



## OTTER EXPLORATION, INC.

422 Crescent Park  
Warren, PA 16365  
Phone: 814-723-8640  
Fax: 814-723-8645

December 20, 2007

Mr. Stephen Platt  
National Expert, UIC Program  
Office of Compliance and Enforcement  
3WP32  
1650 Arch St.  
Philadelphia, PA 19103-2029

Re: Application for Region III  
Enhanced Oil Recovery  
Section III Well Number 3-87  
Lafayette Township, McKean County, PA

Dear Mr. Platt:

In October of 2007 we completed a successful injection test in Well No. 3-87. Please accept this letter as our application for two (2) injection wells with Well No. 3-87 to be the first completed, as a Class II Type R EOR injection well. The proposed project details are listed below:

- 1) The five old wells within the 1320' radius of Well No. 3-87 will be registered and a rig will be mobilized to each old well. Depending on the downhole situation, each old well shall be plugged or a 3½" casing string will be run with a packer below 500' to isolate all the fresh water zones. A string of 1 ½" tubing shall be installed to monitor fluid levels
- 2) Brine water will be injected into Well No. 3-87 for a six month period. Daily injection is estimated at 150 BWPD. The proposed flooding zones are the Bradford Third and Lewis Run.
- 3) The production response in Wells 3-54 and 3-82 will be closely monitored. If the water flood exhibits a positive economic response, the offset Wells 3-66, 3-67, 3-68, and 3-89 will be drilled and completed as producing wells in the Phase I drilling program. If the flood reveals a negative economic result, we shall re-apply to the EPA to classify Well No. 3-87 as a Class II Type D fluid disposal well. The two offset Wells 3-54 and 3-82 would be plugged as part of the fluid disposal well program. If the Phase I program is economically successful we would apply for a second EOR injection well (3-81) with drilling (Phase II) five additional offset production wells (3-86, 3-82, 3-95, 3-79, and 3-69).


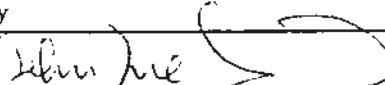
- 4) A bond (or other approved financial instrument) in the amount of \$5,000.00 to cover the plugging of 3-87 will be prepared and in place prior to the base draft permit being issued.
- 5) The proposed injection zones are the Bradford Third (1846' to 1973') and the Lewis Run (1975' to 1987'). Both formations are in the Devonian System, Upper Devonian Series, and the Canadaway Group. The Lewis Run was notched at 1978' and 1984'. The notch at 1978' broke at 3150 psig and was fraced with 7368 gallons of water at an average pressure of 2000 psig. The Lewis Run notch at 1984' was not fraced.
- 6) The average daily volume of injected brine is estimated at 100 BWPD. The maximum daily rate would be 200 BWPD. The average injection pressure at 100 psig with the maximum injection pressure at 375 psig. The injection fluid shall be produced brine from the existing producing wells on the lease (Warrants 3437, 2276, and 2277). The chemical analysis of the brine is attached.
- 7) There shall be no fracturing procedures completed (other than the frac completed at 1978').
- 8) Injection fluid shall be stored in two (2) 210 bbl tanks and a 170 Hp pump (V-8 Chevy motor) used to inject the brine.
- 9) Details of the casing, hole size, cementing, and downhole data are attached.
- 10) The injection pressure shall be monitored and recorded daily. The production and well data from the two (2) offset wells (3-54 and 3-82) shall be monitored for excessive pressures or leaks. The annular pressure (7" casing x 3 1/2" casing) and (3 1/2" casing x 1 1/2" pipe) shall be monitored daily for pressure rises or fluid influx. Appropriate shut ins shall occur if conditions warrant action. Verbal notification of mechanical failure will be provided within 24 hours to the EPA and in writing with 7 days.
- 11) A plugging and abandonment plan is attached.

The purpose of this EOR application is too prove the response and potential oil production in the existing two offset wells to Well No. 3-87 with an immediate drilling program to increase the number of producing wells surrounding the injection well. If economic success is not realized, an application to re-classify Well No. 3-87 will be completed as previously discussed. The purpose for the re-classification will be to dispose of brine produced on the lease. The disposal well would not be used as commercial operation for third party use, but as a disposal well for Swamp Angel Energy's brine production.

Please call me (330-807-0050) if additional information is required.

Sincerely,

John McNally

 <b>United States Environmental Protection Agency</b> <b>Underground Injection Control</b> <b>Permit Application</b> <i>(Collected under the authority of the Safe Drinking Water Act, Sections 1421, 1422, 40 CFR 144)</i>										<b>I. EPA ID Number</b> <div style="border: 1px solid black; height: 20px; width: 100%;"></div>			
										T/A	C		
<b>Read Attached Instructions Before Starting</b> <b>For Official Use Only</b>													
<b>Application approved</b> mo    day    year			<b>Date received</b> mo    day    year			<b>Permit Number</b>		<b>Well ID</b>		<b>FINDS Number</b>			
<b>II. Owner Name and Address</b>						<b>III. Operator Name and Address</b>							
<b>Owner Name</b> Swamp Angel Energy, LLC						<b>Owner Name</b> Otter Exploration							
<b>Street Address</b> 2414 N. Woodlawn, Suite 160				<b>Phone Number</b> (316) 688-5570		<b>Street Address</b> 104 College St.				<b>Phone Number</b> (330) 807-0050			
<b>City</b> Wichita			<b>State</b> KS	<b>ZIP CODE</b> 67220		<b>City</b> Hudson			<b>State</b> OH	<b>ZIP CODE</b> 44236			
<b>IV. Commercial Facility</b>			<b>V. Ownership</b>			<b>VI. Legal Contact</b>			<b>VII. SIC Codes</b>				
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			<input type="checkbox"/> Private <input type="checkbox"/> Federal <input type="checkbox"/> Other			<input type="checkbox"/> Owner <input type="checkbox"/> Operator			1311				
<b>VIII. Well Status (Mark "x")</b>													
<input checked="" type="checkbox"/> A Operating		<b>Date Started</b> mo    day    year		<input type="checkbox"/> B. Modification/Conversion				<input type="checkbox"/> C. Proposed					
<b>IX. Type of Permit Requested (Mark "x" and specify if required)</b>													
<input checked="" type="checkbox"/> A. Individual		<input type="checkbox"/> B. Area		<b>Number of Existing Wells</b>		<b>Number of Proposed Wells</b>		<b>Name(s) of field(s) or project(s)</b>					
<b>X. Class and Type of Well (see reverse)</b>													
<b>A. Class(es)</b> (enter code(s))		<b>B. Type(s)</b> (enter code(s))		<b>C. If class is "other" or type is code "x," explain</b>				<b>D. Number of wells per type (if area permit)</b>					
<b>XI. Location of Well(s) or Approximate Center of Field or Project</b>										<b>XII. Indian Lands (Mark "x")</b>			
<b>Latitude</b>			<b>Longitude</b>			<b>Township and Range</b>							
Deg	Min	Sec	Deg	Min	Sec	Sec	Twp	Range	1/4 Sec	Feet From	Line	Feet From	Line
41	52	27	78	41	05								
<b>XIII. Attachments</b>										<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			
(Complete the following questions on a separate sheet(s) and number accordingly; see instructions) For Classes I, II, III, (and other classes) complete and submit on a separate sheet(s) Attachments A--U (pp 2-6) as appropriate. Attach maps where required. List attachments by letter which are applicable and are included with your application.													
<b>XIV. Certification</b>													
I certify under the penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. (Ref. 40 CFR 144.32)													
<b>A. Name and Title (Type or Print)</b> John McNally										<b>B. Phone No. (Area Code and No.)</b> (330) 807-0050			
<b>C. Signature</b> 										<b>D. Date Signed</b> 12/06/2007			

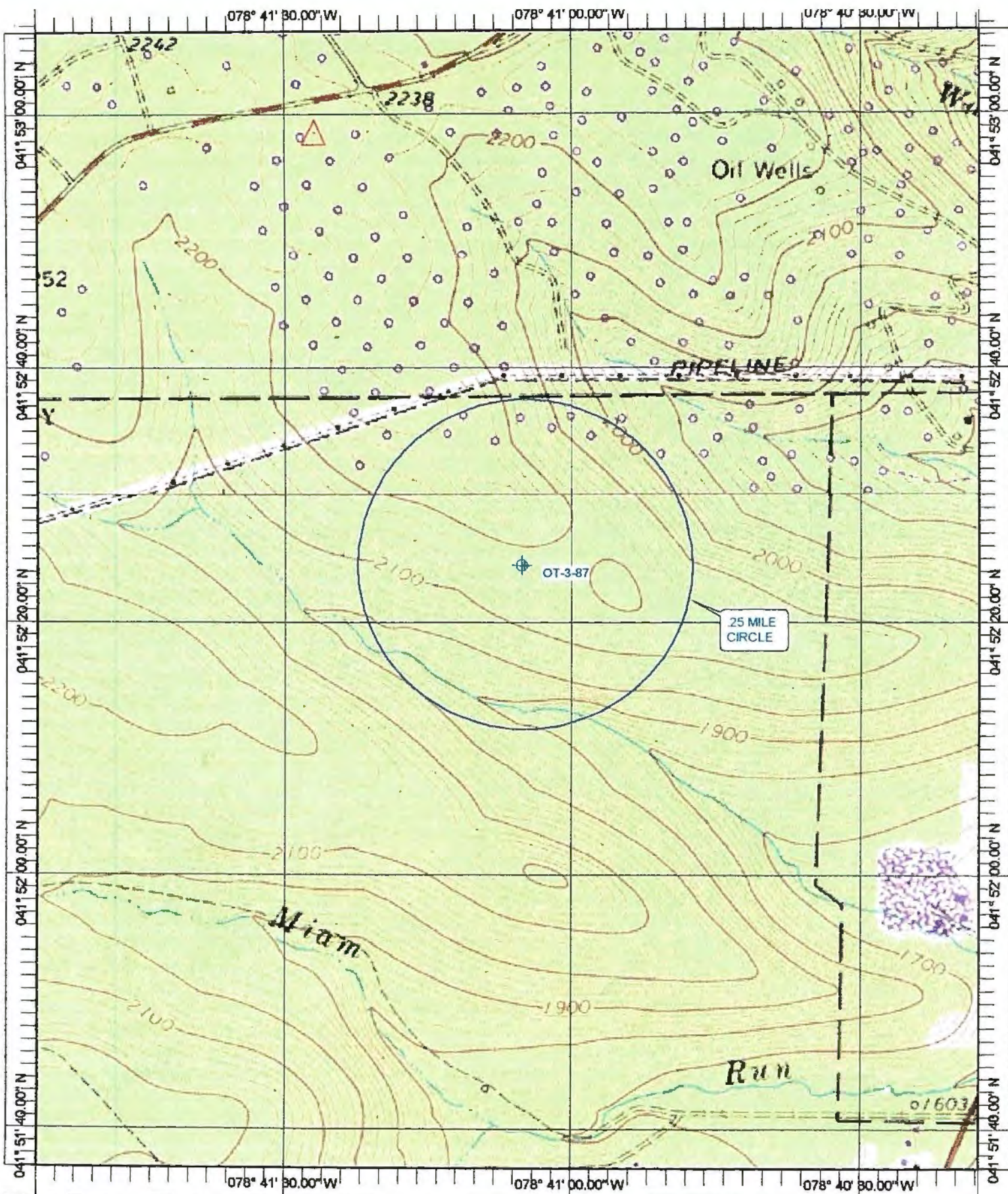
**ATTACHMENT A**  
**AREA OF REVIEW METHODS**

The attached maps are a fixed radius of  $\frac{1}{4}$  mile from the proposed EOR Injection Well.

MAP 1 –  $\frac{1}{4}$  mile topo map.

MAP 2 –  $\frac{1}{4}$  mile showing all known wells.

MAP 3 –  $\frac{1}{4}$  mile showing proposed future programs



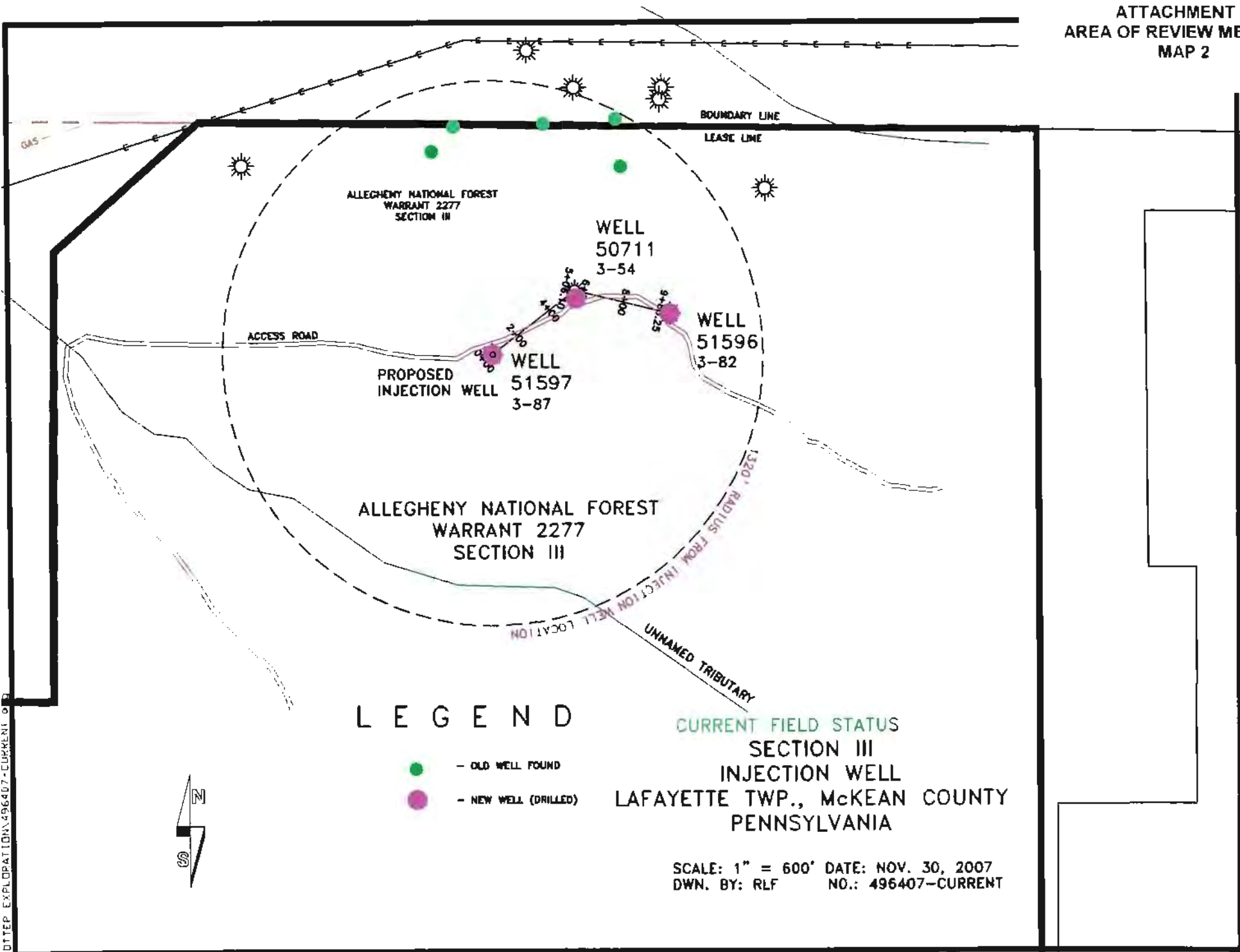
Name: LEWIS RUN  
 Date: 11/30/2007  
 Scale: 1 inch equals 1000 feet

Location: 041° 52' 21.67" N 078° 41' 06.89" W  
 Caption: OTTER EXPLORATION, INC.  
 1320 CIRCLE

Copyright (C) 2001, Maptech, Inc.

ATTACHMENT A  
 AREA OF REVIEW METHODS  
 MAP 1

ATTACHMENT A  
AREA OF REVIEW METHODS  
MAP 2



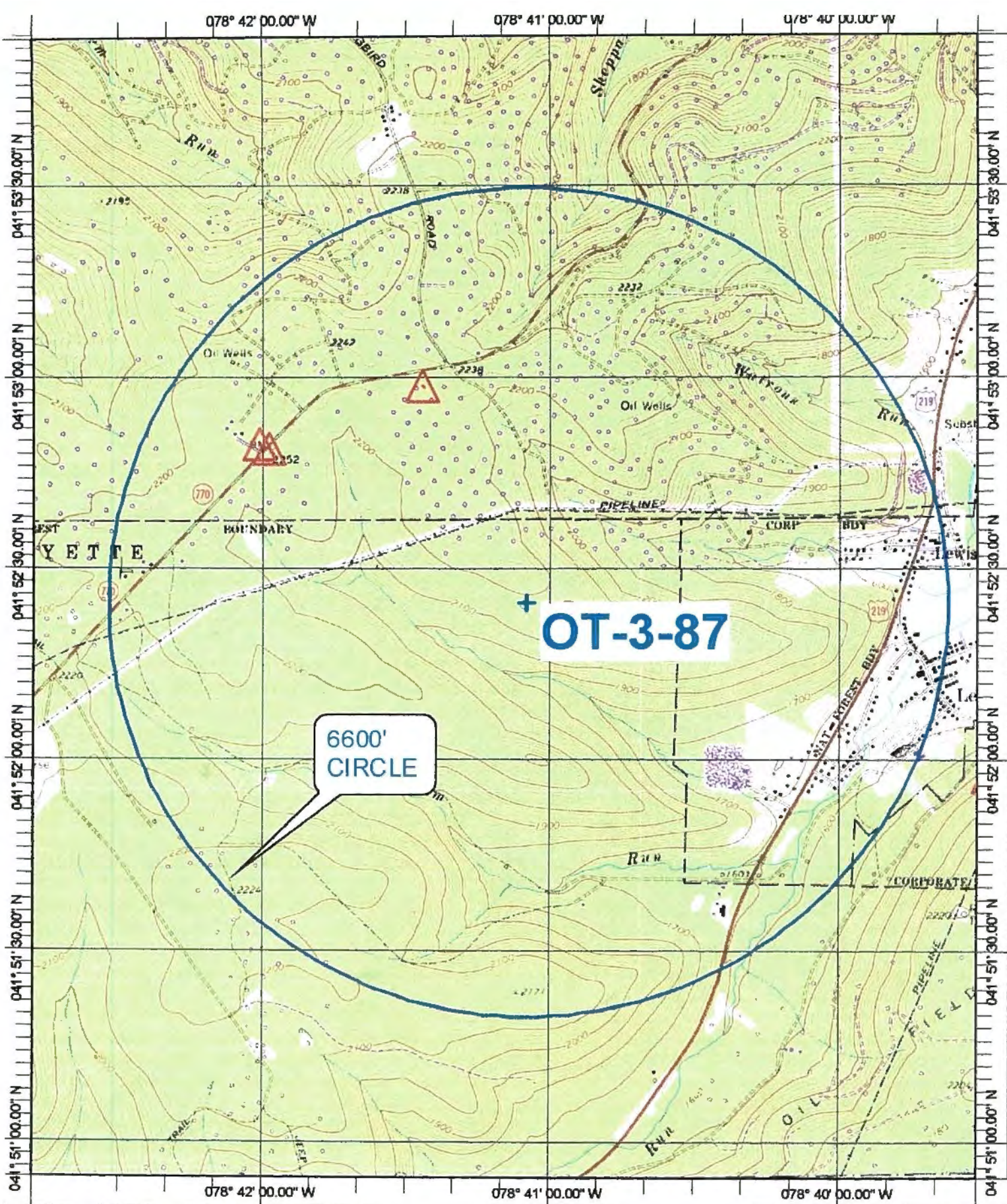
CURRENT FIELD STATUS  
SECTION III  
INJECTION WELL  
LAFAYETTE TWP., McKEAN COUNTY  
PENNSYLVANIA

SCALE: 1" = 600' DATE: NOV. 30, 2007  
DWN. BY: RLF NO.: 496407-CURRENT



**ATTACHMENT B**  
**AREA OF REVIEW METHODS**

Attached is a map showing a one (1) mile radius extended from the  $\frac{1}{4}$  mile area of review.



Name: LEWIS RUN  
 Date: 11/30/2007  
 Scale: 1 inch equals 2000 feet

Location: 041° 52' 24.02" N 078° 41' 10.10" W  
 Caption: OTTER EXPLORATION, INC.  
 1320 CIRCLE

## ATTACHMENT C

### CORRECTION ACTION PLAN AND WELL DATA

There are eight (8) wells (including the proposed EOR Injection Well) within the area of review. A description of each well is listed below.

1. Well No. 3-87 – this the proposed EOR Injection Well. The drilling was completed 10/15/06 and all the pertinent completion data is attached.
2. Well No. 3-54 – this is a producing well that will be monitored for a flood response. The drilling was completed 10/15/05 and all the pertinent completion data is attached.
3. Well No. 3-82 – this is a producing well that will be monitored for a flood response. The drilling was completed 11/2/06 and all the pertinent completion data is attached.
4. There are five (5) additional old wells that were located within the ¼ mile area of review. There is no known well information for these five (5) old wells. Each of these wells shall be registered with the Pennsylvania DEP. A rig will be mobilized on each well to determine well depths and downhole condition. Depending on the conditions found, each well shall be plugged or an isolation casing string (3-1/2") with a string of tubing will be installed and monitored for fluid levels.



**COMMONWEALTH OF PENNSYLVANIA  
DEPARTMENT OF ENVIRONMENTAL PROTECTION  
OIL AND GAS MANAGEMENT PROGRAM**

DEP USE ONLY	
Site Id	Primary Facility Id
Client Id	Sub-facility Id

## WELL RECORD AND COMPLETION REPORT

Well Operator Otter Exploration, Inc.		DEP ID# 207300	Well API # (Permit / Reg) 37-0083-50711-00	Project Number	Acres
Address 104 College St.		Well Form Name Section III		Well # 354	Serial #
City Hudson	State OH	Zip Code 44236	County McKean	Municipality Lafayette	
Phone 814-723-8640	Fax 814-723-8645	USGS 7.5 min. quadrangle map Lewis Run			
Check all that apply: <input type="checkbox"/> Original Well Record <input checked="" type="checkbox"/> Original Completion Report <input type="checkbox"/> Amended Well Record <input type="checkbox"/> Amended Completion Report					

### WELL RECORD Also complete Log of Formations on back (page 2)

<b>Well Type</b>		<input type="checkbox"/> Gas	<input type="checkbox"/> Oil	<input checked="" type="checkbox"/> Combination Oil & Gas	<input type="checkbox"/> Injection	<input type="checkbox"/> Storage	<input type="checkbox"/> Disposal	
<b>Drilling Method</b>		<input checked="" type="checkbox"/> Rotary - Air <input type="checkbox"/> Rotary - Mud <input type="checkbox"/> Cable Tool						
Date Drilling Started 10/17/05		Date Drilling Completed 10/18/05		Surface Elevation 2200 ft.	Total Depth - Driller 2100 ft.	Total Depth - Logger 2100 ft.		
<b>Casing and Tubing</b>				Cement returned on surface casing? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Cement returned on coal protective casing? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A				
Hole Size	Pipe Size	Wt.	Thread / Weld	Amount in Well (ft)	<b>Material Behind Pipe</b> Type and Amount	<b>Packer / Hardware / Centralizers</b> Type Size Depth		Date Run
10 3/4	9 5/8"	25	Thread	22'	n/a	n/a	n/a	10/17/05
8 3/4	7"	17	Thread	519	Cement - 100 sacks Class A	n/a	n/a	10/17/05
6 1/4				2100				10/18/05
Tubing	1 1/2"			2086				11/11/05
Rods	5/8"			2054				11/11/05

### COMPLETION REPORT

Perforation Record			Stimulation Record						
Date	Interval Perforated From	To	Date	Interval Treated	Fluid Type	Amount	Propping Agent Type	Amount	Average Injection
				See Attached					
Natural Open Flow			Natural Rock Pressure			Hours		Days	
After Treatment Open Flow			After Treatment Rock Pressure			Hours		Days	

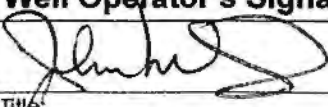
**Well Service Companies** -- Provide the name, address, and phone number of all well service companies involved.

Name Appalachian Well Service	Name R&R Ventures	Name Olson Drilling
Address PO Box 636	Address 15640 Tionesta Rd.	Address 626 Greendale Rd
City - State - Zip Indiana, PA 15701	City - State - Zip Pleasantville, PA 16341	City - State - Zip Kane, PA 16735
Phone 724-354-4400	Phone 814-589-7051	Phone 814-837-9480

**LOG OF FORMATIONS**Well API#: **370835071100**

Formation Name or Type	Top (feet)	Bottom (feet)	Gas at (feet)	Oil at (feet)	Water at (fresh / brine; ft.)	Source of Data
Over Burden	1	25				
Gray Shale	25	340			Fresh @ 50'	
Red Rock & Gray Shale	340	450				
Shale	450	670				
Sand	670	700				
Shale	700	750				
Pink Rock	750	1060				
Shale	1060	1290				
Bradford 1 <sup>st</sup>	1290	1320				
Shale	1260	1360				
Clarendon	1360	1400				
Shale	1400	1550				
Bradford 2 <sup>nd</sup>	1550	1580				
Shale	1580	1730				
Harrisburg Run	1730	1760				
Shale	1760	1870				
Bradford 3 <sup>rd</sup>	1870	1900				
Shale	1900	2000				
Lewis Run	2000	2010				
Shale	2010	2100				
TD		2100				

Please delete empty rows if necessary to make all of page 2 fit on one page.

<b>Well Operator's Signature:</b>		<b>DEP USE ONLY</b>	
 President		Reviewed by:	Date:
Title:	Date:	Comments:	
President	12/6/07		

SUPERIOR WELL SERVICES  
PO BOX 458  
BLACK LICK, PA 15716  
724-248-1001 TELEPHONE  
724-248-1005 FACIMILE  
superiorwells.com

\*\*\*\*\* CUSTOMER & WELL INFORMATION \*\*\*\*\*

3132 11/11/2005  
OTTER-EXPLORATION SECTION-III-NO-3-54  
PENNSYLVANIA MCKEAN COUNTY  
DOUG PERRY  
3-1/2;NPT;J-55; 9.20# - NONE -

\*\*\*\*\* TREATMENT SUMMARY \*\*\*\*\*

Finish	Formation	Top Interval	Low Interval	Treatment	Flush
STAGE: 1	05:13:22 AM	BRADFORD	1299.5 FEET	50 SKS	48 GAL 948 GAL
		1ST			
STAGE: 4	05:51:24 AM	CLARENDON	1366 FEET	90 SKS	7500 GAL 999 GAL
		N-KINZ			
STAGE: 5	06:33:58 AM	CLARENDON	1398 FEET	50 SKS	4800 GAL 1050 GAL
		N-DEWD			
STAGE: 6	07:51:02 AM	CLARENDON	1402 FEET	80 SKS	6800 GAL 1052 GAL
		N-DEWD			
STAGE: 7	08:38:57 AM	CHIPMUNK	1561.5 FEET	70 SKS	6800 GAL 1100 GAL
		SAND			
STAGE: 8	09:08:13 AM	CHIPMUNK	1586 FEET	50 SKS	4800 GAL 1100 GAL
		SAND			
STAGE: 9	10:16:43 AM	BRADFORD-1933.5	FEET	70 SKS	6300 GAL 1200 GAL
		2-ND-			
STAGE: 10	10:54:34 AM	LEWISRUN	2006 FEET	70 SKS	6300 GAL 1200 GAL
STAGE: 11	12:03:12 PM	LEWISRUN	2010 FEET	0 SKS	6300 GAL 1200 GAL

Terms: Net 30 days. Finance charge 1.5% per month on past due accounts.

DATE 10-17-05	LEASE sect 14-3-54	COUNTY McHenry	STATE PA
CUSTOMER ORDER NO.	FIELD	FORMATION	TYPE 7" surface
OWNER Swamp Angel	DRILLING CONTRACTOR Olson Drilling		
CHARGE TO SWAMP ANGEL ENERGY	ARRIVED ON LOCATION Time 3:30 PM Date 10-17		LEFT LOCATION Time 4:15 PM Date 10-17
ADDRESS c/o JOHN McNALLY 104 COLLEGE STREET	JOB TYPE 7" surface		DEPTH 515
Hudson OH 44236	SERVICE ENGINEER John McNally		

I have read, understood and agreed to the terms and conditions printed on the reverse side hereof and represent that I have full power and authority to execute this service order.

YR

AUTHORIZED AGENT

QUANTITY	U/M	DESCRIPTION	UNIT PRICE	AMOUNT
10.0	mi	Pump mileage	960	9600
10.0	mi	Rick-up mileage.	300	3000
1.0	4hrs	Pump charge	135000	135000
100.0	sas	Standard Cement	1235	123500
1.0	cwt	Betonte. Col	3650	3650
40.0	Lbs	Bansconl	265	10600
3.0	cwt	Calcium Chloride	7850	23550
50.0	LBS	CelloFlake	375	18750
100.0	cwft	Dredging charge	200	20000
1.0	mim	Delivery Charge	32500	32500

**CUSTOMER**

BY

AUTHORIZED AGENT

SUB TOTAL	3751	50
Less 20% disc	- 750	30
Fuel Surcharge	100	00
PAY THIS AMOUNT	3101	20

RECEIPT: The above hereby certifies that the equipment and services above listed were received by him and the services performed in a workmanlike manner.



**COMMONWEALTH OF PENNSYLVANIA  
DEPARTMENT OF ENVIRONMENTAL PROTECTION  
OIL AND GAS MANAGEMENT PROGRAM**

DEP USE ONLY	
Site Id	Primary Facility Id
Client Id	Sub-facility Id

## WELL RECORD AND COMPLETION REPORT

Well Operator <b>Otter Exploration, Inc.</b>		DEP ID# <b>207300</b>	Well API # (Permit / Reg) <b>37-0083-51596-00</b>	Project Number	Acres
Address <b>104 College St.</b>		Well Farm Name <b>Section III</b>		Well # <b>382</b>	Serial #
City <b>Hudson</b>	State <b>OH</b>	Zip Code <b>44236</b>	County <b>McKean</b>	Municipality <b>Lafayette</b>	
Phone <b>814-723-8640</b>	Fax <b>814-723-8645</b>	USGS 7.5 min. quadrangle map <b>Lewis Run</b>			
Check all that apply: <input type="checkbox"/> Original Well Record <input checked="" type="checkbox"/> Original Completion Report <input type="checkbox"/> Amended Well Record <input type="checkbox"/> Amended Completion Report					

### WELL RECORD Also complete Log of Formations on back (page 2)

Well Type		<input type="checkbox"/> Gas	<input type="checkbox"/> Oil	<input checked="" type="checkbox"/> Combination Oil & Gas	<input type="checkbox"/> Injection	<input type="checkbox"/> Storage	<input type="checkbox"/> Disposal
Drilling Method		<input checked="" type="checkbox"/> Rotary - Air <input type="checkbox"/> Rotary - Mud <input type="checkbox"/> Cable Tool					
Date Drilling Started <b>10/01/06</b>		Date Drilling Completed <b>11/02/06</b>		Surface Elevation <b>2170 ft.</b>	Total Depth - Driller <b>2121 ft.</b>	Total Depth - Logger <b>2121 ft.</b>	
Casing and Tubing				Cement returned on surface casing? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Cement returned on coal protective casing? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A			
Hole Size	Pipe Size	Wt.	Thread / Weld	Amount in Well (ft)	Material Behind Pipe Type and Amount	Packer / Hardware / Centralizers Type Size Depth	Date Run
10 3/4	9 5/8"	25	Thread	20'	n/a	n/a n/a n/a	10/01/06
8 3/4	7"	17	Thread	514	Cement - 80 sacks Class A	n/a n/a 257/484	10/01/06
6 1/4				2121			10/12/06
Tubing	1 1/2"			2120			11/02/06
Rods	5/8"			2086			11/02/06

### COMPLETION REPORT

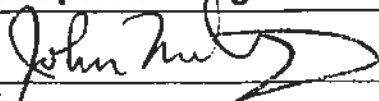
Perforation Record			Stimulation Record				
Date	Interval Perforated From To		Date	Interval Treated	Fluid Type Amount	Propping Agent Type Amount	Average Injection
				See Attached			
Natural Open Flow		Show of gas	Natural Rock Pressure		75 psig	Hours 3 Days	
After Treatment Open Flow		5 mcfd, oil show	After Treatment Rock Pressure		250 psig	Hours 3 Days	

#### Well Service Companies — Provide the name, address, and phone number of all well service companies involved.

Name <b>Appalachian Well Service</b>	Name <b>R&amp;R Ventures</b>	Name <b>Olson Drilling</b>
Address <b>PO Box 636</b>	Address <b>15640 Tionesta Rd.</b>	Address <b>626 Greendale Rd</b>
City - State - Zip <b>Indiana, PA 15701</b>	City - State - Zip <b>Pleasantville, PA 16341</b>	City - State - Zip <b>Kane, PA 16735</b>
Phone <b>724-354-4400</b>	Phone <b>814-589-7051</b>	Phone <b>814-837-9480</b>

**LOG OF FORMATIONS**Well API#: **370835159600**

Formation Name or Type	Top (feet)	Bottom (feet)	Gas at (feet)	Oil at (feet)	Water at (fresh / brine: ft.)	Source of Data
Over Burden	1	40				
Shale & Sandstone	40	325				
Gray Shale	325	458			Fresh @ 75	
Sandstone & Shale	458	562				
Red Shale	562	643				
Sandstone	643	668				
Shale	668	1270				
Sandstone	1270	1310				
Shale	1310	1390				
Sandstone	1390	1425				
Shale	1425	1530				
Sandstone	1530	1565				
Shale	1565	1860	1775'			
Sand	1860	1920				
Shale	1920	1970				
Sandstone	1970	1990				
Shale	1990	2121				

*Please delete empty rows if necessary to make all of page 2 fit on one page.***Well Operator's Signature:****DEP USE ONLY**

 John McNally

Reviewed by:

Date:

Title:

Date:

Comments:

President

12/6/07



DATE 11-2-00

CUSTOMER SWAMP ANGEL

WELL # 3-82

CSG.

STAGE 1	STAGE 2	STAGE 3	STAGE 4	STAGE 5	STAGE 6
DEPTH 1275'	DEPTH 1341'	DEPTH 1375'	DEPTH 1354-1357'	DEPTH DNF	DEPTH DNF
RATE 18	RATE DNF	RATE 18.5	RATE 18.4	RATE	RATE
PRESSURE 1750	PRESSURE	PRESSURE 1650	PRESSURE 1800	PRESSURE	PRESSURE
HHP	HHP	HHP	HHP	HHP	HHP
SAND 60 SKS	SAND	SAND 70 SKS	SAND 70 SKS	SAND	SAND
FLUID 6900	FLUID	FLUID 5870	FLUID 5720	FLUID	FLUID
ISDP 1200	ISDP	ISDP 1300	ISDP 1300	ISDP	ISDP

TIME	RATE (BPM)	VOLUME (GAL) (BBL)	PRESSURE (PSI)		DESCRIPTION OF STAGE OR EVENT
			TUBING	CASING	
4:15					ON LOCATION
5:00					SAFETY MEETING
5:50					LOAD HERE
6:45	0-8	0		2900	BREAKDOWN @ 1275' ATT#1 #1
7:54	3-0	1700		3450	SHUTDOWN (KEWASH)
7:06	0-6	0		2350	BREAKDOWN @ 1275' ATT#2 #1
7:11	17.5	2180		2450	1/2"
7:13	17.6	3230		2125	1"
7:14	18	4280		1750	1 1/2"
7:15	18	5300		1650	2"
7:17	18	6920		1600	FLUSH
7:18	18-0	7670		1650	SHUTDOWN (ISDP 1200)
7:59	0-5	0		3500	NO BREAK @ 1341' #2
8:04	5-0	1450		3500	SHUTDOWN (KEWASH)
8:22	0-7	0		3500	NO BREAK @ 1341' #2
8:26	2-0	1610		3500	SHUTDOWN (WASHTU #3)
8:55	0-7	0		2325	BREAKDOWN @ 1375' #3
8:56	17.8	375		2850	1/2"
8:58	18.5	1430		1800	1"
9:59	18.5	2530		1650	1 1/2"
9:02	18.5	4570		1600	2"
9:03	18.5	5800		1650	FLUSH
9:04	18.5-0	6620		1650	SHUTDOWN (ISDP 1200)

## CEMENT REPORT

DATE: 10/3/2006  
OWNER: Otter Exp  
WELL NUMBER: 82

LEASE: Section 3  
COUNTY:

STAGE 1 Pre-Flush

MATERIAL: Water

VOLUME: 20 BBL  
RATE: 2.8 BPM  
PRESSURE: 0 PSI  
CIRCULATION: no

STAGE 2 Condition Hole

MATERIAL: 200 lbs Bentonite  
80 lbs LCM

VOLUME: 10 BBL  
RATE: 2.8 BPM  
PRESSURE: 0 PSI  
CIRCULATION: no

STAGE 3 Cement

MATERIAL: Type 1 Class A  
80 sacks

VOLUME: 93 CuFt  
RATE: 2.8 BPM  
PRESSURE: 0 PSI  
CIRCULATION: no

STAGE 4 Displace

MATERIAL: Water

VOLUME: 21.2 BBL  
RATE: 2.8 BPM  
PRESSURE: 50 PSI  
CIRCULATION: no

STAGE 5

MATERIAL:

VOLUME:   
RATE:   
PRESSURE:   
CIRCULATION:

REMARKS:

## CEMENT REPORT

DATE: 10/3/2006  
OWNER: Otter Exp  
WELL NUMBER: 82

LEASE: Section 3  
COUNTY: \_\_\_\_\_

STAGE 1 Pre-Flush

MATERIAL: Water

VOLUME: 20 BBL  
RATE: 2.8 BPM  
PRESSURE: 0 PSI  
CIRCULATION: no

STAGE 2 Condition Hole

MATERIAL: 200 lbs Bentonite  
80 lbs LCM

VOLUME: 10 BBL  
RATE: 2.8 BPM  
PRESSURE: 0 PSI  
CIRCULATION: no

STAGE 3 Cement

MATERIAL: Type 1 Class A  
80 sacks

VOLUME: 93 CuFt  
RATE: 2.8 BPM  
PRESSURE: 0 PSI  
CIRCULATION: no

STAGE 4 Displace

MATERIAL: Water

VOLUME: 21.2 BBL  
RATE: 2.8 BPM  
PRESSURE: 50 PSI  
CIRCULATION: no

STAGE 5 \_\_\_\_\_

MATERIAL: \_\_\_\_\_

VOLUME: \_\_\_\_\_  
RATE: \_\_\_\_\_  
PRESSURE: \_\_\_\_\_  
CIRCULATION: \_\_\_\_\_

REMARKS: \_\_\_\_\_  
\_\_\_\_\_



**COMMONWEALTH OF PENNSYLVANIA  
DEPARTMENT OF ENVIRONMENTAL PROTECTION  
OIL AND GAS MANAGEMENT PROGRAM**

DEP USE ONLY	
Site Id	Primary Facility Id
Client Id	Sub-facility Id

## WELL RECORD AND COMPLETION REPORT

Well Operator Otter Exploration, Inc.		DEP ID# 207300	Well API # (Permit / Reg) 37-0083-51597-00	Project Number	Acres
Address 104 College St.		Well Form Name Section III		Well # 387	Serial #
City Hudson	State OH	Zip Code 44236	County McKean	Municipality Lafayette	
Phone 814-723-8640	Fax 814-723-8645	USGS 7.5 min. quadrangle map Lewis Run			

Check all that apply: ☐ Original Well Record ☒ Original Completion Report ☐ Amended Well Record ☐ Amended Completion Report

### WELL RECORD Also complete Log of Formations on back (page 2)

Well Type	<input type="checkbox"/> Gas <input type="checkbox"/> Oil <input checked="" type="checkbox"/> Combination Oil & Gas <input type="checkbox"/> Injection <input type="checkbox"/> Storage <input type="checkbox"/> Disposal						
Drilling Method	<input checked="" type="checkbox"/> Rotary - Air <input type="checkbox"/> Rotary - Mud <input type="checkbox"/> Cable Tool						
Date Drilling Started 10/10/06	Date Drilling Completed 10/15/06	Surface Elevation 2182 ft.	Total Depth - Driller 2123 ft.	Total Depth - Logger 2123 ft.			
Casing and Tubing			Cement returned on surface casing? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Cement returned on coal protective casing? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A				
Hole Size	Pipe Size	Wt.	Thread / Weld	Amount in Well (ft)	Material Behind Pipe Type and Amount	Packer / Hardware / Centralizers Type Size Depth	Date Run
10 3/4	9 5/8"	25	Thread	20'	n/a	n/a n/a n/a	10/10/06
8 3/4	7"	17	Thread	510	Cement - 80 sacks Class A	n/a n/a 255/480	10/12/06
6 1/4				2123			10/15/06
Tubing	1 1/2"			2120			11/14/06
Rods	5/8"			2086			11/14/06

### COMPLETION REPORT

Perforation Record			Stimulation Record				
Date	Interval Perforated From To		Date	Interval Treated	Fluid Type Amount	Propping Agent Type Amount	Average Injection
				See Attached			
Natural Open Flow	Show of gas		Natural Rock Pressure	75 psig		Hours	3 Days
After Treatment Open Flow	5 mcfpd, oil show		After Treatment Rock Pressure	250 psig		Hours	3 Days

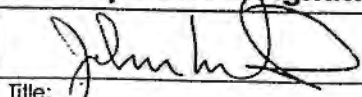
**Well Service Companies** -- Provide the name, address, and phone number of all well service companies involved.

Name Appalachian Well Service	Name R&R Ventures	Name Olson Drilling
Address PO Box 636	Address 15640 Tionesta Rd.	Address 626 Greendale Rd
City - State - Zip Indiana, PA 15701	City - State - Zip Pleasantville, PA 16341	City - State - Zip Kane, PA 16735
Phone 724-354-4400	Phone 814-589-7051	Phone 814-837-9480

**LOG OF FORMATIONS**Well API#: **370835159700**

Formation Name or Type	Top (feet)	Bottom (feet)	Gas at (feet)	Oil at (feet)	Water at (fresh / brine; ft.)	Source of Data
Sandstone	1	40				
Shale	40	52				
Sand & Clay	52	278			Fresh @ 80	Show
Sandstone	278	339			Fresh@ 140	Show
Gray Shale	339	401			Fresh@ 155	Show
Sandstone	401	425				
Shale	425	510				
Shale	510	595				
Red Shale	595	640				
Sandstone	640	655	635		Fresh@ 635	Show
Shale	655	1270				
Sandstone	1270	1310	1280			Show
Shale	1310	1390				
Sandstone	1390	1425				
Shale	1425	1530				
Sandstone	1530	1565				
Shale	1565	1860				
Sand	1860	1920				
Shale	1920	1970				
Sandstone	1970	1990				
Shale	1990	2100				

Please delete empty rows if necessary to make all of page 2 fit on one page.

**Well Operator's Signature:**

Title:  
PresidentDate:  
7/27/07**DEP USE ONLY**

Reviewed by:

Date:

Comments:

**Terms:** Net 30 days. Finance charge  
1.5% per month on past due accounts.

DATE November 14, 2006	LEASE SECTION III NO 3-87	PERMIT NO.	COUNTY McKean Co	STATE AA
CUSTOMER ORDER NO.	LAND OWNERS NAME	FIELD	FORMATION Various	TYPE GAS/oil
OWNER Swamp Angel Energy		NEW USED	SIZE	FROM TO WEIGHT MAXIMUM PSI ALLOWANCE
CHARGE TO JOHN McNALLY	CASING	NOTES	1276	1984 85% oh NO. OF SHOTS
ADDRESS 104 COLLEGE STREET	PERFORATIONS			NO. OF SHOTS
Hudson OH 44236	PERFORATIONS			NO. OF SHOTS
	PERFORATIONS			NO. OF SHOTS
	PERFORATIONS			NO. OF SHOTS
	PERFORATIONS			NO. OF SHOTS
	PERFORATIONS			NO. OF SHOTS

I have read, understood and agreed to the terms and conditions printed on the reverse side hereof and represent that I have full power and authority to execute this service order.

BY

**SERVICE ENGINEER**[illegible]

**CUSTOMER**

BY

**AUTHORIZED AGENT**

RECEIPT: The above hereby certifies that the equipment and services above listed were received by him and the services performed in a workmanlike manner.

SUB TOTAL	22 363 00
Less 46% disc	- 10 134 24
Fuel Surcharge	400 00
PAY THIS AMOUNT	1202876

G

INVOICE NO. 4242DATE November 14, 2006CUSTOMER Swamp AngelWELL Section III #3-87CSG. 3 1/2"

STAGE 1	STAGE 2	STAGE 3	STAGE 4	STAGE 5	STAGE 7
DEPTH <u>1276</u>	DEPTH <u>1288.5</u>	DEPTH <u>1371</u>	DEPTH <u>1502.5</u>	DEPTH <u>1532.5</u>	DEPTH <u>1978</u>
RATE _____	RATE <u>18.5</u>	RATE <u>19</u>	RATE _____	RATE <u>18.3</u>	RATE <u>15.0</u>
PRESSURE _____	PRESSURE <u>1730</u>	PRESSURE <u>2025</u>	PRESSURE <u>ANF</u>	PRESSURE <u>2122</u>	PRESSURE <u>2216</u>
HHP <u>Frac ed</u>	HHP _____	HHP _____	HHP _____	HHP _____	HHP _____
SAND <u>#1 &amp; #2</u>	SAND <u>70 sks</u>	SAND <u>80 sks</u>	SAND _____	SAND <u>90</u>	SAND <u>80</u>
FLUID <u>together</u>	FLUID <u>5573</u>	FLUID <u>6324</u>	FLUID _____	FLUID <u>6583</u>	FLUID <u>6333</u>
ISDP _____	ISDP <u>875</u>	ISDP <u>925</u>	ISDP _____	ISDP <u>970</u>	ISDP <u>1240</u>

TIME	RATE (BPM)	VOLUME (GAL) (BBL)	PRESSURE (PSI)		DESCRIPTION OF STAGE OR EVENT
			TUBING	CASING	
5:10					Safety Meeting
6:00					Load hole & wash pipe
	0-	Ø			Breakdown & est. Rate @ 1276 #1 1/2" Frac #1 + 2 together
10:40	0-10	Ø	2225		Breakdown & est Rate @ 1288.5 #2
10:41	18.5	573	2025	1/2"	
10:43	18.5	1573	1750	1"	70 sks
10:44	18.5	2573	1650	1 1/2"	
10:46	18.5	3573	1625	2"	
10:48	18.5	5573	1600		Flush
10:49	18.5	6494	1625		Shutdown & ISDP 875
11:31	0-10	Ø	1700		Breakdown & est. Rate @ 1371 #3
11:32	18.5	574	2650	1/2"	
11:33	19	1574	2100	1"	80 sks
11:35	19	2574	1875	1 1/2"	
11:37	19	4574	1850	2"	
11:40	19	6324	1900		Flush
11:41	19	7269	1950		Shutdown & ISDP 925

## CEMENT REPORT

DATE: 10/7/2006  
OWNER: Otter Exp  
WELL NUMBER: 87

LEASE: Section 3  
COUNTY: \_\_\_\_\_

STAGE 1 Pre-Flush

MATERIAL: Water

VOLUME: 22 BBL  
RATE: 2.8 BPM  
PRESSURE: 0 PSI  
CIRCULATION: no

STAGE 2 Condition Hole

MATERIAL: 200 lbs Bentonite  
80 lbs LCM

VOLUME: 10 BBL  
RATE: 2.8 BPM  
PRESSURE: 0 PSI  
CIRCULATION: no

STAGE 3 Cement

MATERIAL: Type 1 Class A  
80 sacks

VOLUME: 95 CuFt  
RATE: 2.8 BPM  
PRESSURE: 0 PSI  
CIRCULATION: no

STAGE 4 Displace

MATERIAL: Water

VOLUME: 21.2 BBL  
RATE: 2.8 BPM  
PRESSURE: 150 PSI  
CIRCULATION: yes

STAGE 5 \_\_\_\_\_

MATERIAL: \_\_\_\_\_

VOLUME: \_\_\_\_\_  
RATE: \_\_\_\_\_  
PRESSURE: \_\_\_\_\_  
CIRCULATION: \_\_\_\_\_

REMARKS: Good cement circulation.

## **ATTACHMENT D & E**

### **UNDERGROUND DRINKING WATER SOURCES**

The underground drinking water sources are within the Pennsylvania Pottsville Formation and the Mississippian Knapp Formation. Attached is a subsurface schematic of all the shallow sandstones that are present in Well 3-87 and its two offsets (3-54 and 3-82). Well 3-87 is the proposed EOR Injection Well. Please refer to Attachment A, Map 2.

## **ATTACHMENT F**

**NOT APPLICABLE**

## ATTACHMENT G

### GEOLOGICAL DATA ON INJECTION AND CONFINING ZONES

The Injection Zones shall be the Bradford Third and the Lewis Run formations. Both formations are in the Devonian System, Upper Devonian Series, and the Canadaway Group. There will be no future fracing completed in the proposed EOR Injection Well No. 3-87. The Bradford Third was not fraced during the original completion. The Lewis Run was notched at the 1978' and 1984'. The notch at 1978' broke at 3150 psig and was fraced with 7368 gallons of water at an average pressure of 2000 psig. The instantaneous shut in pressure was 1240 psig.

Bradford Thickness: 1846- to 1873'

Lewis Run Thickness: 1975' to 1987'

There is a confirming shale section from 1500' to 1845' that is above the cemented casing seat at approximately 1830'. Attached is a log of Well No. 3-87 showing this shale section and the complete well.



SUPERIOR

Office: 202-241-1111  
 Mobile: 202-241-1111  
 Fax: 202-241-1111  
 E-mail: info@superiorwellservices.com

# G/R DENSITY TEMP NEUTRON INDUCTION

Company OTTER EXPLORATION, INC.  
 Well SECTION III # 3 - 87  
 Field LEWIS RUN QUADRANGLE  
 County MCKEAN PA  
 State PA

Company OTTER EXPLORATION, INC.

Well SECTION III # 3 - 87

Field LEWIS RUN QUADRANGLE

County MCKEAN State PA

Location: API #: 31-51597

LAT. 41-52-24.4300

LONG. -78-41-4.7500

SOUTH 563' WEST 4899'

SEC TWP RGE

Other Services

TIF  
LAS  
20'

Elevation

Permanent Datum

Elevation 2182'

Log Measured From

TOP OF 7" CSG

Drilling Measured From

DRILL FLOOR

K.B.  
D.F.  
G.L. NA

Date	10-23-2006
Run Number	1
Depth Driller	N/A
Depth Logger	2123'
Bottom Logged Interval	2123'
Top Log Interval	45'
Casing Driller	7" @ 510'
Casing Logger	7" @ 512'
Bit Size	6.25
Type Fluid in Hole	FLUID LEVEL @ 1930'
Density / Viscosity	N/A
pH / Fluid Loss	N/A
Source of Sample	N/A
Rm @ Meas. Temp	N/A
Rmf @ Meas. Temp	N/A
Rmc @ Meas. Temp	N/A
Source of Rmf / Rmc	N/A
Rm @ BHT	N/A
Time Circulation Stopped	4HRS
Time Logger on Bottom	N/A
Maximum Recorded Temperature	N/A
Equipment Number	241
Location	BRADFORD
Recorded By	S. RUSSELL
Witnessed By	

## **ATTACHMENT H**

### **OPERATING DATA**

The average daily volume of injected brine is estimated at 100 BWPD. The maximum daily rate would be 200 BWPD. The average injection pressure at 100 psig with the maximum injection pressure at 375 psig. The injection fluid shall be produced brine from the existing producing wells on the lease (Warrants 3437, 2276, and 2277). The annulus fluids to be used shall be fresh water with corrosion inhibitor. Attached is the analysis of the physical and chemical characteristics of the injection fluid provided by Microbac Laboratories, Inc.

# Microbac

® Microbac Laboratories, Inc.

ERIE DIVISION

1962 WAGER ROAD

ERIE, PA 16509

(814) 825-8533 FAX (814)825-9254

MARK MATROZZA, MANAGING DIRECTOR

http://www.microbac.com E-Mail: erie@microbac.com

Page 1 of 2

STATE CERT ID.

25-067, 10121

C-PA-05

CHEMISTRY · MICROBIOLOGY · FOOD SAFETY · CONSUMER PRODUCTS  
WATER · AIR · WASTES · FOOD · PHARMACEUTICALS · NUTRACEUTICALS

## CERTIFICATE OF ANALYSIS

OTTER EXPLORATION INC.  
MR. JOHN MCNALLY  
104 COLLEGE STREET  
HUDSON, OH 44236

Date Reported 12/26/2007  
Date Received 12/7/2007  
Order Number 0712-01124  
Invoice No. 38184  
Cust # 082337

Permit No.  
Cust P.O.

SUBJECT: INJECTION FLUID CLASS II SAMPLE ANALYSIS

TEST	METHOD	RESULT	UNITS	ANALYSIS DATE	TIME	TECH	ACCRED.
001 INJECTION FLUID							
PH -EXCEEDS 15MIN HOLD TIME	SM20 4500H-B	6.2	UNITS	12/7/2007	15:20	CMC	☞
SPECIFIC GRAVITY	ASTM D 1429	1.02		12/13/2007	15:07	CAP	
CHLORIDE	EPA 325.3/ASTM D512-89A	15,400	MG/L	12/12/2007	14:00	CAP	
ALKALINITY AS CaCO3	SM 2320B	55	MG/L	12/10/2007	9:30	JFR	☞
SOLIDS, DISSOLVED	SM 2540C	31000	MG/L	12/11/2007	16:30	CP	
CONDUCTANCE, SPECIFIC	EPA 1979 120.1	39100	UMHOS/CM	12/7/2007	16:30	CAP	
002 INJECTION FLUID							
Metals by ICP	EPA 200.7			12/19/2007	14:55	MWR	
Barium	EPA 200.7	2.55	MG/L	12/19/2007	14:55	MWR	☞ ◆
Iron	EPA 200.7	77.7	MG/L	12/19/2007	14:55	MWR	☞
Magnesium	EPA 200.7	309	MG/L	12/19/2007	14:55	MWR	☞
Manganese	EPA 200.7	2.27	MG/L	12/14/2007	14:55	MWR	☞
Sodium	EPA 200.7	6140	MG/L	12/19/2007	14:55	MWR	☞
HARDNESS, as CaCO3	EPA 1979 ICP 200.7	6130	MG/L	12/19/2007	14:54	MWR	
003 INJECTION FLUID - NO SAMPLE RCVD FOR DISSOLVED OXYGEN. NO AIR TIGHT CONTAINER WAS PROVIDED.							
NO SAMPLE AVAILABLE						CMC	
004 INJECTION FLUID							
TOC (TOTAL ORGANIC CARBON)	SM18 5310C	7000	MG/L	12/12/2007	9:44	OST	
005 INJECTION FLUID							
SULFIDE	EPA1979 376.1-2	0.11	MG/L	12/18/2007	16:15	OST	

SAMPLE WAS RECEIVED IN A GALLON JUG. ALL SAMPLE PRESERVATION WAS DONE AT LAB.

THE TECH INITIALS "OST" (OUTSIDE TESTING) INDICATE THAT THE TOTAL ORGANIC CARBON ANALYSES WERE SUB-CONTRACTED TO MICROBAC, CAMP HILL DIVISION.



The data and information on this, and other accompanying documents, represent only the sample(s) analyzed and is rendered upon condition that it is not to be reproduced wholly or in part for advertising or other purposes without approval from the laboratory.  
USDA-EPA-NIOSH Testing Food Sanitation Consulting Chemical and Microbiological Analyses and Research

NELAP accredited by PA, NY. Visit our website to view our current NELAP accreditations for various drinking water, wastewater and solid & chemical materials, air & emissions analytes

MEMBER



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ERIE DIVISION

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ERIE, PA 16509

(814) 825-8533 FAX (814) 825-9254

MARK MATROZZA, MANAGING DIRECTOR

<http://www.microbac.com> E-Mail: [erie@microbac.com](mailto:erie@microbac.com)

Page 2 of 2

STATE CERT ID.

25-067, 10121

C-PA-05

CHEMISTRY · MICROBIOLOGY · FOOD SAFETY · CONSUMER PRODUCTS  
WATER · AIR · WASTES · FOOD · PHARMACEUTICALS · NUTRACEUTICALS

## CERTIFICATE OF ANALYSIS

OTTER EXPLORATION INC.  
MR. JOHN McNALLY  
104 COLLEGE STREET  
HUDSON, OH 44236

Date Reported 12/26/2007  
Date Received 12/7/2007  
Order Number 0712-01124  
Invoice No. 38184  
Cust # 082337

Permit No.  
Cust P.O.

SUBJECT: INJECTION FLUID CLASS II SAMPLE ANALYSIS

TEST	METHOD	RESULT	UNITS	ANALYSIS DATE	TIME	TECH	ACCRED.
------	--------	--------	-------	---------------	------	------	---------

THE TECH INITIALS "OST" (OUTSIDE TESTING) INDICATE THAT THE SULFIDE ANALYSES WERE SUB-CONTRACTED TO MICROBAC, CHICAGO LAND DIVISION.

*Mark A. Matrozza*  
Mark A Matrozza  
Managing Director

*Cheri A. Brolaski*  
Cheri A Brolaski  
Laboratory Director

All samples received in proper condition and results conform to ISO 17025 standards unless otherwise noted

### Accred.

- ⌘ This symbol at the end of the test line means the test analysis met the requirements of NELAC (PA ID 25-00067)
- ❖ This symbol at the end of the test line means the test analysis met the requirements of AIHA (ID 100386)
- ◆ This symbol at the end of the test line means the test analysis met the requirements of NY ELAP (NY ID 10121)

### ABBREVIATIONS:

TNTC = Too Numerous To Count  
UG/L = Micrograms per Liter (PPB)  
UG/KG = Micrograms per Kilogram (PPB)  
MG/L = Milligrams per Liter (PPM)  
1000 UG = 1 MG  
Positive = Bacteria or target analyte detected

MG/KG = Milligram per Kilogram (PPM)  
CFU = Colony Forming Unit  
ND = Not detected at or below the reporting limit  
TIC = Tentatively Identified Compound  
"<" = less than (also see "ND")  
Negative = Bacteria or target analyte not detected

For any feedback concerning our services, please contact Mark Matrozza, Managing Director at [mmatrozza@microbac.com](mailto:mmatrozza@microbac.com) or Trevor Boyce President at [president@microbac.com](mailto:president@microbac.com)



The data and information on this, and other accompanying documents, represent only the sample(s) analyzed and is rendered upon condition that it is not to be reproduced wholly or in part for advertising or other purposes without approval from the laboratory.

USDA-EPA-NIOSH Testing Food Sanitation Consulting Chemical and Microbiological Analyses and Research

NELAP accredited by PA, NY. Visit our website to view our current NELAC accreditations for various drinking water, wastewater and solid & chemical materials, air & emissions analytes

MEMBER



## **ATTACHMENT I**

### **FORMATION TESTING PROGRAM**

There will be a pressure gauge on the 3-1/2" X 1-1/2" annulus and on the 3-1/2" x 7" annulus. These pressures will be recorded daily to monitor any pressure increase.

The pressure on the 1-1/2" injection pipe will also be recorded daily to insure the injection pressure at the surface does not exceed 375 psig.

The physical characteristics of the injection fluid is included in Attachment H. The Bradford Third is a 27' thick sandstone with an average porosity of approximately 14%. The Lewis Run is a 11' thick sandstone with an average porosity of approximately 16%. Permeability is not known. Because the maximum surface injection pressure is 375 psig, fracture pressures will not be reached and no fractures will be created.

**ATTACHMENT J**

THERE WILL BE NO STIMULATION PROGRAMS

## **ATTACHMENT K**

### **INJECTION PROCEDURES**

The brine will be collected on the lease from several existing brine storage tanks and transported by truck to the existing Well No. 3-87 injection site. There are two (2) 210 bbl storage tanks for the brine to be injected. The brine will a gravity fed through a filter and a water meter. The fluid will be injected into the well by a 170 Hp V-8 Chevy pump. The injection pressure and volume of injected brine will be recorded daily.

## ATTACHMENT L

### CONSTRUCTION PROCEDURES

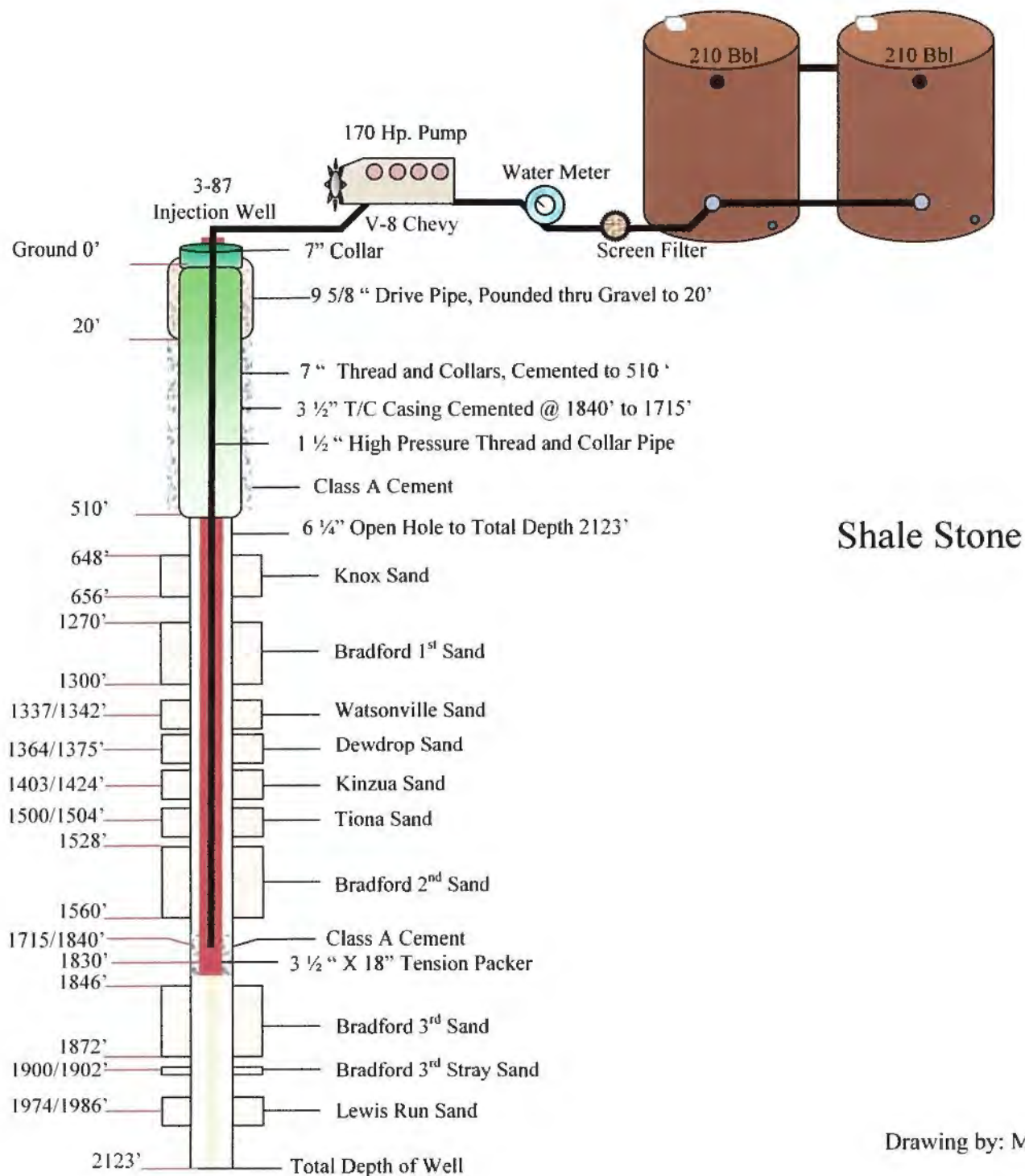
Well No. 3-87 (the proposed EOR injection well) is currently with the 7" (510' depth) cementing data included in Attachment C. A copy of the well log is included in Attachment G. New construction will include the installation of a 3-1/2' isolation casing string. A cement plug will be emplaced from 1715' to 1740' with fresh water left in the 3-1/2" x 6-1/4 open hole annulus. A string of 1-1/2" tubing on packer will be set inside the 3-1/2" just above the Bradford Third sand. No coring was done in the well.

## **ATTACHMENT M**

### **CONSTRUCTION DETAILS**

Attached is a subsurface schematic (Schematic 1) and surface installation diagram (Schematic 2). The surface construction is already complete and was during the 30 day test injection period.

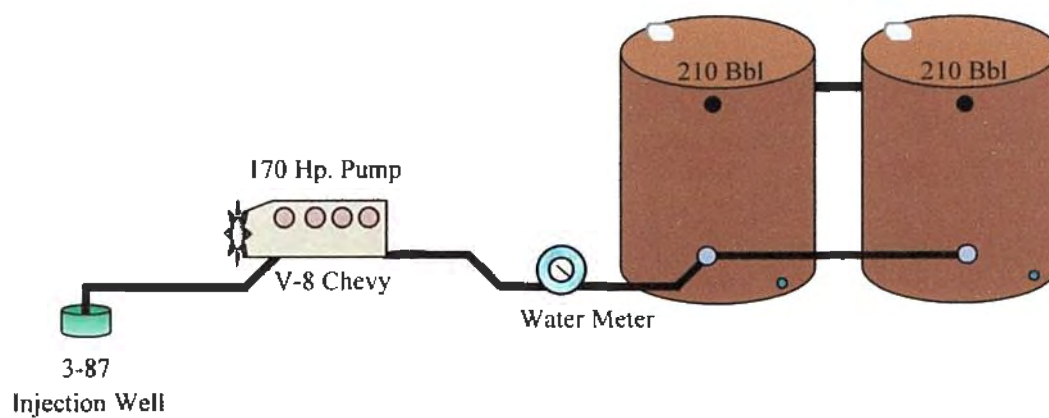
## 3-87 EOR Injection Well; Subsurface Installation



Drawing by: Michael J. Riche

## 3-87 EOR Injection Well; Surface Installation

---



**ATTACHMENT N**

**NOT APPLICABLE**

**ATTACHMENT O**  
**PLANS FOR WELL FAILURE**

Appropriate shut in procedures shall occur if conditions warrant action.

Action:

- 1) Turn off pump.
- 2) Shut in all supplies to pump
- 3) Open 1 ½" injection line valve to tank atmosphere.
- 4) Open any/all affected annulus to atmosphere.
- 5) Verbal notification of mechanical failure will be provided within 24 hours to the EPA and in writing within 7 days.

**ATTACHMENT P**  
**MONITORING PROGRAM**

The injection pressure shall be monitored and recorded daily. The production and well data from the two (2) offset wells (3-54 and 3-82) shall be monitored for excessive pressures or leaks. The annular pressure (7" casing x 3 ½" casing) and (3 ½" casing x 1 ½" pipe) shall be monitored daily for pressure rises or fluid influx. Appropriate shut ins shall occur if conditions warrant action. Verbal notification of mechanical failure will be provided within 24 hours to the EPA and in writing with 7 days.

## **ATTACHMENT Q**

### **PLUGGING AND ABANDONMENT PLAN**

Attached is the plugging and abandonment plan for Well No. 3-87. A service rig, cement pump truck and cement bulk truck would be mobilized at the well site to plug Well No. 3-87. Fresh water would be circulated to surface to stabilize the well and the balance method used for the emplacement of the cement plugs. Plugging cost is estimated at \$5,000.00.



United States Environmental Protection Agency  
Washington, DC 20460

## PLUGGING AND ABANDONMENT PLAN

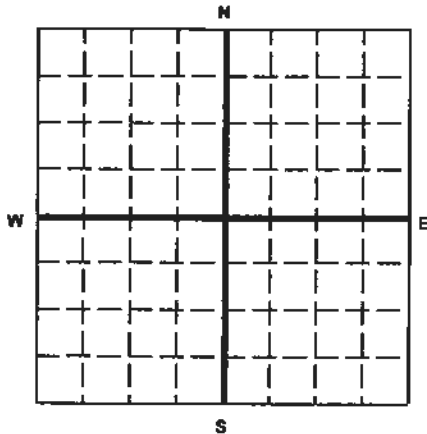
Name and Address of Facility

WT 2277 off SR 777, Lafayette, McKean County, Pennsylvania

Name and Address of Owner/Operator

Swamp Angel  
2414 N. Woodlawn, Suite 160, Wichita, KS 67220

Locate Well and Outline Unit on  
Section Plat - 640 Acres



State

Pennsylvania

County

McKean

Permit Number

37-0083-51597-00

Surface Location Description

1/4 of \_\_\_ 1/4 of \_\_\_ 1/4 of \_\_\_ 1/4 of Section \_\_\_ Township \_\_\_ Range \_\_\_

Locate well in two directions from nearest lines of quarter section and drilling unit

Surface Lat. 41°-52'-24.43" Long. 78°-41'-75"

Location \_\_\_ ft. from (N/S) \_\_\_ Line of quarter section

and \_\_\_ ft. from (E/W) \_\_\_ Line of quarter section.

TYPE OF AUTHORIZATION

- ☐ Individual Permit  
☒ Area Permit  
☐ Rule

Number of Wells 2

Lease Name Music Mountain

WELL ACTIVITY

- ☐ CLASS I  
☒ CLASS II  
☐ Brine Disposal  
☒ Enhanced Recovery  
☐ Hydrocarbon Storage  
☐ CLASS III

Well Number 3-87

### CASING AND TUBING RECORD AFTER PLUGGING

SIZE	WT (LB/FT)	TO BE PUT IN WELL (FT)	TO BE LEFT IN WELL (FT)	HOLE SIZE
7"	17	n/a	510'	8 3/4"
3.5"	10	n/a	150'	6.25"
2"	4	3'	3'	7"

### METHOD OF EMPLACEMENT OF CEMENT PLUGS

- ☒ The Balance Method  
☐ The Dump Baller Method  
☐ The Two-Plug Method  
☐ Other

### CEMENTING TO PLUG AND ABANDON DATA:

	PLUG #1	PLUG #2	PLUG #3	PLUG #4	PLUG #5	PLUG #6	PLUG #7
Size of Hole or Pipe in which Plug Will Be Placed (Inches)	6-1/4"	6-1/4"	6-1/4"				
Depth to Bottom of Tubing or Drill Pipe (ft)	2000'	1560'	590'				
Sacks of Cement To Be Used (each plug)	50 saks	50 saks	25 saks				
Slurry Volume To Be Pumped (cu. ft.)	58.966	58.966	29.483				
Calculated Top of Plug (ft.)	1726'	1286'	460'				
Measured Top of Plug (if tagged ft.)	n/a	n/a	n/a				
Slurry Wt. (Lb./Gal.)	15.6	15.6	15.6				
Type Cement or Other Material (Class III)	Class A	Class A	Class A				

### LIST ALL OPEN HOLE AND/OR PERFORATED INTERVALS AND INTERVALS WHERE CASING WILL BE VARIED (if any)

From	To	From	To
512'	1276'	Open Hole	
1276'	1984'	Open Hole w/Notches	
1984'	2196'	Open Hole	

Estimated Cost to Plug Wells

\$5,000.00

### Certification

I certify under the penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. (Ref. 40 CFR 144.32)

Name and Official Title (Please type or print)

John McNally

Signature

Date Signed

12/27/2007

## **ATTACHMENT R**

### **NECESSARY RESOURCES**

Swamp Angel Energy, LLC will be providing a financial statement (or other sufficient instrument) to verify that Well No. 3-87 can be plugged. The resource required is \$ 5,000.00.

**ATTACHMENT S & T**

NOT APPLICABLE