

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

30-043-20912

APPLICATION FOR PERMIT TO DRILL, DEEPEN, OR PLUG BACK

1a. TYPE OF WORK
DRILL ☒ DEEPEN ☐ PLUG BACK ☐

b. TYPE OF WELL
OIL WELL ☒ GAS WELL ☐ OTHER ☐ SINGLE ZONE ☐ MULTIPLE ZONE ☐

2. NAME OF OPERATOR
ENERGY DEVELOPMENT CORPORATION 7772

3. ADDRESS OF OPERATOR
1000 LOUISIANA STE 2900 HOUSTON TX 77002

4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.)
At surface 2372 FWL AND 2290 FSL
At proposed prod. zone 2290 S, 2372 W 400N, 1725W
1725 FWL AND 1400 FSL

14. DISTANCE IN MILES AND DIRECTION FROM NEAREST TOWN OR POST OFFICE*
APPROXIMATELY 12 MILES WEST FROM CORRA, NEW MEXICO

15. DISTANCE FROM PROPOSED LOCATION TO NEAREST PROPERTY OR LEASE LINE, FT. (Also to nearest dril. unit line, if any)
2290

18. DISTANCE FROM PROPOSED LOCATION TO NEAREST WELL, DRILLING, COMPLETED, OR APPLIED FOR, ON THIS LEASE, FT.
5500 MD

21. ELEVATIONS (Show whether DP, RT, GR, etc.)
6928.5' 6929'

23. PROPOSED CASING AND CEMENTING PROGRAM

SIZE OF HOLE	SIZE OF CASING	WEIGHT PER FOOT	SETTING DEPTH	QUANTITY OF CEMENT
12"	K-55, 9 7/8"	36*/FT	350'	200 SLS
8 3/4"	H-80, 7"	23*/FT	3500'	520 SLS *

* 7" CASING WILL BE CEMENTED IN TWO STAGES DVTOL @ 1800'.

A VERTICAL PILOT HOLE WILL BE DRILLED TO 5500' MD, TO EVALUATE THE MANACES AND SEMILLA FORMATIONS BY LOG. A BALANCED PLUG WILL BE PLACED FROM 3550' TO 3950'. THE PLUG WILL BE PRESSED OFF TO 3638'. THREE HORIZONTAL LATERALS WILL BE KICKED OFF ACCORDING TO THE ATTACHED DIRECTIONAL PROGRAM

RECEIVED

OCT 25 1993

OIL CON. DIV./

DIST-3

IN ABOVE SPACE DESCRIBE PROPOSED PROGRAM: If proposal is to deepen or plug back, give data on present productive zone and location of new productive zone. If proposal is to drill or deepen directionally, give pertinent data on subsurface locations and measured and true vertical depths. Give blowout preventer program, if any.

24. SIGNED [Signature] TITLE SUP. REG. ENV. AFFAIRS DATE 10-1-93
(This space for Federal or State office use)

PERMIT NO. _____ APPROVAL DATE _____
AREA MANAGER
APPROVED BY SHIRLEY MONDY Acting TITLE RIO PUERCO RESOURCE AREA DATE OCT 22 1993
CONDITIONS OF APPROVAL, IF ANY:

C-14 For DD order
R-9330 @

*See Instructions On Reverse Side

Title 18 U.S.C. Section 1001, makes 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.

NMOCD

OIL CONSERVATION DIVISION

P.O. Box 2088
Santa Fe, New Mexico 87504-2088

DISTRICT I

P.O. Box 1980, Hobbs, NM 88240

DISTRICT II

P.O. Drawer DD, Artesia, NM 88210

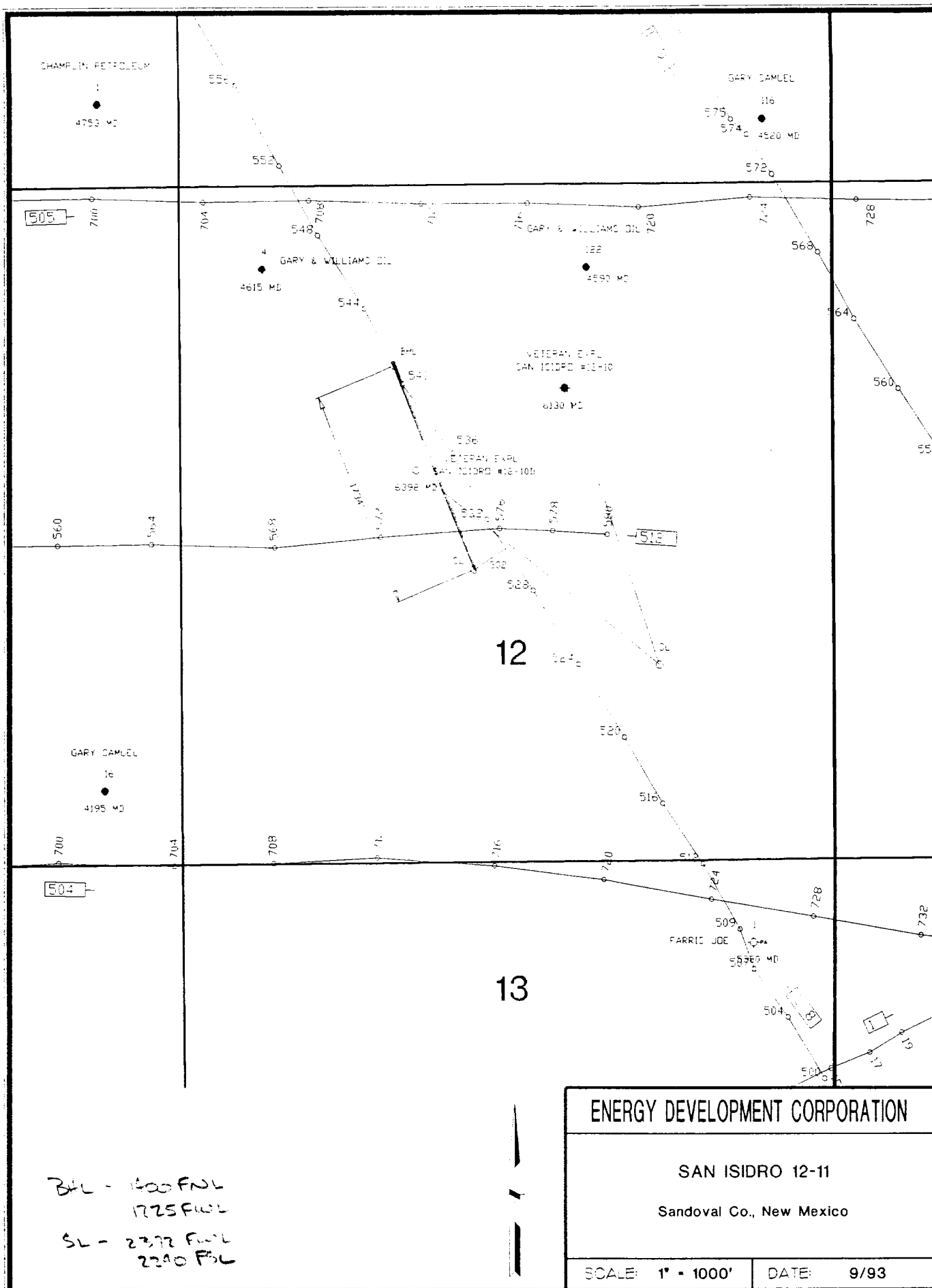
DISTRICT III

1000 Rio Brazos Rd., Aztec, NM 87410

WELL LOCATION AND ACREAGE DEDICATION PLAT

All Distances must be from the outer boundaries of the section

Operator ENERGY DEVELOPMENT CORP.			Lease SAN ISIDRO 12		Well No. 11
Unit Letter K	Section 12	Township 20 NORTH	Range 3 WEST	County SANDOVAL	
Actual Footage Location of Well: 341-1400 P.M. 1725 P.M. 2290 feet from the SOUTH line and 2372 feet from the WEST line					
Ground Level Elevation 6928.5		Producing Formation MANGOS	Pool RIO PUECO-MANGOS		Dedicated Acreage: 640 Acres
1. Outline the acreage dedicated to the subject well by colored pencil or hachure marks on the plat below. 2. If more than one lease is dedicated to the well, outline each and identify the ownership thereof (both as to working interest and royalty). 3. If more than one lease of different ownership is dedicated to the well, have the interest of all owners been consolidated by communitization, unitization, force-pooling, etc.? ☐ Yes ☐ No If answer is "yes" type of consolidation _____ If answer is "no" list of owners and tract descriptions which have actually been consolidated. (Use reverse side of this form necessary.) _____ No allowable will be assigned to the well unit all interests have been consolidated (by communitization, unitization, forced-pooling, otherwise) or until a non-standard unit, eliminating such interest, has been approved by the Division.					
			OPERATOR CERTIFICATION I hereby certify the the information contained herein is true and complete to the best of my knowledge and belief. Signature: <i>Mark S. Gording</i> Printed Name: MARK S. GORDING Position: SR. REG. AND ENV. AFFAIRS Company: ENERGY DEVELOPMENT CORP. Date: 10-1-93		
			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 knowledge and belief. Date Surveyed: SEPTEMBER 14, 1993 Signature & Seal of Professional Surveyor: <i>[Signature]</i> Certificate No. PROFESSIONAL SURVEYOR: 678 GARY L. JONES, 7977 93-11-1741		



WELL PROGRAM

San Isidro 5-2

Sandoval County, NM

Page 2

5-21-93

III. PRESSURE CONTROL EQUIPMENT

TYPE - A 3M blowout prevention system will be used during the drilling phase of this project. A blowout preventer schematic and choke manifold schematic are attached. BOP equipment will consist of a 10" -3M Shaefer blind and pipe rams, a 3M Shaefer bag type annular BOP. The entire stack will be installed on a 11", 3M slip on casing head welded to the 9-5/8" surface casing. A tapered drill string will not be used. Pipe rams will be dressed for 4-1/2" OD drill pipe while drilling the 8-3/4" hole and 3-1/2" OD drill pipe while drilling the 6-1/4" hole. Appropriate size pipe rams will be used when running casing. H₂S gas is not anticipated, so H₂S trim will not be installed. A full opening valve will be kept on the rig floor in the open position at all times with appropriate heads and subs for the drill strings.

BOP TESTING PROCEDURE - After nipple up of the BOP stack, a test plug will be installed. Pipe and blind rams will be tested to 3000 psi. Annular preventers will be tested to 1500 psi. All tests will be conducted using water and the pressure must hold for 10 minutes with no measurable leakoff.

The choke manifold will be tested to 3000 psi from the stack to the most downstream valve. The kill line will be tested to 3000 psi.

The above test procedures will be prepared at 14-day intervals, or following repairs to the BOP system or whenever a seal subject to test pressure is broken. The annular preventers will be functionally operated weekly. The ram preventers will be operated each trip. All BOPE tests will be recorded in the drillers log.

IV. CASING AND CEMENTING PROGRAM

A. CASING PROGRAM

HOLE SIZE	CASING DESCRIPTION	INTERVAL	LENGTH	SF T	SF C	SF B
12-1/4"	9-5/8" 36#, K-55, ST&C	0 - 350'	350'	33.6	11.5	2.6
8-3/4"	7" 23#, N-80, LT&C	0 - 3500'	3500'	5.3	2.3	3.2
6-1/4"						

WELL PROGRAM

San Isidro 5-2

Sandoval County, NM

Page 3

B. CEMENTING PROGRAM

CASING/HOLE SIZE	CEMENT SLURRY	SXS	PPG	YIELD
9-5/8" 12-1/4"	Standard Cement + 2% CaCl + 0.25# Flocele	200	15.6	1.19
FIRST STAGE				
7" 8-3/4"	Lead: Halliburton Lite + 2% CaCl + 0.5#/sk Flocele	160	12.6	1.75
	Tail: Standard cement + 2% CaCl + 0.25#/SK Flocele	110	15.6	1.19
SECOND STAGE				
7" 8-3/4"	Lead: Halliburton Lite + 2% CaCl + 0.5#/SK Flocele	200	12.6	1.75
	Tail: Standard cement + 2% CaCl + 0.25% Flocele	50	15.6	1.19

C. CASING PRESSURE TESTS

The 9-5/8" and 7" casing strings will be pressure tested before the shoe is drilled. The test pressure will be 1000 psi. An acceptable leakoff will be 50 psi or less in 30 minutes.

V. MUD PROGRAM

INTERVAL	TYPE	WEIGHT (PPG)
0 - 350'	Water-Gel	8.4
350 - 3500'	Low solids, non-dispersed	8.4
3500 - 5500' (vertical section)	KCL Polymer Aerated	9.0
5538' - 6215' (horizontal section)	KCL Polymer Aerated	9.0

WELL PROGRAM

San Pedro 5-2

Sandoval County, NM

Page 4

VI. PROPOSED TESTING, LOGGING AND CORING PROGRAMS

A. LOGGING PROGRAM

<u>Run No. 1</u>	<u>Depth Interval</u>
DIL-SFL/CNL/FDC Triple Combo	350 - 3500' TVD
<u>Run No. 2</u>	
DIL-SFL/Array-Sonic LDL/CNL/NGS FMI w/Dipmeter	3500 - 5500' TVD
<u>Run No. 3</u>	
*MWD w/GR	3785 - 6253' MD

*No other logs will be run in the horizontal section of the hole.

B. CORING PROGRAM

No coring is anticipated.

VII. EXPECTED BOTTOMHOLE PRESSURES AND TEMPERATURE

The expected bottomhole pressure in the Mancos is 1600 psi. The expected bottomhole temperature is 150° F.

VIII. DRILLING ACTIVITY

Anticipated Commencement Date:	Oct. 1, 1993
Drilling Days	+/- 30 Days
Completion Days	+/- 10 Days

Surface Use Plan

Energy Development Corporation
San Isidro 12-11
Sandoval County, New Mexico

MULTI-POINT SURFACE USE AND OPERATIONS PLAN

I. EXISTING ROADS

- A. The proposed well site is staked and the surveyor's plat is attached. Four 200 ft. reference stakes are present.
- B. To reach the location from Cuba, New Mexico, go West/ Southwest on Hwy. #197 about 9.5 miles to the Little Chijulla turnoff. Proceed West on Chijulla road for 1.1 miles to location road on left, follow the location road for approximately 1 mile to turnoff on right follow for about 0.5 miles to the location.
- C. Access roads- refer to Map "B".
- D. Existing roads within a one mile radius - refer to Map "A"
- E. Culverts will be installed as per BLM instruction. In general, the existing roads will be maintained in the same or better condition as existing prior to the commencement of operations and maintenance will continue until final abandonment and reclamation of the well location.

II. PLANNED ACCESS ROADS

- A. Width - 16 foot running , crowned and ditched for drilling operations.
- B. Maximum grade: estimated at 2%.
- C. Turnouts : None anticipated.
- D. Drainage design : At the turnoff from the main location road a culvert will be placed under the road to facilitate the natural drainage. In addition, scrap limbs from woodcutting in the area will be placed into existing gulleys next to the location road to prevent additional erosion.
- E. Culverts, cuts, and fills: culverts and/or water ditches and bars will be constructed as necessity. Brush vegetation will be stripped and stockpiled prior to construction. No significant cuts are anticipated in the construction of the new access road.
- F. Surface material: Native materials for the construction of the access road should be adequate for drilling operations. If gravel is necessary, it will be obtained from the BLM gravel pit located in Section 18-T20N-R1W.
- G. Gates, cattle guards, or fence cuts: as required.

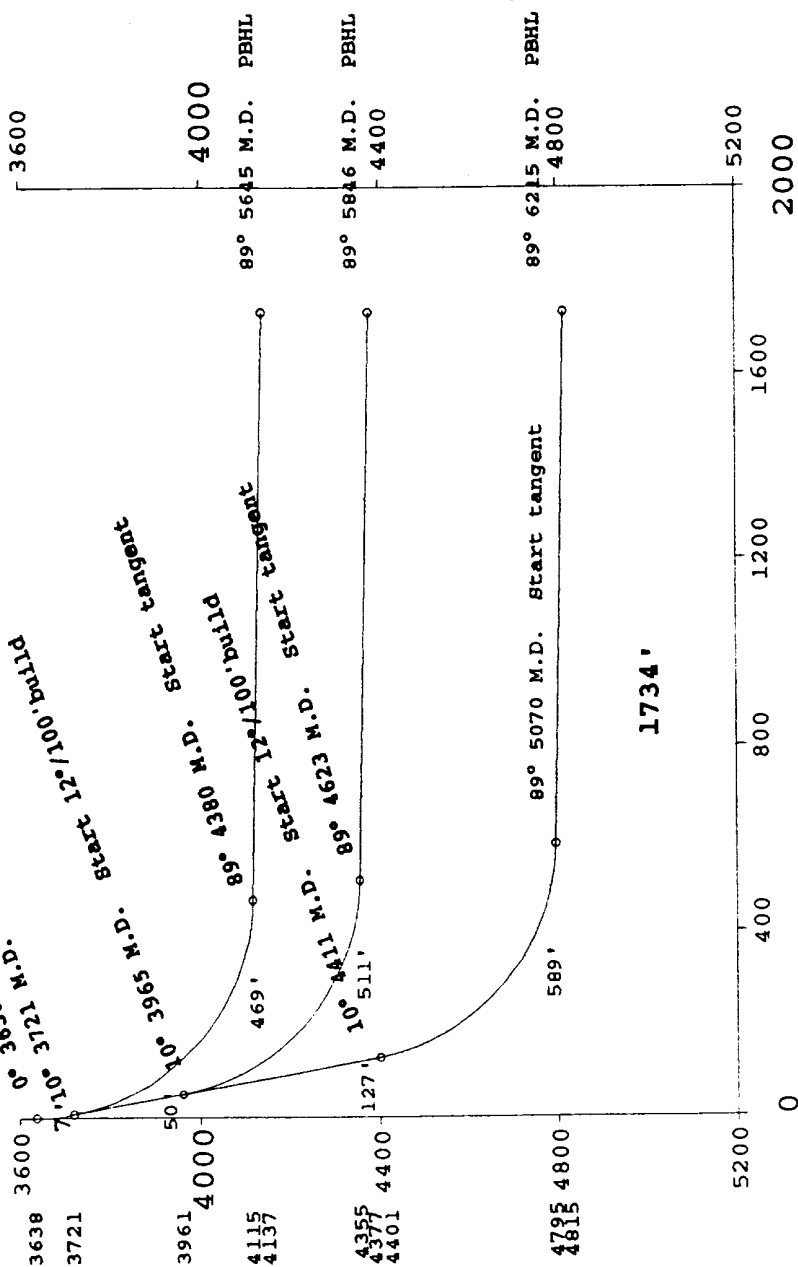
III. LOCATION OF EXISTING WELLS WITHIN A ONE-MILE RADIUS

- A. Water wells: None
- B. Abandoned wells: FARRIS #1
- C. Producing wells: SAN ISIDRO 12-10 ; SAN ISIDRO 11-16
- D. Disposal wells: None
- E. Drilling wells: None
- F. Completing wells: None
- G. Shut-in wells: SAN ISIDRO 12-2 ; SAN ISIDRO 12-4
- H. Injection wells: None
- I. Monitoring wells: None

Proposed B.H.L.
1734' Displacement
@ 338.09° Azimuth
North-1609' West-647'
Top-4137'TVD, 5645'MD
Gallup-4377'TVD, 5846'MD
Semilla-4815'TVD, 6215'MD

PLANE OF PROPOSAL
338.9°

VERTICAL SECTION
Scale 1" = 400'



HORIZONTAL PLAN
Scale 1" = 500'

ENERGY DEVELOPMENT CORPORATION
SAN ISIDRO 12-11
SANDOVAL COUNTY, NEW MEXICO
GALLUP TARGET

Measured Depth Feet	B O R E - H O L E		TRUE Vertical Depth Feet	R E C T A N G U L A R C O O R D I N A T E S		VERTICAL SECTION Feet	C L O S U R E S		DLS Deg/100'
	Inclination Deg	Direction Deg		North/South Feet	East/West Feet		Distance Feet	Direction Deg	
4445.00	67.60	338.09	4319.40	313.43N	126.06W	337.80	337.83	338.09	12.00
4475.00	71.20	338.09	4329.96	339.48N	136.54W	365.87	365.91	338.09	12.00
4505.00	74.80	338.09	4338.73	366.09N	147.24W	394.55	394.59	338.09	12.00
4535.00	78.40	338.09	4345.68	393.16N	158.13W	423.73	423.77	338.09	12.00
4565.00	82.00	338.09	4350.78	420.58N	169.16W	453.28	453.33	338.09	12.00
4595.00	85.60	338.09	4354.02	448.25N	180.29W	483.10	483.15	338.09	12.00
4623.33	89.00	338.09	4355.36	474.50N	190.85W	511.39	511.44	338.09	12.00
Start tangent									
5123.33	89.00	338.09	4364.08	938.32N	377.39W	1011.27	1011.37	338.09	0.00
5623.33	89.00	338.09	4372.81	1402.13N	563.94W	1511.14	1511.29	338.09	0.00
5846.08	89.00	338.09	4376.70	1608.76N	647.04W	1733.83	1734.00	338.09	0.00

PHIL

Final Station Closure Distance: 1734.00 Feet; Direction: N21 54W

GREAT LAND DIRECTIONAL DRILLING, INC.

ENERGY DEVELOPMENT CORPORATION
 SAN ISIDRO 12-11
 SANDOVAL COUNTY, NEW MEXICO

Slot Elevation: 0.00

Plane of Vertical Section: N 21 6 W

Minimum Curvature Calculations

Measured Depth Feet	B O R E - H O L E		TRUE Vertical Depth Feet	R E C T A N G U L A R C O O R D I N A T E S		VERTICAL SECTION Feet	C L O S U R E S		DLS Deg/100'
	Inclination Deg	Direction Deg		North/South	East/West Feet		Distance Feet	Direction Deg	
3638.00	0.00	0.00	3638.00	0.00	0.00	0.00	0.00	0.00	0.00
Start build									
3668.00	3.60	338.09	3667.98	.87N	.35W	.94	.94	338.06	12.00
3698.00	7.20	338.09	3697.84	3.49N	1.40W	3.76	3.76	338.09	12.00
3721.33	10.00	338.09	3720.91	6.73N	2.71W	7.25	7.25	338.09	12.00
3751.33	13.60	338.09	3750.27	12.42N	5.00W	13.39	13.39	338.09	12.00
3781.33	17.20	338.09	3779.19	19.81N	7.97W	21.35	21.35	338.09	12.00
3811.33	20.80	338.09	3807.55	28.87N	11.61W	31.12	31.12	338.09	12.00
3841.33	24.40	338.09	3835.24	39.56N	15.91W	42.64	42.65	338.09	12.00
3871.33	28.00	338.09	3862.16	51.85N	20.85W	55.88	55.89	338.09	12.00
3901.33	31.60	338.09	3888.18	65.68N	26.42W	70.79	70.79	338.09	12.00
3931.33	35.20	338.09	3913.23	81.00N	32.58W	87.30	87.31	338.09	12.00
3961.33	38.80	338.09	3937.18	97.75N	39.31W	105.35	105.36	338.09	12.00
3991.33	42.40	338.09	3959.96	115.86N	46.60W	124.86	124.88	338.09	12.00
4021.33	46.00	338.09	3981.46	135.26N	54.40W	145.78	145.79	338.09	12.00
4051.33	49.60	338.09	4001.61	155.88N	62.69W	167.99	168.01	338.09	12.00
4081.33	53.20	338.09	4020.32	177.62N	71.44W	191.43	191.45	338.09	12.00
4111.33	56.80	338.09	4037.52	200.42N	80.61W	216.00	216.02	338.09	12.00
4141.33	60.40	338.09	4053.15	224.17N	90.16W	241.60	241.63	338.09	12.00

GREAT LAND DIRECTIONAL DRILLING, INC.

ENERGY DEVELOPMENT CORPORATION
 SAN ISIDRO 12-11
 SANDOVAL COUNTY, NEW MEXICO
 GALLUP TARGET

Slot Elevation: 0.00
 Plane of Vertical Section: N 21 6 W

Minimum Curvature Calculations

Measured Depth Feet	B O R E - H O L E		TRUE Vertical Depth Feet	R E C T A N G U L A R C O O R D I N A T E S		VERTICAL SECTION Feet	C L O S U R E S		DLS Deg/100'
	Inclination Deg	Direction Deg		North/South Feet	East/West Feet		Distance Feet	Direction Deg	
3721.33	10.00	338.09	3720.91	6.73N	2.71W	7.25	7.25	338.09	0.00
Start tangent									
3965.00	10.00	338.09	3960.88	45.99N	18.50W	49.56	49.57	338.09	0.00
Start 12°/100'build									
3995.00	13.60	338.09	3990.24	51.68N	20.78W	55.69	55.70	338.09	12.00
4025.00	17.20	338.09	4019.16	59.07N	23.76W	63.66	63.67	338.09	12.00
4055.00	20.80	338.09	4047.52	68.13N	27.40W	73.42	73.43	338.09	12.00
4085.00	24.40	338.09	4075.21	78.82N	31.70W	84.95	84.96	338.09	12.00
4115.00	28.00	338.09	4102.12	91.11N	36.64W	98.19	98.20	338.09	12.00
4145.00	31.60	338.09	4128.15	104.94N	42.21W	113.10	113.11	338.09	12.00
4175.00	35.20	338.09	4153.19	120.26N	48.37W	129.61	129.62	338.09	12.00
4205.00	38.80	338.09	4177.15	137.01N	55.10W	147.66	147.67	338.09	12.00
4235.00	42.40	338.09	4199.92	155.12N	62.39W	167.17	167.19	338.09	12.00
4265.00	46.00	338.09	4221.42	174.52N	70.19W	188.08	188.10	338.09	12.00
4295.00	49.60	338.09	4241.57	195.13N	78.48W	210.30	210.32	338.09	12.00
4325.00	53.20	338.09	4260.29	216.88N	87.23W	233.74	233.76	338.09	12.00
4355.00	56.80	338.09	4277.49	239.68N	96.40W	258.31	258.33	338.09	12.00
4385.00	60.40	338.09	4293.12	263.43N	105.95W	283.91	283.94	338.09	12.00
4415.00	64.00	338.09	4307.11	288.05N	115.85W	310.44	310.47	338.09	12.00

ENERGY DEVELOPMENT CORPORATION

WELL PROGRAM

WELL: San Isidro Well No. 12-11
AREA: Sandoval County, New Mexico
SURFACE LOCATION: 2372' FWL & 2290' FSL of Section 5-T20N-R3W
PBHL: 1725' FWL & 1400' FNL of Section 32-T20N-R3W
KB ELEVATION: 6,928.5'

I ESTIMATED TOPS OF IMPORTANT GEOLOGIC MARKERS (ASSUMES KB ELEVATION OF 6,928.5').

<u>FORMATION</u>	<u>TVD</u>	<u>SUBSEA</u>
CLIFFHOUSE	1,700	5,228.5
MENEFEE	2,350	4,578.5
POINT LOOKOUT	2,970	3,958.5
MANCOS "A"	3,900	3,028.5
MANCOS "B"	4,060	2,868.5
MANCOS "C"	4,200	2,728.5
MANCOS "D"	4,340	2,588.5
TOCITO	4,490	2,438.5
SEMILLA	4,700	2,228.5
DAKOTA	5,230	1,698.5

II ESTIMATED DEPTHS OF ANTICIPATED WATER, OIL, GAS OR MINERAL FORMATIONS

MENEFEE	2,350-2,969	Sand, shale, coal (oil & gas)
POINT LOOKOUT	2,970-3,159	Sand (oil & gas)
MANCOS "A" - "D"	3,900-4,489	Sand & shale (oil & gas)
SEMILLA	4,700-5,229	Sand & shale (oil & gas)

Measured Depth	B O R E - H O L E		TRUE Vertical Depth	R E C T A N G U L A R C O O R D I N A T E S		VERTICAL SECTION	C L O S U R E S		DLS Deg/100'
	Inclination	Direction		North/South	East/West		Distance	Direction	
Feet	Deg	Deg	Feet	Feet	Feet	Feet	Feet	Deg	Deg/100'
4171.33	64.00	338.09	4067.14	248.79N	100.06W	268.13	268.16	338.09	12.00
4201.33	67.60	338.09	4079.44	274.17N	110.27W	295.49	295.52	338.09	12.00
4231.33	71.20	338.09	4089.99	300.22N	120.75W	323.56	323.59	338.09	12.00
4261.33	74.80	338.09	4098.76	326.83N	131.45W	352.24	352.28	338.09	12.00
4291.33	78.40	338.09	4105.71	353.90N	142.34W	381.42	381.46	338.09	12.00
4321.33	82.00	338.09	4110.82	381.33N	153.37W	410.97	411.01	338.09	12.00
4351.33	85.60	338.09	4114.06	408.99N	164.50W	440.79	440.83	338.09	12.00
4379.67	89.00	338.09	4115.39	435.25N	175.06W	469.08	469.13	338.09	12.00
Start tangent									
4879.67	89.00	338.09	4124.12	899.06N	361.60W	968.96	969.06	338.09	0.00
5379.67	89.00	338.09	4132.84	1362.88N	548.15W	1468.83	1468.98	338.09	0.00
5644.73	89.00	338.09	4137.47	1608.76N	647.04W	1733.83	1734.00	338.09	0.00
PBHL									
Final Station Closure Distance: 1734.00 Feet; Direction: N21 54W									

Measured Depth Feet	B O R E - H O L E		TRUE Vertical Depth Feet	R E C T A N G U L A R C O O R D I N A T E S		VERTICAL SECTION Feet	C L O S U R E S		DLS Deg/100'
	Inclination Deg	Direction Deg		North/South	East/West Feet		Distance Feet	Direction Deg	
4861.43	64.00	338.09	4746.75	359.97N	144.78W	387.95	387.99	338.09	12.00
4891.43	67.60	338.09	4759.05	385.35N	154.99W	415.31	415.35	338.09	12.00
4921.43	71.20	338.09	4769.60	411.40N	165.46W	443.38	443.43	338.09	12.00
4951.43	74.80	338.09	4778.37	438.01N	176.17W	472.07	472.11	338.09	12.00
4981.43	78.40	338.09	4785.32	465.08N	187.06W	501.24	501.29	338.09	12.00
5011.43	82.00	338.09	4790.43	492.51N	198.09W	530.80	530.85	338.09	12.00
5041.43	85.60	338.09	4793.67	520.17N	209.21W	560.61	560.67	338.09	12.00
5069.76	89.00	338.09	4795.00	546.42N	219.77W	588.91	588.96	338.09	12.00
Start tangent									
5569.76	89.00	338.09	4803.73	1010.24N	406.32W	1088.78	1088.89	338.09	0.00
6069.76	89.00	338.09	4812.45	1474.05N	592.86W	1588.65	1588.81	338.09	0.00
6214.97	89.00	338.09	4814.99	1608.76N	647.04W	1733.83	1734.00	338.09	0.00
PEHL									
Final Station	Closure Distance:	1734.00 Feet;	Direction: N21 54W						

GREAT LAND DIRECTIONAL DRILLING, INC.

ENERGY DEVELOPMENT CORPORATION
 SAN ISIDRO 12-11
 SANDOVAL COUNTY, NEW MEXICO
 SEMILLA TARGET

Slot Elevation: 0.00

Plane of Vertical Section: N 21 6 W

Minimum Curvature Calculations

Measured Depth Feet	B O R E - H O L E		TRUE Vertical Depth Feet	R E C T A N G U L A R C O O R D I N A T E S		VERTICAL SECTION Feet	C L O S U R E S		DLS Deg/100'
	Inclination Deg	Direction Deg		North/South Feet	East/West Feet		Distance Feet	Direction Deg	
3721.33	10.00	338.09	3720.91	6.73N	2.71W	7.25	7.25	338.09	0.00
Start tangent									
4221.33	10.00	338.09	4213.31	87.28N	35.10W	94.07	94.08	338.09	0.00
4411.43	10.00	338.09	4400.52	117.91N	47.42W	127.07	127.09	338.09	0.00
Start 12°/100' build									
4441.43	13.60	338.09	4429.88	123.60N	49.71W	133.21	133.22	338.09	12.00
4471.43	17.20	338.09	4458.80	130.99N	52.68W	141.17	141.19	338.09	12.00
4501.43	20.80	338.09	4487.16	140.05N	56.33W	150.94	150.95	338.09	12.00
4531.43	24.40	338.09	4514.85	150.74N	60.63W	162.46	162.48	338.09	12.00
4561.43	28.00	338.09	4541.77	163.03N	65.57W	175.71	175.72	338.09	12.00
4591.43	31.60	338.09	4567.79	176.86N	71.13W	190.61	190.63	338.09	12.00
4621.43	35.20	338.09	4592.83	192.18N	77.29W	207.12	207.14	338.09	12.00
4651.43	38.80	338.09	4616.79	208.93N	84.03W	225.17	225.19	338.09	12.00
4681.43	42.40	338.09	4639.56	227.04N	91.31W	244.69	244.71	338.09	12.00
4711.43	46.00	338.09	4661.07	246.44N	99.12W	265.60	265.62	338.09	12.00
4741.43	49.60	338.09	4681.22	267.05N	107.41W	287.82	287.84	338.09	12.00
4771.43	53.20	338.09	4699.93	288.80N	116.16W	311.26	311.29	338.09	12.00
4801.43	56.80	338.09	4717.13	311.60N	125.32W	335.82	335.86	338.09	12.00
4831.43	60.40	338.09	4732.76	335.35N	134.88W	361.42	361.46	338.09	12.00

LOCATION VERIFICATION MAP



SCALE: 1" = 2000'

CONTOUR INTERVAL 10'

SEC. 12 TWP. 20N RGE. 3W

SURVEY N.M.P.M.

COUNTY SANDOVAL STATE N.M.

DESCRIPTION 2372' FWL & 2290' FSL

ELEVATION 6928.5'

OPERATOR ENERGY DEVELOPMENT CORP.

LEASE SAN ISIDRO 12 #11

U.S.G.S. TOPOGRAPHIC MAP

MESA PORTALES, N.M.

JOHN WEST ENGINEERING
HOBBS, NEW MEXICO
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