To: larry crist <larry_crist@fws.gov>, jana mohrman <jana_mohrman@fws.gov>, ...
Date: 9/30/2010 3:00 PM
Subject: Westwater Class II Injection Well
CC: Tom Warnes <tomwarnes53@msn.com>

Mr. Larry Crist
US Department of Interior
Fish and Wildlife Service

Dear Mr. Crist

It was with great interest and concern for the Colorado River that we read your letter dated September 15, 2010 from the FWS to Brad Hill at the Utah Division of Oil, Gas, and Mining concerning our proposed Class II injection well to be located in Sec 10, Tsp 19S, Range 25 E, in Grand County, Utah.

We share your concerns and wish to work closely with both FWS and DOGM to alleviate those concerns. We therefore would support your suggestion that a water quality analysis and monitoring program be initiated after the injection period begins.

Subsequently, we have instructed our environmental engineering company, Stewart Environmental, to prepare a monitoring plan for this purpose. We are prepared to both visually inspect areas of concern and do pressure tests in a routine and ongoing basis to monitor water which is injected into our well.

We hope this addresses your concerns and we look forward to meeting our common goals. We hope that you understand that we too have an interest in maintaining the public trust.

Sincerely

Tom Warnes and Jeff Dyke
Westwater Farms

DIVISION OF OIL, GAS AND MINING
UNDERGROUND INJECTION CONTROL PROGRAM

PERMIT
STATEMENT OF BASIS

Applicant: Westwater Farms, LLC **Well:** Harley Dome #1

Location: T19S, R21E, S10, Grand County, Utah **API:** 4301931622

Ownership Issues:

The well is located on private surface and mineral lands owned by the operator. The operator's agent has provided the Division an Affidavit of Mailing specifying that a copy of the application for a Class II Injection Well permit was sent to all operators, owners and surface owners within a half-mile of the proposed injection well.

Well Integrity:

Description of the Casings and Cement:

CASING PROGRAM

String Type	Hole Size	Depth	Feet	Casing Diameter	Weight	Grade	Connection Type
Surface	11	224'	?	8 5/8"	24#	J-55	?
Production	7 7/8	1,730	?	5 1/2 "	15.5#	J-55	?

CEMENT PROGRAM

String Type	DV Depth	Stage Lead/Tail	Cement Bottom	Cement Top	Number Sacks	Cement Type	Cement Yield	Cement Weight PPG
Surface	-	-	258'	Surface	50	Class A	1.18	15.6
Production	1,227'	Lead	-	96 CBL	210	Class G	?	12.8

Ground Water Protection:

The operator, Westwater Farms, LLC, proposes to inject a regional composite produced water mixture through perforations into the Wingate Sandstone for the purpose of salt water disposal. The perforations span an interval between 1,342 feet and 1,679 feet of depth. The Division of Oil, Gas and Mining (DOGM) has elected to accept analyses of produced waters from sundry regional field wells as representative of the waters to be injected into this well. These were tested for TDS and the results ranged from about 7,000 to about 15,000 mg/L, a value that is greater than what is considered to be moderately saline (10,000 mg/L). Two different Wingate Sandstone connate water samples were taken on different dates and tested. The TDS values ranged from about 34,000 (near seawater) to about 53,000 mg/L. In either

case, these connate waters are found to be of very low quality, despite being relatively shallow, a circumstance that is not without precedent in Grand County. It is unlikely that a good quality ground water resource is to be found in the Wingate Sandstone in this area. Westwater Farms' consultant, Stewart Environmental, reports that it is probable that the mixture will require anti-scaling treatments from Baker Petrolite. The first water reported during drilling was encountered in the Jurassic-age Morrison Formation at 240' TD (31,000 ppm) according to the Well Completion Report.

The operator asks permission to inject at a UIC Form 1 Maximum Allowable Surface Injection Pressure of 260 psig. This injection pressure is supported by frac stimulation pressures, in lieu of Step Rate Test results, which indicate a breakdown pressure at about 400#.

The upper primary confining layers between the injection zone and surface are the Jurassic-age Summerville Formation and Morrison Formation shales and siltstones. The lower primary confining layer is the Chinle Formation.

In this area, the sandstones of the Glen Canyon Group are not considered Underground Sources of Drinking Water (USDW; a water source containing less than 10,000 mg/l, total dissolved solids).

There are no subsurface water rights filed within a mile of the Harley Dome #1.

An analysis of the original Cement Bond Log for this well was undertaken to evaluate the quality of the bond over the confining interval in the well. The results of the review indicated that there was insufficient 80% bond index cement bonding above the injection interval. A remedial cement job was undertaken, which resulted in the attainment of more than sufficient intervals of well-bonded cement and the cement quality was subsequently found to be acceptable.

Oil/Gas & Other Mineral Resources Protection:

The nearest conventional oil and gas development is shut-in Morrison Formation gas about 1.5 miles to the west and also to the north northwest and, also, Dakota Sandstone gas production about 2.5 miles northwest.

A review of the well records of the Division of Oil, Gas and Mining revealed that two P&A'd wells, the Lansdale Gov't. 16 (4301930021) and the Lansdale State 14 (4301930016) are within the one-half mile regulatory area of review. Both of these wells fell short of the depth of the proposed injection zone in the subject well.

The BLM notes an Entrada Sandstone natural gas and helium resource in the area. They posted a protest to the project based on perceived possible threats to these resources as well as proximity to the sundry recreational/scenic/environmental resources in abundance in the

Westwater Canyon area of the Colorado River drainage. After consulting with the Operator and additional study of the project and local geology, they withdrew their protest.

Bonding:

Westwater Farms, LLC, has posted a $15.000.00 CD (Wells Fargo Bank, NA) plugging bond # 8429377339 filed with this Division.

Actions Taken and Further Approvals Needed:

Notice of this application was published in the Salt Lake Tribune and the Moab, Utah, Times. In addition, copies of the notice were provided to EPA Region 8, the BLM Moab Field Office, Grand County Planning, SITLA and the operator. The notice stated the proposed interval for injection to be selective zones in the Wingate Sandstone. Any future injection into strata other than that permitted will require administrative approval after appropriate sampling and testing.

The Noticing period for this SWD candidate well attracted two other protests (from the Living Rivers environmental group and a resident from Moab, Utah), besides the BLM protest noted above, as well as a letter from the United States Fish and Wildlife Service federal agency to advise about the existence of piscine Threatened and Endangered faunas found in that area in the Colorado River.

After reviewing their documentary submission and application, it is my conclusion that Westwater Farms, LLC, ought to be granted a permit to utilize the Harley Dome #1 SWD well for injecting field produced water into the proposed strata. The proposed operations would not result in any meaningful diminution in the quality of the noxious formation water. No negative impacts on any superjacent high quality ground water resource are anticipated resultant of the subject permitted operations, nor is it likely that the injectate will attain the exposures of the Wingate Sandstone in Westwater Canyon area, owing to the lateral and vertical distances involved, as well as the details of the local and regional geologic setting.

A properly designed and constructed injection well, combined with periodic mechanical integrity tests (MIT), demonstrably poses no threat to fresh or useable groundwater supplies. On 12/11/08 the operator conducted a successful MIT on this well that was witnessed by Mr. Mark Jones, an inspector from the Division's Price, Utah, office. The Division staff recommends administrative approval of this application.

Note: Applicable technical publications concerning water resources in the general vicinity of this project have been reviewed and taken into consideration during the permit review process.

Reviewer(s): Christopher J. Kierst Date: 10/6/2010

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Moab Field Office
82 East Dogwood
Moab, Utah 84532

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UTU82619
(UTY012)

Mr. Brad Hill
Utah Division of Oil, Gas and Mining
P.O. Box 145801
Salt Lake City, Utah 84114-5801

SEP 30 2010

Re: Protest Withdrawal
Cause No. UIC-358.1
Application for Class II Injection Well
Westwater Farms, LLC
Harley Dome 1 SWD
Section 10, T19S, R25E
Grand County, Utah

Dear Mr. Hill:

In the interest of ensuring that Federal oil and gas resources would not be degraded, the Moab Field Office of the Bureau of Land Management (BLM) filed a protest of the above referenced Cause on August 27, 2010. A summary of concerns identified in the protest include the potential for the proposal to generate hydrogen sulfide gas, uncertainty of the confining capability of the Kayenta Formation and, more generally, the shallow nature of the proposed injection zone which crops-out in the Colorado River canyon five miles away.

Since filing the protest, our staff has met with the proponent and their consultants, and the exchange has continued by email. Through the course of this communication, the proponent has provided sufficient evidence that the reservoir conditions in this instance are not favorable for hydrogen sulfide generation, and that operational controls will be applied to further minimize the possibility of reservoir souring. Additionally, the proponent has provided electric log data and comparative water analysis data which indicates the Kayenta Formation, locally, is a suitable confining layer to isolate the Entrada Sandstone helium reservoir above, from the proposed Wingate Sandstone injection zone below. Finally, the proponent has presented evidence that the Wingate Sandstone is sufficiently higher structurally, at the nearest Colorado River outcrop, relative to its position at the proposed injection well, to minimize the possibility of injection resulting in surface expression at the river.

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OCT 06 2010
DIV. OF OIL, GAS & MINING

In summary, the concerns expressed in our notice of protest have been suitably addressed by subsequent consultation with the proponent. We therefore respectfully withdraw our protest. Should you have any questions regarding this matter, please call Eric Jones of this office at 435-259-2117.

Sincerely,

Field Manager

cc: Allin Proprietary (consultant for Westwater Farms, LLC)
475 Seasons Drive
Grand Junction, CO 81507-8749
UT922, Utah State Office

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Moab Field Office
82 East Dogwood
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475 Seasons Drive
Grand Junction, CO 81507-8749
UT922, Utah State Office

UIC INJECTION PERMIT ANALYSIS FORM
WELL NAME: Harley Dome #1 SWD (4301931622)

iR649-5-2. Requirements For Class II Injection Wells Including Water Disposal, Storage And Enhanced Recovery Wells.	**Completed Items, Needed Items, & Comments**
1. Injection wells shall be completed, equipped, operated, and maintained in a manner that will prevent pollution and damage to any USDW, or other resources and will confine injected fluids to the interval approved.	1. OK
2. The application for an injection well shall include a properly completed UIC Form 1 and the following:	2. OK
2.1. A plat showing the location of the injection well, all abandoned or active wells within a one-half mile radius of the proposed well, and the surface owner and the operator of any lands or producing leases, respectively, within a one-half mile radius of the proposed injection well.	2.1 OK
2.2. Copies of electrical or radioactive logs, including gamma ray logs, for the proposed well run prior to the installation of casing and indicating resistivity, spontaneous potential, caliper, and porosity.	2.2 OK
2.3. A copy of a cement bond or comparable log run for the proposed injection well after casing was set and cemented.	2.3 Original CBL inadequate for lack of sufficient 80% bonded interval. Remedial cement job. New CBL indicates acceptable cement bonding although it is not ideal for insufficient travel time curve backup or attenuation.
2.4. Copies of logs already on file with the division should be referenced, but need not be refiled.	2.4 OK
2.5. A description of the casing or proposed casing program of the injection well and of the proposed method for testing the casing before use of the well.	2.5 OK
2.6. A statement as to the type of fluid to be used for injection. its source and estimated amounts to be injected daily.	2.6 OK
2.7. Standard laboratory analyses of (1) the fluid to be injected, (2) the fluid in the formation into which the fluid is being injected, and (3) the compatibility of the fluids.	2.7 No Compatibility Analysis.
2.8. The proposed average and maximum injection pressures.	2.8 OK
2.9. Evidence and data to support a finding that the proposed injection well will not initiate fractures through the overlying strata or a confining interval that could enable the injected fluid or formation fluid to enter the fresh water strata.	2.9 OK
2.10. Appropriate geological data on the injection interval and confining beds, and nearby Underground Sources of Drinking Water, including the geologic name, lithologic description, thickness, depth, water quality, and lateral extent; also information relative to geologic structure near the proposed well which may effect the conveyance and/or storage of the injected fluids.	2.10 OK
2.11. A review of the mechanical condition of each well within a one-half mile radius of the proposed injection well to assure that no conduit exists that could enable fluids to migrate up or down the wellbore and enter improper intervals.	2.11 None but subject well.
2.12. An affidavit certifying that a copy of the application has been provided to all operators, owners and surface owners within a one-half mile radius of the proposed injection well.	2.12 OK
2.13. Any other additional information that the board or division may determine is necessary to adequately review the application.	2.13 OK

OTHER COMMENTS AND OBSERVATIONS: Status of informational submission as of 11/30/2010.

Reviewed by: Christopher J. Kierst Date: 11/30/2010

STEWART ENVIRONMENTAL CONSULTANTS, INC.
ENGINEERING FOR LIFE

ACEC MEMBER

December 6, 2010

Mr. Chris Kierst, Senior Petroleum Specialist
Department of Natural Resources
Division of Oil, Gas and Mining
1594 West North Temple, Suite 1210
Salt Lake City, Utah 84116

Subject: Water Compatibility Report – Westwater Farms LLC – Harley Dome Number 1
Project No.: 4422.001(10)

Dear Mr. Kierst:

This letter report details the water compatibility modeling completed for mixing produced water from the Westwater Farms injection treatment system with Wingate Ss formation water with emphasis on solubility. The models were built using existing analytical results for each water and the chemical speciation and solubility modeling program Visual MINTEQ, version 2.53; details about the program and model methodology are below.

The following table summarizes the model results:

Westwater Injection Well Chemistry
Table 1: Summary Table

Component	W181 & Injectate Water Mixed	W201 & Injectate Water Mixed
	Mass Precipitated (lb/1000 bbl)	
Ba+2	4.52	9.26
Ca+2	15.44	26.95
CO3-2	23.72	20.59
H4SiO4	0.92	0.20
Mg+2	9.72	0
SO4-2	3.16	6.48
Total =	**57.48**	**63.49**
	Solids	
	$BaSO_4$ (Barite) = 7.77% of solids	$BaSO_4$ (Barite) = 9.09% of solids
	$Mg_3(Si_2O_5)(OH)_4$ (Chrysotile) = 1.14% of solids	$CaCO_3$ (Calcite) = 90.62% of solids
	$CaMg(CO_3)_2$ (Dolomite [ordered]) = 91.09% of solids	SiO_2 (Quartz) = 0.29% of solids
	8.91% (5.12 lb/1000 bbl) of solids insoluble in acid treatment	**9.38% (5.96 lb/1000 bbl) of solids insoluble in acid treatment**

WESTWATER FARMS, LLC
DOCKET 2010-029
CAUSE UIC-358.1
REBUTTAL EXHIBIT 1

We have had multiple discussions regarding our scaling issues with Mr. John Ruggeri, Product Manager for Flow Assurance at Baker Petrolite in Houston, Texas. He is recommending that we also add an antiscalant to control our precipitation issues within the formation; however, Baker Petrolite is performing some additional testing in order to identify the best antiscalant product for our application.

The modeling software used in this effort was Visual MINTEQ ver. 2.53. The original program, MINTEQA2 ver 4.0, was written in Fortran 77 and released in 1999 by CEAM, US EPA. It has now been entirely rewritten in Visual Basic, with version 2.53 of Visual MINTEQ compiled in Visual Basic 6.0 on October 24, 2007 by Mr. Jon Petter Gustafsson, KTH, Dept. of Land and Water Resources Engineering, Stockholm, Sweden. The aim of the program is to simulate equilibria and speciation of inorganic solutes in natural waters.

There were three water samples evaluated in this exercise: Westwater injectate water, Wingate Ss formation water sample W181, and Wingate Ss formation water sample W201. Analytical data for injectate water was derived from data that was developed as part of Stewart Environmental's pilot testing program, which took place at the Westwater, Utah site from July 26 to September 10, 2010 (please see Attachment 1). Formation water samples W181 and W201 were drawn from the Wingate Ss formation by Mr. David Allin, Westwater's hydrogeologist, on May 20 and June 10, 2010 respectively. Sample W201 was drawn while UDOGM inspector Mr. Bart Kettle was present at the site on June 10, 2010, and thus is of interest to UDOGM. However, Mr. Allin feels that sample W201 was contaminated by water lost during long string cementing operations, and he feels that sample W181 is much more representative of the Wingate Ss formation water. Thus, both formation water samples were included in this modeling exercise. Both formation water samples were tested by Halliburton on May 22 and June 10, 2010 respectively (please see Attachment 2). Stewart Environmental conducted additional testing on sample W181 for barium, silica, and strontium on August 27, 2010 (please Attachment 3).

To calibrate the solubility models, the data for each water was entered into the program without any mixing (please see Attachment 4). Any solids that precipitated in this step were removed from the water accordingly, because solids will be removed from the injectate by Westwater's pre-injection filtration processes and from the formation water by the formation itself, and because precipitated solids are not directly available for aqueous equilibria reactions.

Next, two mixtures were modeled using results from the first step: injectate water with sample W181 and injectate water with sample W201 (please see Attachment 5). The mixtures were created using a 50 percent/50 percent mix of injectate and formation water, which simulates the injectate/formation water interface and is a conservative estimate of the interface interaction. The speciation of components is listed in a table of saturation indices (please see Attachment 6); note that any compound that shows a saturation index value of zero has begun precipitating out of the water.

It is important to note that these models do not account for the use of an appropriate antiscalant chemical, nor do they account for acid treatments performed on the injection well. Model files (compatible with Visual MINTEQ ver. 2.53) are available for review upon request.

Conclusion:

Based on the chemical modeling and discussions with Baker Petrolite, we will be adding an antiscalant to control precipitation in the well bore. This will likely be a phosphate scale inhibitor and we will also add a biocide to prevent

any future microbiological growth within the formation. The exact products will be determined by Baker Petrolite as well as the proper dosing of these chemicals.

Sincerely,

STEWART ENVIRONMENTAL CONSULTANTS, INC.

David R. Stewart, PhD, PE
President and CEO

Enc.

4422.001(10)\Westewater Chemical Compatibility 06dec10.ltr

Representative Chemistry of Injected Water After Oil Removal

Parameter	Units		8/12/2010		8/18/2010		8/20/2010		8/25/2010		8/31/2010		9/2/2010		9/9/2010	Average
Inorganics																
Ammonia as N	ppm		10.3		11.4		14.7		12		12		11.4		8.6	11.49
Heterotrophic, Plate Count	MPN/mL				1											1.00
Solids/Total Dissolved (TDS)	ppm		14404		7098		12544		13628		13810		13914		13600	12714.00
Sulfate	ppm		0.657		25.4		17.2	<	5		3.2		3.3		4.5	8.47
Metals																
Aluminum	ppm		0.0916	<	0.5	<	0.5	<	0.5	<	0.5	<	0.5	<	0.5	0.44
Aluminum, dissolved	ppm	<	0.05	<	0.5	<	0.5	<	0.5	<	0.5	<	0.5	<	0.5	0.44
Arsenic	ppm	<	0.2	<	0.2	<	0.2	<	0.2	<	0.2	<	0.2	<	0.2	0.20
Arsenic, dissolved	ppm	<	0.2	<	0.2	<	0.2	<	0.2	<	0.2	<	0.2	<	0.2	0.20
Barium	ppm		46.3		32.8		42.9		45.9		45		40.5		36.3	41.39
Barium, dissolved	ppm		42.1		29.4		36.1		40.2		42		40.3		31.5	37.37
Boron	ppm		10.1		12.6		13.7		14.2		12.9		11.9		13.04	12.63
Boron, dissolved	ppm		9.69		11.3		11.5		12.4		12		11.8		11.8	11.50
Cadmium	ppm	<	0.03	<	0.03	<	0.03	<	0.03	<	0.03	<	0.03	<	0.03	0.03
Cadmium dissolved	ppm	<	0.03	<	0.03	<	0.03	<	0.03	<	0.03	<	0.03	<	0.03	0.03
Calcium	ppm		143		150		180		202		151		141		153	160.00
Calcium, dissolved	ppm		132		134		164		172		137		137		133	144.14
Chromium	ppm		0.0069	<	0.05	<	0.05	<	0.05	<	0.05	<	0.05	<	0.05	0.04
Chromium, dissolved	ppm	<	0.005	<	0.05	<	0.05	<	0.05	<	0.05	<	0.05	<	0.05	0.04
Copper	ppm		0.0102	<	0.05	<	0.05	<	0.05	<	0.05	<	0.05	<	0.05	0.04
Copper, dissolved	ppm	<	0.005	<	0.05	<	0.05	<	0.05	<	0.05	<	0.05	<	0.05	0.04
Iron	ppm		7.67		12.1		4		23.9		8.13		8.23		6.32	10.05
Iron, dissolved	ppm		5.14		6.56		3		15.9		5.72		5.43		1.24	6.14
Lead	ppm	<	0.02	<	0.2	<	0.2	<	0.2	<	0.2	<	0.02	<	0.2	0.15
Lead, dissolved	ppm	<	0.02	<	0.2	<	0.2	<	0.2	<	0.2	<	0.02	<	0.2	0.15
Magnesium	ppm		16.2		20.7		22.8		23.9		18		16.5		19.2	19.61
Magnesium, dissolved	ppm		15.2		18.5		19.4		20.9		16.5		16.3		16.9	17.67
Manganese	ppm		0.514		0.607		0.633		0.648		0.389		0.378		0.52	0.53
Manganese, dissolved	ppm		0.479		0.508		0.538		0.566		.3.61		0.36		0.435	0.48
Nickel	ppm	<	0.05	<	0.05	<	0.05	<	0.05	<	0.05	<	0.05	<	0.05	0.05
Nickel, dissovled	ppm	<	0.05	<	0.05	<	0.05	<	0.05	<	0.05	<	0.05	<	0.05	0.05
Potassium	ppm		40.1		38.2		83		86.5		57		51.5		43.3	57.09
Potassium, dissolved	ppm		37.4		35.4		70		76.2		53		51		38.5	51.64
Selenium	ppm	<	0.2	<	0.2	<	0.2	<	0.2	<	0.2	<	0.2	<	0.2	0.20
Selenium, dissolved	ppm	<	0.02	<	0.2	<	0.2	<	0.2	<	0.2	<	0.2	<	0.2	0.17
Silica	ppm		46.8		52.2		58.7		70.7		53		68.6		60.4	58.63
Silica, dissolved	ppm		43.6		48.1		54.1		61.8		64.5		64.4		51.4	55.41
Sodium	ppm		4500		3790		3990		4070		4530		4000		4200	4154.29
Sodium, dissolved	ppm		4140		3430		3370		3590		4210		4060		3740	3791.43
Strontium	ppm		32.7		25.7		24.3		25.3		29.1		26.8		26.8	27.24
Strontium, dissolved	ppm		30		23		20.8		22.5		27.3		26.7		23.5	24.83
Zinc	ppm		0.066		0.068		0.058		0.062	<	0.05	<	0.05		0.114	0.07
Zinc, dissolved	ppm		0.13		0.141		0.204	<	0.05		0.176	<	0.05		0.107	0.12
Organics																
Oil and Grease	ppm		9		11		16		8							11.00
Total Organic Carbon	ppm		240		190		210		190		270		260		240	228.57

HALLIBURTON

Halliburton Energy Services
The Rockies NWA Regional Laboratory
Grand Junction, CO 970) 523-3692

Water Analysis Report

Contact Information

Company	West Water Farm	Date Received	5-20/21-10
Reported To	Davis Allin	Date Tested	May 22, 2010
Reported By	Ann Ekx	Tested By	Ann Ekx

Sample Physical Characteristics

Well Name	HD1	Temperature	71 °F
Location	TAC 1720	pH	7.6
Specific Gravity	1.012	Color	Orange
Corrected SG	1.014 at 60°F	Turbidity	None
TDS (calculated)	52763 ppm	Resistivity	0.38 Ω·m

Sample Chemical Characteristics

Anions			Cations		
Chloride	32600	mg/L	Total Iron	0.2	mg/L
Sulfate	360	mg/L	Ferrous Iron	0.6	mg/L
Bicarbonate	290	mg/L	Potassium	510	mg/L
Carbonate	0	mg/L	Calcium	1600	mg/L
Hydroxide		mg/L	Magnesium	1400	mg/L
			Sodium (calculated)	16635	mg/L

General Comments

W181; TAC 1720 Contains foamer 15:25 5-21-10

NOTICE: This report is for information only, and the content is limited to the sample described. Halliburton makes no warranties, expressed or implied, as to the accuracy of the contents or results. Any user of this report agrees Halliburton shall not be liable for any loss or damage, regardless of cause, resulting from the use hereof.

HALLIBURTON

Halliburton Energy Services
The Rockies NWA Regional Laboratory
Grand Junction, CO 970) 523-3692

Water Analysis Report

Contact Information

Company	West Water Farms LLC	Date Received	June 10, 2010
Reported To	Engineers David Allin	Date Tested	June 10, 2010
Reported By	Ann Ekx	Tested By	Ann Ekx

Sample Physical Characteristics

Well Name	Harley Dome 1	Temperature	64 °F
Location	JW Perfs 1344-1631'	pH	7.8
Specific Gravity	1.013	Color	Clear
Corrected SG	1.013 at 60°F	Turbidity	None
TDS (calculated)	34378 ppm	Resistivity	0.36 Ω·m

Sample Chemical Characteristics

Anions	Chloride	20600	mg/L	**Cations**	Total Iron	3.0 mg/L
	Sulfate	580	mg/L		Ferrous Iron	0.6 mg/L
	Bicarbonate	400	mg/L		Potassium	0 mg/L
	Carbonate	0	mg/L		Calcium	1780 mg/L
	Hydroxide		mg/L		Magnesium	330 mg/L
					Sodium (calculated)	11114 mg/L

General Comments

W201; 6-10-10 14:40

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Client: Produced Water Development

Laboratory Report

Attn: SEC Engineering Department

Laboratory ID: S102391505 Sample Name: Harley Dome # 1

Sampled: 6/10/2010 12:40 PM Date Received: 8/27/2010 Matrix: Water Grab Batch No: 10707

Project # 5001-010 BG 001

Analyte	Result	Units	MRL	Method	Date	Analyst	Sent Out	Laboratory
Digest/Total Prep. Batch	74	Dig #	0	SM 3030 F	8/31/2010	VJF	☐	
Barium	0.232	ppm	0.002	EPA 200.7	9/1/2010	MAG	☐	
Silica	14.7	ppm	0.1	EPA 200.7	9/1/2010	MAG	☐	
Strontium	50.4	ppm	0.001	EPA 200.7	9/1/2010	MAG	☐	

Results Approved by: M. Glavanovich

Michael Glavanovich, Laboratory Manager Date Reported: 12/3/2010

Stewart Environmental Consultants, LLC
3801 Automation Way, Suite 200
Fort Collins, CO 80525

Westwater Injection Well Chemistry

Formation Water W201 Only: Precipitated Solids

Component	Total dissolved (molal)	% dissolved	Total precipitated (molal)	% precipitated
Ca+2	0.038294	85.83	0.006322	14.17
Cl-1	0.58105	100	0	0
CO3-2	0.00022425	3.426	0.006322	96.574
Fe+2	0.000010744	100	0	0
H+1	0.00021399	100	0	0
Mg+2	0.013574	100	0	0
Na+1	0.48343	100	0	0
SO4-2	0.0060378	100	0	0

Formation Water W181 Only: Precipitated Solids

Component	Total dissolved (molal)	% dissolved	Total precipitated (molal)	% precipitated
Ba+2	1.9004E-06	100	0	0
Ca+2	0.037733	94.443	0.0022202	5.557
Cl-1	0.91953	100	0	0
CO3-2	0.00030433	6.414	0.0044403	93.586
Fe+2	0.000010744	100	0	0
H+1	0.00029557	100	0	0
K+1	0.013043	100	0	0
Mg+2	0.055397	96.147	0.0022202	3.853
Na+1	0.72358	100	0	0
SO4-2	0.0037476	100	0	0

Injectate Water Only: Precipitated Solids

Component	Total dissolved (molal)	% dissolved	Total precipitated (molal)	% precipitated
Ba+2	0.00019395	71.28	0.000078145	28.72
Ca+2	0.00087575	24.351	0.0027206	75.649
Cl-1	0.18334	100	0	0
CO3-2	0.0084924	73.382	0.0030805	26.618
Fe+2	6.6611E-06	6.059	0.00010328	93.941
H+1	0.0086582	100	0	0
H3BO3	0.0010638	100	0	0
H4SiO4	0.00010925	11.844	0.00081318	88.156
K+1	0.0013206	100	0	0
Mg+2	0.00059402	81.731	0.00013278	18.269
Mn+2	3.2487E-06	37.182	5.4885E-06	62.818
Na+1	0.16492	100	0	0
NH4+1	0.00067466	100	0	0
SO4-2	0.000010028	11.373	0.000078145	88.627
Sr+2	0.00016503	58.235	0.00011835	41.765
Zn+2	1.8357E-06	100	0	0

Westwater Injection Well Chemistry

Injection Water & Formation Water W181 Mixed 50/50: Precipitated Solids

Component	Total dissolved (molal)	% dissolved	Total precipitated (molal)	% precipitated
Ba+2	0.000004107	4.194	0.000093825	95.806
Ca+2	0.018197	94.303	0.0010993	5.697
Cl-1	0.55143	100	0	0
CO3-2	0.00035778	13.996	0.0021986	86.004
Fe+2	8.6844E-06	100	0	0
H+1	0.00025059	100	0	0
H3BO3	0.0010638	100	0	0
H4SiO4	0.000081787	74.867	0.000027456	25.133
K+1	0.0071817	100	0	0
Mg+2	0.054232	97.94	0.0011405	2.06
Mn+2	3.2764E-06	100	0	0
Na+1	0.44425	100	0	0
NH4+1	0.00067466	100	0	0
SO4-2	0.001785	95.006	0.000093825	4.994
Sr+2	0.00016503	100	0	0
Zn+2	1.8357E-06	100	0	0

Westwater Injection Well Chemistry

Injection Water & Formation Water W201 Mixed 50/50: Precipitated Solids

Component	Total dissolved (molal)	% dissolved	Total precipitated (molal)	% precipitated
Ba+2	1.5732E-06	0.811	0.0001924	99.189
Ca+2	0.017567	90.159	0.0019174	9.841
Cl-1	0.3822	100	0	0
CO3-2	0.00061176	24.188	0.0019174	75.812
Fe+2	8.7739E-06	100	0	0
H+1	0.00053664	100	0	0
H3BO3	0.0010638	100	0	0
H4SiO4	0.00010323	94.491	6.0181E-06	5.509
K+1	0.00066032	100	0	0
Mg+2	0.0070837	100	0	0
Mn+2	3.2764E-06	100	0	0
Na+1	0.32417	100	0	0
NH4+1	0.00067466	100	0	0
SO4-2	0.0028315	93.637	0.0001924	6.363
Sr+2	0.00016503	100	0	0
Zn+2	1.8357E-06	100	0	0

Westwater Injection Well Chemistry

Injection Water & Formation Water W181 Mixed 50/50: Saturation Indices

Mineral	log IAP	Sat. Index	Stoichiometry							
Anhydrite	-5.825	-1.447	1	Ca+2	1	SO4-2				
Aragonite	-8.506	-0.141	1	Ca+2	1	CO3-2				
Artinite	3.469	-5.824	-2	H+1	2	Mg+2	1	CO3-2	5	H2O
Ba(OH)2:8H2O	8.679	-15.577	1	Ba+2	10	H2O	-2	H+1		
Barite	-9.921	0	1	Ba+2	1	SO4-2				
Blanchite	-9.942	-8.175	1	Zn+2	1	SO4-2	6	H2O		
Brucite	12.405	-4.404	1	Mg+2	2	H2O	-2	H+1		
CaCO3xH2O	-8.512	-1.33	1	Ca+2	1	CO3-2	1	H2O		
Calcite	-8.506	0	1	Ca+2	1	CO3-2				
Celestite	-7.921	-1.306	1	Sr+2	1	SO4-2				
Chalcedony	-3.943	-0.443	1	H4SiO4	-2	H2O				
Chrysotile	29.336	-2.365	3	Mg+2	2	H4SiO4	1	H2O	-6	H+1
Cristobalite	-3.943	-0.644	1	H4SiO4	-2	H2O				
Dolomite (disordered)	-17.426	-0.768	1	Ca+2	1	Mg+2	2	CO3-2		
Dolomite (ordered)	-17.426	-0.235	1	Ca+2	1	Mg+2	2	CO3-2		
Epsomite	-6.277	-4.18	1	Mg+2	1	SO4-2	7	H2O		
Fe(OH)2 (am)	9.526	-3.73	1	Fe+2	2	H2O	-2	H+1		
Fe(OH)2 (c)	9.526	-3.364	1	Fe+2	-2	H+1	2	H2O		
Goslarite	-9.947	-7.972	1	Zn+2	1	SO4-2	7	H2O		
Greenalite	20.698	-0.112	-6	H+1	3	Fe+2	2	H4SiO4	1	H2O
Gypsum	-5.836	-1.229	1	Ca+2	1	SO4-2	2	H2O		
Halite	-1.307	-2.866	1	Na+1	1	Cl-1				
Huntite	-35.265	-5.022	3	Mg+2	1	Ca+2	4	CO3-2		
Hydromagnesite	-23.295	-13.972	5	Mg+2	4	CO3-2	-2	H+1	6	H2O
Hydrozincite	1.027	-7.07	5	Zn+2	2	CO3-2	-6	H+1	6	H2O
KCl	-4.04	-4.94	1	K+1	1	Cl-1				
Lime	12.824	-19.381	-2	H+1	1	Ca+2	1	H2O		
Magnesite	-8.92	-1.511	1	Mg+2	1	CO3-2				
Melanterite	-9.156	-7	1	Fe+2	1	SO4-2	7	H2O		
Mg(OH)2 (active)	12.405	-6.389	1	Mg+2	2	H2O	-2	H+1		
Mg2(OH)3Cl:4H2O	16.554	-9.446	2	Mg+2	1	Cl-1	-3	H+1	7	H2O
MgCO3:5H2O	-8.947	-4.407	1	Mg+2	1	CO3-2	5	H2O		
Mirabilite	-4.843	-3.931	2	Na+1	1	SO4-2	10	H2O		
MnCl2:4H2O	-7.415	-10.103	1	Mn+2	2	Cl-1	4	H2O		
MnCO3 (am)	-12.248	-1.748	1	Mn+2	1	CO3-2				
MnSO4	-9.567	-11.985	1	Mn+2	1	SO4-2				
Natron	-7.524	-6.381	2	Na+1	1	CO3-2	10	H2O		
Nesquehonite	-8.936	-4.204	1	Mg+2	1	CO3-2	3	H2O		
Periclase	12.411	-8.788	-2	H+1	1	Mg+2	1	H2O		
Portlandite	12.819	-9.557	1	Ca+2	2	H2O	-2	H+1		
Pyrochroite	9.077	-5.87	1	Mn+2	2	H2O	-2	H+1		
Quartz	-3.943	0	1	H4SiO4	-2	H2O				
Rhodochrosite	-12.248	-1.244	1	Mn+2	1	CO3-2				
Sepiolite	12.974	-2.496	2	Mg+2	3	H4SiO4	-4	H+1	-0.5	H2O
Sepiolite (A)	12.974	-5.806	-0.5	H2O	2	Mg+2	3	H4SiO4	-4	H+1
Siderite	-11.799	-1.19	1	Fe+2	1	CO3-2				
SiO2 (am,gel)	-3.943	-1.269	1	H4SiO4	-2	H2O				
SiO2 (am,ppt)	-3.943	-1.242	1	H4SiO4	-2	H2O				

Smithsonite	-12.59	-1.68	1	Zn+2	1	CO3-2				
Strontianite	-10.602	-1.33	1	Sr+2	1	CO3-2				
Thenardite	-4.788	-5.086	2	Na+1	1	SO4-2				
Thermonatrite	-7.474	-8.085	2	Na+1	1	CO3-2	1	H2O		
Vaterite	-8.506	-0.555	1	Ca+2	1	CO3-2				
Witherite	-12.602	-4.037	1	Ba+2	1	CO3-2				
Zincite	8.741	-2.261	1	Zn+2	1	H2O	-2	H+1		
Zincosite	-9.909	-13.628	1	Zn+2	1	SO4-2				
Zn(BO2)2	2.831	-5.459	-2	H2O	-2	H+1	1	Zn+2	2	H3BO3
Zn(OH)2 (am)	8.735	-3.52	1	Zn+2	2	H2O	-2	H+1		
Zn(OH)2 (beta)	8.735	-2.807	1	Zn+2	2	H2O	-2	H+1		
Zn(OH)2 (delta)	8.735	-3.109	1	Zn+2	-2	H+1	2	H2O		
Zn(OH)2 (epsilon)	8.735	-2.598	1	Zn+2	2	H2O	-2	H+1		
Zn(OH)2 (gamma)	8.735	-2.79	1	Zn+2	2	H2O	-2	H+1		
Zn2(OH)2SO4	-1.173	-8.673	-2	H+1	2	Zn+2	2	H2O	1	SO4-2
Zn2(OH)3Cl	9.236	-5.955	2	Zn+2	3	H2O	-3	H+1	1	Cl-1
Zn3O(SO4)2	-11.076	-29.332	-2	H+1	3	Zn+2	2	SO4-2	1	H2O
Zn4(OH)6SO4	16.298	-12.102	-6	H+1	4	Zn+2	6	H2O	1	SO4-2
Zn5(OH)8Cl2	27.207	-11.293	-8	H+1	5	Zn+2	8	H2O	2	Cl-1
ZnCl2	-7.734	-14.6	1	Zn+2	2	Cl-1				
ZnCO3	-12.59	-1.79	1	Zn+2	1	CO3-2				
ZnCO3:1H2O	-12.595	-2.335	1	Zn+2	1	CO3-2	1	H2O		
ZnSO4:1H2O	-9.914	-9.164	1	Zn+2	1	SO4-2	1	H2O		

Westwater Injection Well Chemistry

Injection Water & Formation Water W201 Mixed 50/50: Saturation Indices

Mineral	log IAP	Sat. Index	Stoichiometry							
Anhydrite	-5.825	-1.447	1	Ca+2	1	SO4-2				
Aragonite	-8.506	-0.141	1	Ca+2	1	CO3-2				
Artinite	3.469	-5.824	-2	H+1	2	Mg+2	1	CO3-2	5	H2O
Ba(OH)2:8H2O	8.679	-15.577	1	Ba+2	10	H2O	-2	H+1		
Barite	-9.921	0	1	Ba+2	1	SO4-2				
Bianchite	-9.942	-8.175	1	Zn+2	1	SO4-2	6	H2O		
Brucite	12.405	-4.404	1	Mg+2	2	H2O	-2	H+1		
CaCO3xH2O	-8.512	-1.33	1	Ca+2	1	CO3-2	1	H2O		
Calcite	-8.506	0	1	Ca+2	1	CO3-2				
Celestite	-7.921	-1.306	1	Sr+2	1	SO4-2				
Chalcedony	-3.943	-0.443	1	H4SiO4	-2	H2O				
Chrysotile	29.336	-2.365	3	Mg+2	2	H4SiO4	1	H2O	-6	H+1
Cristobalite	-3.943	-0.644	1	H4SiO4	-2	H2O				
Dolomite (disordered)	-17.426	-0.768	1	Ca+2	1	Mg+2	2	CO3-2		
Dolomite (ordered)	-17.426	-0.235	1	Ca+2	1	Mg+2	2	CO3-2		
Epsomite	-6.277	-4.18	1	Mg+2	1	SO4-2	7	H2O		
Fe(OH)2 (am)	9.526	-3.73	1	Fe+2	2	H2O	-2	H+1		
Fe(OH)2 (c)	9.526	-3.364	1	Fe+2	-2	H+1	2	H2O		
Goslarite	-9.947	-7.972	1	Zn+2	1	SO4-2	7	H2O		
Greenalite	20.698	-0.112	-6	H+1	3	Fe+2	2	H4SiO4	1	H2O
Gypsum	-5.836	-1.229	1	Ca+2	1	SO4-2	2	H2O		
Halite	-1.307	-2.866	1	Na+1	1	Cl-1				
Huntite	-35.265	-5.022	3	Mg+2	1	Ca+2	4	CO3-2		
Hydromagnesite	-23.295	-13.972	5	Mg+2	4	CO3-2	-2	H+1	6	H2O
Hydrozincite	1.027	-7.07	5	Zn+2	2	CO3-2	-6	H+1	6	H2O
KCl	-4.04	-4.94	1	K+1	1	Cl-1				
Lime	12.824	-19.381	-2	H+1	1	Ca+2	1	H2O		
Magnesite	-8.92	-1.511	1	Mg+2	1	CO3-2				
Melanterite	-9.156	-7	1	Fe+2	1	SO4-2	7	H2O		
Mg(OH)2 (active)	12.405	-6.389	1	Mg+2	2	H2O	-2	H+1		
Mg2(OH)3Cl:4H2O	16.554	-9.446	2	Mg+2	1	Cl-1	-3	H+1	7	H2O
MgCO3:5H2O	-8.947	-4.407	1	Mg+2	1	CO3-2	5	H2O		
Mirabilite	-4.843	-3.931	2	Na+1	1	SO4-2	10	H2O		
MnCl2:4H2O	-7.415	-10.103	1	Mn+2	2	Cl-1	4	H2O		
MnCO3 (am)	-12.248	-1.748	1	Mn+2	1	CO3-2				
MnSO4	-9.567	-11.985	1	Mn+2	1	SO4-2				
Natron	-7.524	-6.381	2	Na+1	1	CO3-2	10	H2O		
Nesquehonite	-8.936	-4.204	1	Mg+2	1	CO3-2	3	H2O		
Periclase	12.411	-8.788	-2	H+1	1	Mg+2	1	H2O		
Portlandite	12.819	-9.557	1	Ca+2	2	H2O	-2	H+1		
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Zn(OH)2 (beta)	8.735	-2.807	1	Zn+2	2	H2O	-2	H+1		
Zn(OH)2 (delta)	8.735	-3.109	1	Zn+2	-2	H+1	2	H2O		
Zn(OH)2 (epsilon)	8.735	-2.598	1	Zn+2	2	H2O	-2	H+1		
Zn(OH)2 (gamma)	8.735	-2.79	1	Zn+2	2	H2O	-2	H+1		
Zn2(OH)2SO4	-1.173	-8.673	-2	H+1	2	Zn+2	2	H2O	1	SO4-2
Zn2(OH)3Cl	9.236	-5.955	2	Zn+2	3	H2O	-3	H+1	1	Cl-1
Zn3O(SO4)2	-11.076	-29.332	-2	H+1	3	Zn+2	2	SO4-2	1	H2O
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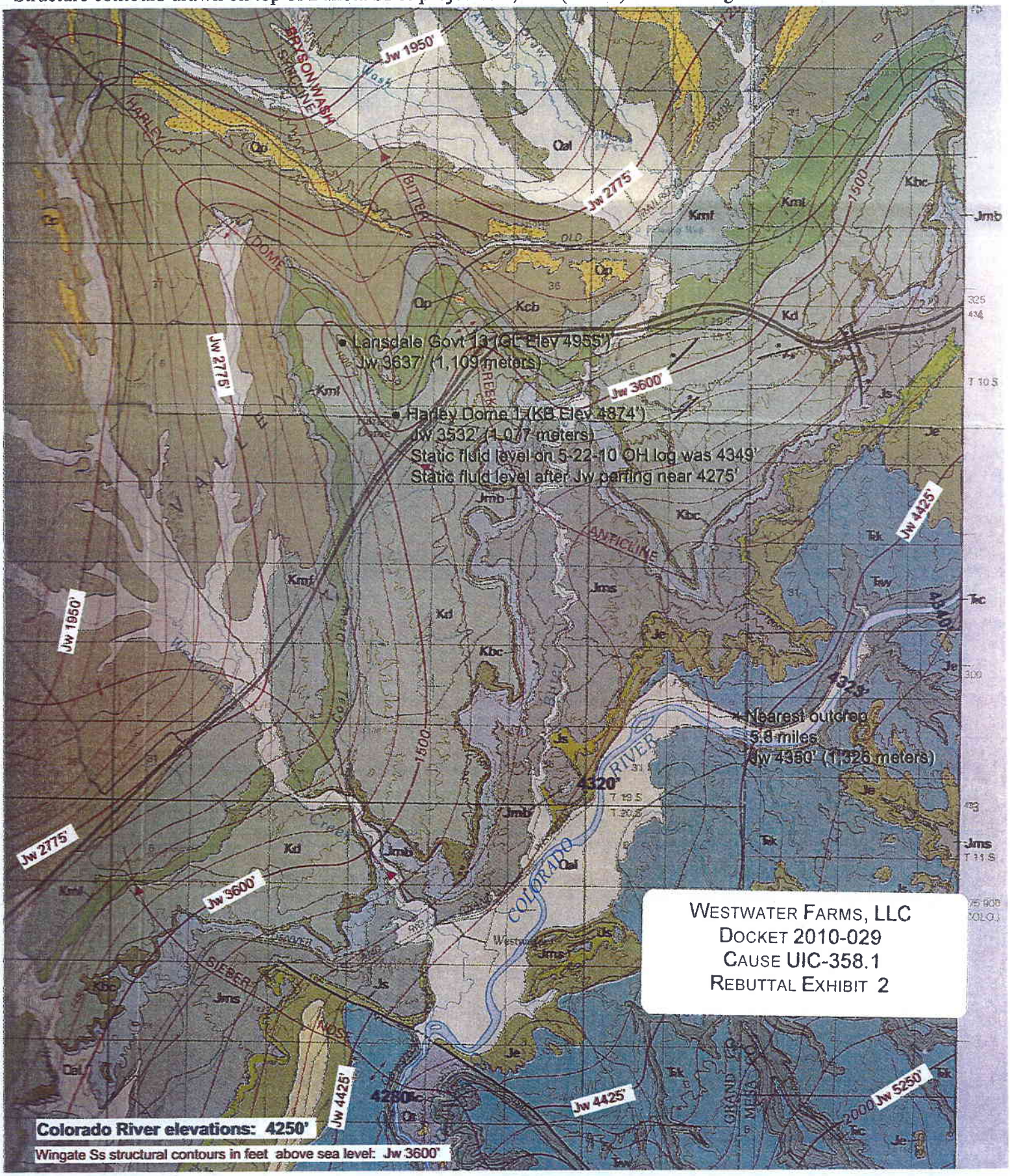
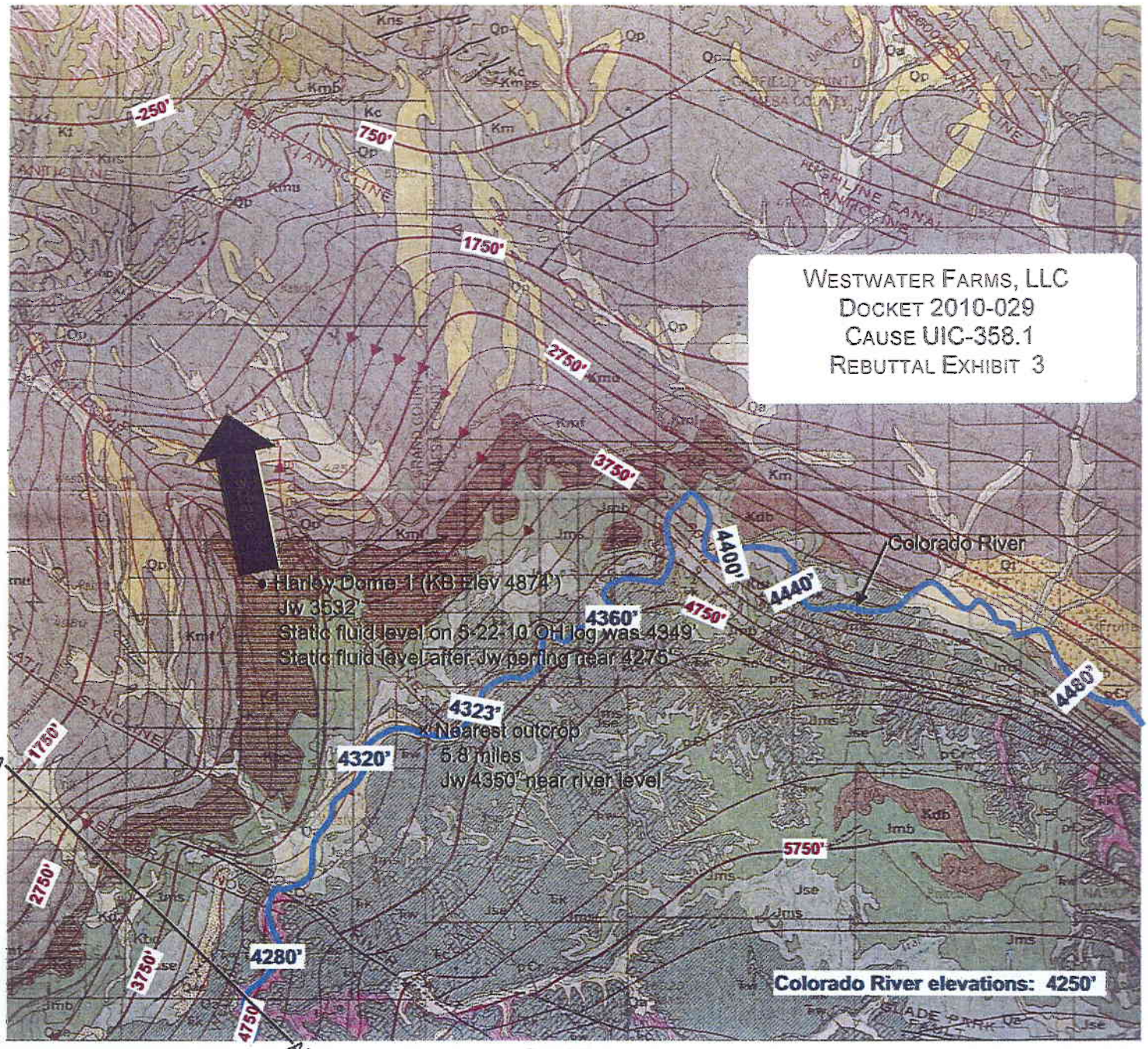
ZnCl2	-7.734	-14.6	1	Zn+2	2	Cl-1				
ZnCO3	-12.59	-1.79	1	Zn+2	1	CO3-2				
ZnCO3:1H2O	-12.595	-2.335	1	Zn+2	1	CO3-2	1	H2O		
ZnSO4:1H2O	-9.914	-9.164	1	Zn+2	1	SO4-2	1	H2O		

Relative Elevations of the Top of the Wingate Sandstone and Distance to Nearest Outcrop
Harley Dome Anticline, Harley Dome 1 UIC Permit Site (Bryson Wash Syncline) and Westwater Canyon Area
Westwater 30' x 60' Geologic Quad Map, USGS Map I-1765 (1988), Scale 1:100,000 w/notes by David L. Allin
Structure contours drawn on top of Dakota Ss & projected 1,148' (350 m) above Wingate Ss where Dakota is absent



WESTWATER FARMS, LLC
DOCKET 2010-029
CAUSE UIC-358.1
REBUTTAL EXHIBIT 2

Relative Elevations of the Top of the Wingate Sandstone and Distance to Nearest Outcrop
Harley Dome Anticline, Harley Dome 1 UIC Permit Site (Bryson Wash Syncline) and Westwater Canyon Area
Map Base: Grand Junction 1° x 2° Geologic Quad Map, USGS Map I-736 (1973), Scale 1:250,000
Structure contours revised to represent top of Wingate Ss
Revisions by David L. Allin December 1, 2010



One Mile

United States Department of the Interior
Bureau of Land Management
Moab Field Office
82 East Dogwood
Moab, Utah 84532

TAKE PRIDE IN AMERICA

IN REPLY REFER TO:
UTU82619
3100
UTY012

DEC - 8 2010

Mr. Brad Hill
Utah Division of Oil, Gas and Mining
P.O. Box 145801
Salt Lake City, Utah 84114-5801

Re: Request for Consideration
Cause No. UIC-358.1
Application for Class II Injection Well
Westwater Farms, LLC
Harley Dome 1 SWD
Section 10, T19S, R25E
Grand County, Utah

RECEIVED
DEC 13 2010
DIV. OF OIL, GAS & MINING

Dear Mr. Hill:

The Moab Field Office of the Bureau of Land Management (BLM) has reviewed the above referenced application and would like to advise the Division of some concerns relative to the conversion of the subject well to a Class II injection well.

The Federal government owns the oil and gas estate on the privately owned parcel (NE Section 10, T19S, R25E) on which the subject well is located, and has issued a lease for the rights to the oil and gas, and has reserved the helium. The surface and mineral estate of the lands surrounding this parcel are federally owned and are administered by the Moab Field Office of the BLM, with the exception of the northeastern corner of the parcel which abuts State of Utah land in section two.

Helium and low Btu gas are known to exist in the Entrada Sandstone in this area. The interest of the Moab Field Office in this proposal is to ensure that Federal oil and gas resources, including helium, will not be adversely affected, and adjacent Federal lands would not be degraded. For the following reasons, we are requesting that a monitoring plan be put in place and followed for the project.

Though it appears that the Kayenta Formation in this area would be a barrier to migration of injected water and hydrogen sulfide from the injection zone into the Entrada, faults and fractures could allow this to happen. If this occurred it would have the potential to degrade the gas/helium resource. Further, if hydrogen sulfide were generated, it is not certain that its migration would be limited to the Harley Dome Anticline due to the subject well's location at the southeastern

margin of the structure. Gas which is not contained in the structure would tend to migrate up-dip toward the southeast. The Entrada, Kayenta and Wingate Formations crop-out in the Colorado River canyon approximately five miles southeast of the subject well. Although this is a substantial distance in terms of reservoir volume and the pace of subsurface fluid migration, there is no barrier to prevent that migration. At the least, visual inspections of these outcroppings in the river canyon should be conducted on some regular basis to determine if injected fluids have traveled towards the river system. The BLM would support the establishment of monitoring wells if this was found to be a feasible method to track the movement of fluids and gas into overlying formations or up-dip to the river canyon. As suggested by the proponent, we support the occasional suspension of injection activities to test fluid pressure in the injection zone formation.

We respectfully submit these concerns and ask that you give them further consideration in your evaluation of this proposal. Should you have any questions regarding this matter, please call Eric Jones of this office at 435-259-2117.

Sincerely,

Jeffrey R. Smith
Field Manager

cc: UT-922
Grand County Council
Grand County Planning Commission

FILED
JAN 13 2011
SECRETARY, BOARD OF OIL, GAS & MINING

BEFORE THE BOARD OF OIL, GAS AND MINING

DEPARTMENT OF NATURAL RESOURCES

STATE OF UTAH

IN THE MATTER OF THE APPLICATION OF WESTWATER FARMS, LLC FOR ADMINISTRATIVE APPROVAL OF THE HARLEY DOME 1 SWD WELL LOCATED IN SECTION 10, TOWNSHIP 19 SOUTH, RANGE 25 EAST, S.L.M., GRAND COUNTY, UTAH, AS A CLASS II INJECTION WELL	)	**FINDINGS OF FACT, CONCLUSIONS OF LAW, AND ORDER** **Docket No. 2010-029** **Cause No. UIC-358.1**

This Cause came on regularly for hearing before the Utah Board of Oil, Gas, and Mining (the "Board") on Wednesday, December 8, 2010, at the hour of 9:00 a.m. in the Auditorium of the Department of Natural Resources, 1594 West North Temple, Salt Lake City, Utah. The following Board members were present and participated at the hearing: Douglas E. Johnson, Chairman, Samuel C. Quigley, Jake Y. Harouny, Ruland J. Gill, Jr., Kelly L. Payne, and James T. Jensen. John R. Baza, Director, and John Rogers, Associate Director--Oil and Gas, were present for the Utah Division of Oil, Gas and Mining (the "Division"). The Board was represented by Michael S. Johnson, Assistant Attorney General.

The petitioner, Westwater Farms, LLC, was represented by Thomas W. Clawson of Van Cott, Bagley, Cornwall & McCarthy, and David R. Stewart, Environmental Engineer, and David L. Allin, Geologist, testified on behalf of the petitioner.

The Division was represented by Emily Lewis, Assistant Attorney General, and Christopher J. Kierst, UIC Permitting Specialist, and Brad Hill, Permitting Manager and Geologist,

testified on behalf of the Division. The Division filed its Staff Memorandum to the Board on November 8, 2010.

Respondent Living Rivers was represented by Patrick A. Shea and Jacque M. Ramos. On November 24, 2010, along with a Notice of Appearance, Living Rivers filed a Motion to Continue Hearing on Notice of Agency's Action. By Order dated December 2, 2010, the Board denied Living River's motion. By letter dated December 7, 2010, and by motion made at the December 8, 2010 hearing, Living Rivers again requested that the hearing be continued, or in the alternative, that certain conditions be attached and incorporated into the UIC permit for the Subject Well (as defined herein) ("Living River's Second Motion to Continue").

No other persons or parties appeared at or participated in the hearing.

The Board, having fully considered the testimony adduced and the exhibits received into evidence at the December 8, 2010 hearing, being fully advised, and good cause appearing, hereby makes the following findings of fact, conclusions of law, and order:

FINDINGS OF FACT

1. Westwater Farms, LLC ("Westwater") originally filed its application for administrative approval of the Harley Dome #1 SWD Well located in the NW¼NE¼ of Section 10, Township 19 South, Range 25 East, S.L.M., Grand County, Utah (the "Subject Well" and "Subject Lands," respectively) as a Class II underground injection well for the disposal of produced water on May 26, 2009. Westwater provided a copy of the application to all operators, owners, and surface owners within a one-half mile radius of the Subject Well as required by Rule R649-5-2(12), Utah Administrative Code ("U.A.C.").

2. Westwater's original application was amended and augmented with supplemental information filed with the Division during the summer of 2010 (together with the

original application, the "Application"). On August 23, 2010 and pursuant to Rule 649-5-3(2), U.A.C., the Division published notice of the Application in the Salt Lake Tribune, Deseret News, newspapers of general circulation in Salt Lake City and Salt Lake County. Notice also was published on the website utahlegals.com. In addition, on August 26, 2010, the Division published notice of the Application in the Moab Times-Independent, a newspaper of general circulation in Emery, Grand, and San Juan Counties.

3. Following publication of the notice of the Application, the Division received a letter dated August 27, 2010, from the United States Department of the Interior, Bureau of Land Management ("BLM") objecting to the Application, and another undated letter (received by the Division on September 7, 2010) from Bill Love, an individual, also objecting to the Application. The Division also received an objection to the Application by email dated September 3, 2010, from John Weisheit on behalf of Living Rivers. The Division also received an advisory letter dated September 15, 2010, which included a request for water analysis and monitoring program, from the United States Department of the Interior, Fish and Wildlife Service ("FWS"). The BLM withdrew its objection by letter dated September 30, 2010.

4. Based on the protests filed in this Cause and pursuant to Rule R649-5-3(4), U.A.C., Westwater filed its Request for Agency Action (the "Request") and a Motion to Convert Informal Adjudicative Proceeding in accordance with Rule R649-10-1(2), U.A.C. The stated purpose of the Request was to set the matter for hearing by the Board at the Board's regularly scheduled hearing on December 8, 2010. By Order dated November 8, 2010, the Division converted the proceeding to a formal proceeding.

5. Notices of the time, place, and purposes of the Board's regularly scheduled December 8, 2010 hearing were mailed to all interested parties by first-class mail, postage prepaid,

and were duly published in the Salt Lake Tribune, Deseret Morning News, and the Moab Times Independent pursuant to the requirements of Rule R641-106-100, U.A.C. Copies of the Request were mailed or emailed by Westwater to all interested parties, including Living Rivers, Bill Love, and the FWS, pursuant to Rule R641-104-135, U.A.C.

6. Westwater is a Utah limited liability company in good standing, having its principal place of business in Cisco, Utah. Westwater is qualified to do and is doing business in Utah.

7. Westwater owns fee simple title to the lands upon which the Subject Well is located. Westwater owns all of the Subject Lands except a triangular-shaped parcel located in the southeast corner of subject Section 10, which is owned by Mid-America Pipeline Company, as depicted on Exhibit 3, which was introduced and admitted at the hearing.

8. Besides Westwater, the surface owners within a one-half mile radius of the Subject Well include the United States of America, State of Utah, and Mid-America Pipeline Company. Grand County and the Federal Highway Administration own the surface rights, based on rights-of-way or easements, to old Highway 6 & 50 and Interstate 70, respectively. The subject federal public lands are administered by the BLM, and the Utah State lands are administered by the Utah School and Institutional Trust Lands Administration ("SITLA").

9. Portions of the oil and gas minerals in the lands embraced within the Subject Lands and within a one-half mile radius of the Subject Well are subject to United States of America Oil and Gas Leases Nos. UTU-70176 and UTU-82619, and Utah State Mineral Lease No. ML-49255. The other oil and gas minerals are unleased. As of September 9, 2010, Shiprock Helium, LLC owned the leasehold rights under UTU-70176, and Petro Resource Corp. owned the leasehold rights under UTU-82619. Retamco Operating, Inc. owns the leasehold rights under ML-49255.

The federal oil and gas leases are administered by the BLM, and the Utah State minerals are administered by SITLA.

10. The Application for Permit to Drill ("APD") for the Subject Well was filed with the Division on June 1, 2009, and the APD was approved by the Division on December 1, 2009. The Subject Well was spud on May 13, 2010, and completed as an injection well on July 13, 2010.

11. Westwater will operate the Subject Well and the proposed injection operations.

12. The formation to be approved by the Board for water injection disposal operations is the Wingate Sandstone Formation ("Wingate"). In the vicinity of the Subject Lands, the Wingate is an aeolian sandstone deposit approximately 337 feet thick. The Wingate is a porous reservoir and is capable of accepting the volume of produced water proposed to be injected by Westwater.

13. The entire stratigraphic interval of the Wingate between 1,342 feet to 1,679 feet is proposed to be used for injection purposes accessed through casing perforations made in the Subject Well between 1,344 feet to 1,631 feet. Those intervals are mechanically isolated from the formations above and below the Wingate.

14. The Kayenta Formation ("Kayenta"), which directly overlies the Wingate, will act as the hydrologic boundary (confining layer) above the injection intervals, and the Chinle Formation ("Chinle"), which underlies the Wingate, will act as the hydrologic boundary below the injection intervals. The Kayenta is approximately 199 feet thick in the vicinity of the Subject Well and is a resistant, impervious formation composed of interbedded shale and sandstone layers with high clay content. Water

salinity samples taken from the Subject Well show that the Kayenta acts as a hydrologic barrier between the Wingate and the Entrada Sandstone Formation, which directly overlies the Kayenta. The Chinle is approximately 138 feet thick at the nearest control point in a plugged and abandoned oil and gas test well located 1.1 miles to the northwest of the Subject Well. The Chinle is a coastal plain shale deposit which demonstrates practically no permeability due to its high clay content. Both the Kayenta and Chinle are competent hydrologic barriers, and therefore, comprise upper and lower hydrologic seals to the aquifer in the Wingate.

15. The Wingate is not currently, nor is it ever expected to be, an underground source of drinking water ("USDW"). The Cedar Mountain, Morrison, Summerville, Entrada, Kayenta, and Chinle Formations in the vicinity of the Subject Well also are not USDW.

16. The following wells have been drilled and/or completed within a one-half mile radius of the Subject Well:

a. Elizondo Water Well situated in the NW¼NE¼ of Section 10, Township 19 South, Range 25 East. The well did not penetrate the Wingate and was plugged and abandoned in June 1965.

b. Lansdale Government #5 Well situated in the NE¼NW¼ of Section 10, Township 19 South, Range 25 East. The well did not penetrate the Wingate and was plugged and abandoned in March 1968.

c. Lansdale Government #10-31-A Well situated in the NE¼SW¼ of Section 10, Township 19 South, Range 25 East. The well did not penetrate the Wingate and was plugged and abandoned in August 1975.

17. Westwater's evidence demonstrated that (i) there are no geologic structures near the Subject Well that will allow the injected fluids to migrate to an USDW; (ii) the Wingate is competent to contain the injected fluids and prevent migration to any USDW, and that it will remain competent under the injection pressures and operations; (iii) the proposed injection well and pressures will not initiate or cause fractures in the Wingate or the confining intervals that would allow the injected fluids or formation fluids to enter a fresh water aquifer or USDW; and (iv) there are no wells within a half-mile radius of the Subject Well that would provide a conduit that would allow the injected or formation fluids to migrate up or down a wellbore and enter improper intervals, such as a fresh water aquifer.

18. There are no fresh water aquifers within a half-mile radius of the Subject Well.

19. The water to be injected into the Subject Well will come from oil and gas producing wells in the Uintah Basin, Paradox Basin, the San Rafael Swell and Book Cliff areas, including the Greater Cisco Field in Utah, and sources in the Piceance Basin in western Colorado. There is a need for produced water disposal facilities for these producing basins.

20. The produced water to be injected into the Subject Well will be tested and treated before it is injected to be certain that it is compatible with the formation water in the Wingate.

21. Westwater will inject approximately 6,500 barrels of produced water per day into the Subject Well at an average injection pressure of 330 pounds per square inch ("psi") with a maximum injection pressure of 360 psi. The maximum pressure is based on the results of step-rate

injection tests run in the Subject Well on July 13, 2010 following installation of the final injection mechanical equipment.

22. The Wingate in the vicinity of the Subject Well is part of a structural anticline that plunges to the northwest creating northerly structural dips at the position of the Subject Well. Respondent Living Rivers expressed its concerns that the injected fluids will migrate upwards against the dip of the Wingate to the southeast to an outcrop of the Wingate located in the canyons carved by the Colorado River near Westwater Canyon, approximately 5.8 miles from the Subject Well. The surface exposures of the Wingate in the Westwater Canyon area are approximately 800 feet higher in elevation than the top of the Wingate in the Subject Well. Westwater's evidence demonstrated that it is unlikely that either the injected fluids or formation fluids will reach the exposures of the Wingate in the Westwater Canyon area because of the lateral and vertical separation between the Subject Well and the outcrops, as well as the details of the local and regional geologic setting and the nature of the injection operations.

23. Living Rivers also expressed its concerns that H2S gas could be generated within the Wingate injection intervals in connection with the injection operations, and that the H2S gas could migrate into and thereby adversely affect a deposit of helium located in the Entrada to the northwest or migrate to the southeast to the exposures of the Wingate in the Westwater Canyon area. Westwater's evidence demonstrated that its operations will remove organic matter from the produced water and treat the water with biocide and sequestering agents before it is injected into the Subject Well to prevent the formation of H2S gas in the Wingate reservoir, and that it will test the water in the Wingate to be certain that no H2S gas is being generated in the reservoir.

24. The bond posted with the Division by Westwater is adequate for the purposes of the Subject Well.

25. The Division expressed its support for Westwater's Request at the hearing.

26. The Subject Well is suitable for approval as a Class II injection well and the proposed injection operations are suitable for approval as produced water disposal operations. The Subject Well and proposed operations will confine the injection fluids to the injection intervals and will prevent pollution and damage to any USDW or other resources.

27. The Board voted unanimously to approve Westwater's Application and Request for Agency Action.

CONCLUSIONS OF LAW

1. Due and regular notice of the time, place, and purposes of the Board's regularly scheduled December 8, 2010 hearing was given to all interested parties in the form and manner and within the time required by law and the rules and regulations of the Board. Due and regular notice of the filing of the Request was given to all interested parties in the form and manner required by law and the rules and regulations of the Board.

2. The Board has exclusive jurisdiction of the parties and subject matter of this Request for Agency Action, and has the power and authority to make and issue the order herein set forth pursuant to Section 40-6-5(5)(a) of the Utah Code Annotated and Rules R649-5-1 and R649-5-3(4), U.A.C.

3. Good cause appears to authorize underground water disposal operations for produced water utilizing the Subject Well as proposed.

4. Westwater's Application meets all applicable statutory and administrative requirements for the approval of the Subject Well as a Class II injection well.

5. Westwater has sustained its burden of proof, demonstrated good cause, and satisfied all legal requirements for granting Westwater's Request for Agency Action.

6. Approving the Subject Well as a Class II injection well, and approving the proposed injection operations, as introduced and adduced at the December 8, 2010 hearing in this Cause, is reasonable and in the public interest, and will prevent waste and will protect the correlative rights of all owners.

ORDER

Based upon Westwater's Request for Agency Action, the testimony and evidence submitted and entered at the December 8, 2010 hearing, and the findings of fact and conclusions of law as stated above, it is therefore ordered that:

1. The Application of Westwater Farms, LLC for approval of the Harley Dome #1 Well as a Class II UIC injection well is approved and Westwater Farms, LLC's Request for Agency Action is granted.

2. The underground injection of produced water into the Wingate Sandstone Formation beneath the Subject Lands for produced water disposal purposes is hereby authorized.

3. The injection pressure in the Harley Dome #1 Well may reach, but not exceed, 360 pounds per square inch.

4. Living River's Second Motion to Continue is denied.

5. Pursuant to U.A.C. Rule R641 and Utah Code Ann. §§ 63G-4-204 to -208, the Board has considered and decided this matter as a formal adjudication.

5. This Findings of Fact, Conclusions of Law, and Order ("Order") is based exclusively on evidence of record in the adjudicative proceeding or on facts officially noted, and constitutes the signed written order stating the Board's decision and the reasons for the decision, all as required by the Utah Administrative Procedures Act, Utah Code Ann. § 63G-4-208 and U.A.C. Rule R641-109.

6. Notice re Right to Seek Judicial Review by the Utah Supreme Court or to Request Board Reconsideration: The Board hereby notifies all parties in interest that they have the right to seek judicial review of this final Board Order in this formal adjudication by filing a timely appeal with the Utah Supreme Court within 30 days after the date that this Order is issued. Utah Code Ann. §§ 63G-4-401(3)(a) and -403. As an alternative to seeking immediate judicial review, and not as a prerequisite to seeking judicial review, the Board also hereby notifies parties that they may elect to request that the Board reconsider this Order, which constitutes a final agency action of the Board. Utah Code Ann. § 63G-4-302. The Utah Administrative Procedures Act provides:

> (1)(a) Within 20 days after the date that an order is issued for which review by the agency or by a superior agency under Section63G-4-301 is unavailable, and if the order would otherwise constitute final agency action, any party may file a written request for reconsideration with the agency, stating the specific grounds upon which relief is requested.
>
> (b) Unless otherwise provided by statute, the filing of the request is not a prerequisite for seeking judicial review of the order.
>
> (2) The request for reconsideration shall be filed with the agency and one copy shall be sent by mail to each party by the person making the request.
>
> (3)(a) The agency head, or a person designated for that purpose, shall issue a written order granting the request or denying the request.
>
> (b) If the agency head or the person designated for that purpose does not issue an order within 20 days after the filing of the request, the request for reconsideration shall be considered to be denied.

Id. The Board also hereby notifies the parties that Utah Administrative Code Rule R641-110-100, which is part of a group of Board rules entitled, "Rehearing and Modification of Existing Orders," states:

> Any person affected by a final order or decision of the Board may file a petition for rehearing. Unless otherwise provided, a petition for rehearing must be filed no later than the 10th

> day of the month following the date of signing of the final order or decision for which the rehearing is sought. A copy of such petition will be served on each other party to the proceeding no later than the 15th day of that month.

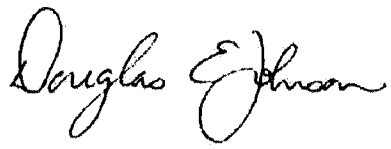
Id. See Utah Administrative Code R641-110-200 for the required contents of a petition for rehearing. If there is any conflict between the deadline in Utah Code Ann § 63G-4-302 and the deadline in Utah Administrative Code R641-110-100 for moving to rehear this matter, the Board hereby rules that the later of the two deadlines shall be available to any party moving to rehear this matter. If the Board later denies a timely petition for rehearing, the party may still seek judicial review of the Order by perfecting a timely appeal with the Utah Supreme Court within 30 days thereafter.

7. The Board retains continuing jurisdiction over all the parties and over the subject matter of this Cause, except to the extent said jurisdiction may be divested by the filing of a timely appeal to seek judicial review of this Order by the Utah Supreme Court.

8. For all purposes, the Chairman's signature on a faxed copy of this Order shall be deemed the equivalent of a signed original.

DATED this _13__ day of January, 2011.

STATE OF UTAH
BOARD OF OIL, GAS AND MINING



By_____
Douglas E. Johnson, Chairman

4819-1630-6952, v. 1

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GARY R. HERBERT
Governor

GREGORY S. BELL
Lieutenant Governor

State of Utah

DEPARTMENT OF NATURAL RESOURCES
MICHAEL R. STYLER
Executive Director

Division of Oil, Gas and Mining
JOHN R. BAZA
Division Director

UNDERGROUND INJECTION CONTROL PERMIT
Cause No. UIC-358.1

Operator: Westwater Farms LLC

Wells: Harley Dome #1 SWD

Location: Section 10, Township19 South, Range 25 East (SLBM)

County: Grand

API No.: 43-019-31622

Well Type: Salt Water Disposal Well

Stipulations of Permit Approval

1. Maximum Allowable Surface Pressure: 360 psi.
2. Corresponding Injection Rate: As limited by pressure.
3. Injection Interval: Perforations between 1,344' and 1,631' in the Wingate Sandstone of the Glen Canyon Group.
4. A Monthly Injection Report shall be filed as required by R649-8-20.
5. A pressure gauge shall be installed to measure pressure in the casing-tubing annulus. This pressure is to be monitored and reported on the Monthly Injection Report.

Approved by: John Rogers
Associate Director

1-20-2014
Date

JR/CJK/js
cc: Bruce Suchomel, Environmental Protection Agency
Bureau of Land Management, Moab Field Office
Grand County Planning
SITLA
Federal Highway Administration
Mid-America Pipeline Company
Petro Resrc Corp
Shiprock Helium, LLC
Retamco Operating, Inc., Joe Glennon
Del-Rio Resources, David L. Allin
N:\O&G Reviewed Docs\ChronFile\UIC\Westwater Farms

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BEFORE THE BOARD OF OIL, GAS AND MINING
DEPARTMENT OF NATURAL RESOURCES
STATE OF UTAH

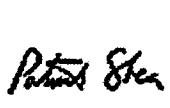
IN THE MATTER OF THE APPLICATION OF WESTWATER FARMS, LLC FOR ADMINISTRATIVE APPROVAL OF THE HARLEY DOME 1 SWD WELL LOCATED IN SECTION 10, TOWNSHIP 19 SOUTH, RANGE 25 EAST, S.L.M., GRAND COUNTY, UTAH, AS A CLASS II INJECTION WELL	**SUPPLEMENT TO REQUEST FOR REHEARING AND MODIFICATION OF EXISTING ORDER, AND IN THE ALTERNATIVE, REQUEST FOR A STAY OF THE ORDER ISSUED ON JANUARY 13, 2011** **Cause No. UIC-358.1**

Living Rivers ("LR") respectfully supplements its request for rehearing and modification of the Findings of Fact Conclusions of Law and Order signed by the board chairman on January 13, 2011. This supplementation is to make of record the expert opinions and report of Professor Kip Solomon, Chairman of the Department of Geology, University of Utah, referenced in LR's original motion for rehearing and modification to the Board. A copy of Professor Kip Solomon's expert report is attached hereto as Exhibit A.

. . .

. . .

Respectfully submitted this 22nd day of February 2011.



Patrick A. Shea
Counsel for Living Rivers

Jacque M. Ramos
Counsel for Living Rivers

MAILING CERTIFICATE

I hereby certify that I mailed a true and correct copy of the foregoing **SUPPLEMENT TO REQUEST FOR RECONSIDERATION AND IN THE ALTERNATIVE REQUEST FOR A STAY OF THE ORDER ISSUED ON JANUARY 13, 2011**, postage prepaid, this 22nd day of February 2011 to the following:

Steven F. Alder
Assistant Attorney General
Board of Oil, Gas and Mining
1594 West North Temple, Suite 300
Salt Lake City, Utah 84116

Michael S. Johnson
Assistant Attorney General
Board of Oil, Gas and Mining
1594 West North Temple, Suite 300
Salt Lake City, UT 84116

Grand County
Road Development
125 East Center
Moab, Utah 84532

United States Bureau of Land Management
Moab Field Office
82 East Dogwood
Moab, UT 84532

Federal Highway Administration
2520 West 4700 South, Suite 9-A
Salt Lake City, UT 84118-1847

Mid-America Pipeline Company
171 7 South Boulder Avenue
Tulsa, OK 74121-1628

Utah School and Institutional Trust Lands Administration
675 East 500 South, Suite 500
Salt Lake City, UT 84102-2818

Petro Resrc Corp.
777 Post Oak Blvd, Suite 910
Houston, TX 77056

RMOC Holdings, LLC
921 East Belleview Avenue
Littleton, CO 80121

Shiprock Helium, LLC
PO Box 51166
Amarillo, TX 79159

Retamco Operating, Inc.
Attn: Joe Glennon
PO Box 790
Red Lodge, MT 59068-0790

Bill Love
2871 East Bench Road
Moab, Utah 84532

United States Fish and Wildlife Service
Attn: Larry Crist
Utah Field Office 2369 West Orton Circle, Suite 50
West Valley City, Utah 84119

Patrick Stern

_____

EXHIBIT A

CONFIDENTIAL ATTORNEY WORK PRODUCT PRIVILEGE

D. Kip Solomon, Ph.D, PG
2355 East 900 South
Salt Lake City, UT 84108

February 20, 2011

Patrick A. Shea
252 South 1300 East, Suite A
Salt Lake City, Utah 84102

Dear Pat:

I have reviewed the hydrogeological aspects of the application from Westwater Farms to inject produced water into the Wingate Formation in the vicinity of Harley Dome. I have also reviewed supporting materials including the hydraulic stimulation report, the water quality report, structural contour maps, etc.

In order to evaluate the potential impact of this injection well on the hydrogeology of the Glen Canyon Group Aquifer, I have simulated the pressure field that would develop radially outward from the well. I have utilized the Theis Equation that is commonly used for evaluating aquifer tests that involve an extraction well and 1 or more observation wells. To use the Theis Equation in forward mode, estimates of the following parameters are needed: aquifer transmissivity (T), aquifer storativity (S), and injection rate (Q). The transmissivity was calculated using a permeability of 20 millidarcies (David K. Dillon, letter report dated July 20, 2010), a fluid density of 1033 kg/m^3, an aquifer thickness of 334 ft, and a fluid viscosity of 9.86×10^{-4} kg/m/s (appropriate for water at 70 °F), to be 19 ft^2/day. The aquifer storativity (S) is a function of the compressibility of the formation, the porosity, and compressibility of water. While the supporting material provides a porosity estimate, and the compressibility of water can be assumed to be about 4.5×10^{-10} Pa^{-1}, I can find no site-specific estimates of the compressibility of the Wingate Formation (which I judge to be a major deficiency in the supporting data). The storativity for the Navajo Sandstone (which is also an aeolian sandstone) was reported by Heilweil et al. (2000) to range from 0.0025 to 0.0007. After adjusting this for the lesser thickness of the Wingate (334 ft versus approximately 1000 feet) yields estimates of 0.0008 to 0.0002 for the Wingate. In the absence of a site-specific value for S, I have assumed a value of 0.001 as this is also considered to be the upper limit for a confined aquifer (Lohman, 1979.) The injection rate was set to 4.5 barrels per minute (David K. Dillon report dated July 20, 2010) which is approximately 36,400 ft^3/day.

TheTheis Equation assumes the aquifer is perfectly confined above and below, and is of infinite lateral extent. The geometric details of the actual aquifer could be incorporated into a standard numerical model such as MODFLOW or SEAWAT.

The outward propagation of pressure from the injection well is controlled by the ratio of the transmissivity to storativity (T/S), which is known as the hydraulic diffusivity. When the hydraulic diffusivity is large (because T is large and/or S is small) the pressure mound

will be spread out over a larger lateral extent than compared to a smaller hydraulic diffusivity. The figure below shows the simulated pressure distribution for a transmissvity of 19 ft^2/day and a storativity of 0.001. This transmissivity is derived from a permeability of 20 millidarcies, consistent with the value reported by David K. Dillon (letter report dated July 20, 2010. It is important to point out that this simulation produced a pressure at the injection well that exceeds the 360 psi limit recommended by David K. Dillon. The simulation agrees relatively well with hydraulic stimulation test conducted by BJ Services after an injection of about 1 hour (i.e. the time at which the stimulation test reached an injection of 5 bpm), but suggests that a prolonged injection at 4.5 barrels per minute will exceed the recommended pressure limit. Nevertheless, an injection rate of 4.5 barrels per minute was utilized in the simulation because this is the value recommended by David K. Dillon, and it would be possible to inject at this rate if the permeability is somewhat higher than 20 millidarcies and/or if multiple injection wells were utilized.

As shown below, the simulated pressure rise at a distance of 5 miles after 5 years of injecting 4.5 barrels per minute would about 0.08 psi, which is equivalent to a rise in the potentiometric surface of about 0.18 feet.

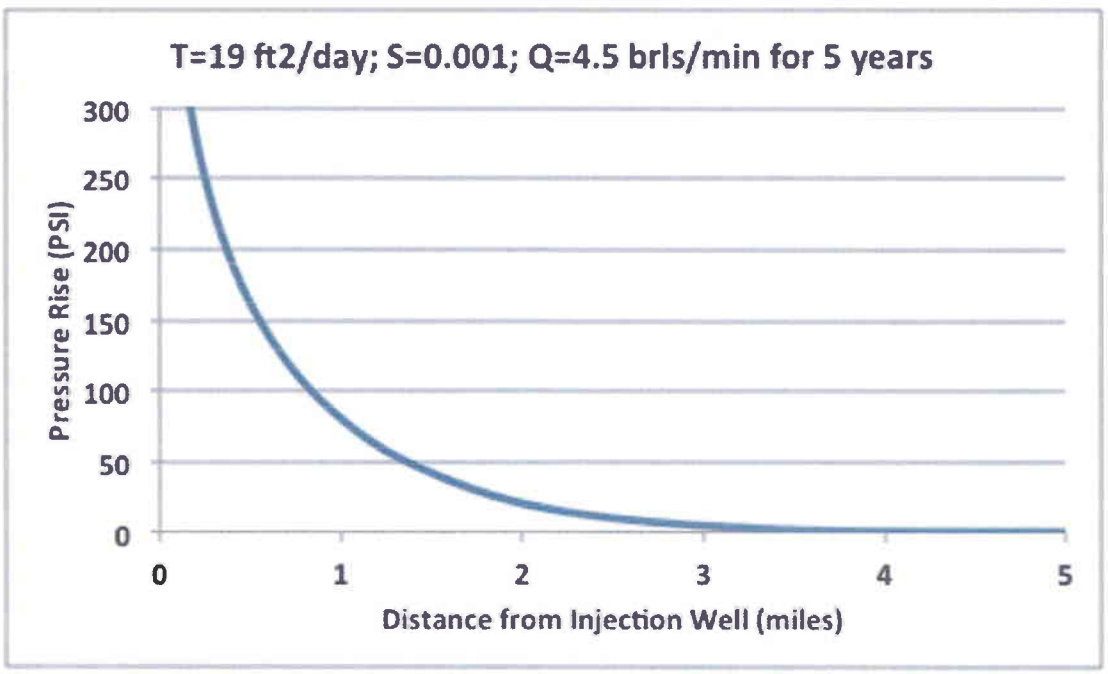


Figure 1. Simulation of pressure mounding that results from injecting 4.5 barrels per minutes for 5 years. This simulation utilizes a transmissivity of 19 ft^2/day (which is derived from a permeability of 20 millidarcies), and a storativity of 0.001. These values are considered to be the best available estimates, although no site-specific values for storativity have been presented.

Because the hydraulic properties of the Wingate in the vicinity of the injection well have uncertainty associated with them (only a single measurement of permeability is available

and no measurements of storativity), I have also simulated the pressure distribution using more extreme, but still realistic values. For example, aquifer testing of the Navajo Sandstone in the vicinity of St. George Utah resulted in transmissivities that ranged from 100 to 19,000 ft^2/day. Figure 2 below shows the simulated pressure distribution after injecting 4.5 barrels per minute for 5 years using a transmissvity of 100 ft^2/day and a storativity of 0.0005. In this case the pressure at the injection wells stays below the recommended limit of 360 psi. The pressure rise at a distance of 5 miles is 7.9 psi which is equivalent to a rise in the potentiometric surface of about 18 feet.

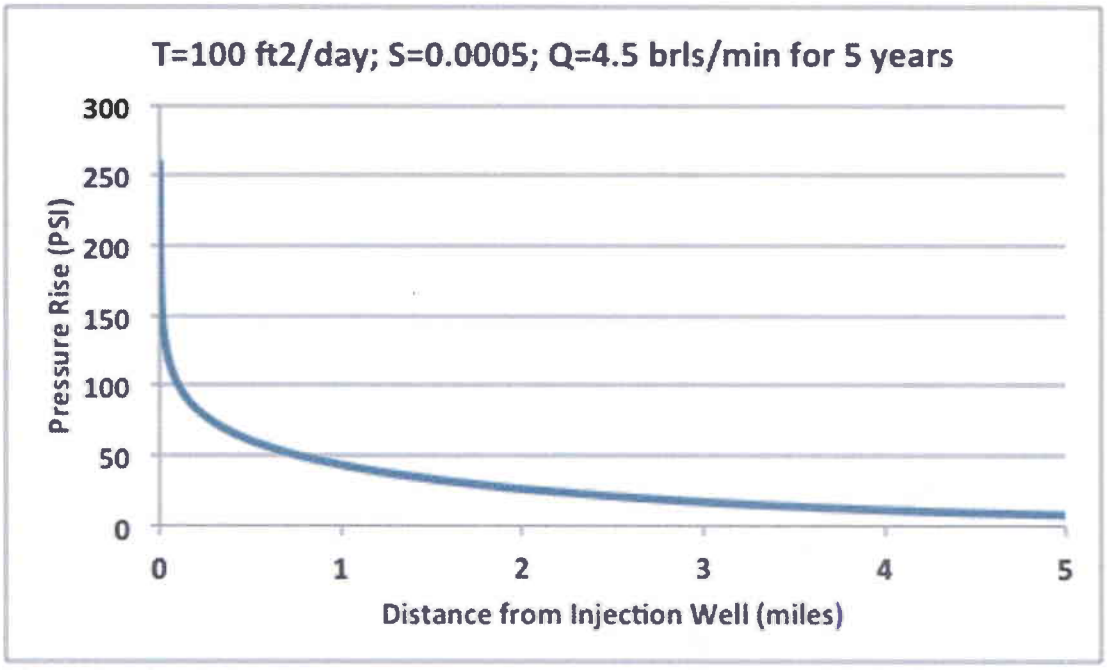


Figure 2. Simulation of pressure mounding that results from injecting 4.5 barrels per minutes for 5 years. This simulation utilizes a transmissivity of 100 ft^2/day (derived from a permeability of 104 millidarcies), and a storativity of 0.0005. These values are considered to be realistic, but result in a hydraulic diffusivity that is higher than the best available estimate.

While the simulation presented above does not take into account the geometric details of the aquifer, it does provide the basis for evaluating the potential impact of the injection operation on the regional hydrogeology. It is important to understand that although the Windgate outcrops near the Colorado River (approximately five miles away) at an elevation that is higher (800 feet according to David L. Allin) than at the proposed injection site, it is not necessary to raise the pressure head 5 miles away by that same amount (i.e. 800 feet) in order affect regional groundwater flow near the Colorado River. The elevation of the Colorado River at a point nearest to Harley Dome is 4323' (Rebuttal Exhibit 3; notes by David L. Allin December 1, 2010). The static water level in the Wingate at the injection well is 4275' (Rebuttal Exhibit 3; notes by David L. Allin December 1, 2010). In order to reverse the northward direction of groundwater flow to southward (towards the Colorado River) it is only necessary to raise the water level in the

injection well to greater than 4323 (i.e. 48 feet.) Figure 3 is a cross section that starts at the injection well and terminates at the Colorado River (at the point labeled "Nearest outcrop 5.8 miles Jw 4350' near river level"; Rebuttal Exhibit 3; notes by David L. Allin December 1, 2010). The redline is an estimate of the current potentiometric surface that connects the two known water levels; the Colorado River at 4325' and the injection well at 4275'. Superimposed on this cross section is the simulated potentiometric surface after 5 years of injecting 4.5 barrels per min. Figure 4 is similar to Figure 3, except it utilized the larger hydraulic diffusivity value discussed previously. In both Figure 3 and Figure 4, the slope of the simulated potentiometric surface is towards the river for most of the cross section as a result of the injection. When the higher hydraulic diffusivity value is utilized, Figure 4 illustrates that existing Wingate Formation fluid would begin discharging into the Colorado River. The environmental impact of such discharge is not known as it depends on both the rate of discharge and the quality of the Wingate Formation water near the river. Nevertheless, this analysis illustrate my concern that the buildup of fluid pressure as a result of an injection could reverse the regional hydraulic gradient and cause existing Wingate Formation water to discharge into the Colorado River. It is important to note that I am not particularly concerned about the actual migration of injected fluid a distance of over 5 miles as this transit time is likely to be far greater than the life of the injection well. Rather, my concern is over the propagation of fluid pressure that might reverse what currently appears to be northward moving regional groundwater flow.

Recommendations:

1. A three dimensional numerical model of groundwater flow should be developed to further refine the possibility of reversing the direction of groundwater flow near the Colorado River. The model should account for the geometry of the aquifer and should consider the variations in fluid density that likely exist between the Colorado River and formation water at the injection well. The model should also be capable of simulating solute transport so that potential salt loading to the Colorado River can be assessed.
2. A monitoring well should be installed that penetrates the Wingate Formation and is located approximately 1 mile to the southeast of the injection well (between the Colorado River and the injection well.) This well can be used to obtain an estimate of the transmissivity and storativity of the aquifer that is integrated over a reasonably large scale. Aquifer parameters obtained from this well could be used to update the numerical model.
3. A shallow monitoring well should be installed into the Wingate Formation approximately 0.25 miles northwest of the "Nearest outcrop 5.8 miles [of] Jw 4350' near [Colorado] river level" noted on the structural contour map prepared by David L. Allin, December 1, 2010. This well will help define the direction of groundwater flow in the Wingate, along with the quality of water in the Wingate near the Colorado River.
4. Monitoring wells in the Wingate Formation at distances of approximately 1 and 5 miles from the injection well, could be used to establish a limit on the pressure

build up from the injection well. For example, as long as the hydraulic head 1 mile from the injection well is lower than the head near the Colorado River, then it is unlikely that Wingate Formation water will discharge into the River. The simplified simulation presented in this report suggest that this will be the case for an injection rate less than about 11,300 ft^3/day (1.4 barrels per min) after 5 years, but not for larger injection rates. It would be reasonable to keep the head at 1 mile at least 10 feet lower than the Colorado River; however, I recommend that an exact criterion be established using a three-dimensional flow and transport model. The end goal is to prevent Wingate Formation water from discharging into the Colorado River as a result of the injection operation.

5. The hydraulic head in fluid bearing zones above the Wingate should be monitored during injection in order to evaluate the extent to which the Wingate Aquifer is completely confined. Ideally such monitoring wells would be as close a possible to the injection well and be finished in the Kayenta Formation. However, existing wells in the area may be a cost-effective alternative to installing new monitoring wells above the Wingate Formation.

References

Heilweil, V. M., G. W. Freethey, B. J. Stolp, C. D. Wilkowske, and D. E. Wilberg, Geohydrology and numerical simulation of ground-water flow in the central Virgin River Basin of Iron and Washington Counties, Utah, State of Utah Department of Natural Resources, Technical Publication No. 116, 2000.

Lohman, S. W., Ground-water hydraulics: U. S. Geological Survey Professional Paper 708, 70 p., 1979.

Respectfully Submitted,

D. Kip Solomon

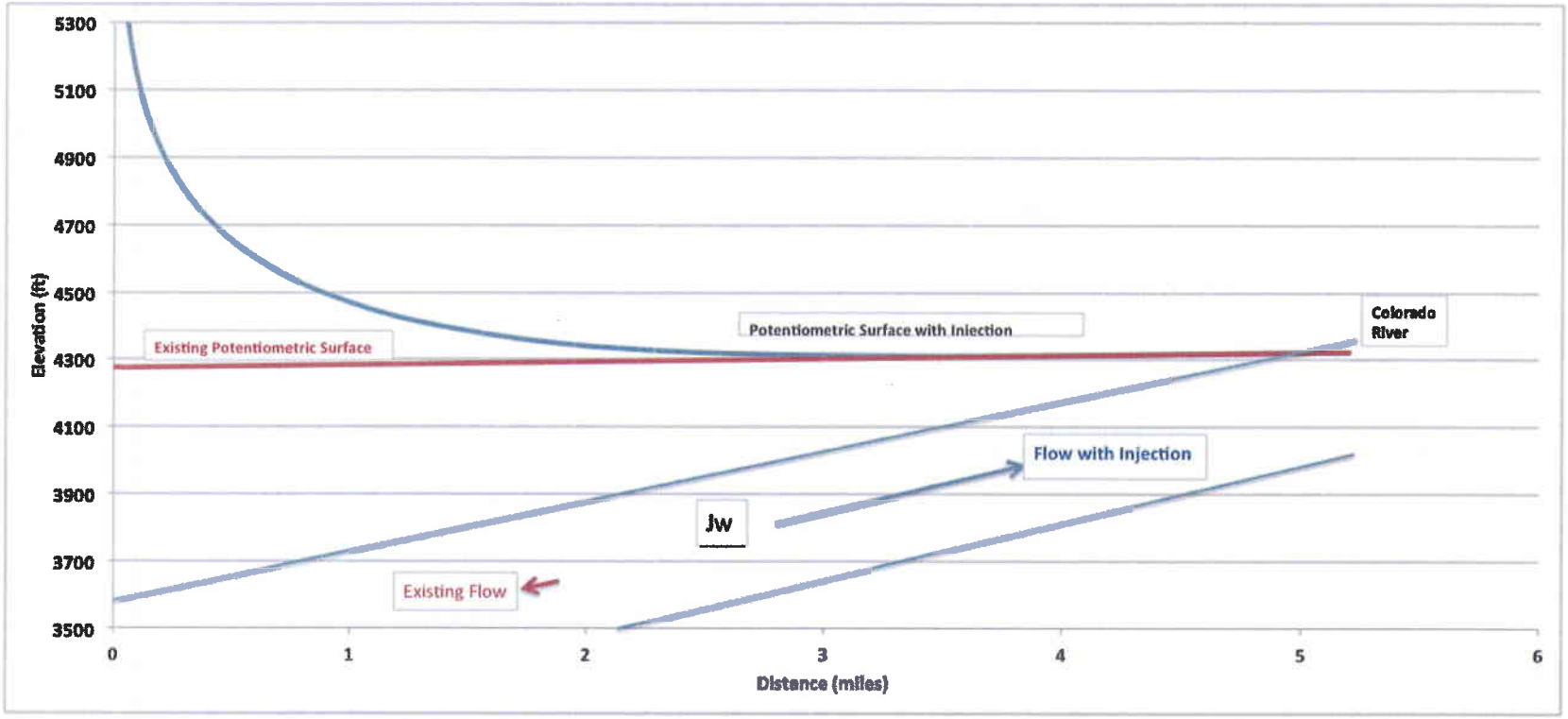


Figure 3. Cross section that extends from the injection well (distance = 0) to the Colorado River. The red lines shows the existing potentiometric surface that was estimated using the two known water levels (4275 at the injection well and 4323 at the Colorado River.) The blue line is the simulated potentiometric surface for pumping 4.5 barrels per minute for 5 years with a transmissivity of 19 ft^2/day and a storativity of 0.001. Also shown are the upper and lower contacts of the Wingate Formation (Jw). The simulated potentiometric surface slopes towards the Colorado River over most of the cross section and indicates that the injection could reverse the direction of regional groundwater flow.

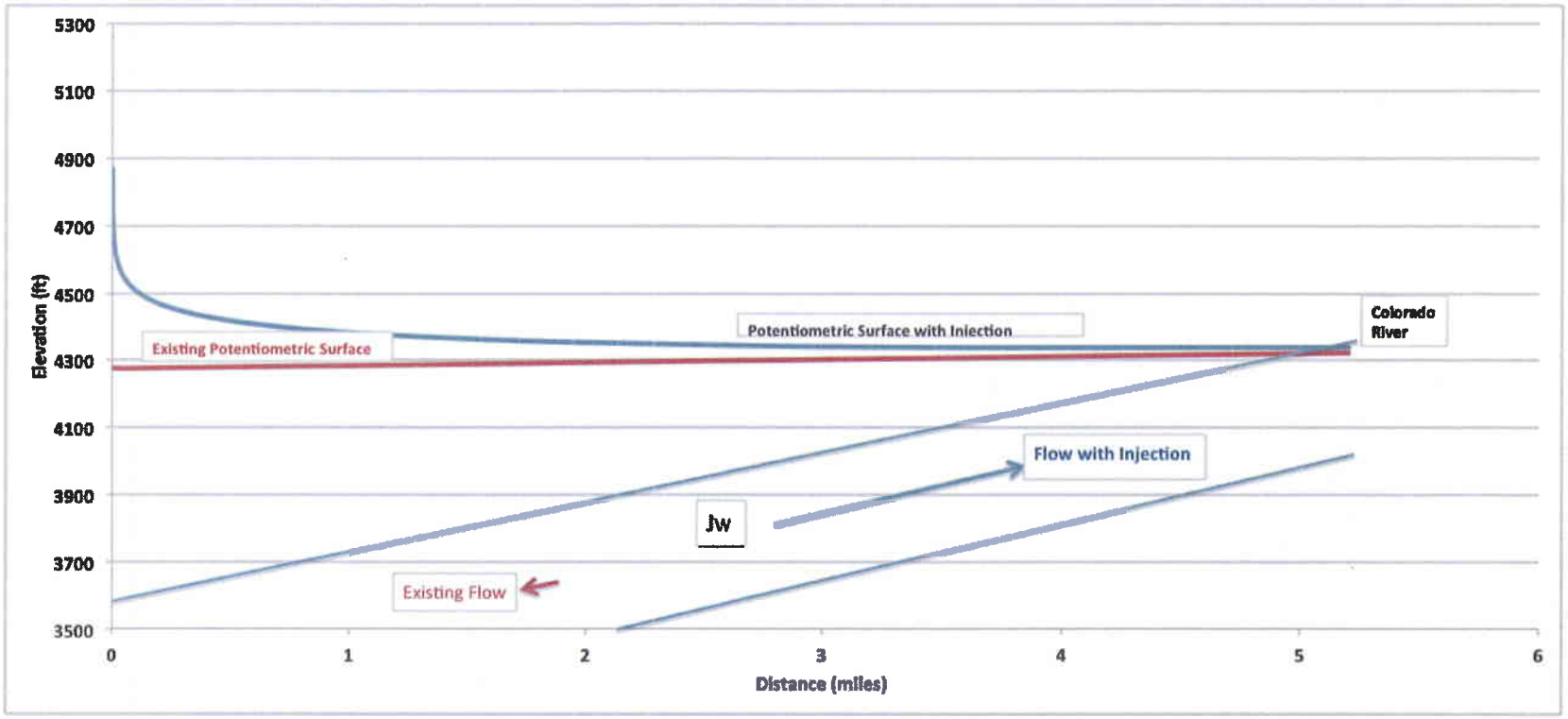


Figure 4. Cross section that extends from the injection well (distance = 0) to the Colorado River. The red lines shows the existing potentiometric surface that was estimated using the two known water levels (4275 at the injection well and 4323 at the Colorado River.) The blue line is the simulated potentiometric surface for pumping 4.5 barrels per minute for 5 years with a transmissivity of 100 ft^2/day and a storativity of 0.0005. Also shown are the upper and lower contacts of the Wingate Formation (Jw). The simulated potentiometric surface slopes towards the Colorado River over all of the cross section and indicates that the injection could reverse the direction of regional groundwater flow. My concern is that this would in turn cause Wingate Formation fluid to discharge into the Colorado River.

DEL-RIO RESOURCES, INC.
P.O. BOX 459, VERNAL, UT 84078
Telephone (435) 789-1703 ☼ Cell (435) 828-1703 ☼ Fax (435) 789-5703

February 23, 2011

David R. Stewart
Stewart Environmental Consultants, LLC
3801 Automation Way, Suite 200
Fort Collins, Colorado 80525

43 019 31622
19S 25E 10

Via e-mail: Dave.Stewart@stewartenv.com

Re: Utah Division of Oil, Gas and Mining Underground Injection Control Permit
Cause No. UIC-358.1, Issued January 20, 2011 for Harley Dome 1 SWD Well
Commentary on Expert Report by Dr. D. Kip Solomon Dated February 20, 2011

Dear Dr. Stewart:

I reviewed the report authored by Dr. D. Kip Solomon dated February 20, 2011 on the subject of modeling the injection operations authorized for the Harley Dome 1 SWD well. The Solomon Report was submitted as an expert report exhibit to the unsuccessful pleading yesterday by Living Rivers' attorneys for a rehearing and modification of the existing order issued on January 13, 2011 by the Utah Board of Oil, Gas and Mining which authorized the Westwater Farms, LLC Underground Injection Control Permit for the Harley Dome 1 SWD well.

Although the filing of the report was rendered moot by the new Board order denying Living Rivers' request yesterday, it is expected to be submitted to Grand County. It is in the public interest to examine the contents and conclusions of the Solomon Report because it was intended to be used to support a conclusion that an additional monitoring effort should be commissioned as part of the proposed operations of Westwater Farms.

An additional monitoring effort has been deemed unnecessary by the Utah DOGM as the primary regulatory authority for the Harley Dome 1 SWD well since adequate monitoring procedures have been established as stipulations to the existing UIC permit. The stipulations require Westwater Farms to constantly measure and record changes in the injection pressure which allow the determination of static formation pressure and static fluid level in the Wingate Sandstone (Ss) injection zone. The stipulations further require monthly reporting of the injection pressure and volume data. Copies of those reports can be provided to Grand County. In addition, on a voluntary basis, Westwater Farms has completed a control survey of the nearest Wingate Ss outcrops near the Colorado River at a location 5.8 miles and farther southeast of the Harley Dome 1 SWD well and has committed to repeat the outcrop surveys periodically to search for any signs of expulsion of water from the aquifer that would indicate unexpected water movement and allow for corrective action long before any pollution event is possible.

I wish to address problems with specific assumptions that were incorrect and led Dr. Solomon to conclusions that were also incorrect. Dr. Solomon did not have much more than a theoretical

framework from which to work and was not aware of some regional potentiometric surface data points that are essential to consider before modeling the behavior water injected into the Wingate Ss aquifer via the Harley Dome 1 SWD well. A key problem with the modeling effort in the Solomon Report is that the Wingate Ss aquifer is the host of a hydrodynamic (flowing) brine reservoir with heterogeneous flow gradients (rates) induced by variations of formation pressure and salinity in different directions. Another problem is that the models used injection pressures which were higher than 360 psi. The maximum allowable surface injection pressure is set by a stipulation to the permit to insure that fractures are not induced in the injection zone, or more importantly, out of the injection zone. That limit was based upon the injection test performed by BJ Services that Dr. Solomon cited in the first paragraph of his report on Page 2. The 360 psi pressure limit is not a recommendation as Dr. Solomon assumed. The injection pump will be equipped with an automatic shut-off or by-pass valve to insure that the prescribed 360 psi limit is never exceeded during the operation of the well.

The Solomon Report states in the last paragraph on Page 3 and on to Page 4 "it is only necessary to raise the water level in the injection well to greater than 4323 (i.e. 48 feet.)" to possibly reverse ground water flow toward the Colorado River under static conditions. The water in the injection zone is under hydrodynamic conditions and is not static. To the layman that 48 feet doesn't sound like much, however to artificially maintain a raised water level in the formation out of equilibrium to points over five miles distant is very difficult to achieve in the real world and impossible in the case at hand. For examples, refer to Dr. Solomon's figures. Figure 1 predicts that after five years of non-stop pumping at 4.5 bpm under the conditions given it could be possible to raise the potentiometric surface slightly over 2 inches (0.18 feet) at a distance of five miles. The example would involve reversal of natural flow from the Colorado River northward only a short distance from the injection well. Figure 2 predicts that after the same period of time and rate of injection with adjusted transmissivity and storativity variables of Dr. Solomon's choice it could be possible to raise the potentiometric surface 18 feet at a distance of five miles.

The latter example is closer to the 48 feet that would be needed to reverse the fluid flow all the way to the bank of the Colorado River but still falls 30 feet short vertically and likely several miles laterally from reversing flow all the way to that point and forcing some river water back out where it came from originally. The equilibrium conditions within the Wingate Ss aquifer make fluid flow reversal impossible without a invoking a massive injection operation at pressures that will not be allowed under the permit. The lack of a site-specific estimate of compressibility for the Wingate Ss is not a "major deficiency" under such circumstances where reasonable estimates are available to the modeling process.

Dr. Solomon's examples do not take into account the variability within the potentiometric surface in different directions. This condition is more important than the inclination of the beds involved although such inclination does assist the regional drain effect due to gravitational force. The potentiometric surface is tilted more steeply between the injection well and the basin or regional "drain". The fairly complete data I have from the parallel and superjacent Entrada Ss aquifer indicates 300 feet reduction in head between the injection well and another well eight miles to the northwest in the direction opposite to that of the Colorado River. This compares with about 50 feet reduction between the injection well and the Colorado River. What this means is that the static conditions that Dr. Solomon modeled do not apply because they do not account for the pressure

reduction from the system due to the six-fold decrease in head to the northwest in the direction 180 degrees away from the Colorado River.

Between the constant leakoff of pressure basinward, the tendency of the aquifer to return to its equilibrium condition every time the pump is shut off, the relatively low, allowable injection rate due to the 360 psi injection pressure limit and the conceivable volume of injectate involved, it will not be possible to threaten the Colorado River. Dr. Solomon admits the same thing himself toward the end of the paragraph at the top of Page 4: "It is important to note that I am not particularly concerned about the actual migration of the injected fluid a distance of over 5 miles as this transit time is likely to be far greater than the life of the injection well." These are the real world conditions that the Utah DOGM staff and Board of Oil, Gas and Mining have considered before they approved the injection permit without requiring off-site monitoring.

One person that testified before the Grand County Council on February 15 stated that by the time water appeared on the Wingate Ss outcrops near the Colorado River irreversible damage of some kind would already be complete and require a remediation effort that would bankrupt the County. That is the kind of speculation that can cause the Council to pause with good reason. Even if a reversal of the flow within the Wingate Ss aquifer were actually induced it would be recognizable from the water saturated surface outcrops of the Wingate Ss near the bank of the Colorado River long before any pollution damage occurred. This is because the water being expelled in such a speculative scenario would be a combination of absorbed rain and river water and certainly not injectate or even the natural brine water resident in the formation near Harley Dome. Dr. Solomon recognized this fact and all of the scientists involved in the regulation of the well are in complete agreement except for the conclusion that additional monitoring is required.

Faithfully submitted,

David L. Allin
Consultant to Westwater Farms, LLC
Vice President, Exploration Manager
970-254-3114
allinpro@bresnan.net

Harley Dome 1
43-019-31622

ACEC MEMBER

19S 25E 10

STEWART ENVIRONMENTAL CONSULTANTS, LLC
ENGINEERING FOR LIFE

November 16, 2011

Mr. Bart Kettle
Utah Division of Oil, Gas, and Mining
319 North Carbonville Road, Unit C
Price, Utah 84501

RECEIVED
NOV 18 2011
DGM PRICE FIELD OFFICE

Subject: WestWater Ownership Changes
Project No.: 5001.001

Dear Mr. Kettle:

This letter is notification of ownership changes of the WestWater Farms Production Water Recycling Facility (WestWater) as of October 31, 2011. As a result of the facility ownership change, Stewart Environmental Consultants, LLC, on behalf of ER & PWD Joint Venture, LLC, is no longer involved in the permitting, management, or operations of the WestWater facility.

All future operations, permitting, or ownership inquiries should be directed to Mr. Tony Marsh and Mr. Mitch Burroughs as follows:

Tony Marsh
Marsh Trucking, LLC
1910 N. 12th Street, Suite A
Grand Junction, Colorado 81501-2934
(970) 201.5519

Mitch Burroughs
New Water Financial, LLC
(970) 484.4100
(970) 567.1414
Mitch@newwaterfinancial.com

Sincerely,

STEWART ENVIRONMENTAL CONSULTANTS, LLC ON BEHALF OF ER & PWD JOINT VENTURE, LLC

David R. Stewart, PhD, PE
President and CEO

cc: Tony Marsh
Mitch Burroughs

5001.001\ww ownership change Bart Kettle 16nov2011.ltr

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

FORM 9

SUNDRY NOTICES AND REPORTS ON WELLS

Do not use this form for proposals to drill new wells, significantly deepen existing wells below current bottom-hole depth, reenter plugged wells, or to drill horizontal laterals. Use APPLICATION FOR PERMIT TO DRILL form for such proposals.

5. LEASE DESIGNATION AND SERIAL NUMBER:

6. IF INDIAN, ALLOTTEE OR TRIBE NAME:

7. UNIT or CA AGREEMENT NAME:

1. TYPE OF WELL: OIL WELL ☐ GAS WELL ☐ OTHER Salt Water Disposal Well

8. WELL NAME and NUMBER: Harley Dome #1 SWD

2. NAME OF OPERATOR: Westwater Farms LLC

9. API NUMBER: 43-019-31622

3. ADDRESS OF OPERATOR: 475 Melody Ln, Grand Junction, Co 81501

PHONE NUMBER: (970) 609-1941

10. FIELD AND POOL, OR WILDCAT:

4. LOCATION OF WELL

FOOTAGES AT SURFACE: 0600 FNL 2139 FEL

COUNTY: Grand

QTR/QTR, SECTION, TOWNSHIP, RANGE, MERIDIAN: 10 19s 25E NWNE

STATE: UTAH

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

TYPE OF SUBMISSION	TYPE OF ACTION		
☐ NOTICE OF INTENT (Submit in Duplicate)	☐ ACIDIZE	☐ DEEPEN	☐ REPERFORATE CURRENT FORMATION
Approximate date work will start:	☐ ALTER CASING	☐ FRACTURE TREAT	☐ SIDETRACK TO REPAIR WELL
	☐ CASING REPAIR	☐ NEW CONSTRUCTION	☐ TEMPORARILY ABANDON
	☐ CHANGE TO PREVIOUS PLANS	☐ OPERATOR CHANGE	☐ TUBING REPAIR
	☐ CHANGE TUBING	☐ PLUG AND ABANDON	☐ VENT OR FLARE
☐ SUBSEQUENT REPORT (Submit Original Form Only)	☐ CHANGE WELL NAME	☐ PLUG BACK	☐ WATER DISPOSAL
Date of work completion:	☑ CHANGE WELL STATUS	☐ PRODUCTION (START/RESUME)	☐ WATER SHUT-OFF
	☐ COMMINGLE PRODUCING FORMATIONS	☐ RECLAMATION OF WELL SITE	☐ OTHER:
	☐ CONVERT WELL TYPE	☐ RECOMPLETE - DIFFERENT FORMATION	

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

Please switch the current well status of the above listed well from inactive to active. The well has been approved for a Maximum allowable surface pressure of 360 psi. The injection rate is limited by pressure. The injection interval has perforations between 1,344' and 1631' in the Wingate Sandstone.

RECEIVED
JAN 27 2012
DIV. OF OIL, GAS & MINING

NAME (PLEASE PRINT) Shawn Marsh

TITLE Project Coordinator

SIGNATURE

DATE 1/26/2012

(This space for State use only)

(5/2000)

(See Instructions on Reverse Side)

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

To: Carol Daniels, UDOGM
From : Shawn Marsh, Westwater Farms LLC
Re: Harley Dome #1 SWD, Well API #4301931622

Mrs Daniels ,

I am following up on a conversation I had this morning with Bart Kettle about the above referenced well being listed as inactive instead of active. During our conversation Mr Kettle asked to me to request a formal change of the well status by you. Please accept this as a formal request to change the above referenced well from inactive to **active**. The well has been accepting water since June of 2011 and the UIC form 3 has been turned in accordingly. Thank you very much for your time. If you need anything else from me my email and phone number follow.

Sincerely,

Shawn Marsh WWF Project Coordinator/ MGR
shawn@marshtrucking.com
cell 970-261-5571
office 970-609-1941

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

FORM 9

5.LEASE DESIGNATION AND SERIAL NUMBER: UTU-82619

SUNDRY NOTICES AND REPORTS ON WELLS

Do not use this form for proposals to drill new wells, significantly deepen existing wells below current bottom-hole depth, reenter plugged wells, or to drill horizontal laterals. Use APPLICATION FOR PERMIT TO DRILL form for such proposals.

6. IF INDIAN, ALLOTTEE OR TRIBE NAME:

7.UNIT or CA AGREEMENT NAME:

1. TYPE OF WELL
Water Disposal Well

8. WELL NAME and NUMBER:
HARLEY DOME 1

2. NAME OF OPERATOR:
WESTWATER FARMS LLC

9. API NUMBER:
43019316220000

3. ADDRESS OF OPERATOR:
P.O. Box 324 , Cisco, UT, 84515

PHONE NUMBER:
970 406-1466 Ext

9. FIELD and POOL or WILDCAT:
GREATER CISCO

4. LOCATION OF WELL
FOOTAGES AT SURFACE:
0600 FNL 2139 FEL
QTR/QTR, SECTION, TOWNSHIP, RANGE, MERIDIAN:
Qtr/Qtr: NWNE Section: 10 Township: 19.0S Range: 25.0E Meridian: S

COUNTY:
GRAND

STATE:
UTAH

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

TYPE OF SUBMISSION	TYPE OF ACTION		
✓ NOTICE OF INTENT Approximate date work will start: 3/30/2012	✓ ACIDIZE	☐ ALTER CASING	☐ CASING REPAIR
	☐ CHANGE TO PREVIOUS PLANS	☐ CHANGE TUBING	☐ CHANGE WELL NAME
	☐ CHANGE WELL STATUS	☐ COMMINGLE PRODUCING FORMATIONS	☐ CONVERT WELL TYPE
☐ SUBSEQUENT REPORT Date of Work Completion:	☐ DEEPEN	☐ FRACTURE TREAT	☐ NEW CONSTRUCTION
	☐ OPERATOR CHANGE	☐ PLUG AND ABANDON	☐ PLUG BACK
	☐ PRODUCTION START OR RESUME	☐ RECLAMATION OF WELL SITE	☐ RECOMPLETE DIFFERENT FORMATION
☐ SPUD REPORT Date of Spud:	☐ REPERFORATE CURRENT FORMATION	☐ SIDETRACK TO REPAIR WELL	☐ TEMPORARY ABANDON
	☐ TUBING REPAIR	☐ VENT OR FLARE	☐ WATER DISPOSAL
☐ DRILLING REPORT Report Date:	☐ WATER SHUTOFF	☐ SI TA STATUS EXTENSION	☐ APD EXTENSION
	☐ WILDCAT WELL DETERMINATION	☐ OTHER	OTHER:

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

Mount rotating head on 3.5" injection tbg, plumb flowline to tank, stage in 1.315" EUE 1.8 ppf tbg circulating with air & remove unknown fill previously sounded at 1622'. Continue to PBTD 1680' circulating with air to recover samples of rathole contents & flush perfs to recover samples of material suspected of reducing injectivity. Evaluate samples & well behavior to identify if injectivity has been affected by indignenous injection zone clay mineral hydation & migration, bacterial slime growth, rust particle migration from casing or some combination thereof. Coordinate evaluation with service company technicians to design & approve an acid breakdown diverted with balls or rock salt to remediate the problem. Pull the 1.315" tbg, pump the treatment, monitor leakoff, rerun 1.315" tbg if necessary and circulate & recover more samples, retreat as indicated & put back in service.

Approved by the Utah Division of Oil, Gas and Mining

Date: April 02, 2012

By:

NAME (PLEASE PRINT)	PHONE NUMBER	TITLE
David L. Allin	970 254-3114	Consulting Petroleum Geologist

SIGNATURE	DATE
N/A	3/27/2012

RECEIVED: Mar. 27, 2012

The Utah Division of Oil, Gas, and Mining

- State of Utah
- Department of Natural Resources

Electronic Permitting System - Sundry Notices

Sundry Conditions of Approval Well Number 43019316220000

An MIT shall be run and approved prior to resuming injection.

RECEIVED: Apr. 02, 2012

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

FORM 9

5.LEASE DESIGNATION AND SERIAL NUMBER: UTU-82619

SUNDRY NOTICES AND REPORTS ON WELLS

Do not use this form for proposals to drill new wells, significantly deepen existing wells below current bottom-hole depth, reenter plugged wells, or to drill horizontal laterals. Use APPLICATION FOR PERMIT TO DRILL form for such proposals.

6. IF INDIAN, ALLOTTEE OR TRIBE NAME:

7.UNIT or CA AGREEMENT NAME:

1. TYPE OF WELL
Water Disposal Well

8. WELL NAME and NUMBER:
HARLEY DOME 1

2. NAME OF OPERATOR:
WESTWATER FARMS LLC

9. API NUMBER:
43019316220000

3. ADDRESS OF OPERATOR:
P.O. Box 324 , Cisco, UT, 84515

PHONE NUMBER:
970 406-1466 Ext

9. FIELD and POOL or WILDCAT:
GREATER CISCO

4. LOCATION OF WELL
FOOTAGES AT SURFACE:
0600 FNL 2139 FEL
QTR/QTR, SECTION, TOWNSHIP, RANGE, MERIDIAN:
Qtr/Qtr: NWNE Section: 10 Township: 19.0S Range: 25.0E Meridian: S

COUNTY:
GRAND

STATE:
UTAH

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

TYPE OF SUBMISSION

- ☐ NOTICE OF INTENT
  Approximate date work will start:
- ✓ SUBSEQUENT REPORT
  Date of Work Completion: 4/17/2012
- ☐ SPUD REPORT
  Date of Spud:
- ☐ DRILLING REPORT
  Report Date:

TYPE OF ACTION

✓ ACIDIZE	☐ ALTER CASING	☐ CASING REPAIR
☐ CHANGE TO PREVIOUS PLANS	☐ CHANGE TUBING	☐ CHANGE WELL NAME
☐ CHANGE WELL STATUS	☐ COMMINGLE PRODUCING FORMATIONS	☐ CONVERT WELL TYPE
☐ DEEPEN	☐ FRACTURE TREAT	☐ NEW CONSTRUCTION
☐ OPERATOR CHANGE	☐ PLUG AND ABANDON	☐ PLUG BACK
☐ PRODUCTION START OR RESUME	☐ RECLAMATION OF WELL SITE	☐ RECOMPLETE DIFFERENT FORMATION
☐ REPERFORATE CURRENT FORMATION	☐ SIDETRACK TO REPAIR WELL	☐ TEMPORARY ABANDON
☐ TUBING REPAIR	☐ VENT OR FLARE	☐ WATER DISPOSAL
☐ WATER SHUTOFF	☐ SI TA STATUS EXTENSION	☐ APD EXTENSION
☐ WILDCAT WELL DETERMINATION	☐ OTHER	OTHER:

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

See attached report of air-lift testing, evaluation, application of acid and brine treatment and subsequent MIT.

Accepted by the Utah Division of Oil, Gas and Mining

Date: May 03, 2012

By:

NAME (PLEASE PRINT)	PHONE NUMBER	TITLE
David L. Allin	970 254-3114	Consulting Petroleum Geologist

SIGNATURE	DATE
N/A	4/18/2012

RECEIVED: Apr. 18, 2012

Westwater Farms LLC
Harley Dome 1 (Salt Water Disposal)
NWNE Section 10, T19S, R25E, SLM
API No. 43-019-31622

Report of air-lift testing, evaluation, application of acid and brine treatment and subsequent MIT
Per Sundry Notice of Intent filed by David L. Allin approved April 2, 2012

2012-04-09 Ceased injection operations with 300 psi on tubing; Flowed well back to filtered injectate tank; Sampled tank vent air flow with meter for CO, CH_4 and H_2S and found no shows; Collected Water Sample 1 from flowback after 1 hr of flow; Halliburton Water Sample Report W172 from Sample 1 issued 2012-04-11 included corrected SG 1.007 @ 60° F, TDS 6,371 ppm, pH 7.1, Rw 0.44 Ω-m @ 69° F, chloride 3,529 mg/L, sulfate 0 mg/L, bicarbonate 480 mg/L, carbonate 0 mg/L, hydroxide 0 mg/L, total iron 33.4 mg/L, ferrous iron 14.6 mg/L, potassium 102 mg/L, calcium 310 mg/L, magnesium 95 mg/L and sodium (calculated) 1,838 mg/L; SITP check 20 psi; Disconnected injection tbg and allowed to flow to facility sump while Propetroco Inc. Rig 1 RU over well; Added 2.875" TIW valve to 3.5" tbg and SIFN.

2012-04-10 SITP 20 psi; Flowed well to facility retention; Outflow checked with meter found no shows of CO or H_2S and 5 ppm CH_4; Fluid flow rates 11.24 gpm (16.05 Bbls/hr) initially, 10.64 gpm (15.20 Bbls/hr) after ½ hr, 6.68 gpm (9.54 Bbls/hr) after 1 hr, 5.23 gpm (7.47 Bbls/hr) after 2 hrs and 4.00 gpm (5.71 Bbls/hr) after 4 hrs; Made-up rotating head on 3.5" tbg and TIH 22 jts 1.66" EUE, integral joint tbg (work string) to 712' Began air-lift to evaluate production performance, backflow perfs and collect samples of water and fines by unloading well with 325 psi air pressure; Collected Water Sample 2 representative of filtered injectate on hand in tanks at facility to determine if it was suitable to use for dilution of concentrated HCl acid; Halliburton Water Sample Report W170 from Sample 2 issued 2012-04-11 included corrected SG 1.017 @ 60° F, TDS 6,668 ppm, pH 6.4, Rw 0.44 Ω-m @ 70° F, chloride 3,897 mg/L, sulfate 0 mg/L, bicarbonate 455 mg/L, carbonate 0 mg/L, hydroxide 0 mg/L, total iron 460.0 mg/L, ferrous iron 10.8 mg/L, potassium 82 mg/L, calcium 850 mg/L, magnesium 110 mg/L and sodium (calculated) 903 mg/L; SDFN.

2012-04-11 Well dead; TIH 5 jts of work string for 27 total to 874', unloaded well w/240 psi and resumed air-lift testing; TIH 5 jts of work string for 32 total to 1038', unloaded well w/320 psi and resumed air-lift testing; Air-lift circulation maintained w/150 psi; TOH 13 jts of work string to add air-lift vent holes in two jts to facilitate unloading the well from near PBTD; TIH 13 jts of work string, unloaded well w/320 psi and resumed air-lift testing; TIH 7 jts of work string for 39 total to 1261' (8' above tbg packer) and resumed circulation without an unloading event; Fluid recovery rate 1 hr after resetting work string was 7.73 gpm (11.05 Bbls/hr); Bart Kettle-DOGM visited project to review operations and determine schedule for treatment and subsequent MIT; TIH 11 jts of work string for 50 total to 1617' and established circulation; Fluid recovery rate 10.71 gpm (15.31 Bbls/hr); Collected Water Sample 3 from flowback after 15 minutes of flow from 1617'; Halliburton Water Sample Report W173 from Sample 3 issued 2012-04-14 included corrected SG 1.014 @ 60° F, TDS 16,830 ppm, pH 7.2, Rw 0.35 Ω-m @ 68° F, chloride 9,447 mg/L, sulfate 460 mg/L, bicarbonate 760 mg/L, carbonate 0 mg/L, hydroxide 0 mg/L, total iron 8.6 mg/L, ferrous iron 0.3 mg/L, potassium 128 mg/L, calcium 1,574 mg/L, magnesium 96 mg/L and sodium (calculated) 4,558 mg/L;

RECEIVED: Apr. 18, 2012

Suspended operations until a vacuum truck was made available to transport produced water; SDFN.

2012-04-12 Well dead; Resumed air-lifting fluid w/200 psi; Fluid recovery rate 16.04 gpm (22.92 Bbls/hr); TIH 1 jt work string for 51 total to 1648'; Established circulation w/220 psi; Collected Water Sample 4 from flowback after 15 minutes of flow from 1648'; Halliburton Water Sample Report W176 from Sample 4 issued 2012-04-13 included corrected SG 1.014 @ 60° F, TDS 21,742 ppm, pH 7.1, Rw 0.40 Ω-m @ 65 F, chloride 12,948 mg/L, sulfate 0 mg/L, bicarbonate 710 mg/L, carbonate 0 mg/L, hydroxide 0 mg/L, total iron 34.6 mg/L, ferrous iron 1.7 mg/L, potassium 112 mg/L, calcium 1,450 mg/L, magnesium 138 mg/L and sodium (calculated) 6,630 mg/L; Cuttings of Wingate Ss stored since the well was drilled during 2010 were delivered for acid solubility testing and Halliburton reported that 1.5% of the samples were dissolved in 15% HCl after 1 hr most likely limited to iron carbonate cement, minor calcite cement and clay minerals; SDFN.

2012-04-13 Well dead; Resumed air-lifting fluid; Sampled vacuum truck tank vent air flow with meter for CO, CH_4 and H_2S and found no shows; Recovered 80 Bbls of fluid in 5.5 hrs for an average rate of 14.55 Bbls/hr; Collected Water Sample 5 from vacuum truck tank drain to include a concentrated sample of recovered fines (which included some formation sand); Halliburton Water Sample Report W177 from Sample 5 issued 2012-04-14 included corrected SG 1.014 @ 60° F, TDS 19,434 ppm, pH 7.4, Rw 0.40 Ω-m @ 65° F, chloride 11,586 mg/L, sulfate 0 mg/L, bicarbonate 690 mg/L, carbonate 0 mg/L, hydroxide 0 mg/L, total iron 31.6 mg/L, ferrous iron 0.1 mg/L, potassium 110 mg/L, calcium 1,140 mg/L, magnesium 260 mg/L and sodium (calculated) 5,869 mg/L; TIH 1 jt of work string for 52 total to near 1680' but did not tag up PBTD; TOH all 52 jts of work string and removed rotating head to be ready for acid and brine treatment to be pumped down 3.5" injection tbg 2012-04-15; Brine staining of work string indicated that the previous night the static fluid level in the well was near 650'; SDFN.

2012-04-14 Well dead; WO finalization of treatment plan based upon solubility testing of fines collected from Sample 5; Results reported 90 to 95% of fines dissolved in 15% HCl in 1 hr; Treatment plan approved; SDFN.

2012-04-15 Well dead; RU Halliburton equipment and pumped four 2,000 gal 15% HCL stages followed by three 1,500 gal saturated brine stages carrying 2.0 ppg rock salt and a final flush stage composed of 900 gal saturated brine; Loss of main pump prime due to rock salt plugging of intake hoses prevented the planned concentration of 3.25 ppg; SI 3.5" tbg and RU Halliburton pump on 5.5" casing to perform MIT; Initial pressurization to 1,000 psi was bled off at pump to reasonable pressure for MIT of 300 psi; 5 min 300.9 psi, 10 min 301.6 psi and 15 min 302.7 psi; See copy of chart appended below; RD Halliburton; After 4 hrs bled down tbg and began to rig up to TIH work string, but the well began to flow back slowly; Well dead 5 hrs after treatment; SDFN.

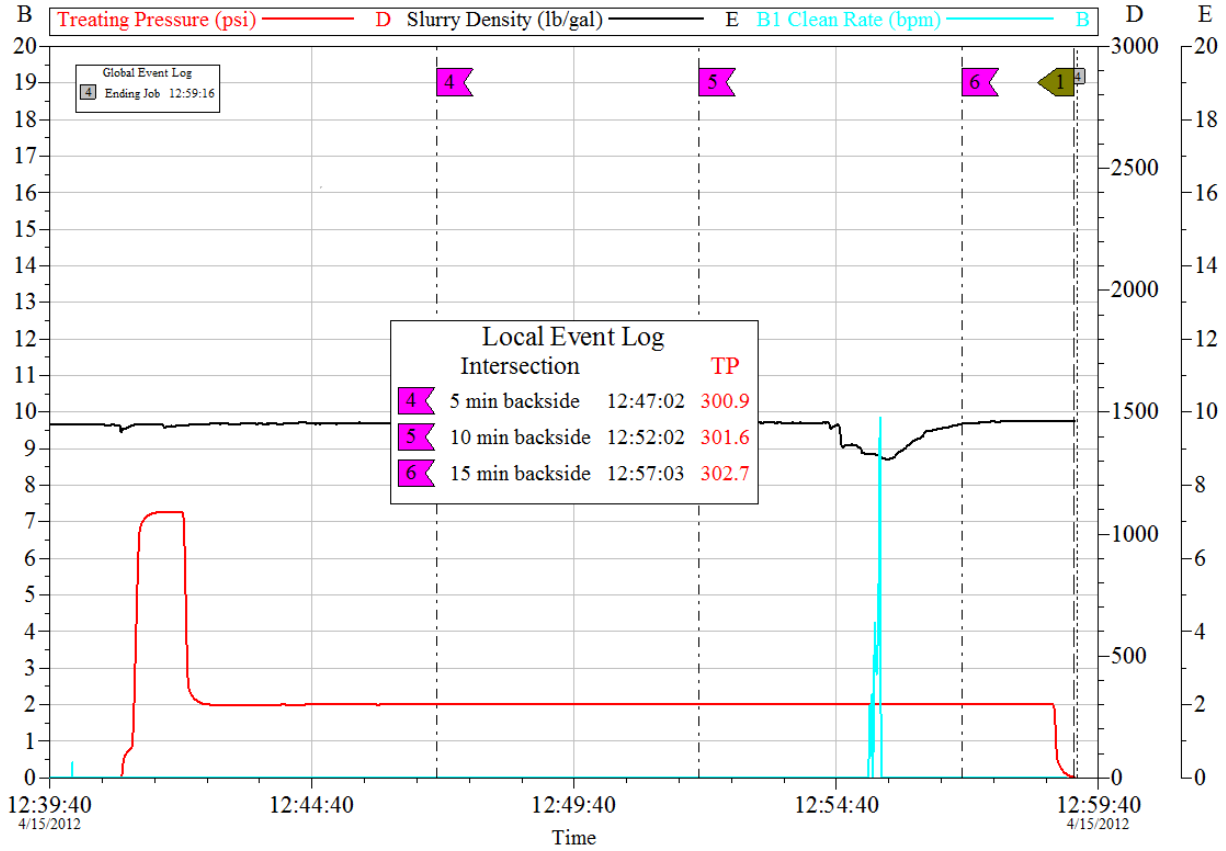
2012-04-16 Well dead; TIH 39 jts work string to 1260' and began air-lift w/220 psi; TIH 11 jts work string to 1617' and resumed air-lift w/280 psi; Recovered 50 Bbls of spent acid and brine in 2 hrs for an average rate of 25.0 Bbls/hr; Recovery reached 70 Bbls of fluid in 3 hrs for an average rate of 23.33 Bbls/hr; Recovered a second truckload of 70 Bbls of fluid in 4.5 hrs for an average rate of 15.56 Bbls/hr; Collected Water Sample 6 from vacuum truck tank; Halliburton Water Sample Report W183 from Sample 6 issued 2012-04-17 included corrected SG 1.056 @ 60° F, TDS 65,818 ppm, pH 2.2, Rw 0.11 Ω-m @ 66° F, chloride 38,620 mg/L, sulfate 0 mg/L, bicarbonate 0 mg/L, carbonate 0 mg/L, hydroxide

RECEIVED: Apr. 18, 2012

0 mg/L, total iron 1,700.0 mg/L, ferrous iron 366.0 mg/L, potassium 112 mg/L, calcium 4,240 mg/L, magnesium 24,400 mg/L and sodium not estimated; SDFN.

2012-04-17 Well dead; TOH work string and RDMO Propetroco Inc. Rig 1; Turned well over to facility crew to plumb in to resume injection.

Harley Dome 1 MIT Chart Recorded 2012-04-15



Customer: Westwater Farms LLC Well Description: Harley Dome 1	Job Date: 15-Apr-2012 UWI:	Sales Order #: 1234456

RECEIVED: Apr. 18, 2012

Division of Oil, Gas and Mining

OPERATOR CHANGE WORKSHEET (for state use only)

ROUTING
CDW

X - Change of Operator (Well Sold) Operator Name Change/Merger

The operator of the well(s) listed below has changed, effective: **7/1/2012**

FROM: (Old Operator):	**TO:** (New Operator):
N3525- Westwater Farms, LLC	N3840- New Water Financial , LLC
475 Melody Lane	1716 East Lincoln Ave #1
Grand Junction, CO 81501	Fort Collins, CO 80524
Phone: 1 (970) 406-1466	Phone: 1 (970) 484-4100

CA No. **Unit:** N/A

WELL NAME	SEC	TWN	RNG	API NO	ENTITY NO	LEASE TYPE	WELL TYPE	WELL STATUS
Harley Dome 1	10	19S	25E	4301931622	17631	Federal	WD	A

OPERATOR CHANGES DOCUMENTATION

Enter date after each listed item is completed

1. (R649-8-10) Sundry or legal documentation was received from the **FORMER** operator on: 7/26/2012
2. (R649-8-10) Sundry or legal documentation was received from the **NEW** operator on: 7/26/2012
3. The new company was checked on the **Department of Commerce, Division of Corporations Database on:** 8/7/2012

4a. Is the new operator registered in the State of Utah: _____ Business Number: 8276181-0161

5a. (R649-9-2)Waste Management Plan has been received on: Yes

5b. Inspections of LA PA state/fee well sites complete on: N/A

5c. Reports current for Production/Disposition & Sundries on: 8/7/2012

6. **Federal and Indian Lease Wells:** The BLM and or the BIA has approved the merger, name change, or operator change for all wells listed on Federal or Indian leases on: BLM Not Yet BIA
7. **Federal and Indian Units:**
   The BLM or BIA has approved the successor of unit operator for wells listed on: N/A
8. **Federal and Indian Communization Agreements ("CA"):**
   The BLM or BIA has approved the operator for all wells listed within a CA on: N/A
9. **Underground Injection Control ("UIC")** Division has approved UIC Form 5 Transfer of Authority to **Inject,** for the enhanced/secondary recovery unit/project for the water disposal well(s) listed on: 7/20/2012

DATA ENTRY:

1. Changes entered in the **Oil and Gas Database on:** 8/7/2012
2. Changes have been entered on the **Monthly Operator Change Spread Sheet on:** 8/7/2012
3. Bond information entered in RBDMS on: 8/7/2012
4. Fee/State wells attached to bond in RBDMS on: 8/7/2012
5. Injection Projects to new operator in RBDMS on: 8/7/2012
6. Receipt of Acceptance of Drilling Procedures for APD/New on: N/A

BOND VERIFICATION:

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

3a. (R649-3-1) The **NEW** operator of any state/fee well(s) listed covered by Bond Number 7530210124

3b. The **FORMER** operator has requested a release of liability from their bond on: 7/23/2012

LEASE INTEREST OWNER NOTIFICATION:

4. (R649-2-10) The **NEW** operator of the fee wells has been contacted and informed by a letter from the Division of their responsibility to notify all interest owners of this change on: N/A

COMMENTS: Well is covered by DOGM bond due to BLM not approving because of fault line

RECEIVED

JUL 26 2012

DIV. OF OIL, GAS & MINING

FORM 9

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

SUNDRY NOTICES AND REPORTS ON WELLS

Do not use this form for proposals to drill new wells, significantly deepen existing wells below current bottom-hole depth, reenter plugged wells, or to drill horizontal laterals. Use APPLICATION FOR PERMIT TO DRILL form for such proposals.

5. LEASE DESIGNATION AND SERIAL NUMBER: Utu-82619

6. IF INDIAN, ALLOTTEE OR TRIBE NAME:

7. UNIT or CA AGREEMENT NAME: Greater Cisco 205

8. WELL NAME and NUMBER: Harley Dome 1

9. API NUMBER: 4301931622

10. FIELD AND POOL, OR WILDCAT:

1. TYPE OF WELL: OIL WELL ☐ GAS WELL ☐ OTHER Injection Well

2. NAME OF OPERATOR: New Water Financial, LLC N3840

3. ADDRESS OF OPERATOR: 1716 E. Lincoln Ave. #1 CITY Fort Collins STATE CO ZIP 80524 PHONE NUMBER: (970) 484-4100

4. LOCATION OF WELL

FOOTAGES AT SURFACE: 600.5 feet fnl and 2,139.0 feet fel COUNTY: Grand

QTR/QTR, SECTION, TOWNSHIP, RANGE, MERIDIAN: NWNE 10 T10 R25 STATE: UTAH

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

TYPE OF SUBMISSION	TYPE OF ACTION		
☑ NOTICE OF INTENT (Submit in Duplicate)	☐ ACIDIZE	☐ DEEPEN	☐ REPERFORATE CURRENT FORMATION
Approximate date work will start: 7/1/2012	☐ ALTER CASING	☐ FRACTURE TREAT	☐ SIDETRACK TO REPAIR WELL
	☐ CASING REPAIR	☐ NEW CONSTRUCTION	☐ TEMPORARILY ABANDON
	☐ CHANGE TO PREVIOUS PLANS	☑ OPERATOR CHANGE	☐ TUBING REPAIR
	☐ CHANGE TUBING	☐ PLUG AND ABANDON	☐ VENT OR FLARE
☐ SUBSEQUENT REPORT (Submit Original Form Only)	☐ CHANGE WELL NAME	☐ PLUG BACK	☐ WATER DISPOSAL
Date of work completion:	☐ CHANGE WELL STATUS	☐ PRODUCTION (START/RESUME)	☐ WATER SHUT-OFF
	☐ COMMINGLE PRODUCING FORMATIONS	☐ RECLAMATION OF WELL SITE	☐ OTHER:
	☐ CONVERT WELL TYPE	☐ RECOMPLETE - DIFFERENT FORMATION	

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

The operator of the Harley Dome 1 well has changed from Westwater Farms, LLC to New Water Financial, LLC. This is covered by bond number 75302100124.

Previous Operator: Westwater Farms
Name: Shawn Marsh
Signature: _____
Date: _____

The operator of the Westwater Facility has also changed from Westwater Farms, LLC to New Water Financial, LLC. This is covered by bond number 7530210116.

Previous Operator: Westwater Farms
Name: Shawn Marsh
Signature: _____
Date: 7/22/2012
N3525

covers both well and facility 7/30/12

NAME (PLEASE PRINT) Mitch Burroughs TITLE Owner/Officer

SIGNATURE Mitch B DATE 7/20/2012

(This space for State use only)

APPROVED

AUG 07 2012

DIV. OIL GAS & MINING

Rachel Medina
Engineer Tech

(5/2000) (See Instructions on Reverse Side)

UIC FORM 5

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

TRANSFER OF AUTHORITY TO INJECT

Well Name and Number Harley Dome 1	API Number 4301931622
Location of Well Footage : 600.5 feet fnl and 2,139.0 feet fel — County : Grand QQ, Section, Township, Range: NWNE 10 T19 R25 — State : UTAH	Field or Unit Name Greater Cisco 205 Lease Designation and Number Utu-82619

EFFECTIVE DATE OF TRANSFER: 7/1/2012

CURRENT OPERATOR

Company: Westwater Farms, LLC
Address: 475 Melody Lane
city Grand Junction state CO zip 81501
Phone: (970) 609-1941
Comments:

Name: Shawn Marsh
Signature: [signature]
Title: Manager
Date: 7/11/12

NEW OPERATOR

Company: Harley Dome 1, LLC
Address: 1716 E. Lincoln Avenue #1
city Fort collins state CO zip 80524
Phone: (970) 484-4100
Comments:

Name: Mitch Burroughs
Signature: [signature]
Title: Manager
Date: 7/9/2012

(This space for State use only)

Transfer approved by: [signature]
Title:

Approval Date: 7/20/12

Comments:

RECEIVED
JUL 17 2012
DIV. OF OIL, GAS & MINING

(5/2000)

STEWART ENVIRONMENTAL CONSULTANTS, LLC
ENGINEERING FOR LIFE

ACEC MEMBER

July 24, 2013

43 019 31622
Harley Dome 1
19S 25E 10

Mr. Brad Hill
Utah Division of Oil, Gas, and Mining
P.O. Box 145801
Salt Lake City, Utah 84114-5801

Subject: Ruby Canyon Water Monitoring Survey—Wingate Sandstone
Harley Dome Well #1 Injection Monitoring
Project No.: 4602.002

Dear Mr. Hill:

In accordance with the monitoring plan outlined in our October 4, 2010 letter and subsequent conversations with the U.S. Fish and Wildlife Service (USFWS), Stewart Environmental Consultants, LLC performed the regularly scheduled water monitoring survey of the Wingate Sandstone. The survey was conducted on June 23, 2013 along the applicable reach of the Colorado River at Ruby Canyon (river miles 132 to 137), as depicted on Figure 1. USFWS concerns are cited in their September 15, 2010 letter and center on the possibility, albeit remote, that injection into the Wingate Sandstone via the Harley Dome Well #1 will promote seepage of liquids into the Colorado River, flowing east to west approximately six miles southeast of the well site.

In their letter, USFWS recognized that injection will occur into the Wingate Sandstone at a depth of approximately 1,750 feet and that the formation dips to the northeast, away from the Colorado River. However, the letter states that *"Despite this low probability of seepage, we wish to make you aware of the importance of the nearby Westwater Canyon of the Colorado River for recovery of endangered fish species."* As the letter states, the canyon is designated critical habitat for four endangered fish species: Colorado pikeminnow (Ptychocheilus lucius), razorback sucker (Xyrauchen texanus), humpback chub (Gila cypha), and bonytail (Gila elegans). The headwaters of Westwater Canyon begin at river mile 125, approximately six linear miles southwest (downstream) of the survey area (see Figure 1).

We observed the outcrop of the Wingate Sandstone in Ruby Canyon from river miles 132 to 137 as an upgradient monitoring point to Westwater Canyon, searching for the presence or absence of seeps, springs, or other water features. This reach of the river is the closest outcrop of the formation to the injection well site and would be the first point of seepage, if seepage were to occur.

In 2012, all of Utah and Colorado (including the survey area) experienced extreme drought conditions and locations that were previously flooded in 2011, such as McDonald Creek Canyon, were dry. Dry conditions were observed during the current survey but river levels and exposed ground mass were closer to average. The area has received rainfall at a rate approximately 15 percent below average for the year. As observed in 2012, the entirety of McDonald Creek Canyon, including the mouth, is dry with minimal evidence of the presence of water except for small eroded drainages, sand and silt deposits, and established flora typical of near-riparian habitat associated with periodic episodes of flooding from the river.

There are signs of limited surface water flow throughout the survey area. These signs include desert varnish staining the canyon walls, erosional features (from both wind and water) cut into the rock, side canyons (both large and small), and collection of sediment in dry washes at the base of the side canyons and in dry stream beds along the bench tops. Thus far only one significant spring has been found. "Spring A" is located at the contact of the Wingate Sandstone and the Kayenta Formation in a remote side canyon on the upgradient end of the survey area near river mile 137 (see Figure 1). The spring is situated midway along the reach of the side canyon and, as discussed below, has very low flow. Erosion of the side canyon and deposition of sediment in the dry wash at its base is attributed to flash flood surface flows rather than flow from Spring A or meteoric waters emanating from higher elevations in the Kayenta Formation.

When the spring was first found, detailed observation of the rock formations in the immediate area was conducted and no other springs were discovered. During the most recent survey a second spring/seep with very low flow was discovered. The second spring/seep is located higher in the stratigraphic column, within beds of the Kayenta Formation, above the Wingate Sandstone, and is inconsequential to the purpose of the survey. Water seeps from the rock on the wall of the side canyon with no distinguished stream or drip.

At Spring A water flows from the cliff face as four to eight individual drips. The fastest drip flows at approximately 0.0010 gpm. In a previous survey, water was observed to flow as thin braids with the largest one flowing at a rate of up to 0.025 gpm. Collectively, the drips (and braids) of water drain to a 3' x 6' x 2' concrete catch basin which is now buried in the cliff face. The history and purpose of an old catch basin in such a remote location is unknown; but, according to long-time residents of the area, it is presumed to be associated with railroad construction in the late 1800s. It has not been used in years and is now completely filled with sediment. This is significant in that it shows that water has been flowing at the spring for an untold number of years and clearly not a result of recent injections at the Harley Dome Well #1. The property is currently owned by U.S. Bureau of Land Management (BLM). We've made contact with area residents familiar with the former landowner to discuss history and use of the spring, but thus far have not been able to secure an interview.

It is too early in the course of the injection process for water from the Harley Dome Well #1 to have reached the spring; however, because we found no other seeps, springs, hanging gardens, or signs of groundwater emanating from the Wingate Sandstone, we recommend that Spring A be carefully monitored in the future to track trends in water flow and quality.

The water monitoring survey is intended to document current conditions and compare the information to baseline data. Plans call for observation of the Wingate Sandstone in the area of interest approximately every six months for a period of three years. The latest survey marks the sixth of six monitoring events. We have not observed additional seeps or springs that are the result of the injection well activity; therefore, per the plan, future observations and monitoring will be conducted on a yearly basis. This schedule may be altered if injection activities escalate or other site conditions warrant a change.

We will report the results of future surveys as they are conducted. Please contact us if you have questions or need more information.

Sincerely,

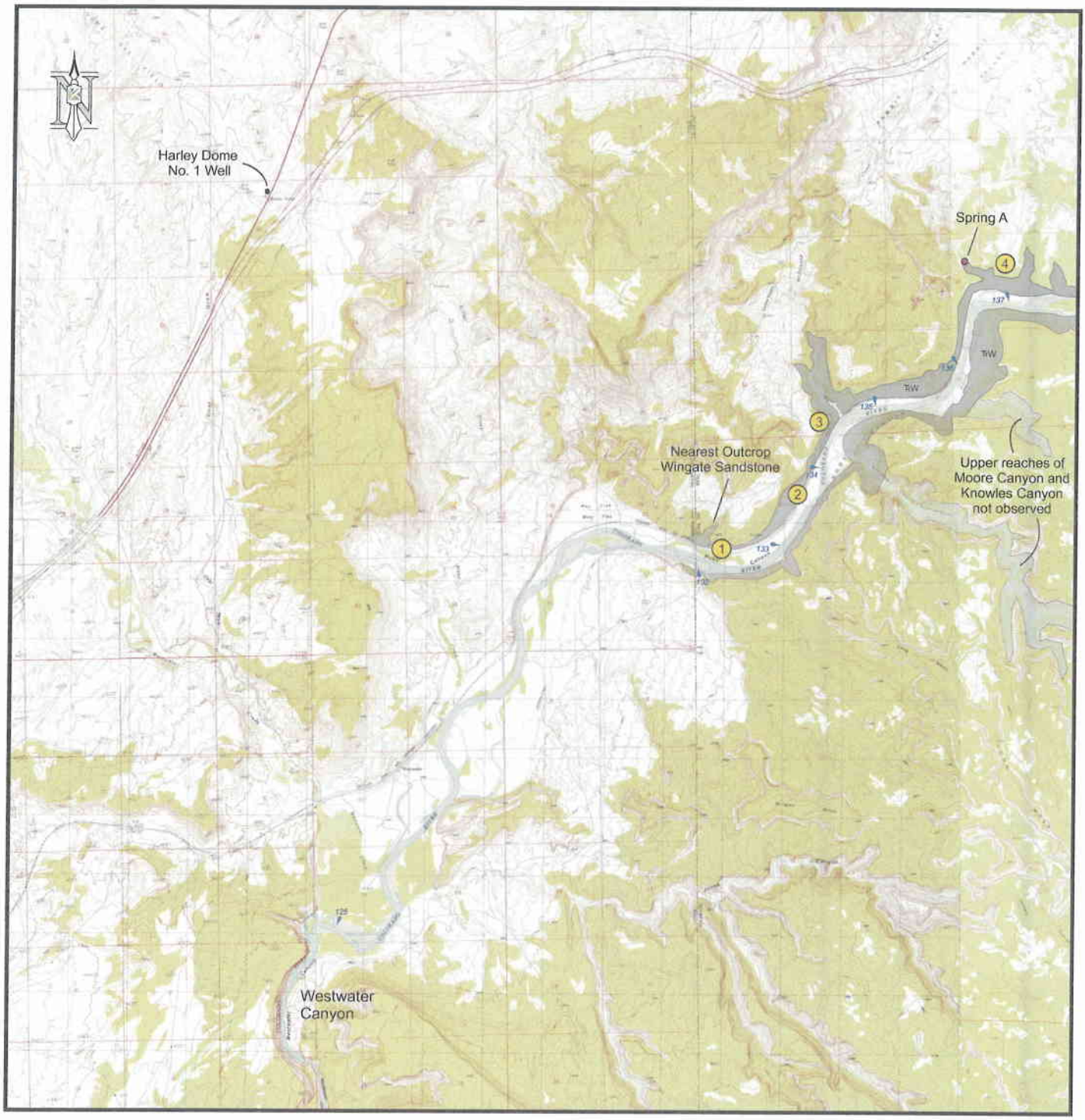
STEWART ENVIRONMENTAL CONSULTANTS, LLC

Paul A. Stone, PG
Senior Geologist

Enc.

cc: Mr. Larry Crist, U.S. Fish and Wildlife Service
Ms. Jana Mohrman, U.S. Fish and Wildlife Service
Mr. Eric Jones, U.S. Bureau of Land Management

4602.002\westwater wingate monitoring 24july13.ltr



SOURCE:

USGS TOPOGRAPHIC MAPS:
Harley Dome, Bitter Creek Well, Ruby Canyon, Agate, Westwater, and Sieber Canyon
USGS GEOLOGIC MAP:
Westwater 30'x60' Geologic Quad Map I-1765

LEGEND

- Wingate Sandstone
- 137 River Mileage
- Observation Location

0 2 4
SCALE IN MILES

CONTOUR INTERVAL 40 FEET

STEWART ENVIRONMENTAL CONSULTANTS, LLC ENGINEERING FOR LIFE	PROJECT	
PROJECT NUMBER 4602.002 / DATE July 2013	Harley Dome Produced Water Treatment Plant Westwater, Utah	FIGURE 1 WINGATE SANDSTONE WATER MONITORING SURVEY

wp files\4602.002\figure 1-wingate ss water survey location.cdr

STEWART ENVIRONMENTAL CONSULTANTS, LLC
ENGINEERING FOR LIFE

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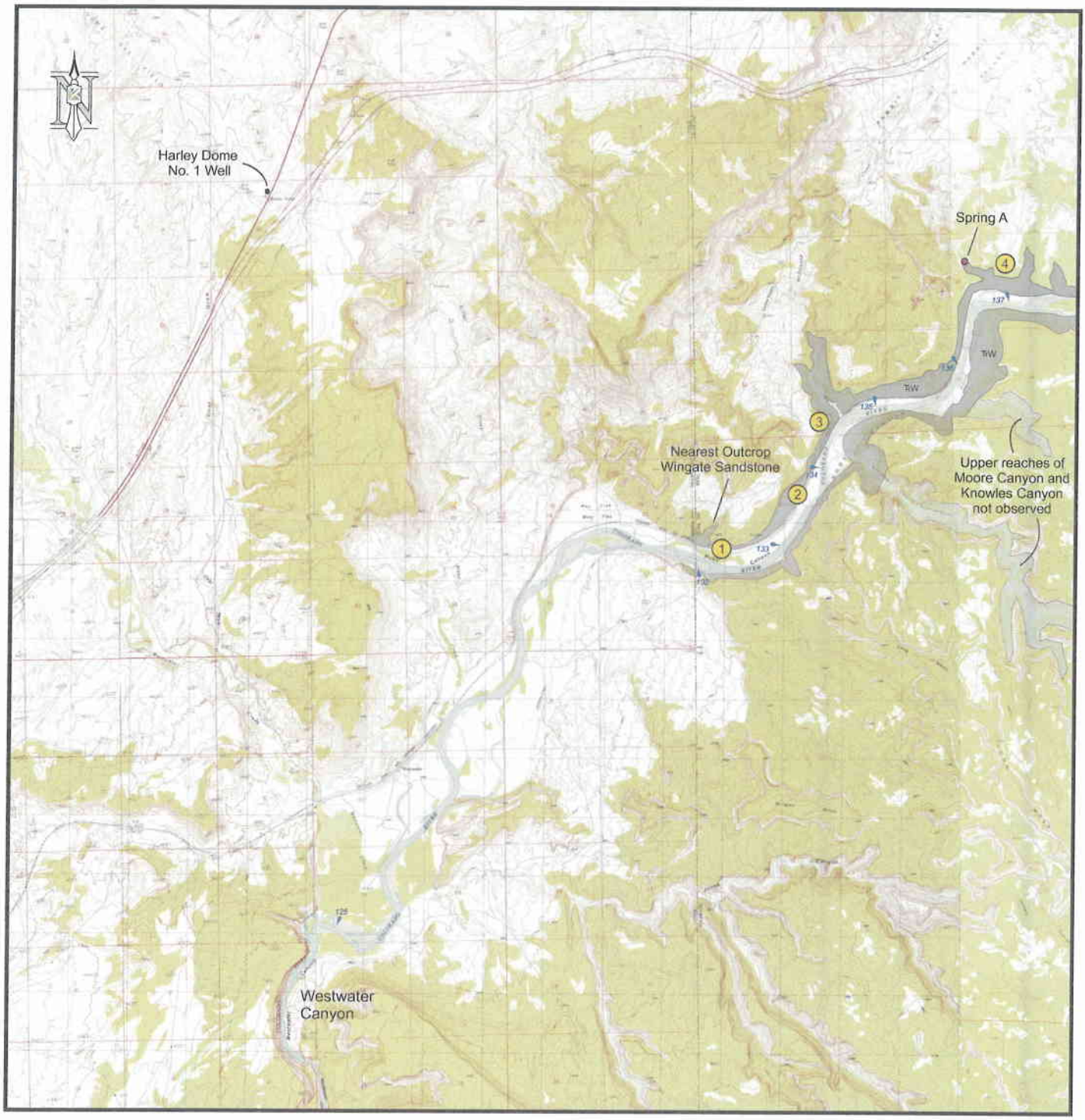

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