

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENTFORM APPROVED
OMB NO. 1004-0137
Expires: January 31, 2018**SUNDRY NOTICES AND REPORTS ON WELLS**
Do not use this form for proposals to drill or to re-enter an abandoned well. Use form 3160-3 (APD) for such proposals.5. Lease Serial No.
NMNM03358

6. If Indian, Allottee or Tribe Name

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

8. Well Name and No.
NEBU 602 COM 1H9. API Well No.
30-045-35775-00-X110. Field and Pool or Exploratory Area
BASIN MANCOS11. County or Parish, State
SAN JUAN COUNTY, NM**SUBMIT IN TRIPLICATE - Other instructions on page 2**

1. Type of Well

☐ Oil Well ☒ Gas Well ☐ Other2. Name of Operator
BP AMERICA PRODUCTION COContact: TOYA COLVIN
E-Mail: Toya.Colvin@bp.com3a. Address
PO BOX 3092
HOUSTON, TX 772533b. Phone No. (include area code)
Ph: 281-892-5369

4. Location of Well (Footage, Sec., T., R., M., or Survey Description)

Sec 12 T31N R7W NWNW 674FNL 825FWL
36.919422 N Lat, 107.528473 W Lon

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

TYPE OF SUBMISSION

TYPE OF ACTION

☒ Notice of Intent☐ Subsequent Report☐ Final Abandonment Notice☐ Acidize☐ Alter Casing☐ Casing Repair☐ Change Plans☐ Convert to Injection☐ Deepen☐ Hydraulic Fracturing☐ New Construction☐ Plug and Abandon☐ Plug Back☐ Production (Start/Resume)☐ Reclamation☐ Recomplete☐ Temporarily Abandon☐ Water Disposal☐ Water Shut-Off☐ Well Integrity☒ Other
Change to Original A
PD

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

BP requests to change the bottom hole location of the proposed pilot, the bottom hole location of our lateral, and the total depth for the subject well.

Please note BP will not produce from the proposed pilot of the subject well.

Please see the attached updated drill plan documents, directional plan, and C-102 plat.

CONDITIONS OF APPROVAL
Adhere to previously issued stipulations**BLM'S APPROVAL OR ACCEPTANCE OF THIS ACTION DOES NOT RELIEVE THE LESSEE AND OPERATOR FROM OBTAINING ANY OTHER AUTHORIZATION REQUIRED FOR OPERATIONS ON FEDERAL AND INDIAN LANDS**

OIL CONS. DIV DIST. 3

JAN 09 2017

14. I hereby certify that the foregoing is true and correct.

**Electronic Submission #361952 verified by the BLM Well Information System
For BP AMERICA PRODUCTION CO, sent to the Farmington
Committed to AFMSS for processing by ABDELGADIR ELMADANI on 01/05/2017 (17AE0124SE)**

Name (Printed/Typed) TOYA COLVIN

Title REGULATORY ANALYST

Signature (Electronic Submission)

Date 12/22/2016

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

Approved By ABDELGADIR ELMANDANI

Title PETROLEUM ENGINEER

Date 01/05/2017

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

Office Farmington

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

(Instructions on page 2)

**** BLM REVISED ** BLM REVISED ** BLM REVISED ** BLM REVISED ** BLM REVISED ******NMOCD**

District I
1625 N French Dr., Hobbs, NM 88240
Phone (575) 393-6161 Fax (575) 393-0720

District II
911 S First St., Artesia, NM 88210
Phone (575) 743-1283 Fax (575) 748-9720

District III
1000 Rio Brazos Road, Aztec, NM 87410
Phone (505) 334-6178 Fax (505) 334-6179

District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505
Phone (505) 476-3460 Fax (505) 476-3462

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

Form C-102
Revised August 1, 2011
Submit one copy to appropriate
District Office
☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

¹ API Number 30.045.35775	² Pool Code 97232	³ Pool Name Mancos Gas
⁴ Property Code 317302	⁵ Property Name Northeast Blanco Unit 602 Com	
⁷ OGRID No. 000778	⁸ Operator Name BP America Production Company	
		⁶ Well Number 1H
		⁹ Elevation 6521

¹⁰ Surface Location

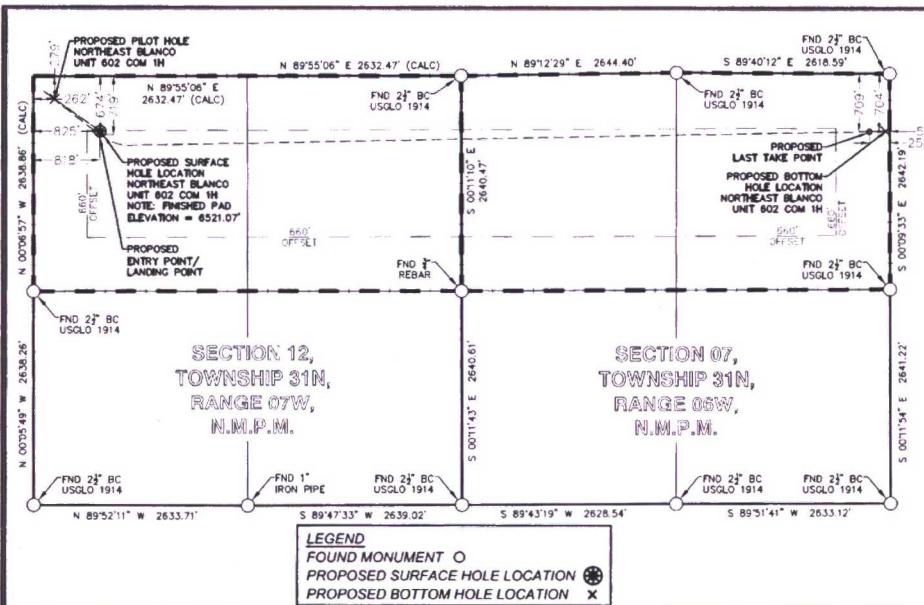
UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
D	12	31N	07W		674	North	825	West	San Juan

¹¹ Bottom Hole Location If Different From Surface

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
A	07	31N	06W		704	North	50	East	San Juan

¹² Dedicated Acres 640.02	¹³ Joint or Infill	¹⁴ Consolidation Code	¹⁵ Order No.
--	-------------------------------	----------------------------------	-------------------------

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



NEBU 602 COM 1H	NMWZ NAD'83	NAD'83	TIES
PROPOSED SURFACE HOLE LOCATION (SHL)	N (Y) = 2,154,140.58' E (X) = 2,812,207.47'	LAT. = 36.91942483°N LON. = 107.52847250°W	FNL = 674' FWL = 825'
PROPOSED PILOT HOLE	N (Y) = 2,154,535.23' E (X) = 2,811,643.85'	LAT. = 36.92051376°N LON. = 107.53039631°W	FNL = 279' FWL = 262'
PROPOSED ENTRY POINT (EP)/ LANDING POINT (LP)	N (Y) = 2,154,095.91' E (X) = 2,812,200.75'	LAT. = 36.91930219°N LON. = 107.52849598°W	FNL = 719' FWL = 818'
PROPOSED LAST TAKE POINT (LTP)	N (Y) = 2,154,135.22' E (X) = 2,821,661.13'	LAT. = 36.91932271°N LON. = 107.49613254°W	FNL = 709' FEL = 250'
PROPOSED BOTTOM HOLE LOCATION (BHL)	N (Y) = 2,154,138.88' E (X) = 2,821,861.12'	LAT. = 36.91933082°N LON. = 107.49544835°W	FNL = 704' FEL = 50'

¹⁷ OPERATOR CERTIFICATION

I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief, and that this organization neither owns a working interest or released mineral interest in the land including the proposed bottom hole location or has a right to drill this well at this location pursuant to a contract with an owner of such a mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order and/or one entered by the division.

Toya Colvin 10/24/16
Signature Date

Toya Colvin

Printed Name

toya.colvin@bp.com

E-mail Address

¹⁸ SURVEYOR CERTIFICATION

I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief.

6-1-16
Date of Survey

Signature and Seal of Professional Surveyor

Marshall W. Lindeen 17078

10-21-16
PROFESSIONAL SURVEYOR

17078
Certificate Number

SECTION – 7 Pressure

Normal to subnormal pressure gradient to TD.

MASP and casing design parameters determined using 0.43 psi/ft.

Maximum expected BHP will be at toe of Mancos Lateral @ 7356' TVD: 3,163 psi

Maximum expected BHT @ 8276' TVD: ~160° F

Possible lost circulation in the Fruitland Coal to Mesa Verde (3,036' to 5,051'). Lost circulation has been successfully mitigated with lost circulation materials in concentrations of up to 30% by volume. Intermediate casing will be set through this interval to +/- 6,500'.

No hydrogen sulfide gas is anticipated, however, if H₂S is encountered, the guidelines in Onshore Order No. 6 will be followed.

Directional Plans: Horizontal directional well, directional plans attached.

Completion:

- **Pressure test**
 - Pressure test production casing to allowable frac pressure or as per BLM requirements
- **Stimulation**
 - well will be stimulated with approximately 35,000,000 pound of proppant in 775,000 bbls of water; the number of stages and the amount of proppant will be adjusted based on the petrophysical properties of the target zone
 - stages will be isolated with plugs
 - plugs will be drilled out
 - flowback well
- **Turn well to production**
 - It is intended to produce the well up the casing, without installing tubing, for at least 60 days or until tubing is needed to unload the well

Timing: BP plans to drill this well in November, 2016

It is anticipated that the drilling of this well will take approximately 45 days.

It is anticipated that completion operations will begin immediately after the well has been drilled depending on stimulation company availability.

Sufficient weighting material will be on hand to weight mud up to 1 PPG over, if required.

The formula for weight up with barite is listed below:

$$\text{Sacks of Barite per 100 bbl of mud} = 1470 \times (W2 - W1) \div (35 - W2)$$

Where; W1 = current mud weight

W2 = new mud weight

$$\text{Sacks} = 1470 \times (10 - 9) / (35 - 10) = 59 \text{ sx} \times 5 \text{ (500bbls minimum)} = 294 \text{sx}$$

Pason Pit Volume Totalizer (PVT) equipment (or equivalent) will be on each pit to monitor pit levels. A trip tank equipped with a Pason PVT will be used to monitor trip volumes.

A closed-loop system will be used to recover drilling fluid and dry cuttings in both phases of the well and on all hole intervals, including fresh water and oil-based operations. Above-ground tanks will be utilized to hold cuttings and fluids for rig operations. A frac tank will be on location to store fresh water. Waste will be disposed of properly at an EPA-approved hazardous waste facility. Fresh water cuttings will be disposed of as outlined in surface use plan. Location will be lined in accordance with the Surface Use Plan of Operations.

SECTION – 6 Test, Logging & Coring

Testing: None planned.

Logging:

GR – Surface Casing shoe to Pilot Hole TD

Quad Combo – Vertical: Pilot Hole TD to +/- 6,500' casing point

Quad Combo – Lateral TD to end of curve

Azimuthal and Radial GR – Drilling curve and lateral

Mud Logging:

Geologist & a manned mud-logging unit will be operational @ +/- 3,000' on the Pilot Hole to TD and of the horizontal hole.

Gas detecting equipment shall be installed in the mud return system for exploratory wells and hydrocarbon gas shall be monitored for pore pressure changes from base of surface casing to TD.

Visual mud monitoring equipment shall be in place to detect volume changes indicating loss or gain of circulating fluid volume.

Coring: +/- 900' of core from Mancos Sh to Dakota Ss

Cement Bond Log:

BP will run a cement bond log (CBL) if cement returns are not observed on the surface and first intermediate casing strings. The CBL will confirm the quality of cement and the actual top of cement.

The closed-loop system will be operated and maintained to contain liquids and solids; minimize the amount of drilling fluids and cuttings that require disposal; maximize the amount of drilling fluid recycled and reused in the drilling process; isolate drilling wastes from the environment; prevent contamination of fresh water; and protect public health and the environment.

Operation and maintenance considerations include:

- Fluid levels will be maintained to provide sufficient freeboard to prevent over-topping.
- Visual inspections will be conducted on a daily basis to identify any potential leaks and to ensure that the closed-loop system storage tanks have sufficient freeboard to prevent over-topping.
- Only drilling fluids or cuttings intrinsic to, used by, or generated from, drilling operations will be stored in the closed-loop system storage tanks. Hazardous waste, miscellaneous solid waste, and/or debris will not be stored in the storage tanks.
- The OCD District Office will be notified within 48 hours of discovery of a leak in the closed-loop drilling system. If a leak is discovered, all liquid will be removed within 48 hours and the damage repaired.

CLOSED-LOOP SYSTEM CLOSURE PLAN

The closed-loop system will be closed in accordance with 19.15.17.13 NMAC. Closure

considerations include:

- Drilling fluids will be recycled and transferred to other permitted closed-loop systems or returned to the vendor for reuse, as practical.
- Residual fluids will be pulled from the storage tanks, mixed with saw dust or similar absorbent material, and disposed of at Industrial Envirotech, Inc. waste disposal facilities.
- Remaining cuttings or sludges will be vacuumed from the storage tanks and disposed of at the Envirotech, Inc and/or Industrial Ecosystem, Inc. waste disposal facilities.
- Storage tanks will be removed from the well location during the rig move.
- The well pad will be reclaimed and seeded in accordance with subsections G, Hand I of 19.15.17.13 NMAC.

Mud Tables

Interval (MD)	Hole Section	Hole Size	Type	MW	FL	PV	YP	PH	REMARKS
0'-300'	Surface	20"	FW/Gel	8.4	NC	8	12	9.0	Spud Mud
300'-6,500'	Intermediate	14 3/4" x 10 5/8"	LSND	8.6-9.0	<8	4-6	12-15	10.0	Fresh Water
6,500' to 8,483'	Pilot for Core	7 7/8"	OBM	9.0-12.0	<8	14-20	8-14	11.0	OBM
6,500'-17,711'	Production	7-7/8"	OBM	9.0-12.0	<8	14-20	8-14	11.0	OBM

Contingency

Interval (MD)	Hole Section	Hole Size	Type	MW	FL	PV	YP	PH	REMARKS
300'-4,000'	Intermediate 1	14 3/4"	LSND	8.6-9.0	<8	4-6	12-15	10.0	Fresh Water
4,000'-6,500'	Intermediate 2	10-5/8"	AIR	NC	NC	NC	NC	NC	

CONTINGENCY – 11.75" string will be run if we see excessive losses.

Intermediate 1 Casing – Two Stage (0-4,000'MD/3,869'TVD) 14.75" hole X 11.75" casing Stage tool @ +/- 2,700'MD: Contingency String

Cement will be circulated to surface. Stage 1 Lead – 235 sx of Poz 12.3 ppg, 1.958 ft³/sk, 61.10 lbm/sk, 0.1250 lbm/sk Poly E Flake, 10.42 Gal/sk fresh water. Tail – 450 sx 13.5 ppg, 1.317 ft³/sk, 94 lbm/sk, 0.10% Halad, 0.150 lbm/sk Poly E Flake, 4.96 Gal/sk freshwater. Stage 2 Lead – 670 sx of Poz 12.3 ppg, 2.005 ft³/sk, 61.10 lbm/sk, 2% CaCl, 0.1250 lbm/sk Poly E Flake, 10.74 Gal/sk. Tail - 150 sx 15.8 ppg, 1.147 ft³/sk, 94 lbm/sk, 4.99 Gal/sk. Volume 2553 ft³

Intermediate 2 Casing – Two Stage (0-6,500'MD/6,369'TVD) 10.625" hole x 8.625" casing Stage tool @ +/- 4,600'MD:

Cement will overlap previous casing shoe at 3,200' MD. Stage 1 Lead – 130 sx of Poz 12.3 ppg, 1.959 ft³/sk, 61.10 lbm/sk, 0.10% HR-5, 0.1250 lbm/sk Poly E Flake, 10.42 Gal/sk fresh water. Tail – 220 sx 13.5 ppg, 1.317 ft³/sk, 47 lbm/sk, 0.10% HR-5, 0.1250 lbm/sk Poly E Flake, 5.95 Gal/sk freshwater. Stage 2 - Lead – 145 sx of Poz 12.3 ppg, 1.959 ft³/sk, 61.10 lbm/sk, 0.10% HR-5, 0.1250 lbm/sk Poly E Flake, 10.42 Gal/sk fresh water. Tail - 70 sx 15.8 ppg, 1.147 ft³/sk, 94 lbm/sk, 0.10 Halad(R) - 9, 4.98 Gal/sk. Volume 888 ft³

Production Casing – Single Stage Conventional Cement (0' - 17,711' MD/ 7,356' TVD) 7.825" hole x 5.5" casing:

Cement will overlap previous 8.625" casing shoe. 1700 sx of Class G cement, 15.8 ppg, 1.174 ft³/sk, 94 lbm/sk, 2% CaCl, 0.1250 lbm/sk Poly E Flake, 5.13 Gal/sk fresh water. Estimated top of cement at 5,500' MD. Volume 1921 ft³

Cement calculations are used for volume estimation. Well conditions will dictate final cement job design.

Actual volumes will be calculated and determined by conditions onsite. All cement slurries will meet or exceed minimum BLM and New Mexico Oil Conservation Division requirements. Slurries used will be the slurries listed above or equivalent slurries depending on service provider selected. Cement yields may change depending on slurries selected.

All waiting on cement times shall be a minimum of 8 hours or adequate to achieve a minimum of 500 psi compressive strength at the casing shoe prior to drilling out.

SECTION – 5 Circulating Medium (Mud Program)

CLOSED-LOOP SYSTEM DESIGN PLAN

The closed-loop system will consist of a series of temporary above-ground storage tanks and/or haul-off bins suitable for holding the cuttings and fluids from drilling operations. The closed-loop system will not entail temporary pits, below-grade storage tanks, below-grade sumps, or drying pads.

Design considerations include:

- The closed-loop system will be signed in accordance with 19.15.17.11 NMAC.
- The closed-loop system storage tanks will be of adequate volume to ensure confinement of all fluids and provide sufficient freeboard to prevent uncontrolled releases.
- Topsoil will be salvaged and stored for use in reclamation activities.

CLOSED-LOOP SYSTEM OPERATING & MAINTENANCE PLAN

Intermediate casing – Centralizers shall be placed on first 3 (bottom 3) joints of casing (1 per joint) and 1 every 3rd joint to surface. (*contingency string will use the same centralizer placement)

Production String – Centralizers will be placed at discretion in lateral to achieve adequate standoff for quality cement job. A toe sleeve will be placed 2 joints above shoe track.

*BP respectfully request to have option to set an 11 3/4" contingency string if severe losses occur while drilling fruitland coal interval. The casing string will cover the fruitland coal interval and shoe will be set at 4,000'. A two stage cement job will be utilized with stage tool at +/- 2700' MD. The following 8 5/8" casing string will have a two stage cement job with stage too at +/- 4,600' MD.

NOTE: If contingency string is not required the 8 5/8" casing will be ran to setting depth and a two stage cement job will be utilized with stage tool at +/- 2700' MD.

NOTE: DV tool placement is described in cement section and will be used at the discretion of the operator if there is evidence of heavy losses and we are concerned that cement will not make it to surface.

*Surface casing maybe preset with a preset rig.

SECTION – 4 Cement

The proposed cementing program has been designed to protect and/or isolate all usable water zones, potentially productive zones, lost circulation zones, abnormally pressured zones, and any prospectively valuable deposits of minerals. Any isolating medium other than cement shall receive approval prior to use. The casing setting depth shall be calculated to position the casing seat opposite a competent formation which will contain the maximum pressure to which it will be exposed during normal drilling operations. All indications of useable water shall be reported.

- Pea Gravel or other material shall not be used to fill up around the surface casing in the event cement fall back occurs.
- The surface casing shall in all cases be cemented back to surface. In the event cement does not circulate to surface or fall back of the cement column occurs, remedial cementing shall be done to cement the casing back to surface. No more than the top 100' will be remediated with 1" line if fall back occurs. Anything more than 100' will require plan approval to remediate.
- Top plugs shall be used to reduce contamination of cement by displacement fluid. A bottom plug or other acceptable technique, such as a pre-flush fluid, inner string cement method, etc. shall be utilized to help isolate the cement from contamination by the mud fluid being displaced ahead of the cement slurry.
- Cement Volumes may be adjusted based on hole conditions.

Surface Casing Single Stage Job – (0-300'MD/TVD): 20" hole x 16" casing – 100% XS

Cement will be circulated to surface with 405 sx of Class G cement, 15.8 ppg, 1.174 ft3/sk, 94 lbm/sk, 2% CaCl, 0.1250 lbm/sk Poly E Flake, 5.13 Gal/sk fresh water. Volume 471 ft3

Intermediate Casing – Two Stage (0-6,500'MD/6,369'TVD): 14.75" (300' to 4,000') hole x 10.625" (4000' to 6500') hole x 8.625" casing Stage tool @ +/- 2,700' MD

Cement will be circulated to surface. Stage 1 Lead – 1075 sx of Poz 12.3 ppg, 1.958 ft3/sk, 61.10 lbm/sk, 0.1250 lbm/sk Poly E Flake, 10.42 Gal/sk fresh water. Tail – 220 sx 15.8 ppg, 1.147 ft3/sk, 94 lbm/sk, 0.10% Halad, 0.150 lbm/sk Poly E Flake, 4.96 Gal/sk freshwater. Stage 2 Lead – 1225 sx of Poz 12.3 ppg, 2.005 ft3/sk, 61.10 lbm/sk, 2% CaCl, 0.1250 lbm/sk Poly E Flake, 10.74 Gal/sk. Tail – 270 sx 15.8 ppg, 1.147 ft3/sk, 94 lbm/sk, 4.99 Gal/sk. Volume 5079 ft3

SECTION – 3 Casing

Bit Program

20" Surface Hole = Surface to 300'
 14 3/4" = 300' to 4,000' MD = *11 3/4" (TO ACCOMMODATE CONTINGENCY STRING IF REQUIRED)
 10 5/8" = 4,000 to 6,500' MD = 8 5/8" casing point. (Above KOP)
 7-7/8" Pilot Hole = 6,500' MD to 8,483 MD (Pilot hole will be cored and plugged back to KOP)
 7-7/8" Curve and Lateral = 6,830' MD (KOP) to 17,711' MD

Casing Program – all casing strings are new casing

Casing & Hole Size	Weight	Grade	Coupling	Setting Depth (MD)	Comments
16" (20")	65 ppf	J-55	ST&C	0' - 300'	New casing. Cement to surface. *Surface Casing maybe preset
*11-3/4" (14-3/4")	*47 ppf *54 ppf	*J-55 *K-55	*BT&C *BT&C	*0' – 2,500' 2,500' – 4,000'	*New Casing. Two Stage Cement *Contingency String
8-5/8" (10-5/8")	32 ppf	N-80HC	BT&C	0' – 6,500'	New Casing. Two Stage Cement to surface
5-1/2" (7-7/8")	20 ppf	P-110	VARoughneck	0' – 17,711'	New Casing – Single Stage Cement to overlap previous casing shoe.

Design Factor Table

Casing & Hole Size	Burst	Collapse	Axial	Tri-axial
16" (20") 65 ppf, J55, STC	1.09	2.56	3.75	3.99
*11-3/4" (14-3/4") 47 ppf, J55, 54 ppf, K55 BTC	2.72 1.97	1.34 1.14	4.08 3.85	1.50 1.60
8-5/8" (10-5/8") 32 ppf, N80HC, BTC	1.92	1.27	2.67	1.69
5-1/2" (7-7/8") 20 ppf, P110, VARoughneck	1.24	2.90	2.82	2.49

Casing strings below the conductor casing will be tested to .22 psi per foot of casing string length or 1500 psi, whichever is greater, but not to exceed 70% of the minimum internal yield.

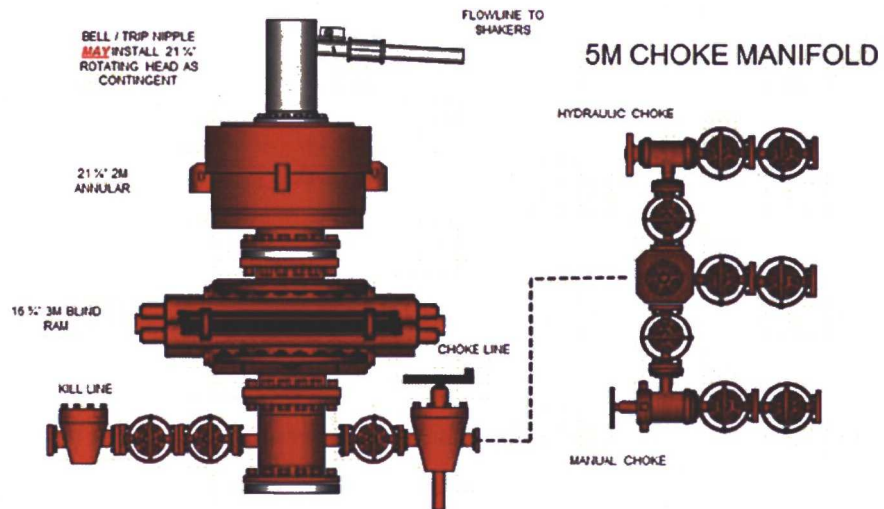
Minimum casing design factors used:

Collapse -	1.125
Burst -	1.1
Jt. Strength -	1.40

Surface Casing – Centralizers shall be placed on the first 4 (bottom 4) joints of casing (1 per joint) and 1 every 3rd joint to surface.

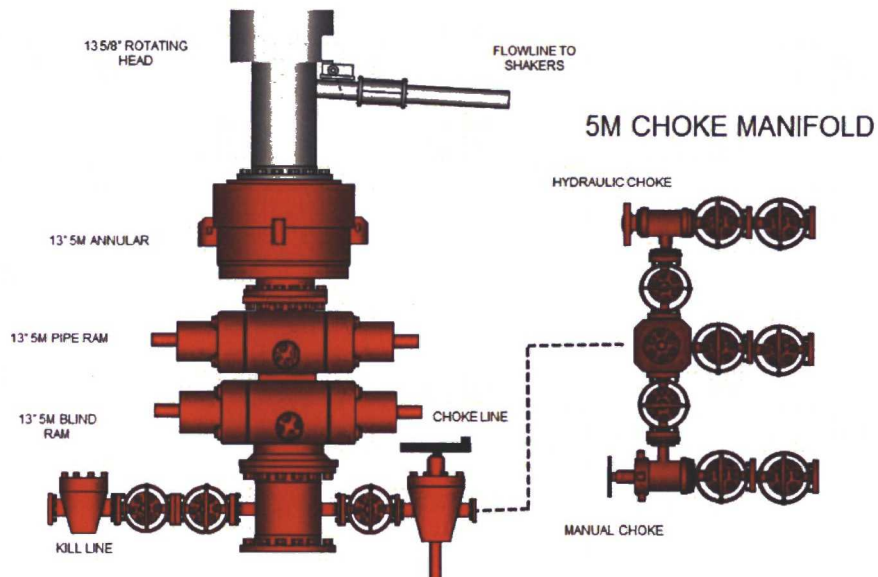
16-3/4" BOPE – DOUBLE RAM

Class 2 (AR 2M) BOP



13-5/8" BOPE – DOUBLE RAM

Class 3 (ARR 5M) BOP



Paguate Ss	7,971	8,106	Gas & water-bearing	0.30
Cubero Ss	7,981	8,116	Gas & water-bearing	0.30
Encinal Canyon Ss	8,051	8,186	Gas & water-bearing	0.30
Burro Canyon Ss	8,106	8,242	Gas & water-bearing	0.30
Morrison	8,146	8,282	Gas- & water bearing	0.30
Total Depth Pilot	8,483	8,346	Gas- & water bearing	0.30

Possible Aquifers: San Jose and Ojo Alamo

Oil Shale: None Expected.

Oil & Gas: Primary objective is the Mancos formation from 7,341' TVD (heel) to 7,356' TVD (toe). Landing point is expected to be in the Mancos at 7,341' TVD.

Protection of oil, gas, water, or other mineral bearing formations: Protection shall be accomplished by setting surface casing below base of possible aquifer and cementing surface casing to surface.

SECTION – 2 BOPE

BOP equipment and accessories will meet or exceed BLM requirements outlined in 43 CFR Part 3160.

A 16 3/4" 2M BOPE and 13 5/8" 5M BOPE will be utilized to drill this well. Maximum anticipated surface pressure for the 16 3/4" 2M BOPE is 1337 psi, maximum anticipated surface pressure for 13 5/8" 5M BOPE is 667 psi. The 16 3/4" BOPE will be tested 250 psi (Low) for 5 minutes and 2000 psi (High) for 10 minutes. The 13 5/8" BOPE will be tested 250 psi (Low) for 5 minutes and 5000 psi (High) for 10 minutes. Pressure test surface and intermediate casing(s) to 1500 psi for 30 minutes. All preventers and surface casing will be tested before drilling out of surface casing. BOP equipment will be tested every 30 days, after any repairs are made to the BOP equipment, and after the BOP equipment is subjected to pressure. Annular preventers will be functionally operated at least once per week. Pipe rams will be activated daily and blind rams shall be activated each trip or at least weekly. The New Mexico Oil & Gas Conservation Commission and the BLM will be notified 24 hours in advance of testing of BOPE.

		BHP	MASP
16 3/4" 2M BOPE	6,369' TVD	2,738	1,337
13 5/8" 5M BOPE	8,346' TVD	2,503	667

*Highest Bottom Hole Pressure encountered at 7,950' tvd. Total depth had less BHP.

*Gradient used to calculate BHP 0.43 psi/ft for Mancos and 0.30 psi/ft for Dakota

SECTION – 1 – GEOLOGIC FORMATIONS AND CONTENTS

Marker	TVD	MD	Comments	BHP PSI/FT
Tertiary/San Jose Ss	25	25	Wet/aquifer	0.43
Ojo Alamo Ss	2,391	2,472	wet/aquifer	0.43
Kirtland (Top/Cretaceous)	2,496	2,583	Gas & water-bearing	0.43
Fruitland	2,981	3,098	Gas & water-bearing	0.15
Fruitland Coal	3,036	3,156	Gas & water-bearing	0.07
Ignacio coal zone	3,186	3,312	Gas & water-bearing	0.07
Pictured Cliffs Ss	3,210	3,336	Wet	0.12
Cotton Wood Coal	3,281	3,409	Gas & water-bearing	0.12
Cahn Coal	3,426	3,555	Gas & water-bearing	0.35
Lewis Sh	3,576	3,706	Gas & water-bearing	0.35
Huerfanito Bentonite	4,266	4,396	Gas & water-bearing	0.35
Chacra Ss	4,696	4,826	Gas & water-bearing	0.35
Lower Cubero Ss	5,056	5,186	Gas- & water-bearing	0.35
Cliffhouse Ss	5,136	5,266	Gas- & water-bearing	0.35
Menefee	5,501	5,631	Gas- & water-bearing	0.30
Point Lookout SS	5,771	5,901	Gas-bearing	0.30
Point Lookout Base	5,861	5,991	Gas-bearing	0.30
Mancos sh	6,181	6,311	Gas-bearing	0.43
K-86 marker	6,911	7,042	Gas-bearing	0.43
K-82 marker	6,986	7,117	Gas-bearing	0.43
"Upper Gallup"	7,086	7,218	Gas-bearing	0.43
K-78_0 marker	7,201	7,333	Gas-bearing	0.43
"Middle Gallup"	7,281	7,413	Gas-bearing	0.43
K-72 marker	7,391	7,524	Gas-bearing	0.43
Sanostee Sh	7,501	7,634	Gas-bearing	0.43
Greenhorn Ls	7,816	7,951	Gas-bearing	0.43
Graneros Sh	7,866	8,001	Gas-bearing	0.43
Two Wells Ss	7,951	8,086	Gas-bearing	0.30

**Attachment to Application for Permit to Drill
Drilling program:
Pilot Hole Change & Bottom Hole Location of Lateral
Change**

**BP America Production Company
US Lower 48 Onshore
200 Energy Court
Farmington, NM 87401
October 2016**

NEBU 602 Com #1H
MANCOS Horizontal Development Well
Surface Location: 674' FNL & 825' FWL
Section 12, T31N, R07W
GL Elevation = 6521.07'
Lat. = 36.91942483° N
Long. = 107.52847250° W
NAD83
San Juan County, New Mexico

Proposed Bottom Hole Location PILOT: 279' FNL – 262'
FWL
Section 12, T31N, R07W
San Juan County, New Mexico

Proposed Bottom Hole Location PILOT: 704' FNL – 50'
FEL
Section 07, T31N, R06W
San Juan County, New Mexico

Drilling program written in compliance with onshore Oil and
Gas Order No. 1

(III.D.3, effective May 2007) and Onshore Order No. 2 Dated November 18, 1988



Company: B.P.
Project: San Juan County, NM NAD83
Site: NEBU 602 Pad
Well: NEBU 602 #1H
Wellbore: Lateral
Design: Plan #6

PROJECT DETAILS: San Juan County, NM NAD83

Geodetic System: US State Plane 1983
Datum: North American Datum 1983
Ellipsoid: GRS 1980
Zone: New Mexico Western Zone
System Datum: Mean Sea Level
Local North: Grid



Azimuths to Grid North
True North: -0.18°
Magnetic North: 9.00°

Magnetic Field
Strength: 50176.2nT
Dip Angle: 63.57°
Date: 5/11/2016
Model: HDGM

WELL DETAILS: NEBU 602 #1H

GL 6521' & RKB 15' @ 6536.00usft
+N/-S +E/-W Northing Easting Latitude Longitude
0.00 0.00 2154140.58 2812207.47 36.9194248 -107.5284725 602 #1H

Plan: Plan #6 (NEBU 602 #1H/Lateral)

Created By: Janie Collins Date: 1:16, October 20 2016

DESIGN TARGET DETAILS

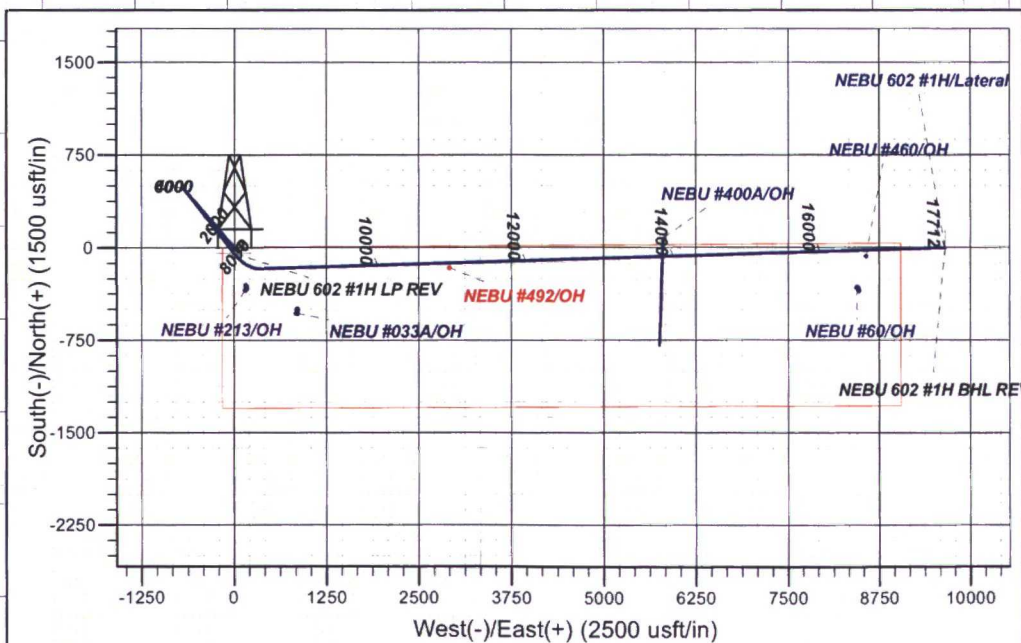
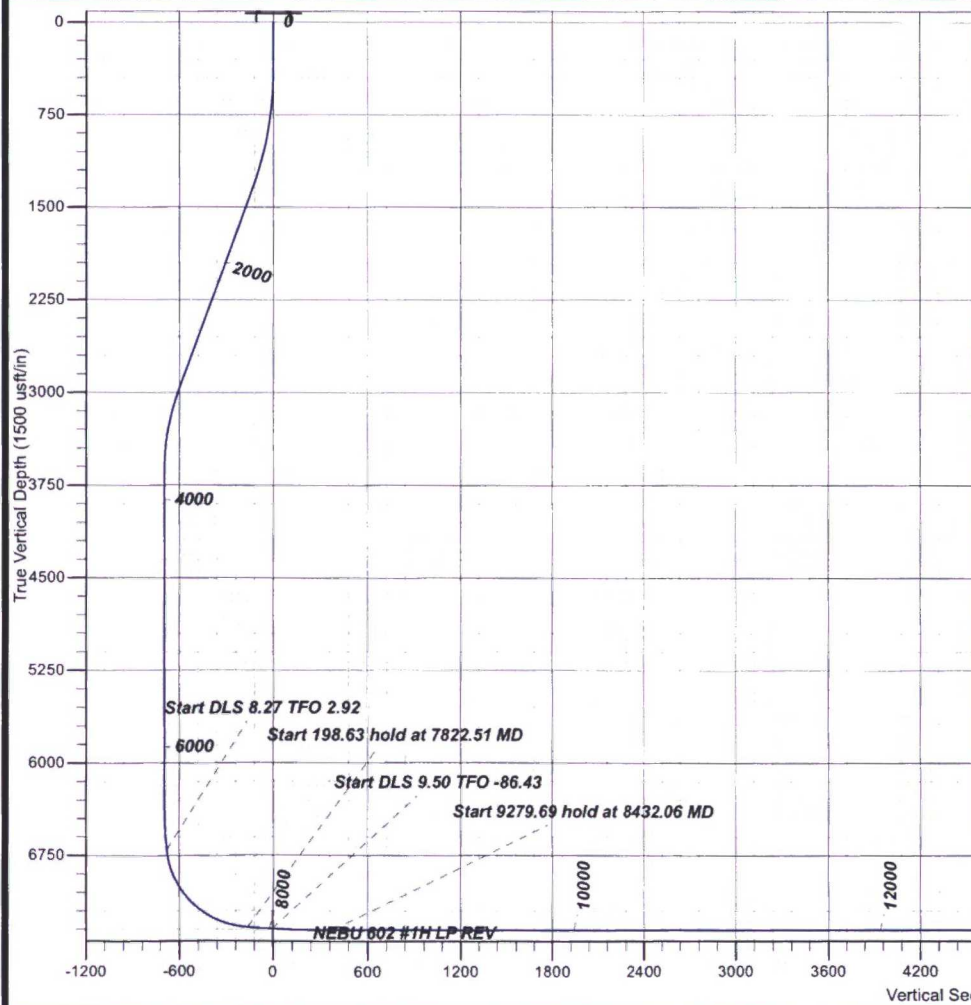
Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
NEBU 602 #1H LP REV	7341.00	-44.67	-6.72	2154095.91	2812200.75	36.9193022	-107.5284960
NEBU 602 #1H BHL REV	7356.00	-1.70	9653.65	2154138.88	2821861.12	36.9193308	-107.4954484

SECTION DETAILS

MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VFace	Target
6830.00	5.00	125.00	6699.26	477.29	-681.64	0.00	0.00	-679.97	
7822.51	87.07	127.90	7330.86	77.17	-163.26	8.27	2.92	-162.99	
8021.15	87.07	127.90	7341.00	-44.67	-6.72	0.00	0.00	-6.88	NEBU 602 #1H LP REV
8432.06	89.98	88.95	7352.00	-171.89	375.52	9.50	-86.43	374.92	
17711.74	89.98	88.95	7356.00	-1.70	9653.65	0.00	0.00	9653.59	NEBU 602 #1H BHL REV

FORMATION TOP DETAILS

TVDPath	MDPath	Formation
6911.00	7049.19	K-86 marker
6986.00	7133.11	K-82 marker
7086.00	7255.54	Upper Gallup



Vertical Section at 89.80° (1200 usft/in)

NEBU 602 #1H/Lateral/Plan #6

TD at 17711.74

NEBU 602 #1H BHL REV



B.P.

San Juan County, NM NAD83

NEBU 602 Pad

NEBU 602 #1H - Slot 602 #1H

Lateral

Plan: Plan #6

Standard Planning Report

20 October, 2016



www.scientificdrilling.com



Planning Report



Database:	Grand Junction District	Local Co-ordinate Reference:	Well NEBU 602 #1H - Slot 602 #1H
Company:	B.P.	TVD Reference:	GL 6521' & RKB 15' @ 6536.00usft
Project:	San Juan County, NM NAD83	MD Reference:	GL 6521' & RKB 15' @ 6536.00usft
Site:	NEBU 602 Pad	North Reference:	Grid
Well:	NEBU 602 #1H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Lateral		
Design:	Plan #6		

Project	San Juan County, NM NAD83		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Western Zone		

Site	NEBU 602 Pad		
Site Position:		Northing:	2,154,140.58 usft
From:	Map	Easting:	2,812,207.47 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13.20 in
		Latitude:	36.9194248
		Longitude:	-107.5284725
		Grid Convergence:	0.18 °

Well	NEBU 602 #1H - Slot 602 #1H		
Well Position	+N/-S	0.00 usft	Northing:
	+E/-W	0.00 usft	Easting:
Position Uncertainty	0.00 usft	Wellhead Elevation:	0.00 usft
		Latitude:	36.9194248
		Longitude:	-107.5284725
		Ground Level:	6,521.00 usft

Wellbore	Lateral		
Magnetics	Model Name	Sample Date	Declination (°)
	HDGM	5/11/2016	9.18
			Dip Angle (°)
			63.57
			Field Strength (nT)
			50,176

Design	Plan #6		
Audit Notes:			
Version:	Phase:	PLAN	Tie On Depth:
			6,830.00
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W
	(usft)	(usft)	(usft)
	0.00	0.00	0.00
			Direction (°)
			89.80

Plan Sections										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
6,830.00	5.00	125.00	6,699.26	477.29	-681.64	0.00	0.00	0.00	0.00	
7,822.51	87.07	127.90	7,330.86	77.17	-163.26	8.27	8.27	0.29	2.92	
8,021.15	87.07	127.90	7,341.00	-44.67	-6.72	0.00	0.00	0.00	0.00	NEBU 602 #1H LP Rf
8,432.06	89.98	88.95	7,352.00	-171.89	375.52	9.50	0.71	-9.48	-86.43	
17,711.74	89.98	88.95	7,356.00	-1.70	9,653.65	0.00	0.00	0.00	0.00	NEBU 602 #1H BHL f



Planning Report



Database:	Grand Junction District	Local Co-ordinate Reference:	Well NEBU 602 #1H - Slot 602 #1H
Company:	B.P.	TVD Reference:	GL 6521' & RKB 15' @ 6536.00usft
Project:	San Juan County, NM NAD83	MD Reference:	GL 6521' & RKB 15' @ 6536.00usft
Site:	NEBU 602 Pad	North Reference:	Grid
Well:	NEBU 602 #1H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Lateral		
Design:	Plan #6		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
6,830.00	5.00	125.00	6,699.26	477.29	-681.64	-679.97	0.00	0.00	0.00
6,900.00	10.79	126.57	6,768.57	471.63	-673.87	-672.22	8.27	8.27	2.25
7,000.00	19.05	127.17	6,865.11	456.17	-653.32	-651.72	8.27	8.27	0.60
7,049.19	23.12	127.31	6,911.00	445.46	-639.23	-637.67	8.27	8.27	0.29
K-86 marker									
7,100.00	27.32	127.42	6,956.96	432.32	-622.03	-620.51	8.27	8.27	0.20
7,133.11	30.06	127.47	6,986.00	422.65	-609.40	-607.93	8.27	8.27	0.16
K-82 marker									
7,200.00	35.59	127.55	7,042.18	400.58	-580.65	-579.25	8.27	8.27	0.13
7,255.54	40.19	127.61	7,086.00	379.78	-553.63	-552.30	8.27	8.27	0.10
Upper Gallup									
7,300.00	43.86	127.64	7,119.03	361.61	-530.06	-528.80	8.27	8.27	0.08
7,400.00	52.13	127.71	7,185.88	316.23	-471.30	-470.19	8.27	8.27	0.07
7,500.00	60.40	127.76	7,241.37	265.37	-405.59	-404.66	8.27	8.27	0.05
7,600.00	68.67	127.81	7,284.32	210.10	-334.30	-333.56	8.27	8.27	0.05
7,700.00	76.94	127.85	7,313.85	151.56	-258.91	-258.38	8.27	8.27	0.04
7,800.00	85.21	127.89	7,329.35	90.97	-180.99	-180.67	8.27	8.27	0.04
7,822.51	87.07	127.90	7,330.86	77.17	-163.26	-162.99	8.27	8.27	0.04
7,900.00	87.07	127.90	7,334.82	29.64	-102.19	-102.09	0.00	0.00	0.00
8,000.00	87.07	127.90	7,339.92	-31.70	-23.38	-23.49	0.00	0.00	0.00
8,011.45	87.07	127.90	7,340.51	-38.72	-14.36	-14.50	0.00	0.00	0.00
NEBU 602 #1H LP									
8,021.15	87.07	127.90	7,341.00	-44.67	-6.72	-6.88	0.00	0.00	0.00
NEBU 602 #1H LP REV									
8,100.00	87.57	120.41	7,344.69	-88.86	58.42	58.11	9.50	0.62	-9.49
8,200.00	88.25	110.93	7,348.36	-132.10	148.38	147.92	9.50	0.68	-9.48
8,300.00	88.97	101.46	7,350.79	-159.94	244.28	243.72	9.50	0.73	-9.47
8,400.00	89.73	91.98	7,351.92	-171.63	343.47	342.87	9.50	0.76	-9.47
8,432.06	89.98	88.95	7,352.00	-171.89	375.52	374.92	9.50	0.76	-9.47
8,500.00	89.98	88.95	7,352.03	-170.65	443.46	442.86	0.00	0.00	0.00
8,600.00	89.98	88.95	7,352.08	-168.81	543.44	542.85	0.00	0.00	0.00
8,700.00	89.98	88.95	7,352.12	-166.98	643.42	642.84	0.00	0.00	0.00
8,800.00	89.98	88.95	7,352.16	-165.14	743.41	742.82	0.00	0.00	0.00
8,900.00	89.98	88.95	7,352.20	-163.31	843.39	842.81	0.00	0.00	0.00
9,000.00	89.98	88.95	7,352.25	-161.48	943.37	942.80	0.00	0.00	0.00
9,100.00	89.98	88.95	7,352.29	-159.64	1,043.35	1,042.79	0.00	0.00	0.00
9,200.00	89.98	88.95	7,352.33	-157.81	1,143.34	1,142.78	0.00	0.00	0.00
9,300.00	89.98	88.95	7,352.38	-155.97	1,243.32	1,242.77	0.00	0.00	0.00
9,400.00	89.98	88.95	7,352.42	-154.14	1,343.30	1,342.76	0.00	0.00	0.00
9,500.00	89.98	88.95	7,352.46	-152.31	1,443.29	1,442.75	0.00	0.00	0.00
9,600.00	89.98	88.95	7,352.51	-150.47	1,543.27	1,542.74	0.00	0.00	0.00
9,700.00	89.98	88.95	7,352.55	-148.64	1,643.25	1,642.73	0.00	0.00	0.00
9,800.00	89.98	88.95	7,352.59	-146.80	1,743.24	1,742.71	0.00	0.00	0.00
9,900.00	89.98	88.95	7,352.64	-144.97	1,843.22	1,842.70	0.00	0.00	0.00
10,000.00	89.98	88.95	7,352.68	-143.14	1,943.20	1,942.69	0.00	0.00	0.00
10,100.00	89.98	88.95	7,352.72	-141.30	2,043.19	2,042.68	0.00	0.00	0.00
10,200.00	89.98	88.95	7,352.76	-139.47	2,143.17	2,142.67	0.00	0.00	0.00
10,300.00	89.98	88.95	7,352.81	-137.63	2,243.15	2,242.66	0.00	0.00	0.00
10,400.00	89.98	88.95	7,352.85	-135.80	2,343.14	2,342.65	0.00	0.00	0.00
10,500.00	89.98	88.95	7,352.89	-133.97	2,443.12	2,442.64	0.00	0.00	0.00
10,600.00	89.98	88.95	7,352.94	-132.13	2,543.10	2,542.63	0.00	0.00	0.00
10,700.00	89.98	88.95	7,352.98	-130.30	2,643.09	2,642.61	0.00	0.00	0.00
10,800.00	89.98	88.95	7,353.02	-128.46	2,743.07	2,742.60	0.00	0.00	0.00
10,900.00	89.98	88.95	7,353.07	-126.63	2,843.05	2,842.59	0.00	0.00	0.00



Planning Report



Database: Grand Junction District
 Company: B.P.
 Project: San Juan County, NM NAD83
 Site: NEBU 602 Pad
 Well: NEBU 602 #1H
 Wellbore: Lateral
 Design: Plan #6

Local Co-ordinate Reference:
 TVD Reference:
 MD Reference:
 North Reference:
 Survey Calculation Method:

Well NEBU 602 #1H - Slot 602 #1H
 GL 6521' & RKB 15' @ 6536.00usft
 GL 6521' & RKB 15' @ 6536.00usft
 Grid
 Minimum Curvature

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
11,000.00	89.98	88.95	7,353.11	-124.80	2,943.04	2,942.58	0.00	0.00	0.00
11,100.00	89.98	88.95	7,353.15	-122.96	3,043.02	3,042.57	0.00	0.00	0.00
11,200.00	89.98	88.95	7,353.20	-121.13	3,143.00	3,142.56	0.00	0.00	0.00
11,300.00	89.98	88.95	7,353.24	-119.29	3,242.98	3,242.55	0.00	0.00	0.00
11,400.00	89.98	88.95	7,353.28	-117.46	3,342.97	3,342.54	0.00	0.00	0.00
11,500.00	89.98	88.95	7,353.32	-115.63	3,442.95	3,442.53	0.00	0.00	0.00
11,600.00	89.98	88.95	7,353.37	-113.79	3,542.93	3,542.52	0.00	0.00	0.00
11,700.00	89.98	88.95	7,353.41	-111.96	3,642.92	3,642.50	0.00	0.00	0.00
11,800.00	89.98	88.95	7,353.45	-110.12	3,742.90	3,742.49	0.00	0.00	0.00
11,900.00	89.98	88.95	7,353.50	-108.29	3,842.88	3,842.48	0.00	0.00	0.00
12,000.00	89.98	88.95	7,353.54	-106.46	3,942.87	3,942.47	0.00	0.00	0.00
12,100.00	89.98	88.95	7,353.58	-104.62	4,042.85	4,042.46	0.00	0.00	0.00
12,200.00	89.98	88.95	7,353.63	-102.79	4,142.83	4,142.45	0.00	0.00	0.00
12,300.00	89.98	88.95	7,353.67	-100.95	4,242.82	4,242.44	0.00	0.00	0.00
12,400.00	89.98	88.95	7,353.71	-99.12	4,342.80	4,342.43	0.00	0.00	0.00
12,500.00	89.98	88.95	7,353.76	-97.29	4,442.78	4,442.42	0.00	0.00	0.00
12,600.00	89.98	88.95	7,353.80	-95.45	4,542.77	4,542.41	0.00	0.00	0.00
12,700.00	89.98	88.95	7,353.84	-93.62	4,642.75	4,642.39	0.00	0.00	0.00
12,800.00	89.98	88.95	7,353.88	-91.78	4,742.73	4,742.38	0.00	0.00	0.00
12,900.00	89.98	88.95	7,353.93	-89.95	4,842.72	4,842.37	0.00	0.00	0.00
13,000.00	89.98	88.95	7,353.97	-88.12	4,942.70	4,942.36	0.00	0.00	0.00
13,100.00	89.98	88.95	7,354.01	-86.28	5,042.68	5,042.35	0.00	0.00	0.00
13,200.00	89.98	88.95	7,354.06	-84.45	5,142.66	5,142.34	0.00	0.00	0.00
13,300.00	89.98	88.95	7,354.10	-82.61	5,242.65	5,242.33	0.00	0.00	0.00
13,400.00	89.98	88.95	7,354.14	-80.78	5,342.63	5,342.32	0.00	0.00	0.00
13,500.00	89.98	88.95	7,354.19	-78.94	5,442.61	5,442.31	0.00	0.00	0.00
13,600.00	89.98	88.95	7,354.23	-77.11	5,542.60	5,542.29	0.00	0.00	0.00
13,700.00	89.98	88.95	7,354.27	-75.28	5,642.58	5,642.28	0.00	0.00	0.00
13,800.00	89.98	88.95	7,354.32	-73.44	5,742.56	5,742.27	0.00	0.00	0.00
13,900.00	89.98	88.95	7,354.36	-71.61	5,842.55	5,842.26	0.00	0.00	0.00
14,000.00	89.98	88.95	7,354.40	-69.77	5,942.53	5,942.25	0.00	0.00	0.00
14,100.00	89.98	88.95	7,354.44	-67.94	6,042.51	6,042.24	0.00	0.00	0.00
14,200.00	89.98	88.95	7,354.49	-66.11	6,142.50	6,142.23	0.00	0.00	0.00
14,300.00	89.98	88.95	7,354.53	-64.27	6,242.48	6,242.22	0.00	0.00	0.00
14,400.00	89.98	88.95	7,354.57	-62.44	6,342.46	6,342.21	0.00	0.00	0.00
14,500.00	89.98	88.95	7,354.62	-60.60	6,442.45	6,442.20	0.00	0.00	0.00
14,600.00	89.98	88.95	7,354.66	-58.77	6,542.43	6,542.18	0.00	0.00	0.00
14,700.00	89.98	88.95	7,354.70	-56.94	6,642.41	6,642.17	0.00	0.00	0.00
14,800.00	89.98	88.95	7,354.75	-55.10	6,742.40	6,742.16	0.00	0.00	0.00
14,900.00	89.98	88.95	7,354.79	-53.27	6,842.38	6,842.15	0.00	0.00	0.00
15,000.00	89.98	88.95	7,354.83	-51.43	6,942.36	6,942.14	0.00	0.00	0.00
15,100.00	89.98	88.95	7,354.88	-49.60	7,042.35	7,042.13	0.00	0.00	0.00
15,200.00	89.98	88.95	7,354.92	-47.77	7,142.33	7,142.12	0.00	0.00	0.00
15,300.00	89.98	88.95	7,354.96	-45.93	7,242.31	7,242.11	0.00	0.00	0.00
15,400.00	89.98	88.95	7,355.00	-44.10	7,342.29	7,342.10	0.00	0.00	0.00
15,500.00	89.98	88.95	7,355.05	-42.26	7,442.28	7,442.09	0.00	0.00	0.00
15,600.00	89.98	88.95	7,355.09	-40.43	7,542.26	7,542.07	0.00	0.00	0.00
15,700.00	89.98	88.95	7,355.13	-38.60	7,642.24	7,642.06	0.00	0.00	0.00
15,800.00	89.98	88.95	7,355.18	-36.76	7,742.23	7,742.05	0.00	0.00	0.00
15,900.00	89.98	88.95	7,355.22	-34.93	7,842.21	7,842.04	0.00	0.00	0.00
16,000.00	89.98	88.95	7,355.26	-33.09	7,942.19	7,942.03	0.00	0.00	0.00
16,100.00	89.98	88.95	7,355.31	-31.26	8,042.18	8,042.02	0.00	0.00	0.00
16,200.00	89.98	88.95	7,355.35	-29.43	8,142.16	8,142.01	0.00	0.00	0.00
16,300.00	89.98	88.95	7,355.39	-27.59	8,242.14	8,242.00	0.00	0.00	0.00



Planning Report



Database:	Grand Junction District	Local Co-ordinate Reference:	Well NEBU 602 #1H - Slot 602 #1H
Company:	B.P.	TVD Reference:	GL 6521' & RKB 15' @ 6536.00usft
Project:	San Juan County, NM NAD83	MD Reference:	GL 6521' & RKB 15' @ 6536.00usft
Site:	NEBU 602 Pad	North Reference:	Grid
Well:	NEBU 602 #1H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Lateral		
Design:	Plan #6		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
16,400.00	89.98	88.95	7,355.44	-25.76	8,342.13	8,341.99	0.00	0.00	0.00
16,500.00	89.98	88.95	7,355.48	-23.92	8,442.11	8,441.97	0.00	0.00	0.00
16,600.00	89.98	88.95	7,355.52	-22.09	8,542.09	8,541.96	0.00	0.00	0.00
16,700.00	89.98	88.95	7,355.56	-20.26	8,642.08	8,641.95	0.00	0.00	0.00
16,800.00	89.98	88.95	7,355.61	-18.42	8,742.06	8,741.94	0.00	0.00	0.00
16,900.00	89.98	88.95	7,355.65	-16.59	8,842.04	8,841.93	0.00	0.00	0.00
17,000.00	89.98	88.95	7,355.69	-14.75	8,942.03	8,941.92	0.00	0.00	0.00
17,051.61	89.98	88.95	7,355.72	-13.81	8,993.63	8,993.53	0.00	0.00	0.00
NEBU 602 #1H BHL									
17,100.00	89.98	88.95	7,355.74	-12.92	9,042.01	9,041.91	0.00	0.00	0.00
17,200.00	89.98	88.95	7,355.78	-11.09	9,141.99	9,141.90	0.00	0.00	0.00
17,300.00	89.98	88.95	7,355.82	-9.25	9,241.98	9,241.89	0.00	0.00	0.00
17,400.00	89.98	88.95	7,355.87	-7.42	9,341.96	9,341.88	0.00	0.00	0.00
17,500.00	89.98	88.95	7,355.91	-5.58	9,441.94	9,441.86	0.00	0.00	0.00
17,600.00	89.98	88.95	7,355.95	-3.75	9,541.92	9,541.85	0.00	0.00	0.00
17,700.00	89.98	88.95	7,356.00	-1.92	9,641.91	9,641.84	0.00	0.00	0.00
17,711.74	89.98	88.95	7,356.00	-1.70	9,653.65	9,653.59	0.00	0.00	0.00
NEBU 602 #1H BHL REV									

Design Targets

Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
- hit/miss target									
- Shape									
NEBU 602 #1H LP REV	0.00	0.00	7,341.00	-44.67	-6.72	2,154,095.91	2,812,200.75	36.9193022	-107.5284960
- plan hits target center									
- Point									
NEBU 602 #1H BHL RE	0.00	0.00	7,356.00	-1.70	9,653.65	2,154,138.88	2,821,861.12	36.9193308	-107.4954484
- plan hits target center									
- Point									



Planning Report



Database:	Grand Junction District	Local Co-ordinate Reference:	Well NEBU 602 #1H - Slot 602 #1H
Company:	B.P.	TVD Reference:	GL 6521' & RKB 15' @ 6536.00usft
Project:	San Juan County, NM NAD83	MD Reference:	GL 6521' & RKB 15' @ 6536.00usft
Site:	NEBU 602 Pad	North Reference:	Grid
Well:	NEBU 602 #1H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Lateral		
Design:	Plan #6		

Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
15.00	15.00	San Jose Ss	Empty	0.00	0.00
2,472.58	2,391.00	Ojo Alamo	Empty	0.00	0.00
2,583.96	2,496.00	Kirtland	Empty	0.00	0.00
3,098.43	2,981.00	Fruitland	Empty	0.00	0.00
3,156.51	3,036.00	Fruitland Coal	Empty	0.00	0.00
3,312.24	3,186.00	Ignacio Coal	Empty	0.00	0.00
3,336.85	3,210.00	Pictured Cliffs Ss	Empty	0.00	0.00
3,409.28	3,281.00	Cottonwood Coal	Empty	0.00	0.00
3,555.77	3,426.00	Cahn Coal	Empty	0.00	0.00
3,706.11	3,576.00	Lewis Sh	Empty	0.00	0.00
4,396.12	4,266.00	Huerfano Bentonite	Empty	0.00	0.00
4,826.12	4,696.00	Chacra Ss	Empty	0.00	0.00
5,266.12	5,136.00	Cliffhouse Ss	Empty	0.00	0.00
5,631.12	5,501.00	Menefee	Empty	0.00	0.00
5,901.12	5,771.00	Point Lookout Ss	Empty	0.00	0.00
5,991.12	5,861.00	Point Lookout Base	Empty	0.00	0.00
6,311.12	6,181.00	Mancos Sh	Empty	0.00	0.00
7,049.19	6,911.00	K-86 marker	Empty	0.00	0.00
7,133.11	6,986.00	K-82 marker	Empty	0.00	0.00
7,255.54	7,086.00	Upper Gallup	Empty	0.00	0.00



B.P.

San Juan County, NM NAD83

NEBU 602 Pad

NEBU 602 #1H - Slot 602 #1H

Pilot

Plan: Plan #4

Standard Planning Report

20 October, 2016



Scientific Drilling

www.scientificdrilling.com





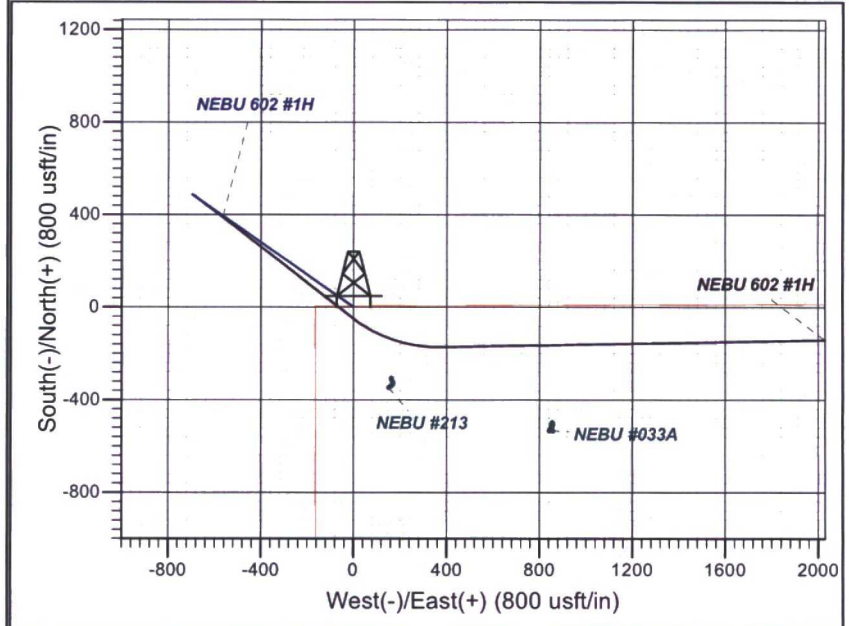
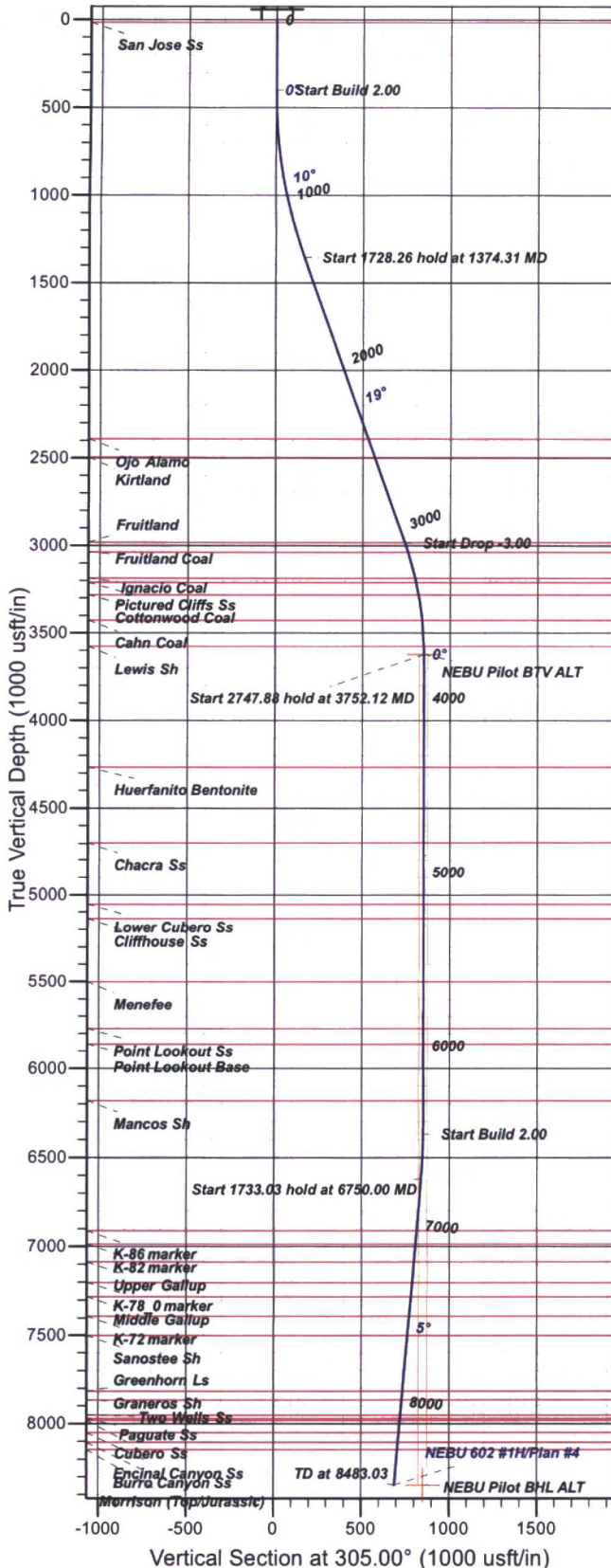
Company: B.P.
Project: San Juan County, NM NAD83
Site: NEBU 602 Pad
Well: NEBU 602 #1H



Well Details: NEBU 602 #1H

+N/-S 0.00 +E/-W 0.00 Northing 2154140.58 Easting 2812207.47 Latitude 36.9194248 Longitude -107.5284725 Slot 602 #1H

Azimuths to Grid North
True North: -0.18°
Magnetic North: 9.00°
Magnetic Field
Strength: 50175.8nT
Dip Angle: 63.57°
Date: 5/12/2016
Model: HDGM



FORMATION TOP DETAILS

TVDPPath	MDPath	Formation
15.00	15.00	San Jose Ss
2391.00	2472.58	Ojo Alamo
2496.00	2583.96	Kirtland
2981.00	3098.43	Fruitland
3036.00	3156.51	Fruitland Coal
3186.00	3312.24	Ignacio Coal
3210.00	3336.85	Pictured Cliffs Ss
3281.00	3409.28	Cottonwood Coal
3426.00	3555.77	Cahn Coal
3576.00	3706.11	Lewis Sh
4266.00	4396.12	Huerfano Bentonite
4696.00	4826.12	Chacra Ss
5056.00	5186.12	Lower Cubero Ss
5136.00	5266.12	Cliffhouse Ss
5501.00	5631.12	Menefee
5771.00	5901.12	Point Lookout Ss
5861.00	5991.12	Point Lookout Base
6181.00	6311.12	Mancos Sh
6911.00	7042.55	K-86 marker
6986.00	7117.83	K-82 marker
7086.00	7218.22	Upper Gallup
7201.00	7333.65	K-78 0 marker
7281.00	7413.96	Middle Gallup
7391.00	7524.38	K-72 marker
7501.00	7634.80	Sanostee Sh
7816.00	7951.00	Greenhorn Ls
7866.00	8001.19	Graneros Sh
7951.00	8086.52	Two Wells Ss
7971.00	8106.60	Paguate Ss
7981.00	8116.63	Cubero Ss
8051.00	8186.90	Encinal Canyon Ss
8106.00	8242.11	Burro Canyon Ss
8146.00	8282.26	Morrison (Top/Jurassic)

Plan: Plan #4

1:06, October 20 2016
Created By: Janie Collins

PROJECT DETAILS: San Juan County, NM NAD83

Geodetic System: US State Plane 1983
Datum: North American Datum 1983
Ellipsoid: GRS 1980
Zone: New Mexico Western Zone

System Datum: Mean Sea Level

CASING DETAILS

No casing data is available

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSecl	Target
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	
3	1374.31	19.49	305.00	1355.64	94.12	-134.42	2.00	305.00	164.09	
4	3102.57	19.49	305.00	2984.91	424.79	-606.67	0.00	0.00	740.61	
5	3752.12	0.00	0.00	3622.00	487.54	-696.28	3.00	180.00	850.00	NEBU Pilot BTV ALT
6	6500.00	0.00	0.00	6369.88	487.54	-696.28	0.00	0.00	850.00	
7	6750.00	5.00	125.00	6619.56	481.29	-687.35	2.00	125.00	839.10	
8	8483.03	5.00	125.00	8346.00	394.65	-563.62	0.00	0.00	688.05	

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape
NEBU Pilot BTV ALT	3622.00	487.54	-696.28	2154628.12	2811511.19	36.9207701	-107.5308491	Circle (Radius: 25.00)
- plan hits target center								
NEBU Pilot BHL ALT	8346.00	487.54	-696.28	2154628.12	2811511.19	36.9207701	-107.5308491	Point
- plan misses target center by 161.33usft at 8488.91usft MD (8331.94 TVD, 395.36 N, -564.63 E)								



Planning Report



Database:	Grand Junction District	Local Co-ordinate Reference:	Well NEBU 602 #1H - Slot 602 #1H
Company:	B.P.	TVD Reference:	GL 6521' & RKB 15' @ 6536.00usft
Project:	San Juan County, NM NAD83	MD Reference:	GL 6521' & RKB 15' @ 6536.00usft
Site:	NEBU 602 Pad	North Reference:	Grid
Well:	NEBU 602 #1H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Pilot		
Design:	Plan #4		

Project	San Juan County, NM NAD83		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Western Zone		

Site		NEBU 602 Pad			
Site Position:		Northing:	2,154,140.58 usft	Latitude:	36.9194248
From:	Map	Easting:	2,812,207.47 usft	Longitude:	-107.5284725
Position Uncertainty:	0.00 usft	Slot Radius:	13.20 in	Grid Convergence:	0.18 °

Well	NEBU 602 #1H - Slot 602 #1H					
Well Position	+N/-S	0.00 usft	Northing:	2,154,140.58 usft	Latitude:	36.9194248
	+E/-W	0.00 usft	Easting:	2,812,207.47 usft	Longitude:	-107.5284725
Position Uncertainty	0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level:	6,521.00 usft	

Wellbore	Pilot				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	5/12/2016	9.18	63.57	50,176

Design	Plan #4			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.00	0.00	0.00	305.00

Plan Sections										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,374.31	19.49	305.00	1,355.64	94.12	-134.42	2.00	2.00	0.00	305.00	
3,102.57	19.49	305.00	2,984.91	424.79	-606.67	0.00	0.00	0.00	0.00	
3,752.12	0.00	0.00	3,622.00	487.54	-696.28	3.00	-3.00	0.00	180.00	NEBU Pilot BTV ALT
6,500.00	0.00	0.00	6,369.88	487.54	-696.28	0.00	0.00	0.00	0.00	
6,750.00	5.00	125.00	6,619.56	481.29	-687.35	2.00	2.00	0.00	125.00	
8,483.03	5.00	125.00	8,346.00	394.65	-563.62	0.00	0.00	0.00	0.00	



Planning Report



Database:	Grand Junction District	Local Co-ordinate Reference:	Well NEBU 602 #1H - Slot 602 #1H
Company:	B.P.	TVD Reference:	GL 6521' & RKB 15' @ 6536.00usft
Project:	San Juan County, NM NAD83	MD Reference:	GL 6521' & RKB 15' @ 6536.00usft
Site:	NEBU 602 Pad	North Reference:	Grid
Well:	NEBU 602 #1H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Pilot		
Design:	Plan #4		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15.00	0.00	0.00	15.00	0.00	0.00	0.00	0.00	0.00	0.00
San Jose Ss									
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00
500.00	2.00	305.00	499.98	1.00	-1.43	1.75	2.00	2.00	0.00
600.00	4.00	305.00	599.84	4.00	-5.72	6.98	2.00	2.00	0.00
700.00	6.00	305.00	699.45	9.00	-12.86	15.69	2.00	2.00	0.00
800.00	8.00	305.00	798.70	15.99	-22.84	27.88	2.00	2.00	0.00
900.00	10.00	305.00	897.47	24.96	-35.65	43.52	2.00	2.00	0.00
1,000.00	12.00	305.00	995.62	35.91	-51.28	62.60	2.00	2.00	0.00
1,100.00	14.00	305.00	1,093.06	48.81	-69.71	85.10	2.00	2.00	0.00
1,200.00	16.00	305.00	1,189.64	63.65	-90.91	110.98	2.00	2.00	0.00
1,300.00	18.00	305.00	1,285.27	80.42	-114.86	140.21	2.00	2.00	0.00
1,374.31	19.49	305.00	1,355.64	94.12	-134.42	164.09	2.00	2.00	0.00
1,400.00	19.49	305.00	1,379.85	99.03	-141.43	172.66	0.00	0.00	0.00
1,500.00	19.49	305.00	1,474.13	118.17	-168.76	206.02	0.00	0.00	0.00
1,600.00	19.49	305.00	1,568.40	137.30	-196.09	239.38	0.00	0.00	0.00
1,700.00	19.49	305.00	1,662.67	156.43	-223.41	272.73	0.00	0.00	0.00
1,800.00	19.49	305.00	1,756.94	175.57	-250.74	306.09	0.00	0.00	0.00
1,900.00	19.49	305.00	1,851.22	194.70	-278.06	339.45	0.00	0.00	0.00
2,000.00	19.49	305.00	1,945.49	213.83	-305.39	372.81	0.00	0.00	0.00
2,100.00	19.49	305.00	2,039.76	232.97	-332.71	406.17	0.00	0.00	0.00
2,200.00	19.49	305.00	2,134.03	252.10	-360.04	439.52	0.00	0.00	0.00
2,300.00	19.49	305.00	2,228.30	271.23	-387.36	472.88	0.00	0.00	0.00
2,400.00	19.49	305.00	2,322.58	290.37	-414.69	506.24	0.00	0.00	0.00
2,472.58	19.49	305.00	2,391.00	304.26	-434.52	530.45	0.00	0.00	0.00
Ojo Alamo									
2,500.00	19.49	305.00	2,416.85	309.50	-442.01	539.60	0.00	0.00	0.00
2,583.96	19.49	305.00	2,496.00	325.57	-464.96	567.61	0.00	0.00	0.00
Kirtland									
2,600.00	19.49	305.00	2,511.12	328.63	-469.34	572.96	0.00	0.00	0.00
2,700.00	19.49	305.00	2,605.39	347.77	-496.66	606.31	0.00	0.00	0.00
2,800.00	19.49	305.00	2,699.66	366.90	-523.99	639.67	0.00	0.00	0.00
2,900.00	19.49	305.00	2,793.94	386.03	-551.31	673.03	0.00	0.00	0.00
3,000.00	19.49	305.00	2,888.21	405.17	-578.64	706.39	0.00	0.00	0.00
3,098.43	19.49	305.00	2,981.00	424.00	-605.54	739.22	0.00	0.00	0.00
Fruitland									
3,100.00	19.49	305.00	2,982.48	424.30	-605.97	739.75	0.00	0.00	0.00
3,102.57	19.49	305.00	2,984.91	424.79	-606.67	740.61	0.00	0.00	0.00
3,156.51	17.87	305.00	3,036.00	434.70	-620.82	757.88	3.00	-3.00	0.00
Fruitland Coal									
3,200.00	16.56	305.00	3,077.54	442.08	-631.36	770.75	3.00	-3.00	0.00
3,300.00	13.56	305.00	3,174.09	456.99	-652.65	796.74	3.00	-3.00	0.00
3,312.24	13.20	305.00	3,186.00	458.61	-654.97	799.57	3.00	-3.00	0.00
Ignacio Coal									
3,336.85	12.46	305.00	3,210.00	461.75	-659.44	805.03	3.00	-3.00	0.00
Pictured Cliffs Ss									
3,400.00	10.56	305.00	3,271.88	468.97	-669.77	817.63	3.00	-3.00	0.00
3,409.28	10.29	305.00	3,281.00	469.94	-671.14	819.31	3.00	-3.00	0.00
Cottonwood Coal									



Database:	Grand Junction District	Local Co-ordinate Reference:	Well NEBU 602 #1H - Slot 602 #1H
Company:	B.P.	TVD Reference:	GL 6521' & RKB 15' @ 6536.00usft
Project:	San Juan County, NM NAD83	MD Reference:	GL 6521' & RKB 15' @ 6536.00usft
Site:	NEBU 602 Pad	North Reference:	Grid
Well:	NEBU 602 #1H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Pilot		
Design:	Plan #4		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
3,500.00	7.56	305.00	3,370.62	478.01	-682.67	833.38	3.00	-3.00	0.00
3,555.77	5.89	305.00	3,426.00	481.76	-688.02	839.92	3.00	-3.00	0.00
Cahn Coal									
3,600.00	4.56	305.00	3,470.04	484.07	-691.32	843.95	3.00	-3.00	0.00
3,700.00	1.56	305.00	3,569.89	487.13	-695.70	849.29	3.00	-3.00	0.00
3,706.11	1.38	305.00	3,576.00	487.22	-695.83	849.45	3.00	-3.00	0.00
Lewis Sh									
3,748.36	0.11	305.00	3,618.25	487.54	-696.28	850.00	3.00	-3.00	0.00
NEBU Pilot BTV									
3,752.12	0.00	0.00	3,622.00	487.54	-696.28	850.00	3.00	-3.00	1,464.68
NEBU Pilot BTV ALT									
3,800.00	0.00	0.00	3,669.88	487.54	-696.28	850.00	0.00	0.00	0.00
3,900.00	0.00	0.00	3,769.88	487.54	-696.28	850.00	0.00	0.00	0.00
4,000.00	0.00	0.00	3,869.88	487.54	-696.28	850.00	0.00	0.00	0.00
4,100.00	0.00	0.00	3,969.88	487.54	-696.28	850.00	0.00	0.00	0.00
4,200.00	0.00	0.00	4,069.88	487.54	-696.28	850.00	0.00	0.00	0.00
4,300.00	0.00	0.00	4,169.88	487.54	-696.28	850.00	0.00	0.00	0.00
4,396.12	0.00	0.00	4,266.00	487.54	-696.28	850.00	0.00	0.00	0.00
Huerfanito Bentonite									
4,400.00	0.00	0.00	4,269.88	487.54	-696.28	850.00	0.00	0.00	0.00
4,500.00	0.00	0.00	4,369.88	487.54	-696.28	850.00	0.00	0.00	0.00
4,600.00	0.00	0.00	4,469.88	487.54	-696.28	850.00	0.00	0.00	0.00
4,700.00	0.00	0.00	4,569.88	487.54	-696.28	850.00	0.00	0.00	0.00
4,800.00	0.00	0.00	4,669.88	487.54	-696.28	850.00	0.00	0.00	0.00
4,826.12	0.00	0.00	4,696.00	487.54	-696.28	850.00	0.00	0.00	0.00
Chacra Ss									
4,900.00	0.00	0.00	4,769.88	487.54	-696.28	850.00	0.00	0.00	0.00
5,000.00	0.00	0.00	4,869.88	487.54	-696.28	850.00	0.00	0.00	0.00
5,100.00	0.00	0.00	4,969.88	487.54	-696.28	850.00	0.00	0.00	0.00
5,186.12	0.00	0.00	5,056.00	487.54	-696.28	850.00	0.00	0.00	0.00
Lower Cubero Ss									
5,200.00	0.00	0.00	5,069.88	487.54	-696.28	850.00	0.00	0.00	0.00
5,266.12	0.00	0.00	5,136.00	487.54	-696.28	850.00	0.00	0.00	0.00
Cliffhouse Ss									
5,300.00	0.00	0.00	5,169.88	487.54	-696.28	850.00	0.00	0.00	0.00
5,400.00	0.00	0.00	5,269.88	487.54	-696.28	850.00	0.00	0.00	0.00
5,500.00	0.00	0.00	5,369.88	487.54	-696.28	850.00	0.00	0.00	0.00
5,600.00	0.00	0.00	5,469.88	487.54	-696.28	850.00	0.00	0.00	0.00
5,631.12	0.00	0.00	5,501.00	487.54	-696.28	850.00	0.00	0.00	0.00
Menefee									
5,700.00	0.00	0.00	5,569.88	487.54	-696.28	850.00	0.00	0.00	0.00
5,800.00	0.00	0.00	5,669.88	487.54	-696.28	850.00	0.00	0.00	0.00
5,900.00	0.00	0.00	5,769.88	487.54	-696.28	850.00	0.00	0.00	0.00
5,901.12	0.00	0.00	5,771.00	487.54	-696.28	850.00	0.00	0.00	0.00
Point Lookout Ss									
5,991.12	0.00	0.00	5,861.00	487.54	-696.28	850.00	0.00	0.00	0.00
Point Lookout Base									
6,000.00	0.00	0.00	5,869.88	487.54	-696.28	850.00	0.00	0.00	0.00
6,100.00	0.00	0.00	5,969.88	487.54	-696.28	850.00	0.00	0.00	0.00
6,200.00	0.00	0.00	6,069.88	487.54	-696.28	850.00	0.00	0.00	0.00
6,300.00	0.00	0.00	6,169.88	487.54	-696.28	850.00	0.00	0.00	0.00
6,311.12	0.00	0.00	6,181.00	487.54	-696.28	850.00	0.00	0.00	0.00



Planning Report



Database:	Grand Junction District	Local Co-ordinate Reference:	Well NEBU 602 #1H - Slot 602 #1H
Company:	B.P.	TVD Reference:	GL 6521' & RKB 15' @ 6536.00usft
Project:	San Juan County, NM NAD83	MD Reference:	GL 6521' & RKB 15' @ 6536.00usft
Site:	NEBU 602 Pad	North Reference:	Grid
Well:	NEBU 602 #1H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Pilot		
Design:	Plan #4		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
Mancos Sh									
6,400.00	0.00	0.00	6,269.88	487.54	-696.28	850.00	0.00	0.00	0.00
6,500.00	0.00	0.00	6,369.88	487.54	-696.28	850.00	0.00	0.00	0.00
6,600.00	2.00	125.00	6,469.86	486.54	-694.85	848.25	2.00	2.00	0.00
6,700.00	4.00	125.00	6,569.72	483.54	-690.56	843.02	2.00	2.00	0.00
6,750.00	5.00	125.00	6,619.56	481.29	-687.35	839.10	2.00	2.00	0.00
6,800.00	5.00	125.00	6,669.38	478.79	-683.78	834.74	0.00	0.00	0.00
6,900.00	5.00	125.00	6,769.00	473.79	-676.64	826.02	0.00	0.00	0.00
7,000.00	5.00	125.00	6,868.62	468.79	-669.50	817.31	0.00	0.00	0.00
7,042.55	5.00	125.00	6,911.00	466.66	-666.46	813.60	0.00	0.00	0.00
K-86 marker									
7,100.00	5.00	125.00	6,968.23	463.79	-662.36	808.59	0.00	0.00	0.00
7,117.83	5.00	125.00	6,986.00	462.90	-661.09	807.04	0.00	0.00	0.00
K-82 marker									
7,200.00	5.00	125.00	7,067.85	458.79	-655.22	799.88	0.00	0.00	0.00
7,218.22	5.00	125.00	7,086.00	457.88	-653.92	798.29	0.00	0.00	0.00
Upper Gallup									
7,300.00	5.00	125.00	7,167.47	453.79	-648.08	791.16	0.00	0.00	0.00
7,333.65	5.00	125.00	7,201.00	452.11	-645.68	788.23	0.00	0.00	0.00
K-78_0 marker									
7,400.00	5.00	125.00	7,267.09	448.79	-640.94	782.45	0.00	0.00	0.00
7,413.96	5.00	125.00	7,281.00	448.10	-639.95	781.23	0.00	0.00	0.00
Middle Gallup									
7,500.00	5.00	125.00	7,366.71	443.79	-633.80	773.73	0.00	0.00	0.00
7,524.38	5.00	125.00	7,391.00	442.58	-632.06	771.61	0.00	0.00	0.00
K-72 marker									
7,600.00	5.00	125.00	7,466.33	438.80	-626.66	765.02	0.00	0.00	0.00
7,634.80	5.00	125.00	7,501.00	437.06	-624.18	761.98	0.00	0.00	0.00
Sanostee Sh									
7,700.00	5.00	125.00	7,565.95	433.80	-619.52	756.30	0.00	0.00	0.00
7,800.00	5.00	125.00	7,665.57	428.80	-612.39	747.58	0.00	0.00	0.00
7,900.00	5.00	125.00	7,765.19	423.80	-605.25	738.87	0.00	0.00	0.00
7,951.00	5.00	125.00	7,816.00	421.25	-601.60	734.42	0.00	0.00	0.00
Greenhorn Ls									
8,000.00	5.00	125.00	7,864.81	418.80	-598.11	730.15	0.00	0.00	0.00
8,001.19	5.00	125.00	7,866.00	418.74	-598.02	730.05	0.00	0.00	0.00
Graneros Sh									
8,086.52	5.00	125.00	7,951.00	414.47	-591.93	722.61	0.00	0.00	0.00
Two Wells Ss									
8,100.00	5.00	125.00	7,964.43	413.80	-590.97	721.44	0.00	0.00	0.00
8,106.60	5.00	125.00	7,971.00	413.47	-590.50	720.86	0.00	0.00	0.00
Paguate Ss									
8,116.63	5.00	125.00	7,981.00	412.97	-589.78	719.99	0.00	0.00	0.00
Cubero Ss									
8,186.90	5.00	125.00	8,051.00	409.46	-584.76	713.86	0.00	0.00	0.00
Encinal Canyon Ss									
8,200.00	5.00	125.00	8,064.05	408.80	-583.83	712.72	0.00	0.00	0.00
8,242.11	5.00	125.00	8,106.00	406.70	-580.82	709.05	0.00	0.00	0.00
Burro Canyon Ss									
8,282.26	5.00	125.00	8,146.00	404.69	-577.95	705.55	0.00	0.00	0.00
Morrison (Top/Jurassic)									
8,300.00	5.00	125.00	8,163.67	403.80	-576.69	704.01	0.00	0.00	0.00



Planning Report



Database:	Grand Junction District	Local Co-ordinate Reference:	Well NEBU 602 #1H - Slot 602 #1H
Company:	B.P.	TVD Reference:	GL 6521' & RKB 15' @ 6536.00usft
Project:	San Juan County, NM NAD83	MD Reference:	GL 6521' & RKB 15' @ 6536.00usft
Site:	NEBU 602 Pad	North Reference:	Grid
Well:	NEBU 602 #1H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Pilot		
Design:	Plan #4		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
8,400.00	5.00	125.00	8,263.29	398.80	-569.55	695.29	0.00	0.00	0.00
8,468.91	5.00	125.00	8,331.94	395.36	-564.63	689.29	0.00	0.00	0.00
NEBU Pilot BHL ALT									
8,483.03	5.00	125.00	8,346.00	394.65	-563.62	688.05	0.00	0.00	0.00
NEBU 602 #1H Pilot BHL									

Design Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
NEBU Pilot BTV ALT - plan hits target center - Circle (radius 25.00)	0.00	0.01	3,622.00	487.54	-696.28	2,154,628.12	2,811,511.19	36.9207700	-107.5308492
NEBU Pilot BHL ALT - plan misses target center by 161.33usft at 8468.91usft MD (8331.94 TVD, 395.36 N, -564.63 E) - Point	0.00	0.01	8,346.00	487.54	-696.28	2,154,628.12	2,811,511.19	36.9207700	-107.5308492



Database:	Grand Junction District	Local Co-ordinate Reference:	Well NEBU 602 #1H - Slot 602 #1H
Company:	B.P.	TVD Reference:	GL 6521' & RKB 15' @ 6536.00usft
Project:	San Juan County, NM NAD83	MD Reference:	GL 6521' & RKB 15' @ 6536.00usft
Site:	NEBU 602 Pad	North Reference:	Grid
Well:	NEBU 602 #1H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Pilot		
Design:	Plan #4		

Formations						
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
15.00	15.00	San Jose Ss		0.00	0.00	
2,472.58	2,391.00	Ojo Alamo		0.00	0.00	
2,583.96	2,496.00	Kirtland		0.00	0.00	
3,098.43	2,981.00	Fruitland		0.00	0.00	
3,156.51	3,036.00	Fruitland Coal		0.00	0.00	
3,312.24	3,186.00	Ignacio Coal		0.00	0.00	
3,336.85	3,210.00	Pictured Cliffs Ss		0.00	0.00	
3,409.28	3,281.00	Cottonwood Coal		0.00	0.00	
3,555.77	3,426.00	Cahn Coal		0.00	0.00	
3,706.11	3,576.00	Lewis Sh		0.00	0.00	
4,396.12	4,266.00	Huerfano Bentonite		0.00	0.00	
4,826.12	4,696.00	Chacra Ss		0.00	0.00	
5,186.12	5,056.00	Lower Cubero Ss		0.00	0.00	
5,266.12	5,136.00	Cliffhouse Ss		0.00	0.00	
5,631.12	5,501.00	Menefee		0.00	0.00	
5,901.12	5,771.00	Point Lookout Ss		0.00	0.00	
5,991.12	5,861.00	Point Lookout Base		0.00	0.00	
6,311.12	6,181.00	Mancos Sh		0.00	0.00	
7,042.55	6,911.00	K-86 marker		0.00	0.00	
7,117.83	6,986.00	K-82 marker		0.00	0.00	
7,218.22	7,086.00	Upper Gallup		0.00	0.00	
7,333.65	7,201.00	K-78_0 marker		0.00	0.00	
7,413.96	7,281.00	Middle Gallup		0.00	0.00	
7,524.38	7,391.00	K-72 marker		0.00	0.00	
7,634.80	7,501.00	Sanostee Sh		0.00	0.00	
7,951.00	7,816.00	Greenhorn Ls		0.00	0.00	
8,001.19	7,866.00	Graneros Sh		0.00	0.00	
8,086.52	7,951.00	Two Wells Ss		0.00	0.00	
8,106.60	7,971.00	Paguate Ss		0.00	0.00	
8,116.63	7,981.00	Cubero Ss		0.00	0.00	
8,186.90	8,051.00	Encinal Canyon Ss		0.00	0.00	
8,242.11	8,106.00	Burro Canyon Ss		0.00	0.00	
8,282.26	8,146.00	Morrison (Top/Jurassic)		0.00	0.00	