PERMIT APPLICATION APPENDICES

APPENDIX A
DENR LETTER





DEPARTMENT of ENVIRONMENT and NATURAL RESOURCES

PMB 2020
JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3182
www.state.sd.us/denr

February 23, 2010

Mr. Richard E. Blubaugh Vice President EH&S Resources Powertech (USA) Inc. 5575 DTC Parkway, Suite 140 Greenwood Village, CO 80111

Re: Dewey-Burdock Project, Class V Well Rules

Dear Mr. Blubaugh:

This letter is in response to your January 4, 2010 letter concerning South Dakota's ARSD 74:55:02 Underground Injection Control Class V Rules regarding waste disposal well installation and operation.

- The Class V rules do not require state approval of a Class V well and do not require a surety arrangement.
- The Class V rules allow injection subject to SDCL 34A-2 governing the prevention of pollution of the waters of the state. This being the case, Powertech will need to ensure any Class V injection will not pollute the waters of the state. Powertech could show this through an EPA approved Class V permit.
- The Class V rules state Powertech will need to notify the department of the well within 30 days of well completion.
- Pursuant to South Dakota's In situ Leach Mining Rules, ARSD 74:29:11:03 (6), as part of its mine permit application, Powertech will need to provide information regarding the composition of all known and anticipated wastes and procedures for their disposal. This includes Class V injection.

DENR is coordinating with EPA and NRC where possible to streamline the permitting process, reduce duplication, and reach the same technical and scientific conclusions.

Sincerely,

Bill Markley, Ground Water Quality Program Administrator

cc: Valois Shea, US Environmental Protection Agency Region VIII Ronald Burrows, US Nuclear Regulator Commission

APPENDIX B OIL AND GAS WELLS PLUGGING RECORDS

ORIGINAL WELL CONSTRUCTION	DURING OPERATION	PLUGGING AND ABANDONMENT CONSTRUCTION
	API No. 4004705095 2-7S-1E	
	Surface	Surface
	Surface Casing 8 5/8", 24#, set @ 142' with 60 sx	10 sx @ Surface Surface Casing 8 5/8", 24#, set @ 142' with 60 sx 25 sx @ 325'-400' (Lakota/Morrison)
		Balance of hole filled with gel-based drilling mud 25 sx @ 525'-600' (Morrison)
Perforations None (DH) Hole Size 11" (to 145') & 7 7/8" 145'-TD	Total Depth 2447'	25 sx 1575'-1650' (Opeche/Minnelusa) 25 sx 2360' - 2435' (Minnelusa) Feet of cement from Plugging Report

PLUGGING RECORD

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Karl To					1		dent			
_ocation of W						1	Sec-Twp	-Rge or Block	& Survey	County
0 m 327	Sp. Caction		-01E			 				Fall River
Application to in name of	drill this well was	filed	Has this well produced oil o	ever or gas		ter of w (bbls/da		ompletion (in: Gas (MCF		•
A manage in	Dolesal, Jr.			-	011	(wasa) ust	"	Gas (MCI	, 40,	Dry? ₹
Date plugged:	WALTER OF	·	Total depth	- 1	Amoun	t well -	roducin	g when plugg	ed:	
2			Total debrii	- 1		t wen p bbls/day		Gas (MCF		Water (bbls./day)
Anionist	19. 195%		9,14491	,	. 10	236		None_		Tone
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formation oper time of pluggin	formation contains. Indicate which to well-bore at ang				<u> </u>				giving an	ones squeeze cemen count cement.
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				CASING	RECORD					
Size pipe	Put in well (ft.)	Pulled out		2) (ft)	Olive den	th and I			Packers and	i shoes
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Was well filled	with mud-laden fi	uid, accordin	g to regulations	?	Indicate	deepes	t forma	tion containin	g fresh wate	r.
To addition to	Yes		Al- 6 10 11 1			el bost		no o fo}-	ton and 12 miles	all mouth and are a
of plugging op letter from sur ging which mi	erations to base of face owner authori ght be required.	fresh wate zing comple	r sand, perforation of this well	ed interv as a wa	val to free ter well	h water and agr	sand, reeing to	neme and adds	ess of surfa liability for	e all pertinent detai ce owner, and attac any subsequent plu
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					Committee.		A Ker .	VK (1971)		

DO NOT WRITE BELOW THIS LINE

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INSTRUCTIONS

File 3 copies of this form with Secretary, Oil and Gas Board, Pierre.

Coment Plugs Det As Follows:

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25				Týs	24351	÷0	2000
	no: I	٠		lycoir	1650	to	1575
	acks			-	5001	ťο	5251
	-30.18			難	4001	10	325
	lact.c		•		1651	to	901

Dry hole Marker and 10 sacks at surface. Melance of hole filled with gel-base drilling mud.

George Dolezal Jr., Sun Oil Co., etal.

No. 1 Earl Darrow

Location:

C SE SE Section 2, T. 78. R. 1E. 660' FSL 660' FEL Fall River County, South Dakota.

Ground 3792' К. В. 3797

Contractor:

Baker Drilling Company Rig No. 3 - Sullivan draw works Tool Pusher: Jim Baker Drillers: Don Garhart Ed Buchannan

Spud Date:

July 24, 1964

Completion Date:

August 19, 1964

140' 8-5/8" used 24# @ 142' ground with 60 sacks of regular cement.

Hole Bize:

Constitution of the sugar and the 11" cable tool hole to 145' 7-7/8" from 145' to total depth.

Mud:

Mo-Mar Mud Company Casper, Wyoming J. M. Bunce Engineer Gel base

Logging: ::

Drilling time: From surface casing to total depth (Geolograph)

Schlumberger: Dual Induction-Laterlog

Schlumberger: Sonic Log-Gamma Ray 147.1 to 2441.1

Samples:

10-foot samples 140 - 2100 feet 5-foot samples 2100 - 2250 feet 10-foot samples 2250 - 2450 feet

Samples on file at AmStrat in Denver.

Geology: ...

Well site geology by S. D. Ayres

Lost Circulation: Lost minor amounts of mud from 1630' to total depth.

2446' - Schlumberger

ta		

Plugged and Abandoned

Plugs:	1650' to	2360	- 25 - 25	sacks sacks
	600' to	525		sacks
•	. 400° to	325	- 25	sacks
•	165' to	90' -	-525	sacks

Dry-hole marker and 10 sacks at surface.

Drill Stem Tests: Schlumberger Formation Tester 1688' to 1690.5' Converse sand. Tool open 30 minutes
Tool shut in 23 minutes Recovered 600 co mud Pressures O

Cores:

Core #1-2155' to 2206'. First Leo zone (see sample desc.)

ELECTRIC LOG FORMATION TOFS

Formation	<u>Depth</u>	Datum
Fuson Lakota Morrison Sundance Spearfish Goose Egg Minnekahta Opeche Minnelusa Red Shale Marker	300 350 425 640 918 1240 1479 1520 1616 2032	+3497 +3447 +3372 +3157 +2879 +2557 +2318 +2277 +2181 +1765

GEOLOGICAL SUMMARY

The subject well was drilled to a total depth of 2450 feet within a sand that would possibly coorelate with the Third Leo sandstone of the Pennsylvanian stratigraphic section in the Lance Creek field.

The Dakota sandstone between the base of the surface casing and 300 feet gave no indications of oil staining

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ORIGINAL WELL CON	STRUCTION DURING OPERATION	PLUGGING AND ABANDONMENT CONSTRUCTION
	API No. 4004720071 11-7S-1E	
	Surface	Surface
Perforations None (DH) Hole Size	Surface Casim. 8 5/8", 24#, se 163" w/ 135 sx to surface	10 sx @ Surface Surface Casing 8 5/8", 24#, set @ 163' w/ 135 sx to surface Mud from 384'-TD 50 sx 750'-900 (Sundance) 35 sx 1900'-2000' (Minnelusa-Leo)
7 7/8" below surf	2250'	2250'
039 (0 10		Mud wt. 9.3 #/gal

AQUARIUS RESOURCES CORPORATION AQUARIUS RESOURCES CORPORATION ADDRESS 307 Conroy Building, Casper, Wyoming 82601 LOCATION (In feet from merret lines of section or legit subdivides, where possible) 660' FSL, 2217' FEL Section 11-78-1E ELEVATIONS (D.F. R.K.B., R.T., GRD. ste: new determined) 3679' Gr., 3689' K.B. NOICE OF DITENTION TO: **NOICETE BELOW BY CHECK MARK NATURE OF REPORT, NOTICE OR OTHER DATA NOTICE OF INTENTION TO: **SUBSQUENT REPORT OF: REPAIR WELL FRACTURE TREAT **REPAIR WELL FRACTURE TREAT **REPAIR WELL FRACTURE TREATMENT **REPAIR WELL **REPAIR WELL FRACTURE TREATMENT **REPAIR WELL **REPAIR WELL **REPAIR WELL **PRACTURE TREATMENT **REPAIR WELL **REPAIR WELL **PRACTURE TREATMENT **REPAIR WELL **RE	OIL WELL GAS WELL DRY SRATOR AQUARIUS RESOURCES CORPORATION ADDRESS 307 Conroy Building, Casper, Wyoming 82601 LOCATION (In feet from measest lines of section or legal subdivision, where possible) 660' FSL, 2217' FEL Section 11-78-1E ELEVATIONS (D.F. R.K.B., R.T., GRD., etc.; how determined) 3679' Gr., 3689' K.B, INDICATE BELOW BY CRECE MARK NATURE OF REPORT, NOTICE OR OTHE NOTICE OF INTENTION TO: SUBSEQUENT TEST WATER SHUT-OFF SHOOT OR ACIDIZE REPAIR WELL FRACTURE TREATMENT MULTIPLE COMPLETE REPAIR WELL FRACTURE TREATMENT DESCRIBE PROPOSED OR COMPLETED OPERATIONS (Clearly state all pertinent details, and give pertined of starting any proposed work) Water was encountered in all porous zones drilled. The Leo sa porosity but yielded sulphur water when tested. Proposed plug by telephone is as follows: 35 sx 1900-2000 Minnelusa-Leo 50 sx 750-900 Sundance 30 sx 105-190 base of surface casing	Wildcat Wildcat NO. ACRES IN LEASE 1080.00 W. BEC. TWP. RGE. SW SE 11-7S-IE COUNTY Fall River R DATA REPORT OF: SHOOTING OR ACIDIZING REPAIRING WELL ALTERING CASING multiple completion on Well n and Log Form—Form 4) ant dates, including estimated de
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SIGNED PRESIDENT	SIGNED President	

See Instructions On



Supervisor

Well:

#34-11 Peterson

Location:

C/SW SE; 660' FSL, 2217' FEL Section 11, T. 7S., R. 1E. Fall River County, South Dakota

Area:

Wildcat (Driftwood Canyon Prospect)

Elevation:

3679' Ground, 3689' K.B.

Spudded:

December 9, 1976 (7:30 A.M.)

Ceased Drilling:

December 22, 1976 (3:30 A.M.)

Completed:

December 23, 1976 (12:30 A.M.)

Statusi

P & A

Total Depth:

2250' driller, 2248' log

Casingi

8-5/8" surface casing set @ 163'

Hole Size:

7-7/8" below surface to TD

Contractor:

A. O. Bullock Drilling Co. - Rig #1

Tool Pusher - Ray Cottrell

Drillers - Larry Halligan, D. F. Ellsworth, Chuck Sides

Drilling Mud:

Wyoming Mud Co., Casper, Wyo. Gel-Chemical from 384' to TD Engineer - Bruce Johnson

Lost Circulation:

Lost Circulation for 52 hours @ 384'.

Coring:

No cores cut.

Drill Stem Tests:

Halliburton Services

DST #1; 2nd Leo, 2060'-2082' (adjusted to log from 2068'-2090')
Rec. 125' muddy water, 1838' black sulfur water.

Engineer - D. R. Rook, Gillette, Wyoming

Logs:

Schlumberger Well Surveying Corp.

Ran Dual Induction-Laterdog from 2248' to base of surface casing. Ran Borehold Compensated Sonic Log w/caliper from 2248' to base of surface casing. Ran Camma Ray log from base of surface casing to

surface.

Engineer - Craig Rang, Gillette, Wyo.

Samples:

All samples were delivered to American Stratigraphic Co., Casper,

Wyo., for shipment to their Billings, Montana office where a cut

will be made for the South Dakota State Geologist.

ORIGINAL WELL CONSTRUCTION DU	RING OPERATION	PLUGGING AND ABANDONM	ENT CONSTRUCTION
,	API No. 4004720065 14-7S-1E	· .	
	Surface		Surface
	125 sx cement to surface Surface Casing 8 5/8", 24#, set @ 152'	30 sx 850'-950'	125 sx cement to surface Surface Casing 8 5/8" set @ 152' No Plug in Surface Pipe since left as a water well
		(Sundance)	1
Perforations None (DH)		30 sx 1500'-1600' (1st Converse Sand)	
Hole Size Unknown	Total Depth 2267'	40 sx 1900'-2020' (2nd Leo) Feet of cement from Plugging Report Mud wt. 10.3 #/gal	Total Depth 2267'

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Operator	····		·		Addr	ess		08/991	مرن ۲	
PO	WER RESOURCES	S CORPOR	ATION		ĺ	_1660	So. 7	Albion, S	uite 827	Denver CO 8
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pplication to	drill this well was	filed	Has this	Well ever				ompletion (ini		
	esources Cor	poration	No	i oil or gas	On	(bbis/da		Gas (MCF	/uzy)	Dry? Yes
ate plugged;			Total de	pth		int well p (bbis/day		g when plugge Gas (MCF	ed: /dev)	Water (bbls./day)
December	2, 1975		22	66		None	' .\	None	,,	None
ame of each in gold or gas crimation oper me of pluggin	formation contains, Indicate which to well-bore at	Fluid con	itent of ea	ch formation	Dept	th interva	l of eac	h formation	indicate 2	i & depth of plugs used cones squeszs cemented, nount cement
Morrison							339			
Basal Su	ndance Sand		· · · · · · · · · · · · · · · · · · ·				862		950-85	0 30 Sacks
First Co	nverse Sand						1571		1650-1	500 30 Sacks
Base 2nd	Converse Sa	n <u>d</u>	·				1722		1900-2	2020 40 Sacks —
2nd Leo	Sand						2099-	-2113	Traces	Yellow Fluores
	,,,			CABING	RECOR	מ.				
Size pipe	Put in well (ft.)	Pulled out	(ft.) Left	in well (ft.)	Give d	epth and of part-	ļ		Packers ar	nd shoes
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Executed this State of	the 12thday of Colorado	Janu	ary !	19			Ca	Sagar Signature	ham of Affiant	V.P.
Before me	e, the undersigned hose name is subsc ve report and that d and sworn to be	authority, on ribed to the he has know	this day above instilledge of the 12th	personally a rument, who he facts state Janua	ppeared being b d thereir YY	y me dul	y sworn	on oath state apport is true in	es, that he and correct.	known to me to be is duly authorized to

29, 1979

Notary Public in and for County,

County,

DO NOT WRITE BELOW THIS LINE

ON AND GAS BOARD OF THE STATE OF SOUTH DAKOTA

Approved Jan. 23, 1976. ____

ly commission expires My Commission expires Sept. 29, 1979

THE PARTY OF THE P

2029 ground. 3647 K.B.

Type Well:

Wildoat.

Spud Date:

10:00 P.M., December 11, 1975.

Completion Date: 9:00 P.M., December 26, 1975.

Casing Record: Ran 8 5/8" surface casing. Set at 152 ground. Cemented with 125 sacks of regular cement with 3%

Calcium chloride. Pipe set at 152 ground. 24# casing.

Total Depth:

2269 Driller.

2267 Schlumberger.

Deepest Formtion

Penetrated:

Lower Leo Section.

Depth Datum:

3647 K.B.

Well Status:

Plugged and abandoned(left as water well for landowner).

Mud Program: 100

Drilled out from under surface with water. Continued drilling with native mud down to 1070 in Spearfish red beds. Converted to a red bed between between 1070 and 1283 in the Goose Egg formation after retting stuck at 1283. Added 1 sack of soda ash, 5 Rayvan, 4 caustic soda, 1 can suf-drill, and 25 sacks of gel. Above 1283 a water-flow was continually

thinning mud, particularly when mud pump was shut

down on trips for bit.

Between 1625 in the Converse Massive Anhydrite and 1729 in middle Converse tourly treatment was Gel, 1 sack caustic soda, 1 soda ash, 1 Rayvan, and mud weight was 9.4-9.6 and vis. was 36 to 37. At 2045 to 2078 in upper Leo wt. was 9.7 and vis. was 46, with tourly treatments of 1 sack of soda ash, 1 Rayvan, 1 caustic soda, and 4 CMC to get water loss down to 5 co. or less before Second

Leo was reached at approximately 2100.
At 2105 in Second Leo Sand main objective wt. was 10.0, vis. 36, and water loss 6.0. Water flow from up the hole continued to create problems in maintaingood quality mud.

Logs were run without any hole trouble. Wt. was

10.3, vis. 85, and water loss 7.2. Mud furnished by Pro-Mud, Casper; Phil Hogan, engineer.

Page 1

Drill-Stem

Tests: (None).

Logs: ,

Schlumberger Borehole Compensated Sonic Log was run from T.D. up to base of surface casing on a 5" scale 40-70-100, and on a 5" scale 40-90-140 from T.D. up to 1400 above Minnekahta. Gamma Ray Log and Caliper Log were also run with Sonic Log. Two repeats were run from T.D. up to 1980 first and then from T.D. up to 1400 on a 40-90-140 scale. Dual Induction Laterolog was run second and did not work. 8 hours were spent waiting for a second tool to arrive. A 2" scale was run from T.D. to base of surfac pipe, and a 5" scale over same interval was also run, with a repeat from T.D. up to 1900. Engineer: Don Marquez, Gillette.

Plugging Record: 40 sacks from 2020 to 1900 across the Red Marker. 30 sacks from 1600 to 1500 across top of the First Converse Sand. 30 sacks from 950 to 850 acorss Basal Sand of the Sundance.

> Cementing by Halco, Gillette (No plug in surface pipe since left as water well).

Contractor and Rig Equipment: Rig Equipment: Farnsworth & Kaiser, Newcastle, Wyoming.

U-34 rig.
3% IF drill pipe.
5% drill collars totaling 341.

Mud pump GD FXQ with 6" liners and 16" stroke. Radios on rig and at Newcastle base plus in pusher's pickup.

Mud pump trailer-mounted.

Hig trailer-mounted.

Buzz Farnsworth, pusher-owner.

Sample Storage: One cut of samples were sent to Americah Stratigraphic in Casper. sent One cut of samples were to the South Dakota Geologic Survey in Vermillion.

Drilling Time

Records: Original copy of Star Recording 1' drilling time charts is on file in Denver office of G.A. Nelson.

APPENDIX D HISTORICAL PHOTO, CITY OF EDGEMONT WATER WELL

