

# **Appendix A**

# **Attachment B-1**

	United States Environmental Protection Agency <b>Underground Injection Control                  Permit Application</b> <i>(Collected under the authority of the Safe Drinking                  Water Act. Sections 1421, 1422, 40 CFR 144)</i>	I. EPA ID Number	
			T/A
			C

**Read Attached Instructions Before Starting  
For Official Use Only**

Application approved mo    day    year	Date received mo    day    year	Permit Number	Well ID	FINDS Number

II. Owner Name and Address				III. Operator Name and Address			
Owner Name West Bay Exploration Company				Owner Name West Bay Exploration Company			
Street Address 13685 South West Bay Shore Drive, Suite #200			Phone Number (231) 946-0200	Street Address 13685 South West Bay Shore Suite #200			Phone Number (231) 946-0200
City Traverse City		State MI	ZIP CODE 49684	City Traverse City		State MI	ZIP CODE 49684

IV. Commercial Facility	V. Ownership	VI. Legal Contact	VII. SIC Codes
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input checked="" type="checkbox"/> Private <input type="checkbox"/> Federal <input type="checkbox"/> Other	<input checked="" type="checkbox"/> Owner <input type="checkbox"/> Operator	1311

VIII. Well Status (Mark "x")

<input type="checkbox"/> A. Operating	Date Started mo    day    year	<input type="checkbox"/> B. Modification/Conversion	<input checked="" type="checkbox"/> C. Proposed
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IX. Type of Permit Requested (Mark "x" and specify if required)

<input checked="" type="checkbox"/> A. Individual <input type="checkbox"/> B. Area	Number of Existing Wells 0	Number of Proposed Wells 1	Name(s) of field(s) or project(s) Napoleon
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X. Class and Type of Well (see reverse)

A. Class(es) (enter code(s)) H	B. Type(s) (enter code(s)) D	C. If class is "other" or type is code 'x,' explain	D. Number of wells per type (if area permit)
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XI. Location of Well(s) or Approximate Center of Field or Project												XII. Indian Lands (Mark 'x')					
Latitude			Longitude			Township and Range										<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Deg	Min	Sec	Deg	Min	Sec	Sec	Twp	Range	1/4 Sec	Feet From	Line	Feet From	Line				
42	06	16	84	11	08	22	4S	2E	SW	665	S	1407	W				

XIII. Attachments

*(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.

XIV. 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)

A. Name and Title (Type or Print) Timothy Brock-Agent	B. Phone No. (Area Code and No.) (231) 946-0200
C. Signature <i>Timothy Brock</i> for Timothy Brock - Agent	D. Date Signed 3/20/11

*for WBE*

## Well Class and Type Codes

**Class I** Wells used to inject waste below the deepest underground source of drinking water.

**Type** "I" Nonhazardous industrial disposal well  
 "M" Nonhazardous municipal disposal well  
 "W" Hazardous waste disposal well injecting below USDWs  
 "X" Other Class I wells (not included in Type "I," "M," or "W")

**Class II** Oil and gas production and storage related injection wells.

**Type** "D" Produced fluid disposal well  
 "R" Enhanced recovery well  
 "H" Hydrocarbon storage well (excluding natural gas)  
 "X" Other Class II wells (not included in Type "D," "R," or "H")

**Class III** Special process injection wells.

**Type** "G" Solution mining well  
 "S" Sulfur mining well by Frasch process  
 "U" Uranium mining well (excluding solution mining of conventional mines)  
 "X" Other Class III wells (not included in Type "G," "S," or "U")

**Other Classes** Wells not included in classes above.  
 Class V wells which may be permitted under §144.12.  
 Wells not currently classified as Class I, II, III, or V.

## Attachments to Permit Application

<b>Class</b>	<b>Attachments</b>
I new well	A, B, C, D, F, H – S, U
existing	A, B, C, D, F, H – U
II new well	A, B, C, E, G, H, M, Q, R; optional – I, J, K, O, P, U
existing	A, E, G, H, M, Q, R, – U; optional – J, K, O, P, Q
III new well	A, B, C, D, F, H, I, J, K, M – S, U
existing	A, B, C, D, F, H, J, K, M – U
Other Classes	To be specified by the permitting authority

## INSTRUCTIONS - Underground Injection Control (UIC) Permit Application

**Paperwork Reduction Act:** The public reporting and record keeping burden for this collection of information is estimated to average 224 hours for a Class I hazardous well application, 110 hours for a Class I non-hazardous well application, 67 hours for a Class II well application, and 132 hours for a Class III well application. Burden means the total time, effort, or financial resource expended by persons to generate, maintain, retain, or disclose or provide information to or for a Federal Agency. This includes the time needed to review instructions; develop, acquire, install, and utilize technology and systems for the purposes of collecting, validating, and verifying information, processing and maintaining information, and disclosing and providing information; adjust the existing ways to comply with any previously applicable instructions and requirements; train personnel to be able to respond to the collection of information; search data sources; complete and review the collection of information; and, transmit or otherwise disclose the information. An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number. Send comments on the Agency's need for this information, the accuracy of the provided burden estimates, and any suggested methods for minimizing respondent burden, including the use of automated collection techniques to Director, Collection Strategies Division, U.S. Environmental Protection Agency (2822), 1200 Pennsylvania Ave., NW, Washington, DC 20460. Include the OMB control number in any correspondence. Do not send the completed forms to this address.

This form must be completed by all owners or operators of Class I, II, and III injection wells and others who may be directed to apply for permit by the Director.

- I. **EPA I.D. NUMBER** - Fill in your EPA Identification Number. If you do not have a number, leave blank.
- II. **OWNER NAME AND ADDRESS** - Name of well, well field or company and address.
- III. **OPERATOR NAME AND ADDRESS** - Name and address of operator of well or well field.
- IV. **COMMERCIAL FACILITY** - Mark the appropriate box to indicate the type of facility.
- V. **OWNERSHIP** - Mark the appropriate box to indicate the type of ownership.
- VI. **LEGAL CONTACT** - Mark the appropriate box.
- VII. **SIC CODES** - List at least one and no more than four Standard Industrial Classification (SIC) Codes that best describe the nature of the business in order of priority.
- VIII. **WELL STATUS** - Mark Box A if the well(s) were operating as injection wells on the effective date of the UIC Program for the State. Mark Box B if wells(s) existed on the effective date of the UIC Program for the State but were not utilized for injection. Box C should be marked if the application is for an underground injection project not constructed or not completed by the effective date of the UIC Program for the State.
- IX. **TYPE OF PERMIT** - Mark "Individual" or "Area" to indicate the type of permit desired. Note that area permits are at the discretion of the Director and that wells covered by an area permit must be at one site, under the control of one person and do not inject hazardous waste. If an area permit is requested the number of wells to be included in the permit must be specified and the wells described and identified by location. If the area has a commonly used name, such as the "Jay Field," submit the name in the space provided. In the case of a project or field which crosses State lines, it may be possible to consider an area permit if EPA has jurisdiction in both States. Each such case will be considered individually, if the owner/operator elects to seek an area permit.
- X. **CLASS AND TYPE OF WELL** - Enter in these two positions the Class and type of injection well for which a permit is requested. Use the most pertinent code selected from the list on the reverse side of the application. When selecting type X please explain in the space provided.
- XI. **LOCATION OF WELL** - Enter the latitude and longitude of the existing or proposed well expressed in degrees, minutes, and seconds or the location by township, and range, and section, as required by 40 CFR Part 146. If an area permit is being requested, give the latitude and longitude of the approximate center of the area.
- XII. **INDIAN LANDS** - Place an "X" in the box if any part of the facility is located on Indian lands.
- XIII. **ATTACHMENTS** - Note that information requirements vary depending on the injection well class and status. Attachments for Class I, II, III are described on pages 4 and 5 of this document and listed by Class on page 2. Place EPA ID number in the upper right hand corner of each page of the Attachments.
- XIV. **CERTIFICATION** - All permit applications (except Class II) must be signed by a responsible corporate officer for a corporation, by a general partner for a partnership, by the proprietor of a sole proprietorship, and by a principal executive or ranking elected official for a public agency. For Class II, the person described above should sign, or a representative duly authorized in writing.

## INSTRUCTIONS - Attachments

Attachments to be submitted with permit application for Class I, II, III and other wells.

- A. AREA OF REVIEW METHODS** - Give the methods and, if appropriate, the calculations used to determine the size of the area of review (fixed radius or equation). The area of review shall be a fixed radius of 1/4 mile from the well bore unless the use of an equation is approved in advance by the Director.
- B. MAPS OF WELL/AREA AND AREA OF REVIEW** - Submit a topographic map, extending one mile beyond the property boundaries, showing the injection well(s) or project area for which a permit is sought and the applicable area of review. The map must show all intake and discharge structures and all hazardous waste treatment, storage, or disposal facilities. If the application is for an area permit, the map should show the distribution manifold (if applicable) applying injection fluid to all wells in the area, including all system monitoring points. Within the area of review, the map must show the following:

### **Class I**

The number, or name, and location of all producing wells, injection wells, abandoned wells, dryholes, surface bodies of water, springs, mines (surface and subsurface), quarries, and other pertinent surface features, including residences and roads, and faults, if known or suspected. In addition, the map must identify those wells, springs, other surface water bodies, and drinking water wells located within one quarter mile of the facility property boundary. Only information of public record is required to be included in this map;

### **Class II**

In addition to requirements for Class I, include pertinent information known to the applicant. This requirement does not apply to existing Class II wells;

### **Class III**

In addition to requirements for Class I, include public water systems and pertinent information known to the applicant.

- C. CORRECTIVE ACTION PLAN AND WELL DATA** - Submit a tabulation of data reasonably available from public records or otherwise known to the applicant on all wells within the area of review, including those on the map required in B, which penetrate the proposed injection zone. Such data shall include the following:

### **Class I**

A description of each well's types, construction, date drilled, location, depth, record of plugging and/or completion, and any additional information the Director may require. In the case of new injection wells, include the corrective action proposed to be taken by the applicant under 40 CFR 144.55.

### **Class II**

In addition to requirement for Class I, in the case of Class II wells operating over the fracture pressure of the injection formation, all known wells within the area of review which penetrate formations affected by the increase in pressure. This requirement does not apply to existing Class II wells.

### **Class III**

In addition to requirements for Class I, the corrective action proposed under 40 CFR 144.55 for all Class III wells.

- D. MAPS AND CROSS SECTION OF USDWs** - Submit maps and cross sections indicating the vertical limits of all underground sources of drinking water within the area of review (both vertical and lateral limits for Class I), their position relative to the injection formation and the direction of water movement, where known, in every underground source of drinking water which may be affected by the proposed injection. (Does not apply to Class II wells.)

- E. NAME AND DEPTH OF USE (CLASS II)** - For Class II wells, submit geologic name, and depth to bottom of all underground sources of drinking water which may be affected by the injection.
- F. MAPS AND CROSS SECTIONS OF GEOLOGIC STRUCTURE OF AREA** - Submit maps and cross sections detailing the geologic structure of the local area (including the lithology of injection and confining intervals) and generalized maps and cross sections illustrating the regional geologic setting. (Does not apply to Class II wells.)
- G. GEOLOGICAL DATA ON INJECTION AND CONFINING ZONES (Class II)** - For Class II wells, submit appropriate geological data on the injection zone and confining zones including lithologic description, geological name, thickness, depth and fracture pressure.
- H. OPERATING DATA** - Submit the following proposed operating data for each well (including all those to be covered by area permits): (1) average and maximum daily rate and volume of the fluids to be injected; (2) average and maximum injection pressure; (3) nature of annulus fluid; (4) for Class I wells, source and analysis of the chemical, physical, radiological and biological characteristics, including density and corrosiveness, of injection fluids; (5) for Class II wells, source and analysis of the physical and chemical characteristics of the injection fluid; (6) for Class III wells, a qualitative analysis and ranges in concentrations of all constituents of injected fluids. If the information is proprietary, maximum concentrations only may be submitted, but all records must be retained.
- I. FORMATION TESTING PROGRAM** - Describe the proposed formation testing program. For Class I wells the program must be designed to obtain data on fluid pressure, temperature, fracture pressure, other physical, chemical, and radiological characteristics of the injection matrix and physical and chemical characteristics of the formation fluids.
- For Class II wells the testing program must be designed to obtain data on fluid pressure, estimated fracture pressure, physical and chemical characteristics of the injection zone. (Does not apply to existing Class II wells or projects.)
- For Class III wells the testing must be designed to obtain data on fluid pressure, fracture pressure, and physical and chemical characteristics of the formation fluids if the formation is naturally water bearing. Only fracture pressure is required if the program formation is not water bearing. (Does not apply to existing Class III wells or projects.)
- J. STIMULATION PROGRAM** - Outline any proposed stimulation program.
- K. INJECTION PROCEDURES** - Describe the proposed injection procedures including pump, surge, tank, etc.
- L. CONSTRUCTION PROCEDURES** - Discuss the construction procedures (according to §146.12 for Class I, §146.22 for Class II, and §146.32 for Class III) to be utilized. This should include details of the casing and cementing program, logging procedures, deviation checks, and the drilling, testing and coring program, and proposed annulus fluid. (Request and submission of justifying data must be made to use an alternative to packer for Class I.)
- M. CONSTRUCTION DETAILS** - Submit schematic or other appropriate drawings of the surface and subsurface construction details of the well.
- N. CHANGES IN INJECTED FLUID** - Discuss expected changes in pressure, native fluid displacement, and direction of movement of injection fluid. (Class III wells only.)
- O. PLANS FOR WELL FAILURES** - Outline contingency plans (proposed plans, if any, for Class II) to cope with all shut-ins or wells failures, so as to prevent migration of fluids into any USDW.
- P. MONITORING PROGRAM** - Discuss the planned monitoring program. This should be thorough, including maps showing the number and location of monitoring wells as appropriate and discussion of monitoring devices, sampling frequency, and parameters measured. If a manifold monitoring program is utilized, pursuant to §146.23(b)(5), describe the program and compare it to individual well monitoring.
- Q. PLUGGING AND ABANDONMENT PLAN** - Submit a plan for plugging and abandonment of the well including: (1) describe the type, number, and placement (including the elevation of the top and bottom) of plugs to be used; (2) describe the type, grade, and quantity of cement to be used; and (3) describe the method to be used to place plugs, including the method used to place the well in a state of static equilibrium prior to placement of the plugs. Also for a Class III well that underlies or is in an exempted aquifer, demonstrate adequate protection of USDWs. Submit this information on EPA Form 7520-14, Plugging and Abandonment Plan.

- R. **NECESSARY RESOURCES** - Submit evidence such as a surety bond or financial statement to verify that the resources necessary to close, plug or abandon the well are available.
- S. **AQUIFER EXEMPTIONS** - If an aquifer exemption is requested, submit data necessary to demonstrate that the aquifer meets the following criteria: (1) does not serve as a source of drinking water; (2) cannot now and will not in the future serve as a source of drinking water; and (3) the TDS content of the ground water is more than 3,000 and less than 10,000 mg/l and is not reasonably expected to supply a public water system. Data to demonstrate that the aquifer is expected to be mineral or hydrocarbon production, such as general description of the mining zone, analysis of the amenability of the mining zone to the proposed method, and time table for proposed development must also be included. For additional information on aquifer exemptions, see 40 CFR Sections 144.7 and 146.04.
- T. **EXISTING EPA PERMITS** - List program and permit number of any existing EPA permits, for example, NPDES, PSD, RCRA, etc.
- U. **DESCRIPTION OF BUSINESS** - Give a brief description of the nature of the business.



**West Bay 22 SWD**  
**EPA Permit Attachments and Appendices 4/20/11**  
**Attachment A**

Area of Review Methods:

The area of review is a fixed radius of ¼ mile from the well bore.

**Attachment B**

Maps of Wells/Area and Area of Review:

Attached is a topographic map that extends at least 1 mile beyond the proposed injection well. Shown are the following: the injection well, the ¼ mile radius of review, all producing wells, injection wells, abandoned wells, surface bodies of water, springs and other pertinent surface features. The map also shows residences and roads. There are five residences within the area of review, and each has a fresh water well. However, not all of the fresh water wells have records available in the public record (a copy of the available records has been included in Appendix 4). Also, it is planned to drill a temporary fresh water well for water supply for drilling in the vicinity of the proposed injection well. No faults are known to exist or suspected in the area of review. The following is a list of the wells within the area of review and their type:

Map Ref.	Well Name	Surface Location	Date Drilled	State PN	Operator	Total Depth	Status
59996	West Bay 1-22	NW/SE/SW Sec. 22 T4S R2E	1/2010	59996	West Bay Exploration Company	4,370'	Producing Oil Well
60010	West Bay and Boyd 1-27	SW/SE/SW Sec. 22 T4S R2E	2/2010	60010	West Bay Exploration Company	4,845'	Producing Oil Well
60011	West Bay and Boyd 2-27	SW/SE/SW Sec. 22 T4S R2E	3/2010	60011	West Bay Exploration Company	4,495'	Dry Hole
60094	West Bay and Boyd 2-27 HD1	SW/SE/SW Sec. 22 T4S R2E	5/2010	60094	West Bay Exploration Company	5,102'	Producing Oil Well

All of these wells penetrate the injection zone (only three penetrations due to the directional geometries of the wells) and have been cased and cemented across the injection zone. There are no known springs within the area of review. There are 5 seasonally-wet, marshy areas shown on the map as surface bodies of water.

**Attachment C**

Corrective Action Plan and Well Data:

Should upward fluid migration occur through the well bore of any previously unknown, improperly plugged or unplugged well due to injection of permitted fluids, injection will

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**EPA Permit Attachments and Appendices 4/20/11**

be shut-in until proper plugging can be accomplished. The UIC branch of the EPA will be notified immediately. Should any problems develop in the casing of the injection well, injection will be shut-in until such repairs can be made to remedy the situation. Operations shall not be resumed until the Director gives approval in writing.

Attached are copies of the well completion reports for all wells within the area of review. (See Appendix A)

**Attachment D**

Maps and Cross Sections of USDW's:

Does not apply to Class II wells.

**Attachment E**

Name and Depth of USDW's:

The following are the USDW's in the area of the subject permit. This information was gathered from public well records, as well as the publication 'Hydrogeology for Underground Injection Control in Michigan: Part 1' and the Michigan Hydrogeologic Atlas (Plate 24), both published by the Department of Geology, College of Arts and Sciences, Western Michigan University, Kalamazoo, Michigan, 1981. The depth to the base of the lowermost USDW was determined by mapping the existing well control in the area. Attached is a map showing the subsea depth of the base of lowest USDW in this area.

<b>Name of USDW</b>	<b>Measured Top of USDW</b>	<b>Measured Base of USDW</b>
Glacial Drift	Surface	155'
Marshall Sandstone	155'	226'

**Attachment F**

Maps and Cross Sections of Geologic Structure of Area:

Does not apply to Class II injection wells.

**Attachment G**

Geologic Data on Injection and Confining Zones:

Upper Confining Zone:

Name: Salina A2 Evaporite  
Depth: 2,634'-2,662'

**West Bay 22 SWD**  
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Thickness: 28 feet  
Lithologic Description: Anhydrite, dense, hard, white, excellent barrier to flow.

Injection Zone:  
Name: Salina A1/Niagaran  
Depth: 2,662'-3,032'  
Thickness: 370 feet  
Lithologic Description: Dolomite, hard, sucrosic, vuggular, porous and permeable, brown and grey.

Lower Confining Zone:  
Name: Clinton Shale  
Depth: 3,032'-3,152'  
Thickness: 120 feet  
Lithologic Description: Shale and tight argillaceous limestone and dolomite. Hard and dense. Excellent barrier to flow.

**Attachment H**

Operating Data:

Estimated maximum injection rate: 1200 bbl/day

Proposed maximum injection pressure:

Assumed frac gradient: 0.8 psi/ft  
Specific Gravity of Fluid: 1.193 (fresh water = 1)  
Upper Depth of Inj. Zone: 2,662 feet

$$P_{\max} = \{[0.8 - (0.433) * (\text{SG of Inj. Fluid} + 0.05)] * \text{Upper Depth of Inj. Zone}\} - 14.7$$

$$P_{\max} = \{[0.8 - (0.433) * (1.193 + 0.05)] * 2,662\} - 14.7$$

$$P_{\max} = 682 \text{ psig}$$

**Attachment I**

Formation Testing Program:

No formation testing is planned for this well.

**Attachment J**

**West Bay 22 SWD**  
**EPA Permit Attachments and Appendices 4/20/11**

Stimulation Program:

A small acid job of about 3,000 gallons of 28% HCl acid will be used to stimulate the well and clean up any drilling damage.

**Attachment K**

Injection Procedures:

Injection into the subject well will be from a tank, equipped with a dump valve. It is anticipated that the well will accept the estimated daily injection volume on a vacuum. However, if it becomes necessary to use a pump to dispose of fluids from the separator, an appropriately sized positive displacement pump will be installed. This pump will be equipped with a bypass downstream of the pump with a pressure relief valve that will be set to maintain an injection pressure below the maximum permitted injection pressure. This relief will be plumbed back into the tank and will be periodically tested to insure it is in good, working order.

**Attachment L**

Construction Procedures:

It is proposed to drill the West Bay 22 SWD as a dedicated disposal well. Attached are the State of Michigan forms that will be filed to permit the drilling of this well. They show casing and cementing details for all the strings. After the well is drilled, it is planned to drill out the casing shoe, clean out to TD and stimulate it with about 3,000 gallons of 28% HCl acid to remove drilling damage and improve injectivity. No other stimulation is planned. A packer will be run to about 2,630' and set. Treated fluid will be circulated into the annulus between the 5-1/2" production casing and the 2-7/8" tubing to inhibit corrosion and scavenge oxygen.

**Attachment M**

Construction Details:

Attached is a schematic showing the construction details of the well. The injection fluid will be sampled at the wellhead.

**Attachment N**

Changes in Injection Fluid:

Does not apply to Class II wells.

**Attachment O**

**West Bay 22 SWD**  
**EPA Permit Attachments and Appendices 4/20/11**

Plans for Well Failures:

Should any situation arise which would indicate a possible well failure, injection will be immediately discontinued and the source of the problem traced. If a loss of mechanical integrity occurs, the EPA will be immediately notified and plans to remediate the well will be prepared. Upon approval, the well will be repaired and a new, witnessed mechanical integrity test will be performed. Upon EPA approval, the well will then be placed back into service. A shut-in of the injection well will not pose a threat to USDW's, as long as mechanical integrity is maintained. Brine production from wells using this injection well will either be trucked in the interim or the wells will be shut-in until the well is placed back into service.

**Attachment P**

Monitoring Program:

The monitoring program for this well will consist of compliance with the EPA permit requirements of filing monthly, quarterly and annual reports.

**Attachment Q**

Plugging and Abandonment (P&A) Plan:

Attached is the plugging and abandonment plan for this well. Also attached is a detailed plugging cost estimate prepared by West Bay Exploration Company.

**Attachment R**

Necessary Resources:

Attached is information to verify that the financial resources are available to close, plug and abandon the well.

**Attachment S**

Aquifer Exemption:

An aquifer exemption is not being requested for this injection well.

**Attachment T**

Existing EPA Permits:

**West Bay 22 SWD  
EPA Permit Attachments and Appendices 4/20/11**

West Bay Exploration has the following other existing EPA permits:

<b>Well Name</b>	<b>EPA Permit Number</b>	<b>State Permit Number</b>	<b>Location</b>	<b>Township</b>	<b>County</b>
Neeley 1-22	MI-025-25-2D-0037	39700	NW/SW/SE 22 1S 5W	Lee	Calhoun
Tel B2-25	MI-101-2D-C030	47875	NW/SE/NW 25 23N 15W	Bear Lake	Manistee

**Attachment U**

Description of Business:

West Bay Exploration Company is involved in the exploration, production and marketing of crude oil and natural gas.

**West Bay 22 SWD  
EPA Permit Attachments and Appendices 4/20/11**

**Appendix 1**

Listing of Names and Addresses of Landowners Within the Area of Review:

See attached list that contains the names and addresses of the landowners within the AOR.

**Appendix 2**

State Historic Preservation Office Notification:

See attached letter.

**Appendix 3**

State Coastal Zone Management Notification:

Jackson County does not border the Great Lakes and as such is not within a Coastal Zone Management Area.

**Appendix 4**

Records of all State Drilling, Completion and/or Plugging Reports for all Wells Within the Area of Review:

All known State drilling, completion and plugging records of oil and gas wells and fresh water wells within the Area of Review have been attached.

**Appendix 5**

Physical and Chemical Characteristics and Description of the Source of the Injection Fluid:

Attached is an analysis of brine similar to that which will be injected. This brine was collected from the Lantis 2-30, which is a well operated by West Bay Exploration Company in the Napoleon Field. The following is a list of wells that will use this disposal well, if approved:

<b>Well Name</b>	<b>State Permit Number</b>	<b>Location</b>	<b>Field</b>	<b>County</b>
ADAMS 1-21	60144	NW/NE/SE 21 4S 2E	Napoleon	JACKSON
BRADLEY ET AL 1-27	60088	SW/NE/SE/27 4S 2E	Napoleon	JACKSON
CANNING 1-15	60013	SW/SW/SE 15 4S 2E	Napoleon	JACKSON
COCHRANE 1-13A	60112	NE/NE/SE 13 3S 1E	Napoleon	JACKSON
COCHRANE 3-13	60089	SE/SW/NE 13 3S 1E	Napoleon	JACKSON
CURRIE ET AL 1-34	60143	NE/SE/NW 34 4S 2E	Napoleon	JACKSON

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CURTIS 1-32	60069	SE/SW/SE 32 3S 2E	Napoleon	JACKSON
CURTIS 1-5	60102	NE/SW/NE 5 4S 2E	Napoleon	JACKSON
DENSMORE 1-36	59269	SW/SE/SW/36 4S 3W	Napoleon	JACKSON
EIGHMEY 1-15	60014	SW/SW/SE 15 4S 2E	Napoleon	JACKSON
GOLOWIC 1-22	59955	SW/NW/NW 22 4S 2E	Napoleon	JACKSON
HARDCASTLE 1-26	60085	NE/SW/NW 26 4S 2E	Napoleon	JACKSON
HAUSER 1-32	59907	SE/SW/NE 32 3S 2E	Napoleon	JACKSON
HAYSTEAD 1-9A	60106	NE/NW/SW 9 4S 2E	Napoleon	JACKSON
HAYSTEAD 2-9	60077	NE/SE/NW 9 4S 2E	Napoleon	JACKSON
HAYSTEAD 3-9	60078	NE/NW/SW 9 4S 2E	Napoleon	JACKSON
HILDEN-ROVSEK ET AL 1-15	60053	SW/NE/SE 16 4S 2E	Napoleon	JACKSON
HILDEN-ROVSEK ET AL 1-16	59853	SW/NW/SE 16 4S 2E	Napoleon	JACKSON
HILDEN-ROVSEK ET AL 2-16	59852	SW/NW/SE 16 4S 2E	Napoleon	JACKSON
HILDEN-ROVSEK PART. 3-16	60049	SW/NE/SE 16 4S 2E	Napoleon	JACKSON
JENNINGS 1-32 HD1	59911	SW/SE/NW 32 3S 2E	Napoleon	JACKSON
LANTIS ET AL 1-29	59583	SE/NE/SE 30 3S 2E	Napoleon	JACKSON
LANTIS ET AL 2-30	60009	NW/NE/NE 30 3S 2E	Napoleon	JACKSON
LANTIS ET AL 1-30	59893	SE/NE/SE 30 3S 2E	Napoleon	JACKSON
LENNOX TRUST ET AL 1-15	60055	SW/SE/SW 15 4S 2E	Napoleon	JACKSON
MORSE TRUST 1-16	60091	NW/SE/NW 16 4S 2E	Napoleon	JACKSON
NAPOLEON FARMS ET AL 1-4	60113	SE/SE/SE 5 4S 2E	Napoleon	JACKSON
NAPOLEON FARMS ET AL 1-5	60105	NE/SE/SE 5 4S 2E	Napoleon	JACKSON
RICHARDSON ET AL 1-30	59940	SW/NW/NE 30 3S 2E	Napoleon	JACKSON
SHELL 1-35	APPD FOR	SE/NW/NW 35 4S 2E	Napoleon	JACKSON
SWANK 1-22	59954	NW/SE/NW 22 4S 2E	Napoleon	JACKSON
WALBY 1-27	60087	NE/NW/SW 27 4S 2E	Napoleon	JACKSON
WALBY 2-27	60086	NE/NW/SW 27 4S 2E	Napoleon	JACKSON
WAROLIN ET AL 1-30	59939	SW/NW/NE 30 3S 2E	Napoleon	JACKSON
WEST BAY & BOYD 1-27	60010	SW/SE/SW 22 4S 2E	Napoleon	JACKSON
WEST BAY & BOYD 2-27 HD1	60094	SW/SE/SW 22 4S 2E	Napoleon	JACKSON
WEST BAY 1-22	59996	NW/SE/SW 22 4S 2E	Napoleon	JACKSON
WHALEN BYRON ET AL 1-16	60052	SW/NE/NE 16 4S 2E	Napoleon	JACKSON
WHALEN BYRON ET AL 2-16 HD1	APPD FOR	NW/SE/NE 16 4S 2E	Napoleon	JACKSON
WILSON 1-27	60081	SW/SE/NE 27 4S 2E	Napoleon	JACKSON

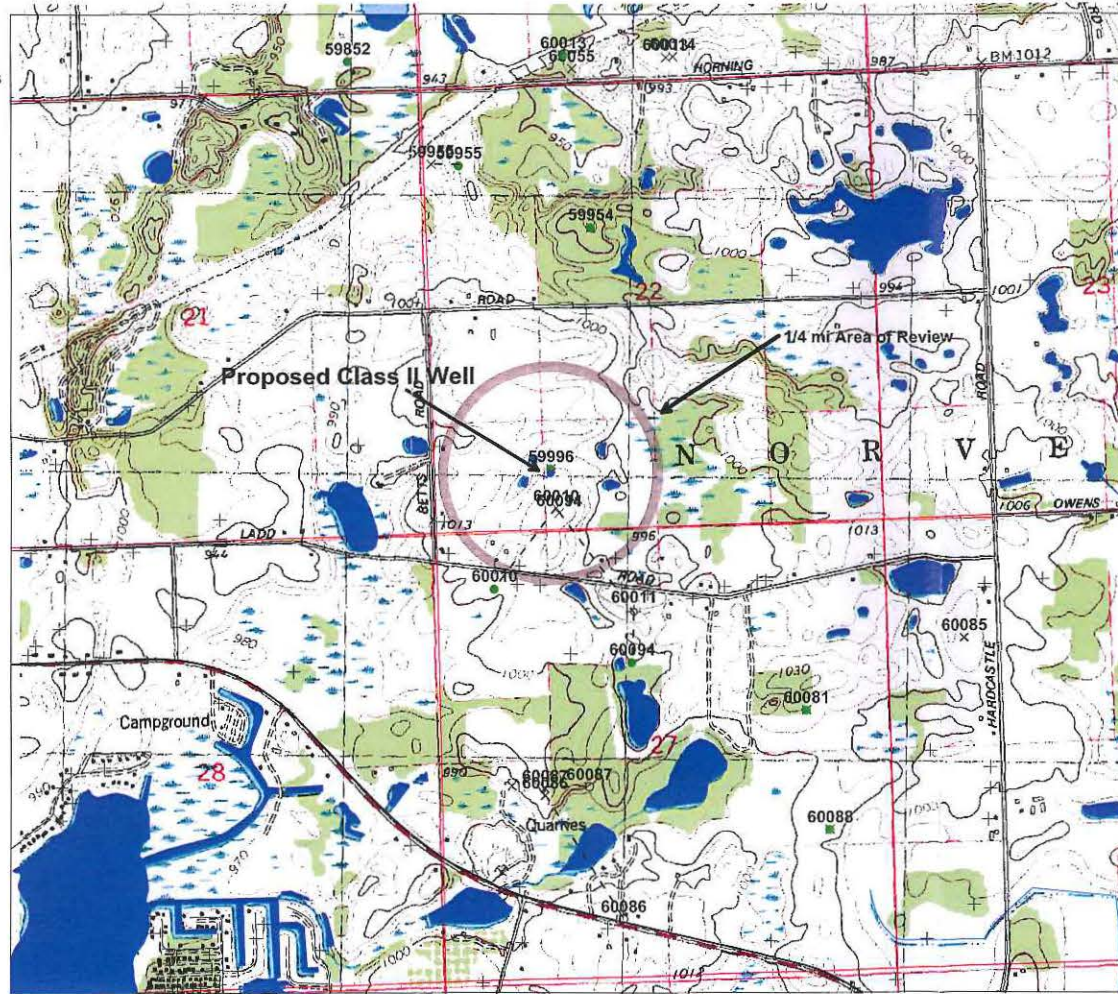
Plus other later wells in this area, if it becomes necessary to dispose of water from them. This field is currently undergoing development and additional wells may be added to fully develop the field.



**Attachment  
"L"**

# West Bay Exploration Company Locator Map for West Bay 22 SWD Attachment B

- Proposed Class II Well
- × Surface Loc of Oil and Gas Wells
- Oil Well BHL
- ◇ Dry Hole BHL
- Permitted Oil and Gas Well BHL
- + Water Well
- Section Lines
- Roads
- State Roads
- Water Features



Scale In Feet

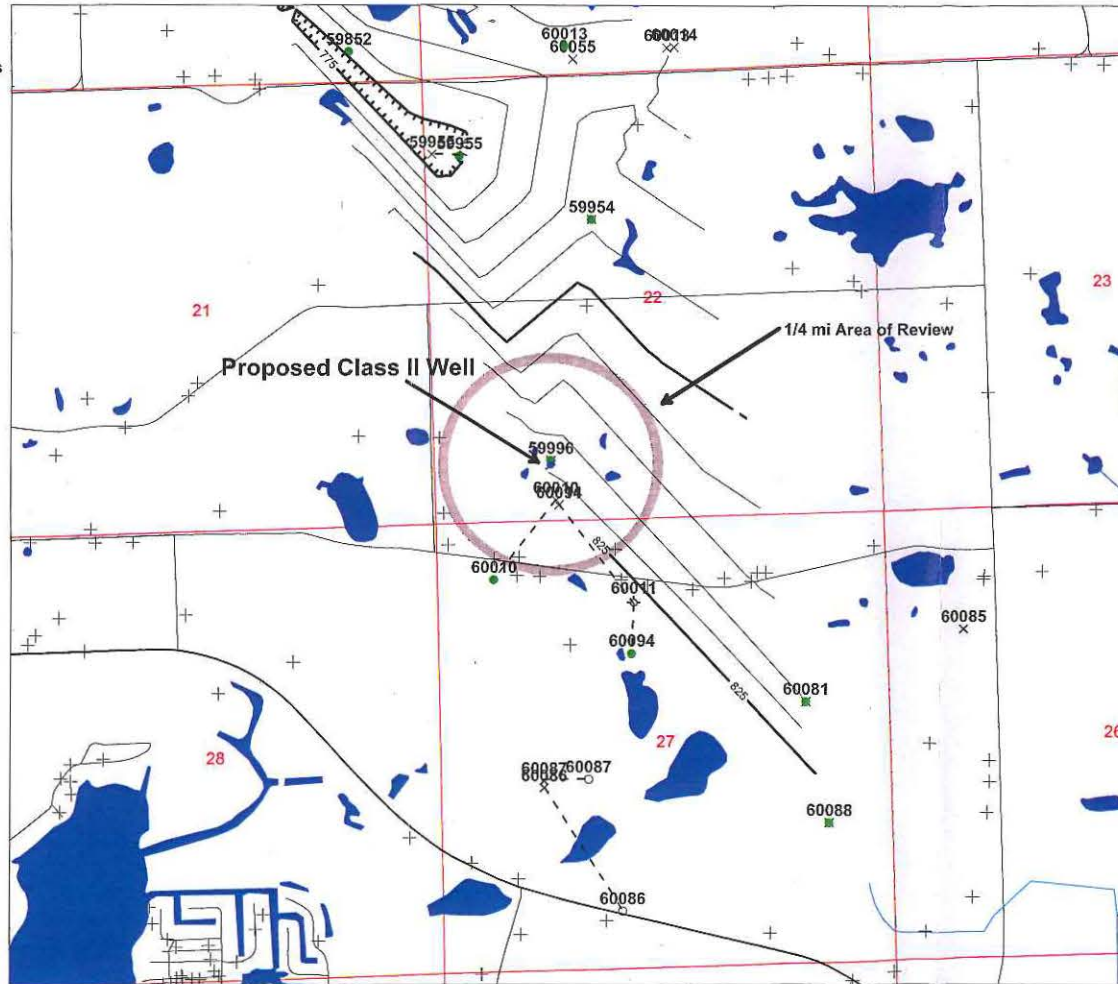


# West Bay Exploration Company

## Attachment E

### Subsea Top of Base of USDW

- Proposed Class II Well
- × Surface Loc of Oil and Gas Wells
- Oil Well BHL
- ◇ Dry Hole BHL
- Permitted Oil and Gas Well BHL
- + Water Well
- Section Lines
- Roads
- State Roads
- Water Features



Scale In Feet





## APPLICATION FOR PERMIT TO:

DRILL  DEEPEN  CONVERT  
AND OPERATE A WELL

By authority of Part 615 or Part 625 of Act 451 PA 1994, as amended.  
Non-submission and/or falsification of this information  
may result in fines and/or imprisonment.

## 1a. Part 615 Supervisor of Wells

- Oil and Gas  
 Brine Disposal  
 Hydrocarbon Storage  
 Injection for Secondary Recovery

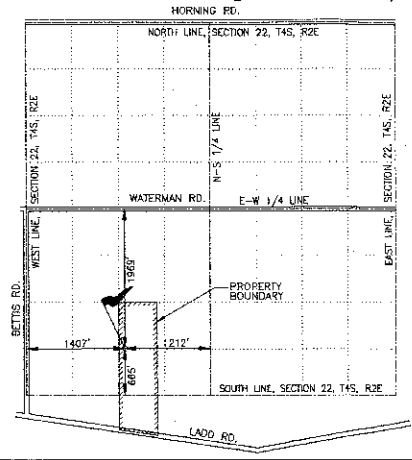
## Part 625 Mineral Wells

- Waste Disposal  
 Brine Production  
 Processed brine disposal  
 Storage  
 Test, fee sched. on rev.

## 1c. Fee enclosed

- Yes  
 No, revision of application  
 No, leg of horz drainhole

2. List all previous permit numbers		3. Fed. ID. No. (do not use SSN) 38-2348162		Locate well and outline drilling unit on section plat							
4. Conformance bond <input checked="" type="checkbox"/> Blanket <input type="checkbox"/> Single well		5. <input type="checkbox"/> Attached <input checked="" type="checkbox"/> On file		6. Bond number 08784181		7. Bond amount 250,000					
8. Applicant (name of permittee as bonded) West Bay Exploration Company											
9. Address 13685 South West Bay Shore Drive Suite 200 Traverse City, MI 49684				Phone (231) 946-0200 I authorize DEQ 4 additional days to process this application. <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No							
10. Lease or well name (be as brief as possible) West Bay				Well number 22 SWD							
11. Surface owner West Bay Exploration Company											
12. Surface location NW 1/4 of SE 1/4 of SW 1/4 of Sec 22 T4S R2E				Township Norvell		County Jackson					
13. If directional, bottom hole location 1/4 of 1/4 of 1/4 of Sec T R				Township		County					
14. The surface location for this well is 665 feet from nearest (N/S) S section line AND 1407 feet from nearest (E/W) W section line											
15. Is this a directional well? <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes If yes, complete line 15. The bottom hole location for this well is feet from nearest (N/S) section line AND feet from nearest (E/W) section line											
16. The bottom hole location (whether straight or directional) of this well is feet from nearest (N/S) drilling unit line AND feet from nearest (E/W) drilling unit line											
17. Kind of tools <input checked="" type="checkbox"/> Rotary <input type="checkbox"/> Cable <input type="checkbox"/> Combination		18. Is sour oil or gas expected? <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> H <sub>2</sub> S Cont. plan enclosed		19. Base of lowest known fresh water aquifer Formation Michigan Marshall Depth 200+							
20. Intended total depth MD 2950' TVD		21. Formation at total depth Salina A1/Niagaran		22. Producing/injection formation(s) Salina A1/Niagaran		23. Objective pool, field, or project Napoleon/Norvell					
24. PROPOSED DRILLING, CASING AND CEMENTING AND SEALING PROGRAM											
HOLE		CASING				CEMENT		MUD			
Depth (MD)	Geol. Formation	Bit Dia.	O.D. Size	Wt/Ft	Grade Condition	Depth (MD)	Sacks	T.O.C.	W.O.C	Wt.	Vis.
350'	Shales	14 3/4"	11 3/4"	42#/ft	H-40 New	350'	335	Surf	12	8.4	50+
900'	Coldwater Sh	10 5/8"	8 5/8"	24#/ft	J-55 New	900'	215	Surf	12	8.5	40+
2680'	G-Unit/C-Shale	7 7/8"	5 1/2"	15.5#/ft	J-55 New	2680'	425	Surf	24	9.7	28+
25. DETAIL CEMENTING PROGRAM. (IDENTIFY ALL CEMENT CLASSES, ADDITIVES, AND VOLUMES (IN CU. FT.) FOR EACH CASING STRING.)											
Surface AV=153 cu ft-335 sx Class A w/2% CaCl, (1.18 yield) cement to surf											
Intermediate AV=238 cu ft- 50 sx 50/50 POZ w/2% CaCl <sub>2</sub> , (1.56 yield), Tail 165 sx Class A w/2% CaCl-Cement to Surf											
Production/Injection AV=568 cu ft- Lead-225 Sx 50/50 POZ w/2% CaCl (1.56 yield), 200 sx CIA (1.18 yield) Cement to Surf											
26. Send correspondence and permit to Name West Bay Exploration Company E-mail anni@wbeco.net Address 13685 South West Bay Shore Drive, Suite 200, Traverse City, MI 49684 Phone (231) 946-0200											
CERTIFICATION "I state that I am authorized by said applicant. This application was prepared under my supervision and direction. The facts stated herein are true, accurate and complete to the best of my knowledge."						Enclose permit fee of \$300 for all Part 615 wells; \$2,500 for a Part 625 waste disposal well; or \$500 for a brine production, processed brine disposal, or storage well. Make checks payable to State of Michigan. DEQ Cashier use only.					
27. Application prepared by (print or type) Phone Ann M Baker (231) 946-0200											
28. Signature Date <i>Ann M Baker</i> 4/18/11											
Office of Geological Survey Use Only											
Permit number		API number		Date issued		Owner number					



# West Bay Exploration company

13685 S. West Bay Shore / Suite 200  
Traverse City, MI 49684  
231-946-0200 / Fax: 231-946-8180

5555 N. Hogback Road  
Fowlerville, MI 48836  
517-223-4011 / Fax: 517-223-4020

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April 18, 2011

Permits and Bonding Unit  
Office of Geological Survey  
Oil and Gas Division  
PO Box 30256  
Lansing, MI 18909-7756

RE: West Bay 1-22 SWD

Enclosed, please find the materials necessary to apply for a permit to drill the West Bay #1-22 SWD. As West Bay Exploration is the landowner in the case of this well, there is no letter notifying the landowner in the permitting packet.

1. Application for Permit to Drill and Operate A Well (7200-1)
2. Survey Record of Well Location (7200-2)
3. Supplemental Plat Drawing
4. Wellhead Blowout Control System & Testing Procedures (7200-4)
5. Soil Erosion and Sedimentation Control Plan (7200-18)
6. Environmental Impact Assessment (7200-19)
7. Injection well data (7200-14) and required attachments
8. Letter to Jackson County Clerk's Office
9. Credit Card Transaction Authorization

If you have any questions regarding the above, please feel free to call us at 231-946-0200. Thanks so much.

Sincerely,



Anni Baker  
Operations Office



# SURVEY RECORD OF WELL LOCATION

This information is required by authority of Part 615 Supervisor of Wells, or Part 625 Mineral Wells, of Act 451 PA 1994, as amended, in order to obtain a drilling permit.

Applicant <b>West Bay Exploration Company</b>
Well name and number <b>West Bay 22 SWD</b>

1a. Surface location <b>NW 1/4 of SE 1/4 of SW 1/4 of section 22 T 4S R 2E</b>	Township <b>Norvell</b>	County <b>Jackson</b>
1b. If this is a directional well, bottom hole location will be <b>1/4 of 1/4 of 1/4 of section T R</b>	Township	County

**Instructions:** Outline drilling unit for oil/gas wells (Part 615) or property boundary for mineral wells (Part 625) and spot well location on plat shown. Locate the well in two directions from the nearest section, quarter section, and unit (or property, Part 625) lines.

**2. The surface location is**

**665** ft. from nearest (N/S) **S** section line

**1407** ft. from nearest (E/W) **W** section line  
**and**

**1969** ft. from nearest (N/S) **N** quarter section line

**1212** ft. from nearest (E/W) **E** quarter section line

**3. Bottom hole will be (if directional)**

\_\_\_\_\_ ft. from nearest (N/S) \_\_\_\_\_ section line

\_\_\_\_\_ ft. from nearest (E/W) \_\_\_\_\_ section line  
**and**

\_\_\_\_\_ ft. from nearest (N/S) \_\_\_\_\_ quarter section line

\_\_\_\_\_ ft. from nearest (E/W) \_\_\_\_\_ quarter section line

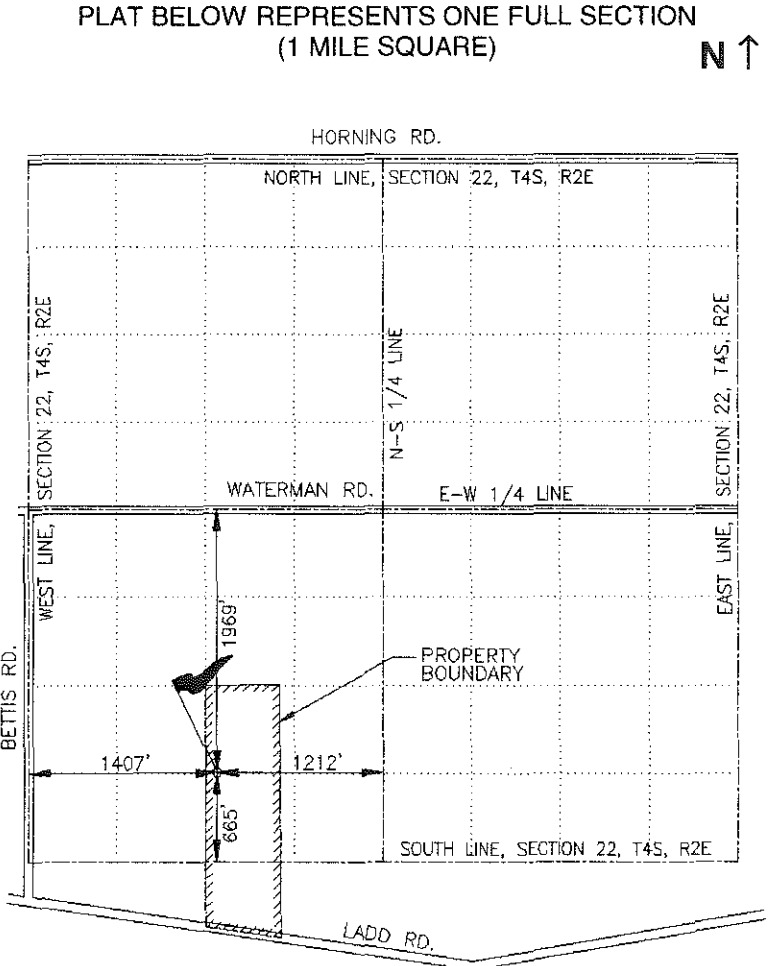
**4. Bottom hole will be (directional or straight)**

\_\_\_\_\_ ft. from nearest (N/S) \_\_\_\_\_ drilling unit line

\_\_\_\_\_ ft. from nearest (E/W) \_\_\_\_\_ drilling unit line

**5. Show access to stake on plat and describe if it is not readily accessible. Take M-50 to Horning/Case Road, go east 4.25 miles, go south on Hardcastle Road 1.15 miles, go west on Ladd Road 1.0 mile to gravel drive at House #12180, then go north on gravel drive 1300' to well site marked with double lath in field.**

**6. Zoning**  Residential, effective date \_\_\_\_\_  
Initial date of residential zoning \_\_\_\_\_  
 Other **Agricultural**



**ON SEPARATE PLAT OR PLOT PLAN, LOCATE, IDENTIFY AND SHOW DISTANCES TO:**

A. All roads, power lines, buildings, residences, fresh water wells, and other man-made features, within 600 feet of the stake.

B. All lakes, streams, wetlands, drainage-ways, floodplains, environmentally sensitive areas, natural rivers, critical dune areas, and threatened or endangered species within 1320 feet of the stake.

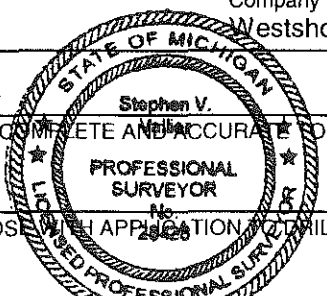
C. All type I and IIa public water supply wells within 2000 feet and all type IIb and III public water supply wells within 800 feet of the well stake.

Name of individual who surveyed site <b>Stephen V. Vallier, P.S.</b>	Company <b>Westshore Consulting</b>	Date of survey <b>09/28/2010</b>
---	--	-------------------------------------

Address <b>2534 Black Creek Road, Muskegon, MI 49444</b>	Phone <b>231-777-3447</b>
---	------------------------------

I CERTIFY THE ABOVE INFORMATION IS COMPLETE AND ACCURATE TO THE BEST OF MY KNOWLEDGE AND BELIEF.

Signature of licensed surveyor (affix seal) *Stephen V. Vallier* Date **3/17/11**



**SOIL EROSION & SEDIMENTATION CONTROL PLAN**

By authority of Part 91, and Part 615 or Part 625 of Act 451 PA 1994, as amended. Non-submission and/or falsification of this information may result in fines and/or imprisonment.

Part 615 Oil/Gas Well     Part 625 Mineral Well

1. Name and address of applicant  
West Bay Exploration Company  
13685 South West Bay Shore Drive, Suite 200  
Traverse City, MI 49684

Phone: (231) 946-0200    Fax: (231) 946-8180

2. Well or project name:

West Bay 22 SWD

3. Well or project location:

Section(s) 22    T4S    R2E

4. Name and address of County or local Enforcement Agent (CEA)

Jackson County Health Department  
1715 Lansing Avenue, Suite 221  
Jackson, MI 49202  
Phone: (517) 788-4420    Fax: (517) 788-4373

5. Township

Norvell

6. County

Jackson

7. Date earth changes expected to start

Spring 2011

8. Date of expected completion

Summer 2011

9. Name and address of person responsible for earth change:

Tim Baker  
West Bay Exploration Company  
4161 Legion Drive  
Mason, MI 48854  
Phone: (517) 676-5167    Fax: (517) 676-5224

10. Name and address of person responsible for maintenance:

Tim Baker  
West Bay Exploration Company  
4161 Legion Drive  
Mason, MI 48854  
Phone: (517) 676-5167    Fax: (517) 676-5224

11. Send copies of supplemental plat required by Part 615, R 324.201(2)(b) or R 324.504(4), and this form and all attachments, to CEA.

Date sent to CEA March 21, 2011

**EARTH CHANGE ACTIVITIES**

12. Project description: (Project activities may be permitted sequentially.) **No earth change activities – using existing drilling pad.**

- a. Number of well sites 1 - Existing pad , N/A acres    d. Flow line(s) trenched in off well site\* N/A feet, \_\_\_\_\_ acres  
b. Number of surface facility sites N/A , \_\_\_\_\_ acres    e. Flow line(s) plowed in off well site\* N/A feet, \_\_\_\_\_ acres  
c. New access roads N/A feet, \_\_\_\_\_ acres    \*Contact CEA for fee schedule

13. Describe sites for which permits are being sought under Part 301 (Inland Lakes & Streams) None

Describe sites for which permits are being sought under Part 303 (Wetlands) None

List file numbers if known \_\_\_\_\_

14 Areas requiring control structures

Will earth changes occur in areas with slopes of 10% or greater; areas where runoff water is likely, such as runs greater than 500' of moderate slope (5% to 10%), narrow valley bottoms, etc.; areas within 500' of a lake or stream; or other areas where sedimentation to a wetland or drainage way may occur?

Yes Attach detail map at scale of 1"=200' or larger, with contour lines at a minimum of 20' intervals OR percent slope descriptions.

Also indicate any of the following erosion control structures that will be utilized. Identify location on map and attach detail plan.

Indicate on plan whether erosion control structures are temporary or permanent.

Diversions     Culverts     Sediment basins     Silt fences     Rip-rap     Berms     Check dams     Other \_\_\_\_\_

No

15. Site restoration

Topsoil will be segregated from subsoil and stockpiled    OR     No topsoil on site

Recontour and revegetate as soon as weather permits. Seed mix \_\_\_\_\_

Describe other proposed methods of restoration \_\_\_\_\_

16. Application prepared by (name)

Wade A. VandenBosch, P.E.

Signature

*Wade A. VandenBosch*

Date

*3/17/11*

**FOR USE OF COUNTY OR LOCAL ENFORCING AGENT**

INSTRUCTIONS TO COUNTY OR LOCAL ENFORCMENT AGENT: Return this form to the applicable field or district office of the Office of Geological Survey within 30 days of receipt. Explain reasons for recommendation or disapproval and conditions required for approval. Include copies of any revisions to the plan.

17. Comments

Conducted on site inspection    Date \_\_\_\_\_

Inspected site with representative of applicant    Date \_\_\_\_\_

18.  Approved     Disapproved

CEA signature \_\_\_\_\_

Date \_\_\_\_\_

**ENVIRONMENTAL IMPACT ASSESSMENT**

Required for issuance of well permit pursuant to Part 615, 1994 PA 451, as amended. Falsification of this information may result in fines and/or imprisonment. Check all boxes and fill in all blanks which apply to this drilling application. Attach additional pages as necessary.

**A. DESCRIPTION OF PROJECT**

<b>1. Applicant's name</b> West Bay Exploration Company	<b>Well name and number</b> West Bay 22 SWD	<b>Intended use of well</b> Brine Disposal
<b>2. Mineral ownership</b> , check each category of mineral owners in drilling unit or Antrim Uniform Spacing Plan <input checked="" type="checkbox"/> Private <input type="checkbox"/> State <input type="checkbox"/> Federal <input type="checkbox"/> Other, identify		
<b>3. Applicable spacing order and drilling unit size</b> <input type="checkbox"/> S.O. 14-9-94 N. Mich. Antrim, 80 acres <input type="checkbox"/> S.O. 3-3-95 S. Mich. Antrim, 40 acres <input type="checkbox"/> S.O. 1-73 Niagaran, 80 acres <input type="checkbox"/> S.O. 2-81 Oakland Co. Niagaran, 40 acres <input type="checkbox"/> R 324.301 General rule, 40 acres <input type="checkbox"/> S.O. 1-86 P.D.C., 640 acres <input checked="" type="checkbox"/> Field Spacing or Unitization Order (identify below) Order #18-2007 applies <input type="checkbox"/> Antrim USP (identify name, number of acres, and number of drilled and permitted wells)		
<input type="checkbox"/> Administrative exception requested per R324.303 (2). See instructions for applying for an administrative spacing exception <input type="checkbox"/> Exception to spacing requested, petition for hearing filed <input type="checkbox"/> Non-producing well, no drilling unit		
<b>4. Applicant's right to drill and produce</b> <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Are all mineral interests in the drilling unit under lease and controlled by the applicant/permittee? If no, <input type="checkbox"/> petition filed for compulsory pooling OR <input type="checkbox"/> certified efforts to obtain leases are attached (if allowed by spacing order) <input type="checkbox"/> Not applicable, no drilling unit. <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Has applicant obtained all contractual rights needed to locate the well where it is proposed? If no, <input type="checkbox"/> what additional approvals are needed? _____		
<b>5. Special considerations</b> <input type="checkbox"/> Replacement well for permit no. _____ or <input type="checkbox"/> Existing well pad <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is well expected to encounter H <sub>2</sub> S? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is well located in a city, township, or village with a population greater than 70,000? <input type="checkbox"/> Other (describe) _____		

**B. IMPACTS AS A RESULT OF DRILLING**

<b>1. Access route dimensions</b> _____ 1400 _____ feet x _____ 20 _____ feet / 43,560 = _____ 0.64 _____ acres. Provide a detailed description of topography, drainage, soil type(s), direction and percentage of slopes, land cover and present land use for the access route while drilling. Identify route on attached plat. The access route is existing for the West Bay 1-22 well, the topography of the existing ground surface is rolling land. The slope of the proposed access route varies between 0% and 10%. Surface drainage is directed to a low wet area easterly of the access route. Specific soil types per the USDA Soil Survey are Gilford-Colwood Complex and Leoni gravelly-sandy loam. The existing land is open field.
<b>2. Well site dimensions</b> _____ 283 _____ feet x _____ 152 _____ feet / 43,560 = _____ 0.99 _____ acres. Provide a detailed description of topography, drainage, soil types(s), direction and percentage of slopes, land cover and present land use for the well site. Identify well site on attached plat. The topography of the existing ground surface is rolling land. The elevation drops an average of approximately 3% northerly across the pad with a low point at the northwest corner of the pad location. Surface drainage is directed towards a low wet area westerly of the well site. Specific soil types per the USDA Soil Survey are Leoni gravelly-sandy loam. The existing land is open field.
<b>3. Is well site located in residentially zoned area?</b> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If yes, R324.407(3) and R324.505 apply.
<b>4. Are drain tiles present?</b> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If yes, identify where they exist on attached plat or project map. How will they be handled if they are encountered? .
<b>5. Identify the distance and direction to all of the following, also identify on attached plat</b> a. All buildings, fresh water wells, public roads, power lines and other man-made features within 600' of the well site. The West Bay 1-22 well is located 85 feet north. The West Bay/Boyd 1-27 well is located 396 feet south. The West Bay/Boyd 2-27 well is located 480 feet south. The Norvell 22 CTB facility is located 311 feet east. No other man-made features exist within 600 feet of the proposed well.  b. All Type I and Type IIa public water supply wells within 2000' of the well site and all Type IIb and Type III public water wells within 800' of the well site. No Type I, II or III public water supply wells were identified within the specified radii.  <small>(Type I is a community water supply with year-round service ≥ 15 living units or ≥ 25 residents. Type II is a non-community water supply with ≥ 15 service connections or ≥ 25 individuals for not less than 60 days per year. Average daily water production: IIA ≥ 20,000 GPD IIB &lt;20,000 GPD Type III is a public water supply which is neither type I or II.)</small>



(Part B-5 continued)

c. Surface waters, floodplains, wetlands, natural rivers, critical dune areas, threatened or endangered species within 1320' and Great Lake shorelines within 1500' of the well site.

There are two marshes approximately 226 and 279 feet west of the well site and a wooded marsh 583 feet east of the well site. There is a creek flowing northerly from the wooded marsh located 1221 feet northeast of the well site. Indiana Bat habitat may exist in the vicinity of the proposed well site, however, this project is unlikely to affect these species because no clearing of suitable bat habitat is anticipated.

d. Describe the actions to be taken to mitigate impacts to any of the items identified in Part B-5 a-c above.

The existing marsh/wetland features will be protected using earthen berms around the well site and strategic soil erosion and sedimentation control measures, such as geotextile silt fence and vegetation preservation outside the limits of the well site and access route. There is no anticipated tree removal or activity that would affect Indiana Bat habitat.

#### 6. Identify the source of fresh water used to drill this well

"Permanent" water well, to be retained after final completion OR used for drinking water (shall be drilled and installed pursuant to Part 127 of 1979 PA 368, as amended)

"Temporary" water well, will be plugged upon final completion and not used for drinking water (consult R 324.403 (2) for minimum construction requirements)

Fresh water will be hauled from existing water well or municipal source (identify) \_\_\_\_\_

No fresh water will be used in drilling this well

#### 7. Pit location and handling and disposal of drill cuttings, muds and fluids

Anticipated depth to groundwater 14' +/- Method determined by Geological interpretation

On site in-ground pit, anticipated dimensions: L 80' W 40' D 14'

Remote in-ground pit, anticipated dimensions: L \_\_\_\_\_ W \_\_\_\_\_ D \_\_\_\_\_

Attach approval of landowner and attach survey of remote pit location

Well drilled below base of Detroit River Anhydrite. Describe how mud and cuttings pursuant to R324.407(7)(iv) will be handled.

Pit fluids below DRA disposed by \_\_\_\_\_ licensed liquid waste hauler OR

Pit fluids below DRA disposed at the \_\_\_\_\_ disposal well.

If drill cuttings & mud don't pass paint filter test, they will be disposed at \_\_\_\_\_ landfill.

No salt cuttings OR

Salt cuttings dissolved and disposed by Seller Tank Truck Service, Inc. licensed liquid waste hauler OR

Salt cuttings hauled to Liberty Environmentalists, Inc., Clark Lake, Michigan landfill

Temporary pit, cuttings and muds disposed at (identify) Liberty Environmentalists, Inc., Clark Lake, Michigan

No in-ground pit, cuttings and muds disposed at (identify) \_\_\_\_\_

Pit will be solidified.

### C. IMPACTS AS A RESULT OF PRODUCTION

1. Kind of well  exploratory  development  Other (describe) Brine Disposal

Antrim project (submit separate project EIA, form EQP 7200-21, for access roads, flow lines, and surface facilities)

where is project EIA found? \_\_\_\_\_ and complete C-2, omit C-3 and C-4

2. Location of surface facilities (Prior to construction, the District Geologist, pursuant to R324.1002, must also approve all surface facility secondary containment plans.)

Greater than 300' from wellhead. Identify facility location on attached plat and complete C-3 and C-4.

Less than 300' from wellhead. Identify facility location on attached plat, complete C-3, omit C-4

Surface facility exists or was previously approved for construction and is known as \_\_\_\_\_ complete C-3, omit C-4.

Surface facility location was not determined for this **exploratory** well (omit C-3 and C-4). Submit a separate request for **Surface Facility Location Approval (form 7200-22)**, which includes a Facility Plan, Environmental Impact Assessment, and Soil Erosion and Sedimentation Control Plan, to District Geologist prior to construction pursuant to R324.504.

#### 3. Flow Line Environmental Impact Assessment

Identify flow line location and course from well to the surface facility on attached plat.

Flow line route dimensions \_\_\_\_\_ feet x \_\_\_\_\_ feet / 43,560 = \_\_\_\_\_ acres.

Describe the topography, drainage, soil type(s), direction and percentage of slopes, land cover and present land use along the flow line route

#### 4. Surface Facility Environmental Impact Assessment

a. Dimensions of surface facility \_\_\_\_\_ feet x \_\_\_\_\_ feet / 43,560 = \_\_\_\_\_ acres.

b. Describe the topography, drainage, soil type(s), direction and percentage of slopes, land cover, and present land use

1. Along access route to surface facility

Part C-4, continued

2. At surface facility site

c. Are surface facilities likely to receive oil or gas with H<sub>2</sub>S concentration greater than 300 ppm?  Yes  No, if yes, R324.1106(2) applies.

d. Will surface facilities be located in residentially zoned area?  Yes  No, If yes, R324.506 may apply

e. Identify the distance and direction to all of the following, and identify on attached plat

1. Distance and direction to all buildings, fresh water wells, public roads, power lines and other man-made features within 600' of surface facility

2. Distance and direction to any surface waters, floodplains, wetlands, natural rivers, critical dune areas, and threatened or endangered species within 1320' and Great Lakes shorelines within 1500' of the surface facility site

3. Describe the actions to be taken to mitigate impacts to any of the items identified in Part C-4e 1 and 2 above.

4. Distance and direction to all Type I and Type IIa public water supply wells within 2000' of the surface facility site and all Type IIb and Type III wells within 800' of the surface facility

Type I is a community water supply with year-round service  $\geq 15$  living units or  $\geq 25$  residents. Type II is a non-community water supply with  $\geq 15$  service connections or  $\geq 25$  individuals for not less than 60 days per year. Average daily water production: IIA  $\geq 20,000$  GPD IIB  $< 20,000$  GPD Type III is a public water supply which is neither type I or II.

**5. Method of brine disposal**

Dedicated flow line to disposal well \_\_\_\_\_, permit number \_\_\_\_\_  
 Transported by tanker.  Other Injection well

**6. Method of transporting hydrocarbons past the point of sale**

Oil sold through transmission line  Gas sold through transmission line  
 Oil transported by tanker for sale  Gas flared on site (production restrictions may apply)  
 Other Not Applicable - Brine Disposal Well

**D. MITIGATION OF IMPACTS FROM DRILLING AND/OR PRODUCTION**

Describe additional measures to be taken to protect environmental and/or land use values

Berms and erosion control measures will be used to protect the areas beyond the access route and pad location. Due to the remote location of this well, it is not anticipated that there will be a negative impact on residents and land use values. The well site berm will contain any accidental releases and control storm water, and the soil erosion plan will be followed. Hospital-type mufflers will be used to mitigate noise. All applicable environmental and safety requirements will be followed.

**E. ADDITIONAL PERMITS**

Identify additional permits to be sought None

**F. SOIL EROSION AND SEDIMENTATION PLAN**

Submit a soil erosion and sedimentation plan (form 7200-18) which addresses each well site, surface facility, and flow line route identified in this application. (Refer to requirements under Part 91, 1994 PA 451)

**G. ALTERNATE WELL AND SURFACE FACILITY LOCATIONS**

Were alternate surface locations considered for this well or surface facility?

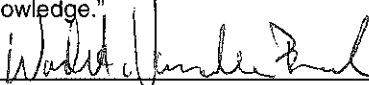
No, alternate sites did not seem necessary or more desirable  
 Yes, the following locations were considered

Why were they rejected in favor of the proposed location?

**H. CERTIFICATION**

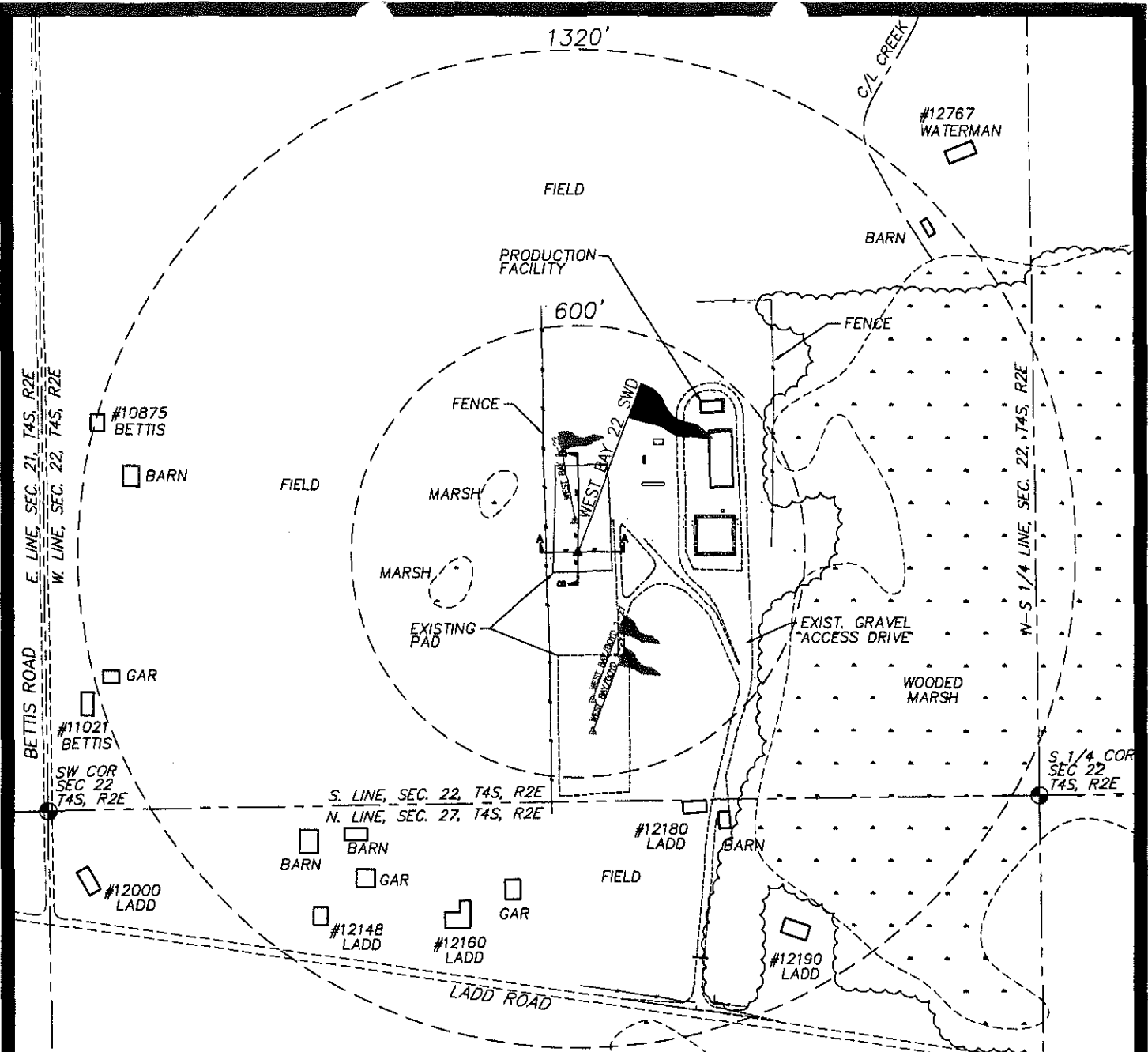
"I state that I am authorized by said applicant to prepare this document. It was prepared under my supervision and direction. The facts stated herein are true, accurate and complete to the best of my knowledge."

Wade A. VandenBosch, P.E.  
Name and title (printed or typed)

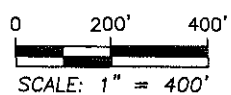
  
Authorized Signature

4/5/11  
Date

Enclose with Application For Permit To Drill



N46°E	1258'	SW COR BARN	S17°W	972'	NE COR 12160 LADD
N48°E	1221'	C/L CREEK	S33°W	1002'	NE COR GARAGE
N66°E	583'	EDGE OF MARSH	S35°W	1153'	NE COR 12148 LADD
N90°E	311'	NORVELL 22 CTB	S37°W	923'	NE COR BARN
S29°E	1117'	NW COR 12190 LADD	S43°W	1008'	NE COR BARN
S28°E	785'	NW COR BARN	S71°W	1350'	NE COR 11021 BETTIS
S23°E	720'	NW COR 12180 LADD	S76°W	1251'	NE COR GARAGE
S8°E	1260'	EDGE OF MARSH	S81°W	279'	EDGE OF MARSH
S6°E	396'	WEST BAY/BOYD 1-27 WELL	N81°W	1172'	SE COR BARN
S5°E	480'	WEST BAY/BOYD 2-27 WELL	N75°W	1292'	SE COR 10875 BETTIS
S8°W	1161'	C/L LADD ROAD	N53°W	226'	EDGE OF MARSH
S10°W	885'	NE COR GARAGE	N6°W	85'	WEST BAY 1-22 WELL



LOCATION: 665' FEET FROM THE SOUTH LINE AND 1407 FEET FROM THE WEST LINE OF SECTION 22, T4S, R2E, NORVELL TOWNSHIP, JACKSON COUNTY, MICHIGAN.

# WESTSHORE CONSULTING

Engineers ■ Scientists ■ Surveyors ■ Planners

2534 Black Creek Road  
Muskegon, MI 49444  
(231) 777-3447

250B Washington Avenue  
Grand Haven, MI 49417  
(616) 844-1260

P.O. Box 7  
Manistee, MI 49660  
(231) 920-5818

**WEST BAY EXPLORATION COMPANY**  
13685 South West Bay Shore Dr.  
Traverse City, Mi. 49684

**SURVEY OF THE WEST BAY 22 SWD WELL**  
LOCATED IN SECTION 22, T4S, R2E,  
NORVELL TWP, JACKSON CO.

Checked:	SW
Date:	3/16/11
Drawn by:	WAV
Date:	3/16/11
File No.:	323-131
Figure:	1



### WELLHEAD BLOWOUT CONTROL SYSTEM

Worksheet supplement for "Application for Permit to Drill or Deepen a Well

This information is required by authority of Part 615 Supervisor of Wells or Part 625 Mineral Wells, Act 451 PA 1994, as amended, in order to obtain a permit.

Applicant  
West Bay Exploration Company  
13685 South West Bay Shore, Suite #200  
Traverse City, MI 49684

Well name and number  
West Bay #1-22 SWD

Max. anticipated surface pressure 900 psi

Annular B.O.P. 11 3/4", 3000 psi W.P.

B.O.P. Blind Rams 11", 3000 psi W.P.  
(Pipe/Blind)

B.O.P. Pipe Rams 11", 3000 psi W.P.  
(Pipe/Blind)

Check Valve 2 9/16", 3000 psi W.P.

Valve 2 9/16", 3000 psi W.P.

Valve 2 9/16", 3000 psi W.P.

Valve 2 9/16", 3000 psi W.P.

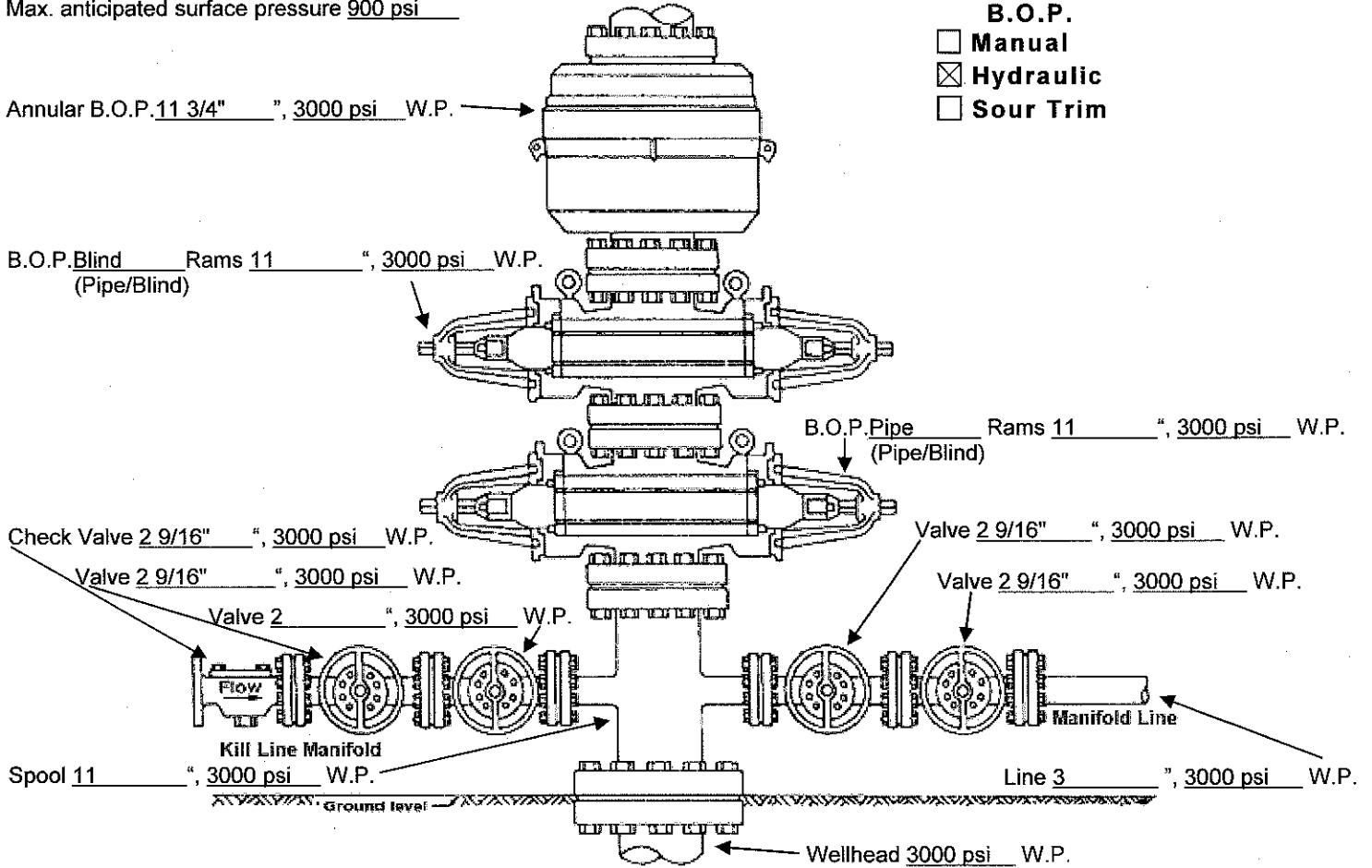
Valve 2", 3000 psi W.P.

Spool 11", 3000 psi W.P.

Line 3", 3000 psi W.P.

Wellhead 3000 psi W.P.

- B.O.P.**
- Manual
  - Hydraulic
  - Sour Trim



Fill above blanks with applicable information. If not applicable, enter "N.A." or cross-out item shown.

Describe test pressures and procedure for conducting pressure test. Identify any exceptions to R324.406 being requested.

## BOP Testing, Inspection, Training and Maintenance

### BOP Testing Procedure

The Annular, double gate, HCR, Accumulator as well as all auxiliary equipment shall be tested when installed and every 14 days there after. We shall follow an overbearing program to protect all parties involved. BOP testing shall go as follows:

1. When the BOP is installed after running casing
  - (a) Fill hole, close blind rams, close standpipe, open kill line master and control valves, open choke line master and control valves, open HCR, open master valve on panic line, open inward choke valves, open chokes, close panic line control valve and isolation valves for chokes. Do low pressure test (200-300 psi ) for 5 min. Do high pressure test (1500psi) for 5 min. Record in Book
  - (b) All following test will have same pressures and time limits
  - (c) Bleed pressure off at pump and see if check valve closes and what pressure is left. Record in Book. Bleed off pressure
  - (d) Close inward valves on chokes and master valve on panic line. Do low pressure test. Record. Do high pressure test and record. Bleed off
  - (e) Open blind rams and RIH with BHA and drill pipe (no float), circulate out air
  - (f) With the Kelly made up into string Close pipe rams, close master valve on kill and choke line, Disconnect kill line at check valve. Do low pressure test and record, do high pressure test and record, bleed off
  - (g) With pipe rams still closed, open master valves on kill and choke lines, close control valves on kill and choke line, do low pressure test and record, close upper kelly cock and bleed off at pump, record and open upper kelly cock, do high pressure test and record, close upper Kelly cock and bleed off at pump and record. Open Kelly cock and bleed off
  - (h) With pipe rams closed, kill and choke lines closed, do low pressure test and close standpipe trapping pressure, bleed off at pump and record. Same with high pressure test
  - (i) Open pipe rams, close bag, close kill line, open control and master valves on choke line, close HCR valve, do low pressure test and record, do high pressure test and record, bleed off
  - (j) Reconnect kill line and open both valves, install FOSV in drill pipe. Through kill line do low pressure test and record, do high pressure test and record, bleed off
  - (k) Take off FOSV and install internal preventer, Through kill line do low pressure test and record, do high pressure test and record, bleed off
  - (l) The auxiliary pump line valve will be tested every time as well as most other valves
  - (m) Check all levels in accumulator and back up systems, Record in Book.
  
2. During normal operation every 14 days
  - (a) Blind rams will be tested when out of the hole with a test plug
  - (b) Pipe, bag and HCR will be tested while still inside the shoe on trip in the hole with a test plug
  - (c) All low and high pressure test will be the same
  - (d) All shall be recorded in Book

## **BOP Inspection and Actuation**

All required BOP equipment shall be actuated periodically to ensure operational readiness. Following are the minimum frequencies.

1. Every 12 hour shift the following are to be performed:
  - (a) Check the accumulator pressure
  - (b) Check the pressure of the emergency back-up system
  - (c) Check the hydraulic fluid level in the accumulator
  - (d) Check air pressure to support system
  - (e) Record all of the above in IADC Log Book and well Ledger
  
2. Every trip, but do not do twice in 24 hours
  - (a) Function test pipe rams (when inside shoe)
  - (b) Function test blind rams (when out of hole)
  - (c) Operate all Kelly cocks
  - (d) Check Drill pipe safety valve
  - (e) Function test HCR valve
  - (f) Record all of the above in IADC Log Book and well Ledger
  
3. Every 7 days or 1 week actuate the following:
  - (a) Annular preventer
  - (b) All gate valves in the choke and kill system
  - (c) Inside BOP
  - (d) Record all of the above in IADC Log Book and well Ledger

## **Crew Training and Drills**

BOP Practice drills and training sessions shall be conducted at least once each week for each crew. These drills shall be performed with everyone on site to provide training for each crew member to ensure:

1. A clear understanding of the purpose and the method of operation of each preventer and all associated equipment
2. The ability to recognize the warning signs that accompany a kick
3. The crew shall be aware this is a shallow slim hole which reduces volume in the annulus and requires increased attention
4. A clear understanding of each crew members station and duties in the event of a kick while drilling, tripping or out of the hole
5. A clear understanding of the maximum allowable casing pressure (MACP) and the significance of the pressure for well conditions that exist at the time of the drill or training session

## **BOP Records Requirements**

1. A record of all inspections and tests must be recorded in IADC Log book and well ledger
2. A record of all crew drills and training sessions must be kept in the IADC Log book and well ledger

## **BOP Maintenance Requirements**

1. All equipment shall be maintained in accordance with the manufacturer's recommendations
2. All maintenance records shall be kept for the past three years

## **Shut-In Procedure Drilling and Tripping**

### **Drilling**

1. For a kick while drilling stop the rotary and sound the alarm
2. Pick up drill string until the Kelly saver sub clears the rotary table
3. Stop the pumps
4. Close the annular preventer
5. Confirm that all flow from the well is stopped. No flow should occur from the choke manifold, the bell nipple or back through the drill string
6. Open the HCR valve
7. Read and record SIDPP (shut in drill pipe pressure) SICP (shut in casing pressure) Allow to stabilize first
8. Read and record the pit level increase
9. Notify Supervisor

The primary advantage of a hard shut-in is that the kick influx is held to a small volume because the well is closed in more quickly.

### **Tripping**

1. For a kick while tripping immediately set the slips and sound the alarm
2. Install and make up the FOSV in the drill pipe. It should be open
3. Close the drill pipe safety valve
4. Open the HCR valve
5. Close the BOP
6. Close the choke
7. Confirm that all flow from the well has stopped
8. Pick up and make up the Kelly
9. Record SIDPP and SICP
10. Read and record pit level increase
11. Notify Supervisor

**INJECTION WELL DATA**

Supplemental information for drilling or converting to an injection well  
By authority of Part 615 or Part 625 of Act 451 PA 1994, as amended.  
Non-submission and/or falsification of this information  
may result in fines and/or imprisonment.

Applicant

West Bay Exploration Company  
13685 South West Bay Shore Drive, Suite 200  
Traverse City, MI 49684

Well name and number

West Bay 22 SWD

INSTRUCTIONS: Complete all portions of form which apply to this well. **Attach supplemental documents as needed.**

- File a separate plat which identifies the depth and location of this proposed well and all producing, abandoned, or drilling wells within 1320 feet of it. Also identify the permittee of each producing well within 1320 feet of this proposed well.
- Enclose a copy of the completion reports for all wells and the plugging records for all plugged wells shown on the plat. Identify what steps will be necessary to prevent injected fluids from migrating up or into inadequately plugged or completed wells.
- If this is an existing well to be converted to an injection well, enclose this form with an Application To Change Well Status (form EQP 7200-6). Also enclose a copy of the completion report and geologic description and electric logs for this well.
- Injection wells (except for gas storage) must receive a mechanical integrity test every 5 years pursuant to Rule 324.805.

5. Type of fluids to be injected

- Brine  Natural Gas (omit #7 & #12)  
 Fresh Water (omit #12)  Other \_\_\_\_\_

6. Maximum expected injection rate 1,200 BWPD

7. Specific gravity of injected fluid 1.193

8. Maximum expected injection pressure 682 PSIG

9. Maximum bottom hole injection pressure 2100 PSIG

Show calculations

BHP =  $.433 * (1.193 + .05) * 2662 - 14.7 + 682 = 2100$  PSIG (EPA formula)

10. Fracture pressure of confining formation 2647 PSIG

Show calculations ASSUME FG = 1 PSI/FT

2662 FT \* 1 PSI/FT - 14.7 PSIG/PSIA = 2647 PSIG

11. Fracture pressure of injection formation 2115

Show calculations ASSUME FG = 0.8 PSI/FT

2662 FT \* 0.8 PSI/FT - 14.7 PSIG/PSIA = 2115 PSIG

12. Chemical analysis of representative samples of injected fluid

Specific conductance .046 OHM METERS

Cation (mg/l)	Anions (mg/l)
Calcium 28,400	Chloride 174,000
Sodium 37,600	Sulfate 315
Magnesium 4,870	Bicarbonate 230
Potassium 3,000	

What was the source of this representative sample? LANTIS 2-30

SEE ATTACHED COPY

13. Is this well to be completed in a potential or previous oil or gas producing formation?  Yes  No

If yes, provide a list of all offset permittees and proof of service of notification of this application to all permittees by certified mail.

14. Attach proposed plugging and abandonment plan. OR Briefly list depths, volumes and types of cement and mechanical plugs and depths where casing will be recovered.

SET CEMENT RETAINER AT 2,630' AND SQUEEZE PERFS W/  
50 SX OF CLASS A CMT. PLACE 50 SX CMT ON TOP OF  
CMT RET. SPOT 25 SX PLUG AT 1,000'. SPOT 40 SX FROM  
350 FT TO SURFACE. CUT OFF ALL CSGS, WELD ON 1/2"  
STEEL PLATE, WELD ON STATE AND EPA PN'S.

**Schematic of wellbore construction**

Complete bottom of diagram as needed to conform with proposed construction (e.g. show rat hole below casing, open hole completion, packer loc. etc.)

Fresh water fms., name &amp; depth

GLACIAL DRIFT, 155'

MARSHALL SS, 155'-226'

Base of freshwater, name &amp; depth

MARSHALL SS, 226'

Surface casing 11-3/4" x 350

Amount of cement 335 sacks

T.O.C. SURFACE

Intermediate casing (if applicable)

8-5/8" x 900

Amount of cement 265 sacks

T.O.C. SURFACE

Long string casing 5-1/2" x 2680

Amount of cement 425 sacks

T.O.C. SURFACE

Confining formation(s) A2 EVAPORITE

Depth to top 2634

Depth to base 2662

Injection formation(s) NIAGARAN

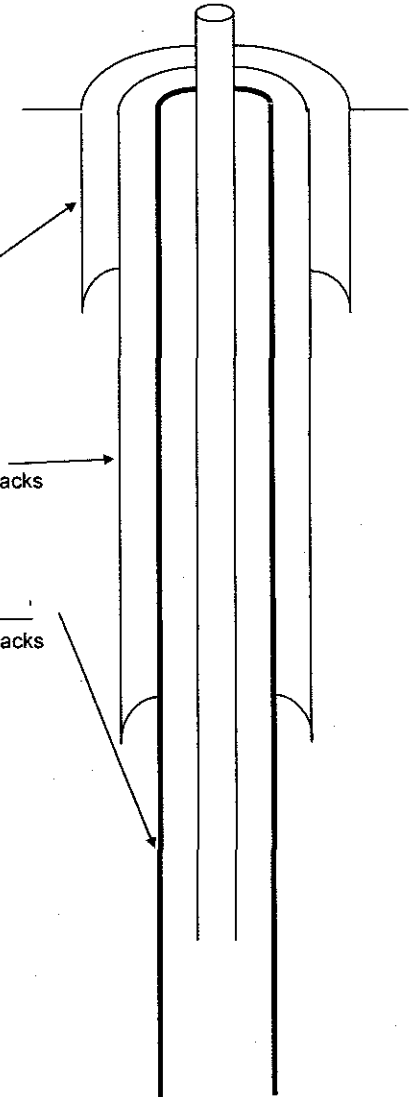
Depth to top 2662

Depth to base 3032

Tubing 2-7/8" x 2630

Packer Depth 2630

Bottom TD or PBTD 2950 ft.



15. Application prepared by (print or type):

TIMOTHY J BROCK

Date

1/25/2011





# APPENDIX 5

SPL Inc.  
 459 Hughes Drive  
 Traverse City, MI 49686  
 Phone: (231) 947-5777  
 Fax: (231) 947-1072

## GENERAL WATER ANALYSIS

WorkOrder: T10080299 LANTIS 2-30 WELL

Lab ID: T10080299001 Date/Time Received: 8/26/2010 10:51 Matrix: Water  
 Sample ID: LANTIS 2-30 WELL Date/Time Collected: 8/19/2010 12:30

Method	Parameters	Results	Analyzed
<b>ANION</b>			
EPA 310.1	Alkalinity, CO32- as CaCO3	ND mg/l	09/02/2010 14:19 by MD
EPA 310.1	Alkalinity, HCO3- as CaCO3	230 mg/l	09/02/2010 14:19 by MD
EPA 325.2	Chloride	174000 mg/l	09/10/2010 16:27 by MD
EPA 375.4	Sulfate	315 mg/l	09/09/2010 14:20 by MD
EPA 376.2	Sulfide	ND mg/l	09/09/2010 15:49 by JS
<b>CATION</b>			
EPA 200.8	Calcium	28400 mg/l	09/09/2010 21:40 by JS
EPA 200.8	Magnesium	4870 mg/l	09/09/2010 22:39 by JS
EPA 200.8	Potassium	3000 mg/l	09/09/2010 22:39 by JS
EPA 200.8	Sodium	37600 mg/l	09/09/2010 21:40 by JS
EPA 200.8	Barium	2.25 mg/l	09/09/2010 22:39 by JS
EPA 200.8	Iron	81.4 mg/l	09/09/2010 22:39 by JS
<b>OTHER</b>			
EPA 150.1	pH	6.1 SU	09/03/2010 11:59 by MD
EPA 120.1	Resistivity	0.0460 ohm-meter	09/03/2010 00:37 by MD
ASTM D1429	Specific Gravity	1.193	09/08/2010 14:39 by JS
	Total dissolved solids (calculated) =	248498.65	

¼ mile area of review owners

Larry and Linda Klopfer  
12160 Ladd Rd  
Brooklyn, MI 49230

Michael and Laura Caines  
12148 Ladd Rd  
Brooklyn, MI 49230

Peggy Cornell  
10875 Bettis Rd  
Brooklyn, MI 49230

Robert Waldron and Joyce Hill  
12767 Waterman Rd  
Brooklyn, MI 49230

Brian Waters  
20310 Schwab  
Brooklyn, MI 49230

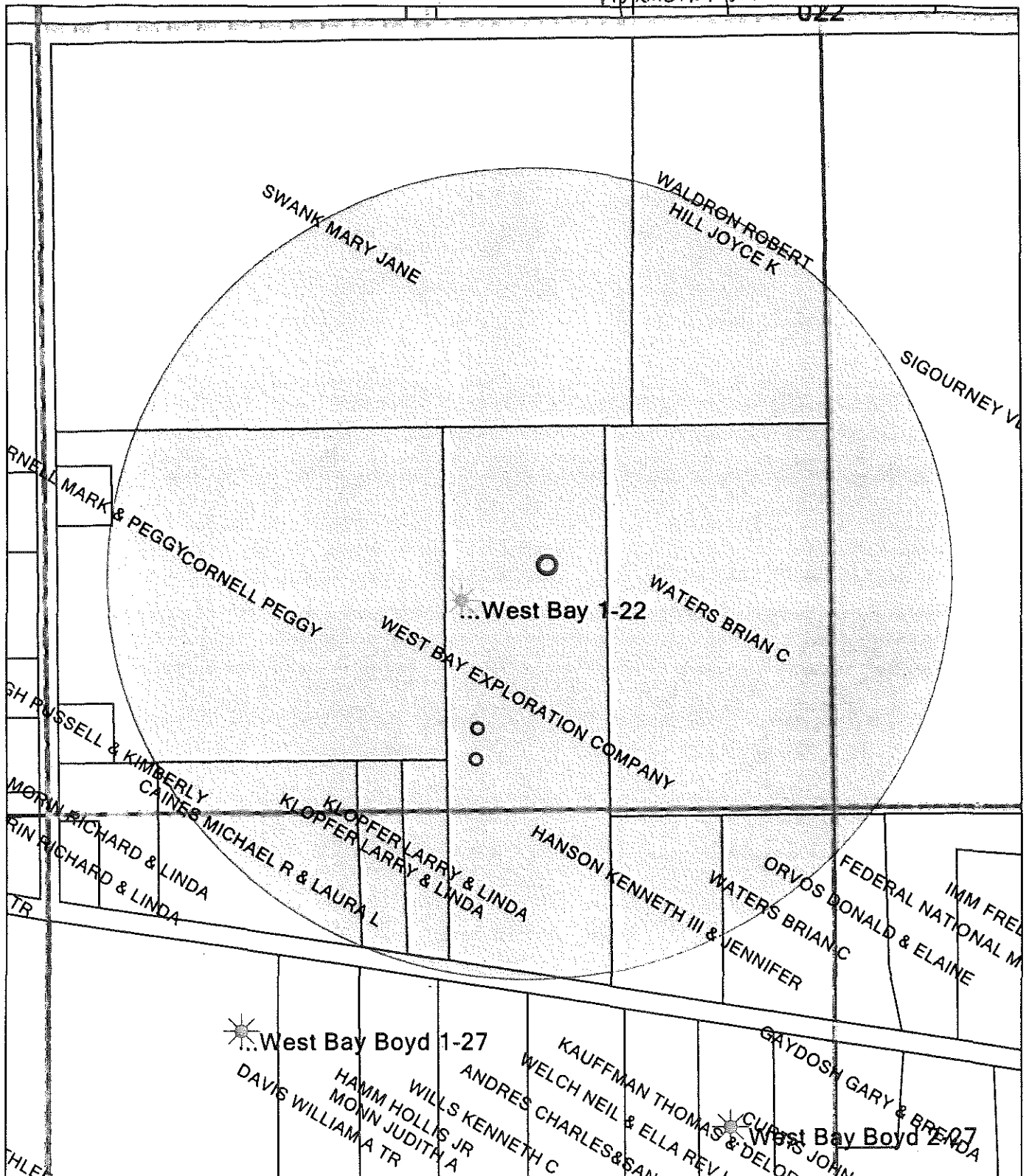
Mary Jane Swank  
12101 Waterman  
Brooklyn, MI 49230

West Bay Exploration Company  
13685 S West Bay Shore, Suite 200  
Traverse City, MI 49684

Kenneth and Jennifer Hanson  
12190 Ladd Rd  
Brooklyn, MI 49230

Donald and Elaine Orvos  
12536 Ladd Rd  
Brooklyn, MI 49230

022



West Bay Exploration Company		
SWD 1/4 Mile Area of review		
January 25, 2011	16:25:23	
link map 9-14-10.gm		KWaterson



## RECORD OF WELL DRILLING OR DEEPENING

Required by authority of Part 615 Supervisor of Wells or Part 625 Mineral Wells, of Act 451 PA 1994, as amended. Non-submission and/or falsification of this information may result in fines and/or imprisonment.

Permit number/Deepening number  
59996

(Submit 3 copies within 60 days of drilling completion.)

Part 615 Oil/Gas Well  Part 625 Mineral Well

Name and address of permittee West Bay Exploration 13685 S. West Bay Shore Suite 200 Traverse City Mi. 49684		API number 21-075-59996	
Name and address of drilling contractor Advanced Enerav Services P.O. Box 85 South Boardman Mi. 49680		Well name and number West Bay #1-22	
Date drilling began 01/11/2010		Surface location NW 1/4 of SE 1/4 of SW 1/4 Section 22 T4S R2E	
Date drilling completed 01/27/2010		Township Norvell	
Total depth of well Driller 4370' Log 4369'		County Jackson	
Formation at total depth Black River		Footages North/South East/West 567' ft. from N line and 575' ft. from E line of sec.	
Elevations K.B. 1028.24 ft. R.F. ft. R.T. 1027 ft. Grd 1015.27 ft		Directionally drilled (check one) <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
		Previous permit numbers	
		Subsurface location (if directionally drilled) 1/4 of 1/4 of 1/4 Section T R	
		Township I	
		County	
		Footages North/South East/West ft. from line and ft. from line of sec.	
		Feet drilled - cable tools from to	
		Feet drilled - rotary tools from surf to 4370'	

Casing, Casing Liners and Cementing, Operating Strings					Water Fill Up (F.U.) or Lost Circulation (L.C.) (X)				
Size	Where set	Cement	T.O.C.	Ft. pulled	Formation	F.U.	L.C.	Depth	Amount
11 3/4"	419'	150 lite/150 A	surface		Niagaran		x	2920	partial
8 5/8"	3112'	600 lite/200 A	surface						
5 1/2"	4151'	80 Halcem	1998'						
		300 Halcem							

Gross Pay Intervals				All Other Oil and Gas Shows Observed or Logged								
Formation	Oil or Gas	From	To	Where Observed (X)								
Formation	Oil or Gas	Depth	Sam- ples	Odor	Pits	Mud Line	Gas Log	Fill Up				
Trenton/Black River	both	3966'	4290'									

Depth Correction		Deviation Survey		Plugged Back		
Depth	Correction	Run at	Degrees	Yes	No	Operation Date
						01/15/2010

Geophysical / Mechanical Logs (list each type run)		
Brand	Log types	Logged intervals
Baker Atlas	CDL/CNL/GR	TD-Surf
	DLL/MLL/GR	TD-Min

Notice: Report complete sample and formation record, coring record, and drill stem test information on reverse side.

CERTIFICATION "I state that I am authorized by said owner. This report was prepared under my supervision and direction. The facts stated herein are true, accurate and complete to the best of my knowledge."

Date 02/15/2010	Name and title (print) Timothy L. Baker	Signature 
--------------------	--	---------------

Submit to: OFFICE OF GEOLOGICAL SURVEY,  
MICHIGAN DEPT OF ENVIRONMENTAL QUALITY  
PO BOX 30256, LANSING, MI 48909-7756



## RECORD OF WELL COMPLETION

By authority of Part 615 or Part 625 of Act 451 PA 1994, as amended. Non-submission and/or falsification of this information may result in fines and/or imprisonment.

(Submit 3 copies within 60 days of well completion.)

Part 615 Oil/Gas Well  Part 625 Mineral Well

Permit number/deepening permit no. 59996	API number 21-075-59996-00-00
Type of well (after completion) Oil & Gas	
Well name & number West Bay 1-22	

Name and address of permittee West Bay Exploration 13685 S. West Bay Shore #200 Traverse City, MI 49684					
Directionally drilled (check one) <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Previous permit numbers		Total depth of well M.D. 4370 T.V.D.	
Surface location NW ¼ of SE ¼ of SW ¼ Section 22 T 4S R 2E				Subsurface location (if directionally drilled) ¼ of ¼ of ¼ Section T R	
Township Norvell		County Jackson		Township County	
Footages: North/South 750 Ft. from South line and 1400 Ft. from West line of Sec.			Footages: North/South East/West Ft. from line and Ft. from line of Sec.		
Part 615 - oil/gas wells			Part 625 - mineral wells		
Date well completed 2/5/2010	Producing formation(s) Black River	Injection formation(s)	Date of first injection	Disposal formation(s)	Solution formation(s)

## COMPLETION INTERVALS(S)

Date	Number holes	Perforation or open hole interval	Open	
			Yes	No
1/30/2010	60	4224-4254'	X	

## STIMULATION BY ACID OR FRACTURING

Date	Interval treated	Materials and amount used
1/30/2010	4224-4254'	500 gallons 28% Hcl Acid
2/4/2010	4224-4254'	6000 gallons 28% Hcl Acid w/ 20 Ball sealers

OPERATIONS OFFICE  
FEB 14 2010

## PRODUCTION TEST DATA

Oil Bbls/day	Gravity °API	Condensate Bbls/day	Gas MCF/day	Water Bbls/day	H <sub>2</sub> S Grains/100 ft <sup>3</sup>	B.H.P. and depth
200	47		90	0	NA	1768 @ 4239

CERTIFICATION "I state that I am authorized by said owner. This report was prepared under my supervision and direction. The facts stated herein are true, accurate and complete to the best of my knowledge."

Name and title (print or type) Timothy L. Baker Operations Manager	Signature 	Date 2/16/2010
---	---------------	-------------------

Submit to: OFFICE OF GEOLOGICAL SURVEY  
MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY  
PO BOX 30256  
LANSING MI 48900-7756

**RECORD OF WELL DRILLING OR DEEPENING**

Required by authority of Part 615 Supervisor of Wells or Part 625 Mineral Wells, of Act 451 PA 1994, as amended. Non-submission and/or falsification of this information may result in fines and/or imprisonment.

Permit number/Deepening number  
60010

(Submit 3 copies within 60 days of drilling completion.)

Part 615 Oil/Gas Well  Part 625 Mineral Well

Name and address of permittee West Bay Exploration 13685 S. West Bay Shore Suite 200 Traverse City Mi. 49684		API number 21-075-60010	
Name and address of drilling contractor Advanced Energy Services P.O. Box 85 South Boardman Mi. 49680		Well name and number West Bay & Boyd #1-27	
Date drilling began 01/30/2010		Surface location SW 1/4 of SE 1/4 of SW 1/4 Section 22 T4S R2E	
Date drilling completed 02/14/2010		Township Norvell	
Total depth of well Driller 4495 Log 4490		County Jackson	
Formation at total depth Black River		Footages North/South East/West 271' ft. from S line and 1440' ft. from W line of sec.	
Elevations K.B. 1043 ft. R.F. ft. R.T. 1042 ft. Grd 1029 ft.		Directionally drilled (check one) <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
		Previous permit numbers	
		Subsurface location (if directionally drilled) NW 1/4 of NW 1/4 of NW 1/4 Section 27 T 4S R 2E	
		Township Norvell	
		County Jackson	
		Footages North/South East/West 679' ft. from N line and 661' ft. from W line of sec.	
		Feet drilled - cable tools from to	
		Feet drilled - rotary tools from surf to TD	

Casing, Casing Liners and Cementing, Operating Strings					Water Fill Up (F.U.) or Lost Circulation (L.C.) (X)				
Size	Where set	Cement	T.O.C.	Ft. pulled	Formation	F.U.	L.C.	Depth	Amount
11 3/4"	426'	150 lite/150 A	surface		Niagaran		x	3220	Partial
8 5/8"	3333'	650 lite/200 A	surface		Trenton/Black River		x	4267	Full
5 1/2"	4151'	80 Halcem	2580'						
		250 Halcem							

Gross Pay Intervals				All Other Oil and Gas Shows Observed or Logged										
Formation	Oil or Gas	From	To	Where Observed (X)										
Formation	Oil or Gas	Depth	Sample	Odor	Pits	Mud Line	Gas Log	Fill Up						
Trenton/Black River	both	4273'	TD											

Depth Correction		Deviation Survey			Plugged Back		
Depth	Correction	Run at	Degrees	Yes	No	Depth	
see	attached	directional					

Geophysical / Mechanical Logs (list each type run)		
Brand	Log types	Logged intervals
Baker Atlas	CNL/GR/CCL (Unable to run open hole)	4487'-Surf
	SBT/GR/CCL	4487'-2100'

Notice: Report complete sample and formation record, coring record, and drill stem test information on reverse side.

CERTIFICATION "I state that I am authorized by said owner. This report was prepared under my supervision and direction. The facts stated herein are true, accurate and complete to the best of my knowledge."

Date 02/19/2010	Name and title (print) Timothy L. Baker	Signature 
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Submit to: OFFICE OF GEOLOGICAL SURVEY,  
MICHIGAN DEPT OF ENVIRONMENTAL QUALITY  
PO BOX 30256, LANSING, MI 48909-7756



MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY - OFFICE OF GEOLOGICAL SURVEY

**RECORD OF WELL COMPLETION**

By authority of Part 615 or Part 625 of Act 451 PA 1994, as amended. Non-submission and/or falsification of this information may result in fines and/or imprisonment.

(Submit 3 copies within 60 days of well completion.)  
 Part 615 Oil/Gas Well  Part 625 Mineral Well

Permit number/deepening permit no. 60010	API number 21-075-60010-00-00
Type of well (after completion) Oil & Gas	
Well name & number West Bay Boyd 1-27	

Name and address of permittee West Bay Exploration 13685 S. West Bay Shore Dr #200 Traverse City, MI 49684					
Directionally drilled (check one) <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		Previous permit numbers		Total depth of well M.D. T.V.D.	
Surface location SW ¼ of SE ¼ of SW ¼ Section 27 T 4S R 2E			Subsurface location (if directionally drilled) NW ¼ of NW ¼ of NW ¼ Section 27 T 4S R 2E		
Township Norvell		County Jackson		Township Norvell	
Footages: North/South 271 Ft. from South line and 1440 Ft. from West line of Sec.		Footages: North/South 600 Ft. from North line and 660 Ft. from West line of Sec.		Footages: East/West	
Part 615 - oil/gas wells			Part 625 - mineral wells		
Date well completed 2/20/10	Producing formation(s) Black River	Injection formation(s)	Date of first injection	Disposal formation(s)	Solution formation(s)

**COMPLETION INTERVALS(S)**

Date	Number holes	Perforation or open hole interval	Open	
			Yes	No
2/19/2010	Open Hole	O.H. 4495-4525	X	

**STIMULATION BY ACID OR FRACTURING**

Date	Interval treated	Materials and amount used
2/20/2010	4495-4525	5000 gal 28% Hcl Acid

**PRODUCTION TEST DATA**

Oil Bbls/day	Gravity °API	Condensate Bbls/day	Gas MCF/day	Water Bbls/day	H <sub>2</sub> S Grains/100 ft <sup>3</sup>	B.H.P. and depth
200	47		95	0	0	TBD

CERTIFICATION "I state that I am authorized by said owner. This report was prepared under my supervision and direction. The facts stated herein are true, accurate and complete to the best of my knowledge."

Name and title (print or type) Timothy L. Baker Operations Manager	Signature <i>Timothy L. Baker</i>	Date 2-23-10
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Submit to: OFFICE OF GEOLOGICAL SURVEY  
MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY  
PO BOX 30256  
LANSING MI 48909-7756



## RECORD OF WELL DRILLING OR DEEPENING

Required by authority of Part 615 Supervisor of Wells or Part 625 Mineral Wells, of Act 451 PA 1994, as amended. Non-submission and/or falsification of this information may result in fines and/or imprisonment.

Permit number/Deepening number  
60011

(Submit 3 copies within 60 days of drilling completion.)

Part 615 Oil/Gas Well  Part 625 Mineral Well

Name and address of permittee West Bay Exploration 13685 S. West Bay Shore Suite 200 Traverse City Mi. 49684		API number 21-075-60011	
Name and address of drilling contractor Advanced Energy Services P.O. Box 85 South Boardman Mi. 49680		Well name and number West Bay & Boyd #2-27	
Date drilling began 02/15/2010		Surface location SW 1/4 of SE 1/4 of SW 1/4 Section 22 T4S R2E	
Date drilling completed 03/03/2010		Township Norvell	
Total depth of well Driller 4845 Log 4846		County Jackson	
Formation at total depth Black River		Footages North/South East/West 186' ft. from S line and 1440' ft. from W line of sec.	
Elevations K.B. 1042.6 ft. R.F. ft. R.T. 1041 ft. Grd 1029.2 ft		Directionally drilled (check one) <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
		Previous permit numbers	
		Subsurface location (if directionally drilled) SE 1/4 of NE 1/4 of NW 1/4 Section 27 T 4S R 2E	
		Township Norvell	
		County Jackson	
		Footages North/South East/West 963' ft. from N line and 2264' ft. from W line of sec.	
		Feet drilled - cable tools from to	
		Feet drilled - rotary tools from surf to TD	

Casing, Casing Liners and Cementing, Operating Strings					Water Fill Up (F.U.) or Lost Circulation (L.C.) (X)				
Size	Where set	Cement	T.O.C.	Ft. pulled	Formation	F.U.	L.C.	Depth	Amount
11 3/4"	424'	150 lite/150 A	surface		Niagaran		x	3300	Partial
8 5/8"	3417'	650 lite/200 A	surface						
5 1/2"	4842'	75 Halcem	3300"						
		150 Halcem							

Gross Pay Intervals				All Other Oil and Gas Shows Observed or Logged								
Formation	Oil or Gas	From	To	Where Observed (X)								
Formation	Oil or Gas	Depth	Samples	Odor	Pits	Mud Line	Gas Log	Fill Up				
Black River	both	4510'	4590'									

Depth Correction		Deviation Survey			Plugged Back		
Depth	Correction	Run at	Degrees	Yes	No	Depth	
see	attached	directional					

Geophysical / Mechanical Logs (list each type run)		
Brand	Log types	Logged intervals
Baker Atlas	CNL/ZDL/GR	4846'-Surf
	DLL/MLL/GR	4846'-3417'

Notice: Report complete sample and formation record, coring record, and drill stem test information on reverse side.

CERTIFICATION "I state that I am authorized by said owner. This report was prepared under my supervision and direction. The facts stated herein are true, accurate and complete to the best of my knowledge."

Date 06/20/2010	Name and title (print) Timothy L. Baker	Signature 
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Submit to: OFFICE OF GEOLOGICAL SURVEY,  
MICHIGAN DEPT OF ENVIRONMENTAL QUALITY  
PO BOX 30256, LANSING, MI 48909-7756



# FORMATION LOG

Attach additional sheets if necessary

API number

Permit number/Deepening number

60011

Elevation used

Geologist name

Tops taken from

1043

Fowler/Baker/Vancyck

Driller's log

Sample log

Electric log

From	To	Formation (type, color, hardness)	From	To	Formation (type, color, hardness)
<p>Note: if well directionally drilled, add true vertical depth formation tops where appropriate</p>					
surf	222(log)	Drift- Unconsolidated sand and gravel			
222	290	Shale& Siltstone- brn-gy-Grn, silty at top organic at base			
290	1230	Shale-Coldwater- Md-dk Brn-Blk,Silty, incr organic at base			
1230	1370	Sunbury Sh/Berea siltstone-Sh, Md Brn-Blk Silty,pyr. mixed w/siltstone, SSO-Lt md brn, Arg			
1370	15	Antrim-Dk Brn-Blk,Pyrand incr organic at base,SG incr toward base			
1554	1622	Traverse Fm- Limestone, Dk Brn-md Brn, Dns, Pyr, Dolomite, Md Gy-Gy, Dns			
1622	1744	Traverse Limestone-Md Brn-lt Brn Vfxln,Hd,			
1744	1978	Shale intbd w Dolomite and Lmst, Md Brn-Gy, Vfxln, Dns, Pos Dundee@1728'-Brn-Lt brn,Poor Samp,Pos Cvgs			
1978	2200	Detroit River- Anhydrite and Dolomite/Limestone, Lt-Md Brn Dns,Vfxln in pt,NS			
2200	2416	Bass Island/Bois Blanc- Dolomite,Anhydrite & Limestone AA			
2416	2685	G-Unit-Dolomite-Arg,Hd grading to Anhydrite- Lt-md Gy Brn			
2685	2766	C Shale-Gy-rdBrn, W/Dolomite and Anhydrite,Lt gy-Brn-bf Poor Samp.l			
2766	2972	B Evap-Anhydrite Wh-Lt Gy W/Dolomite-Vfxln, Lt-md Gy, Intbd at base with Anhy. AA	If well was cored, attach core description		
2972	3160	Dolo &Limst-Wh-lt Gy,Dns,Anhydritic @3110-Wh, Dns	DRILL STEM TEST DATA		
3160	3386	Niagaran-Dolomite,AA,Md Gy, Vfxln Intbd W/Anhydrite AA,V porous 2880'-3300'			
3386	3884	Clinton/Cinn-Dolomite, Arg, hd, dk gy, grd to lt gy intbd w/Lmst,lt-md gy Dns			
3884	4212	Utica- Shale, Gy-Grn,Gummy-Hd			
4212	4526	Trenton-Dolo, Lt -Md Gy,Dns,W/ Lmst @ 4236'-4526' Lt-Md Gy Brn,Vfxln,			
4526	TD	Black River- Dolomite,Md Brn-GyBrn,SO&G@4590'			



Directional Drilling Contractors, LLC.

Job Number: DR100040

Company: WEST BAY EXPLORATION

Lease/Well: WEST BAY/ BOYD 2-27

Location: NORVELL TWP., JACKSON CO.

Rig Name: ADVANCED # 2

RKB:

G.L. or M.S.L.:

State/Country: MICHIGAN / USA

Declination: 6.33 DEGREES WEST

Grid:

File name: C:\WINSERVE\ASDRIL-1\2010\BOYD227.SVY

Date/Time: 04-Mar-10 / 10:03

Curve Name: WESTBAY/BOYD 2-27 ( as drilled )

Directional Drilling Contractors  
SURVEY REPORT

WINSERVE SURVEY CALCULATIONS  
Minimum Curvature Method  
Vertical Section Plane 144.40  
Vertical Section Referenced to Wellhead  
Rectangular Coordinates Referenced to Wellhead

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	True Vertical Depth	N-S FT	E-W FT	Vertical Section FT	CLOSURE		Dogleg Severity Deg/100
							Distance FT	Direction Deg	
<b>KOP @ 484 MD</b>									
484.00	.00	.00	484.00	.00	.00	.00	.00	.00	.00
486.00	.70	169.10	486.00	-.01	.00	.01	.01	169.05	35.00
516.00	1.80	164.20	515.99	-.65	.17	.62	.67	165.64	3.68
546.00	3.20	162.10	545.96	-1.90	.55	1.86	1.97	163.79	4.68
576.00	4.70	161.00	575.89	-3.85	1.21	3.84	4.04	162.59	5.01
606.00	6.10	159.30	605.76	-6.51	2.17	6.56	6.86	161.54	4.70
636.00	7.70	157.80	635.54	-9.86	3.49	10.05	10.46	160.48	5.37
667.00	9.10	156.80	666.21	-14.04	5.25	14.47	14.98	159.51	4.54
697.00	10.70	157.80	695.76	-18.80	7.23	19.49	20.14	158.95	5.36
728.00	12.80	157.80	726.11	-24.64	9.62	25.63	26.45	158.68	6.77
757.00	14.90	157.80	754.26	-31.07	12.24	32.39	33.39	158.50	7.24
788.00	17.30	157.50	784.04	-39.02	15.51	40.75	41.99	158.32	7.75
818.00	19.80	156.10	812.48	-47.78	19.28	50.08	51.53	158.03	8.46
848.00	22.10	154.30	840.50	-57.52	23.78	60.61	62.24	157.53	7.96
878.00	24.20	152.90	868.08	-68.08	29.03	72.25	74.01	156.90	7.24
907.00	26.50	151.50	894.29	-79.06	34.83	84.55	86.39	156.22	8.20
937.00	28.90	150.10	920.85	-91.22	41.64	98.41	100.28	155.47	8.29
968.00	31.00	148.00	947.71	-104.49	49.60	113.84	115.67	154.61	7.57
1008.00	31.60	144.80	981.89	-121.79	61.10	134.60	136.26	153.36	4.42
1038.00	31.70	142.70	1007.43	-134.48	70.41	150.34	151.80	152.37	3.69
1068.00	31.70	141.70	1032.95	-146.94	80.07	166.09	167.34	151.41	1.75
1097.00	31.90	141.70	1057.60	-158.93	89.54	181.35	182.42	150.60	.69
1126.00	32.20	142.00	1082.18	-171.03	99.05	196.73	197.64	149.92	1.17

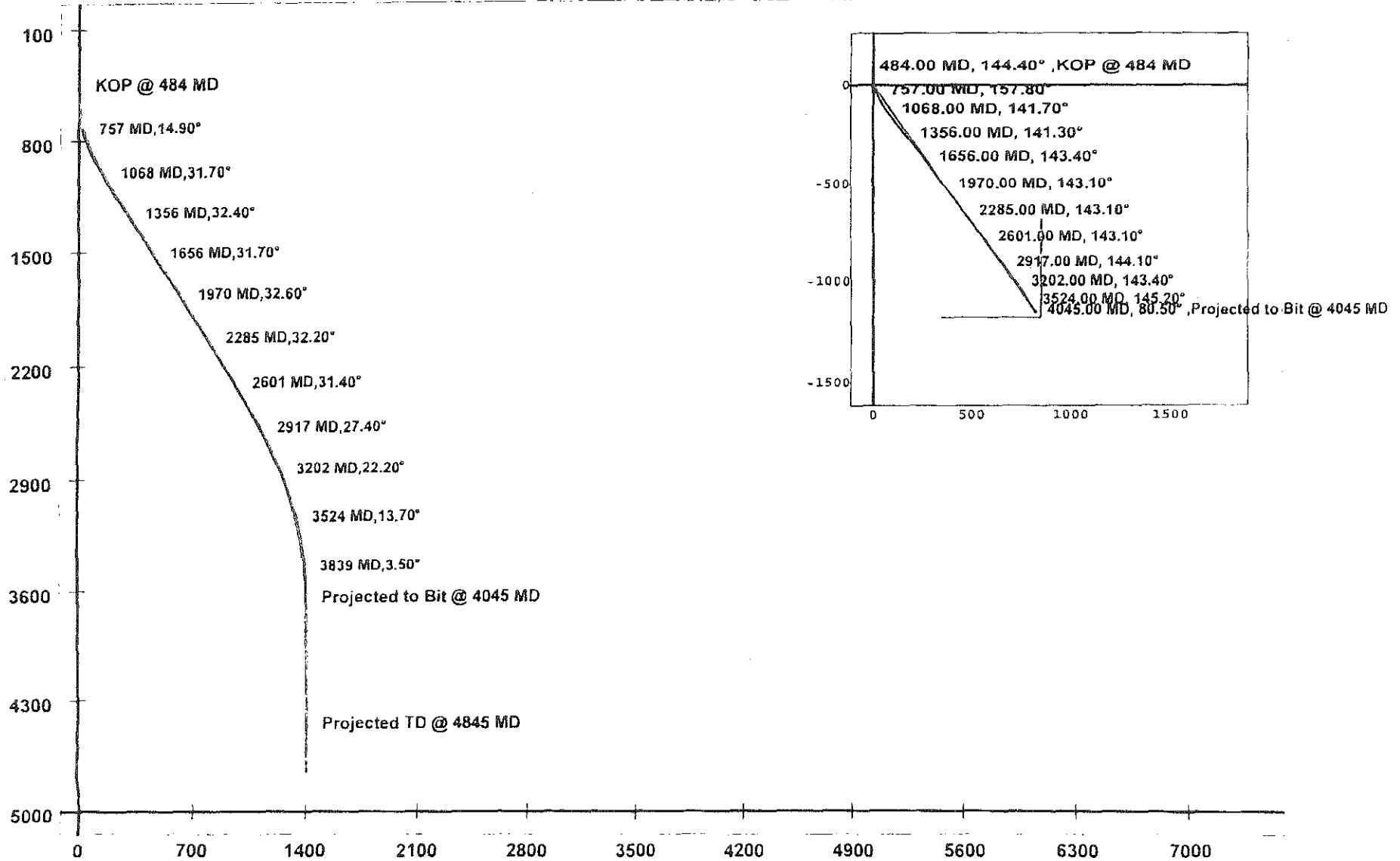
Measured Depth FT	Incl Angle Deg	Drift Direction Deg	True Vertical Depth	N-S FT	E-W FT	Vertical Section FT	CLOSURE		Dogleg Severity Deg/100
							Distance FT	Direction Deg	
1156.00	32.10	141.70	1107.58	-183.59	108.91	212.67	213.46	149.32	.63
1177.00	32.30	142.00	1125.35	-192.39	115.82	223.85	224.56	148.95	1.22
1207.00	32.40	142.00	1150.69	-205.04	125.71	239.89	240.50	148.49	.33
1237.00	32.70	141.70	1175.98	-217.73	135.68	256.02	256.54	148.07	1.14
1267.00	33.00	142.00	1201.18	-230.53	145.73	272.27	272.73	147.70	1.14
1297.00	32.60	141.70	1226.40	-243.31	155.77	288.51	288.90	147.37	1.44
1327.00	32.10	141.30	1251.74	-255.87	165.76	304.54	304.87	147.06	1.81
1356.00	32.40	141.30	1276.27	-267.95	175.44	319.99	320.27	146.79	1.03
1385.00	32.40	141.70	1300.75	-280.11	185.11	335.51	335.75	146.54	.74
1415.00	31.80	141.70	1326.17	-292.62	194.99	351.44	351.63	146.32	2.00
1446.00	31.80	141.70	1352.51	-305.44	205.11	367.75	367.92	146.12	.00
1476.00	30.90	140.60	1378.13	-317.60	214.90	383.34	383.47	145.92	3.56
1506.00	30.20	140.60	1403.97	-329.38	224.58	398.55	398.66	145.71	2.33
1536.00	30.20	142.00	1429.90	-341.15	234.02	413.62	413.70	145.55	2.35
1566.00	30.40	143.10	1455.80	-353.17	243.22	428.75	428.82	145.45	1.97
1596.00	30.80	143.10	1481.62	-365.38	252.39	444.01	444.08	145.37	1.33
1626.00	31.00	143.40	1507.36	-377.73	261.61	459.42	459.47	145.29	.84
1656.00	31.70	143.40	1532.98	-390.26	270.91	475.02	475.07	145.23	2.33
1688.00	31.90	143.10	1560.18	-403.77	281.00	491.88	491.93	145.16	.80
1719.00	32.30	142.40	1586.44	-416.88	290.97	508.35	508.38	145.09	1.76
1750.00	32.30	142.40	1612.65	-430.00	301.08	524.90	524.93	145.00	.00
1782.00	32.40	142.40	1639.68	-443.57	311.53	542.01	542.04	144.92	.31
1813.00	32.20	142.40	1665.88	-456.70	321.63	558.57	558.59	144.84	.65
1845.00	32.40	141.70	1692.93	-470.18	332.15	575.65	575.67	144.76	1.33
1876.00	33.10	141.30	1719.00	-483.30	342.59	592.40	592.41	144.67	2.36
1908.00	33.40	141.00	1745.76	-496.97	353.60	609.92	609.92	144.57	1.07
1939.00	33.10	142.00	1771.69	-510.27	364.18	626.89	626.90	144.48	2.02
1970.00	32.60	143.10	1797.73	-523.62	374.40	643.70	643.70	144.43	2.51
2001.00	32.60	143.10	1823.85	-536.97	384.43	660.40	660.40	144.40	.00
2031.00	32.60	143.40	1849.12	-549.92	394.10	676.56	676.56	144.37	.54
2064.00	32.90	144.80	1876.88	-564.38	404.57	694.41	694.41	144.37	2.47
2096.00	33.20	144.80	1903.70	-578.64	414.63	711.86	711.86	144.38	.94
2127.00	33.40	144.80	1929.61	-592.55	424.44	728.88	728.88	144.39	.65
2158.00	33.70	144.10	1955.44	-606.49	434.40	746.01	746.01	144.39	1.58
2189.00	34.00	144.10	1981.19	-620.48	444.52	763.28	763.28	144.38	.97
2221.00	33.30	143.80	2007.83	-634.81	454.96	781.01	781.01	144.37	2.25
2252.00	32.30	143.10	2033.88	-648.31	464.96	797.80	797.80	144.35	3.45
2285.00	32.20	143.10	2061.79	-662.39	475.53	815.41	815.41	144.33	.30
2317.00	32.50	143.10	2088.83	-676.08	485.81	832.52	832.53	144.30	.94
2348.00	32.40	143.40	2114.99	-689.41	495.76	849.15	849.16	144.28	.61
2379.00	32.40	144.10	2141.16	-702.80	505.59	865.76	865.77	144.27	1.21
2411.00	32.10	145.90	2168.22	-716.79	515.38	882.84	882.84	144.28	3.14
2442.00	31.80	146.20	2194.53	-730.40	524.54	899.23	899.23	144.32	1.09
2474.00	31.20	145.20	2221.81	-744.21	533.96	915.95	915.95	144.34	2.49
2506.00	31.60	144.80	2249.13	-757.87	543.53	932.62	932.62	144.35	1.41

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	True Vertical Depth			Vertical Section FT	CLOSURE		Dogleg Severity Deg/100
				N-S FT	E-W FT		Distance FT	Direction Deg	
2538.00	31.50	144.10	2276.40	-771.49	553.26	949.36	949.36	144.35	1.19
2569.00	31.40	143.40	2302.84	-784.53	562.82	965.54	965.54	144.34	1.22
2601.00	31.40	143.10	2330.16	-797.89	572.80	982.21	982.21	144.33	.49
2632.00	31.70	144.10	2356.57	-810.95	582.42	998.42	998.43	144.31	1.95
2664.00	31.60	144.10	2383.81	-824.55	592.27	1015.22	1015.22	144.31	.31
2696.00	31.20	143.80	2411.13	-838.03	602.08	1031.89	1031.89	144.30	1.34
2727.00	30.90	143.80	2437.69	-850.93	611.52	1047.88	1047.88	144.30	.97
2759.00	30.60	143.80	2465.19	-864.13	621.19	1064.24	1064.24	144.29	.94
2791.00	30.30	143.40	2492.77	-877.19	630.81	1080.45	1080.45	144.28	1.13
2823.00	29.60	142.40	2520.50	-889.93	640.45	1096.42	1096.42	144.26	2.69
2855.00	28.70	143.10	2548.45	-902.34	649.88	1112.00	1112.01	144.24	3.01
2886.00	27.90	143.40	2575.74	-914.11	658.68	1126.70	1126.70	144.22	2.62
2917.00	27.40	144.10	2603.20	-925.71	667.18	1141.08	1141.09	144.22	1.92
2949.00	27.20	144.50	2631.64	-937.63	675.75	1155.76	1155.76	144.22	.85
<b>TOP NIAGRINE</b>									
2972.00	26.34	144.22	2652.17	-946.05	681.78	1166.12	1166.12	144.22	3.79
2981.00	26.00	144.10	2660.25	-949.27	684.11	1170.08	1170.09	144.22	3.79
3013.00	25.60	143.40	2689.06	-960.50	692.34	1184.01	1184.02	144.22	1.57
3044.00	25.10	143.40	2717.08	-971.15	700.26	1197.28	1197.29	144.21	1.61
3075.00	25.00	143.40	2745.16	-981.69	708.08	1210.40	1210.41	144.20	.32
3107.00	24.90	143.80	2774.17	-992.56	716.09	1223.90	1223.91	144.19	.61
3139.00	24.30	143.10	2803.27	-1003.26	724.02	1237.22	1237.23	144.18	2.08
3171.00	23.00	143.10	2832.58	-1013.52	731.73	1250.05	1250.06	144.17	4.06
3202.00	22.20	143.40	2861.20	-1023.07	738.86	1261.96	1261.98	144.16	2.61
3233.00	21.70	144.50	2889.95	-1032.44	745.68	1273.55	1273.56	144.16	2.09
3264.00	20.80	145.50	2918.84	-1041.64	752.13	1284.79	1284.80	144.17	3.13
3296.00	20.20	146.60	2948.82	-1050.93	758.38	1295.99	1296.00	144.18	2.23
3327.00	19.40	147.70	2977.99	-1059.75	764.08	1306.48	1306.48	144.21	2.85
3358.00	18.80	148.40	3007.28	-1068.36	769.45	1316.60	1316.60	144.24	2.07
3368.00	18.80	148.40	3016.74	-1071.10	771.14	1319.81	1319.82	144.25	.00
3430.00	17.50	149.10	3075.66	-1087.61	781.16	1339.07	1339.07	144.31	2.13
3460.00	16.30	148.40	3104.36	-1095.07	785.68	1347.77	1347.77	144.34	4.06
3492.00	15.10	146.60	3135.17	-1102.37	790.33	1356.41	1356.41	144.36	4.05
3524.00	13.70	145.20	3166.16	-1108.97	794.79	1364.37	1364.37	144.37	4.51
3556.00	12.70	144.10	3197.32	-1114.93	799.01	1371.67	1371.67	144.37	3.22
3587.00	11.40	143.40	3227.63	-1120.15	802.84	1378.14	1378.14	144.37	4.22
3619.00	10.60	143.80	3259.04	-1125.06	806.46	1384.25	1384.25	144.37	2.51
3650.00	9.20	144.80	3289.58	-1129.39	809.58	1389.58	1389.58	144.37	4.55
3682.00	7.70	146.20	3321.23	-1133.26	812.24	1394.28	1394.28	144.37	4.73
3713.00	6.60	145.90	3351.99	-1136.46	814.40	1398.14	1398.14	144.37	3.55
3744.00	5.80	144.80	3382.81	-1139.22	816.30	1401.48	1401.48	144.38	2.61
3776.00	5.10	145.50	3414.67	-1141.71	818.04	1404.52	1404.52	144.38	2.20
3808.00	4.50	145.90	3446.55	-1143.92	819.55	1407.20	1407.20	144.38	1.88
3839.00	3.50	143.40	3477.48	-1145.69	820.79	1409.36	1409.36	144.38	3.27
3870.00	2.60	141.30	3508.43	-1147.00	821.80	1411.01	1411.01	144.38	2.93

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	True Vertical Depth	N-S FT	E-W FT	Vertical Section FT	CLOSURE		Dogleg Severity Deg/100
							Distance FT	Direction Deg	
3902.00	2.30	143.40	3540.40	-1148.08	822.63	1412.38	1412.38	144.38	.98
3934.00	1.70	141.00	3572.38	-1148.96	823.31	1413.49	1413.49	144.38	1.89
3965.00	.60	142.70	3603.38	-1149.45	823.70	1414.11	1414.11	144.37	3.55
3997.00	.30	80.50	3635.38	-1149.57	823.89	1414.32	1414.32	144.37	1.66
<b>Projected to Bit @ 4045 MD</b>									
4045.00	.30	80.50	3683.38	-1149.53	824.13	1414.43	1414.43	144.36	.00
<b>Projected TD @ 4845 MD</b>									
4845.00	.30	80.50	4483.37	-1148.84	828.27	1416.27	1416.28	144.21	.00

Job Number: DR100040  
 Company: WEST BAY EXPLORATION  
 Lease/Well: WEST BAY/BOYD 2-27  
 Location: NORVELL TWP., JACKSON CO.  
 Rig Name: ADVANCED # 2  
 State/Country: MICHIGAN / USA

Declination: 6.33 DEGREES WEST  
 File name: C:\WINSERVE\ASDRIL~1\2010  
 Date/Time: 04-Mar-10 / 10:01





## RECORD OF WELL COMPLETION

By authority of Part 615 or Part 625 of Act 451 PA 1994, as amended. Non-submission and/or falsification of this information may result in fines and/or imprisonment.

(Submit 3 copies within 60 days of well completion.)

Part 615 Oil/Gas Well  Part 625 Mineral Well

Permit number/deepening permit no. 60011	API number 21-075-60011
Type of well (after completion) oil	
Well name & number West Bay Boyd #2-27	

Name and address of permittee West Bay Exploration 13685 S. West Bay Shore Drive Suite 200, Traverse City Mi. 49684					
Directionally drilled (check one) <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		Previous permit numbers		Total depth of well M.D. 4845' T.V.D. 4483'	
Surface location SW ¼ of SE ¼ of SW ¼ Section 27 T 4S R 2E			Subsurface location (if directionally drilled) SE ¼ of NE ¼ of NW ¼ Section 27 T 4S R 2E		
Township Napoleon		County Jackson		Township Napoleon	
Footages: North/South 186' Ft. from South line and 1440' Ft. from West line of Sec.		Footages: North/South 963' Ft. from North line and 2264' Ft. from West line of Sec.		East/West	
Part 615 - oil/gas wells			Part 625 - mineral wells		
Date well completed D&A	Producing formation(s) D&A	Injection formation(s)	Date of first injection	Disposal formation(s)	Solution formation(s)

## COMPLETION INTERVALS(S)

Date	Number holes	Perforation or open hole interval	Open	
			Yes	No
3/11/10	52	4592-4605		x
3/15/10	28	4507-4514		x

## STIMULATION BY ACID OR FRACTURING

Date	Interval treated	Materials and amount used
3/12/10	4592-4605	500 gal 28% Hcl acid
3/15/10	4507-4514	500 gal 28% Hcl acid

## PRODUCTION TEST DATA

Oil Bbls/day	Gravity °API	Condensate Bbls/day	Gas MCF/day	Water Bbls/day	H <sub>2</sub> S Grains/100 ft <sup>3</sup>	B.H.P. and depth
0				100		

CERTIFICATION "I state that I am authorized by said owner. This report was prepared under my supervision and direction. The facts stated herein are true, accurate and complete to the best of my knowledge."

Name and title (print or type) Timothy L. Baker	Signature 	Date 7/29/10
--	---------------	-----------------

Submit to: OFFICE OF GEOLOGICAL SURVEY  
MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY  
PO BOX 30256  
LANSING MI 48909-7756



**RECORD OF WELL PLUGGING  
OR CHANGE OF WELL STATUS**

Required by authority of Part 615 Supervisor of Wells or Part 625 Mineral Wells of Act 451 PA 1994, as amended. Non-submission and/or falsification of this information may result in fines and/or imprisonment.

- Part 615 Oil/Gas Well       Plugging
- Part 625 Mineral Well       Change of Well Status

Permit number 60094	Well name and number West Bay Boyd #2-27		
API number 21-075-60011			
Name and address of permittee West Bay Exploration 13685 S West Bay Shore Drive Suite 200, Traverse City Mi. 49684			
Name and address of contractor/service company McConnell & Scully 146 W. Main St. Homer, Mi. 49245		Type of well Oil \$ Gas	Field name
		Surface location SW 1/4   SE 1/4   SW 1/4   Sec 21   T 4S   R 2E	
		Township Napoleon	County Jackson
		Date plugging/change started 05/14/10	Date plugging/change completed 05/21/10

DEQ employee issuing plugging permit or approving Change of Well Status. Date issued  
Walt Danyluk 05/03/10

Any change of well status which results in a change of production or a change in injectivity must include production or injection test records. All records must include a narrative or daily chronology and signed certification noted on reverse.

WELL PLUGGING (Hole conditions after plugging)							
CASING							
Casing size	Where set	Amount casing pulled	Depth casing cut/perfed; or windows milled				
11 3/4"	424	0	NA				
8 5/8"	3417	0	NA				
5 1/2"	4842	0	window milled to facilitate lateral under permit # 60094				
PLUGS							
Depth of plug Bottom      Top		Make and type of bridge or plug	Cement plugs: type, amount of cement & mix water	Additives, type and percent	Volume and types of spacers/flushes	Wait time	Tagged Top? Y/N
4571	4570	BakerI	Mechanical				Y
4322	4321	Baker	Mechanical				Y

Check if NORM or other materials were left or reinserted into wellbore. If so, describe materials fully in the Daily Chronology section on reverse.

Check if cores were taken and attach core descriptions

Mail completed original and three copies to the appropriate DEQ district office within 60 days after completion of plugging/change of a Part 615 oil/gas well or within 30 days of a Part 625 mineral well.

OFFICE OF GEOLOGICAL SURVEY  
MICHIGAN DEPT OF ENVIRONMENTAL QUALITY  
PO BOX 30256  
LANSING, MI 48909-7756

COMPLETE BOTH SIDES



API number  
21-075-60011

Permit number  
60094

**CHANGE OF WELL STATUS**

Change was to:  Convert current zone to:  Remediate well:  Plugback (recomplete as)  Redrill:

Production  Perf and test existing zone  New production zone  Horizontal drain hole

Disposal  Repair casing/cement  Disposal  Collapsed casing

Secondary recovery  Other \_\_\_\_\_  Secondary recovery  Underream open hole

Storage  Storage

Other \_\_\_\_\_  Other \_\_\_\_\_

**Well casing record - BEFORE change**

Casing		Cement		Perforations			Acid or fracture treatment record
Size	Depth	Sacks	Type	From	To	If plugged, HOW?	
11 3/4"	424'	150/150	lite/A				
8 5/8"	3417'	650/200	lite/A				
5 1/2"	4842'	75/150	Halcm/A	4592	4605		500 gal 28% Hcl acid
				4507	4514		500 gal 28% Hcl acid

**Well casing record - AFTER change (Indicate additions and changes only, complete test record)**

Casing		Cement		Perforations			Acid or fracture treatment record
Size	Depth	Sacks	Type	From	To	If plugged, HOW?	
				4592	4605	CIBP	
				4507	4514	CIBP	

**BEFORE CHANGE**

**AFTER CHANGE**

Total depth 4842	Completed Fm Black River	Well completed for Oil & Gas	Total depth 4583	Completed Fm Black River	Well completed for Oil & Gas		
BOPD 0	MCFGPD	Inj Rate	Pressure	BOPD 200	MCFGPD 98	Inj Rate	Pressure 460

**DAILY PRODUCTION TEST RECORD**

**DAILY INJECTION TEST RECORD**  Injection well  Brine disposal

Date	Oil (bbls)	Water (bbls)	Gas (Mcf)	Pressure		Date	Bbls water or Mcf gas	Pressure		Specific gravity of water
				Tubing	Casing			Beginning	Ending	
5/25/10	231	0	68	520	620					
5/26/10	178	0	96	482	688					
5/27/10	196	0	100	492	690					
5/28/10	211	0	100	460	691					
5/29/10	188	0	100	457	688					
5/30/10	195	0	100	453	688					
5/31/10	195	0	100	447	688					

**DAILY CHRONOLOGY**

Describe in detail the daily chronology of change/plugging, include days shut down. Describe exceptions to issued plugging instructions. Describe tools, tubing, etc. left in hole and any logs run. Include dates pits filled, surface restored etc. Use additional pages as needed.

Date	Narrative
5/14/10	MIRU set CIBP @ 4321' Mill Window & Kick off at 4310 under permit # 60094 land lateral at 4267', 2140' South of surface and 824' East TOH Run lbg to T.D.
5/21/10	Test Well

NOTICE: Under Part 615 Supervisor of Wells or Part 625 Mineral Wells, Act 451 PA 1994, as amended, a well owner has continuing liability for the integrity of a plugged well.

CERTIFICATION "I state that I am authorized by said owner. This report was prepared under my supervision and direction. The facts stated herein are true, accurate and complete to the best of my knowledge."

Name and title (printed or typed) Timothy L. Baker - Operations Mgr Authorized signature [Signature] Date 3/21/10

NOTE: Bonds cannot be terminated until plugging is completed, cellar, rat and mouse holes, and pits filled, site leveled and cleaned and records filed.



## REC'D OF WELL DRILLING OR DEEPENING

Required by authority of Part 615 Supervisor of Wells or Part 625 Mineral Wells, of Act 451 PA 1994, as amended. Non-submission and/or falsification of this information may result in fines and/or imprisonment.

Permit number/Deepening number  
60094

(Submit 3 copies within 60 days of drilling completion.)

Part 615 Oil/Gas Well  Part 625 Mineral Well

Name and address of permittee West Bay Exploration 13685 S. West Bay Shore Suite 200 Traverse City Mi. 49684		API number 21-075-60011	
Name and address of drilling contractor Advanced Energy Services P.O. Box 85 South Boardman Mi. 49680		Well name and number West Bay & Boyd #2-27 HD 1	
Date drilling began 05/15/2010		Surface location SW 1/4 of SE 1/4 of SW 1/4 Section 22 T4S R2E	
Date drilling completed 05/21/2010		Township Norvell	
Total depth of well Driller 5102 Log NA		County Jackson	
Formation at total depth Black River		Footages North/South East/West 186' ft. from S line and 1440' ft. from W line of sec.	
Elevations K.B. 1042.6 ft. R.F. ft. R.T. 1041 ft. Grd 1029.2 ft		Directionally drilled (check one) <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
		Previous permit numbers	
		Subsurface location (if directionally drilled) NE 1/4 of SE 1/4 of NW 1/4 Section 27 T 4S R 2E	
		Township Norvell	
		County Jackson	
		Footages North/South East/West 1590' ft. from N line and 2256' ft. from W line of sec.	
		Feet drilled - cable tools from to	
		Feet drilled - rotary tools from surf to TD	

Casing, Casing Liners and Cementing, Operating Strings				Water Fill Up (F.U.) or Lost Circulation (L.C.) (X)					
Size	Where set	Cement	T.O.C.	Ft. pulled	Formation	F.U.	L.C.	Depth	Amount
11 3/4"	424'	150 lite/150 A	surface						
8 5/8"	3417'	650 lite/200 A	surface						
5 1/2"	4842'	75 Halcem	3300"						
		150 Halcem							
		(PN 60011)							

Gross Pay Intervals				All Other Oil and Gas Shows Observed or Logged						
Formation	Oil or Gas	From	To	Where Observed (X)						
Formation	Oil or Gas	Depth	Sam- ples	Odor	Pits	Mud Line	Gas Log	Fill Up		
Black River	both	4310'	5102'							

Depth Correction		Deviation Survey		Plugged Back		
Depth	Correction	Run at	Degrees	Yes	No	Depth
see	attached	directional				

Geophysical / Mechanical Logs (list each type run)		
Brand	Log types	Logged intervals
Unable to run logs in lateral		

Notice: Report complete sample and formation record, coring record, and drill stem test information on reverse side.

CERTIFICATION "I state that I am authorized by said owner. This report was prepared under my supervision and direction. The facts stated herein are true, accurate and complete to the best of my knowledge."

Date 06/22/2010	Name and title (print) Timothy L. Baker	Signature 
--------------------	--	---------------

Submit to: OFFICE OF GEOLOGICAL SURVEY,  
MICHIGAN DEPT OF ENVIRONMENTAL QUALITY  
PO BOX 30256, LANSING, MI 48909-7756

# FORMATION RECORD

Attach additional sheets if necessary

API number

Permit number/Deepening number

60094

Elevation used	Geologist name	Tops taken from	
1043	Fowler/Baker/Vancytle	<input type="checkbox"/> Driller's log <input checked="" type="checkbox"/> Sample log <input type="checkbox"/> Electric log	

From	To	Formation (type, color, hardness)	From	To	Formation (type, color, hardness)
Note: if well directionally drilled, add true vertical depth formation tops where appropriate					
surf	222(log)	Drift- Unconsolidated sand and gravel			
222	290	Shale& Siltstone- brn-gy-Grn, silty at top organic at base			
290	1230	Shale-Coldwater- Md-dk Brn-Blk,Silty, incr organic at base			
1230	1370	Sunbury Sh/Berea siltstone-Sh, Md Brn-Blk Silty,pyr. mixed w/siltstone, SSO-Lt md brn, Arg			
1370	15	Antrim-Dk Brn-Blk,Pyrand incr organic at base,SG incr toward base			
1554	1622	Traverse Fm- Limestone, Dk Brn-md Brn, Dns, Pyr, Dolomite, Md Gy-Gy, Dns			
1622	1744	Traverse Limestone-Md Brn-lt Brn Vfxln,Hd,			
1744	1978	Shale intbd w Dolomite and Lmst, Md Brn-Gy, Vfxln, Dns, Pos Dundee@1728'-Brn-Lt brn,Poor Samp,Pos Cvg			
1978	2200	Detroit River- Anhydrite and Dolomite/Limestone, Lt-Md Brn Dns,Vfxln in pt,NS			
2200	2416	Bass Island/Bois Blanc- Dolomite,Anhydrite & Limestone AA			
2416	2685	G-Unit-Dolomite-Arg,Hd grading to Anhydrite- Lt-md Gy Brn			
2685	2766	C Shale-Gy-rdBrn, W/Dolomite and Anhydrite,Lt gy-Brn-bf Poor Samp.l			
2766	2972	B Evap-Anhydrite Wh-Lt Gy W/Dolomite-Vfxln, Lt-md Gy, Intbd at base with Anhy. AA	If well was cored, attach core description		
2972	3160	Dolo &Limst-Wh-lt Gy,Dns,Anhydritic @3110-Wh, Dns	DRILL STEM TEST DATA		
3160	3386	Niagaran-Dolomite,AA,Md Gy, Vfxln Intbd W/Anhydrite AA,V porous 2880'-3300'			
3386	3884	Clinton/Cinn-Dolomite, Arg, hd, dk gy, grd to lt gy intbd w/Lmst,lt-md gy Dns			
3884	4212	Utica- Shale, Gy-Grn,Gummy-Hd			
4212	4526	Trenton-Dolo, Lt -Md Gy,Dns,W/ Lmst @ 4236'-4526' Lt-Md Gy Brn,Vfxln,			
4526	TD	Black River- Dolomite,Md Brn-GyBrn,SO&G@4590'			
	Under PN 60011				

4311

5102

discriptions of rock cuttings after  
drilling windc  
Dolomite- Lt Gy - Lt Brn, fxln,so &G,  
G cut & Flu ,Tr Frac,Partial loss of  
returns

LIST ATTACHMENTS

OFFICE OF GEOLOGICAL SURVEY USE ONLY

Reviewed by

Date of review



Directional Drilling Contractors, LLC.

Job Number: DR100134

Company: WEST BAY EXPLORATION

Lease/Well: WEST BAY/ BOYD 2-27 HD1

Location: NORVELL TWP., JACKSON CO.

Rig Name: MCCONNELL & SCULLY

RKB:

G.L. or M.S.L.:

State/Country: MICHIGAN / USA

Declination: 6.37 DEGREES WEST

Grid:

File name: C:\WINSERVE\PENDING\2010\BOYD227.SVY

Date/Time: 24-May-10 / 12:20

Curve Name: WEST BAY/BOYD 2-27 HD1 ( as drilled )

Directional Drilling Contractors  
SURVEY REPORT

WINSERVE SURVEY CALCULATIONS  
Minimum Curvature Method  
Vertical Section Plane 158.94  
Vertical Section Referenced to Wellhead  
Rectangular Coordinates Referenced to Wellhead

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	True Vertical Depth	N-S FT	E-W FT	Vertical Section FT	CLOSURE Distance FT	Direction Deg	Dogleg Severity Deg/100
KOP @ TIE @ 4315 MD									
4315.00	30	80.50	3953.37	-1149.29	825.53	1369.17	1415.05	144.31	.00
4346.00	5.20	164.10	3984.33	-1150.63	826.00	1370.59	1416.41	144.33	16.69
4379.00	11.30	164.50	4016.97	-1155.19	827.27	1375.30	1420.86	144.39	18.49
4409.00	18.00	173.60	4045.98	-1162.63	828.57	1382.72	1427.67	144.52	23.55
4440.00	25.90	180.70	4074.72	-1174.18	829.03	1393.66	1437.36	144.78	26.84
4472.00	34.30	181.70	4102.38	-1190.21	828.67	1408.49	1450.28	145.15	26.30
4503.00	40.00	181.70	4127.08	-1208.92	828.12	1425.75	1465.35	145.59	18.39
4535.00	45.80	181.70	4150.51	-1230.68	827.47	1445.83	1483.00	146.08	18.12
4567.00	51.30	181.40	4171.68	-1254.65	826.83	1467.96	1502.59	146.61	17.20
4598.00	57.90	180.70	4189.63	-1279.90	826.37	1491.36	1523.49	147.15	21.37
4630.00	64.60	181.00	4205.01	-1307.94	825.95	1517.37	1546.90	147.73	20.95
4662.00	72.30	183.10	4216.76	-1337.66	824.87	1544.72	1571.54	148.34	24.82
4693.00	79.20	184.90	4224.39	-1367.61	822.77	1571.92	1596.03	148.97	22.96
4722.00	83.30	184.50	4228.80	-1396.17	820.42	1597.73	1619.38	149.56	14.20
4754.00	86.60	184.50	4231.61	-1427.94	817.92	1626.48	1645.61	150.20	10.31
4786.00	89.10	183.40	4232.81	-1459.84	815.72	1655.46	1672.28	150.80	8.53
4817.00	89.90	182.40	4233.08	-1490.80	814.15	1683.78	1698.63	151.36	4.13
4848.00	89.60	180.70	4233.22	-1521.79	813.31	1712.40	1725.49	151.88	5.57
4880.00	90.20	180.00	4233.28	-1553.79	813.12	1742.19	1753.69	152.38	2.88
4911.00	92.70	180.70	4232.49	-1584.77	812.93	1771.04	1781.11	152.84	8.37
4943.00	92.80	180.00	4230.96	-1616.74	812.73	1800.80	1809.52	153.31	2.21

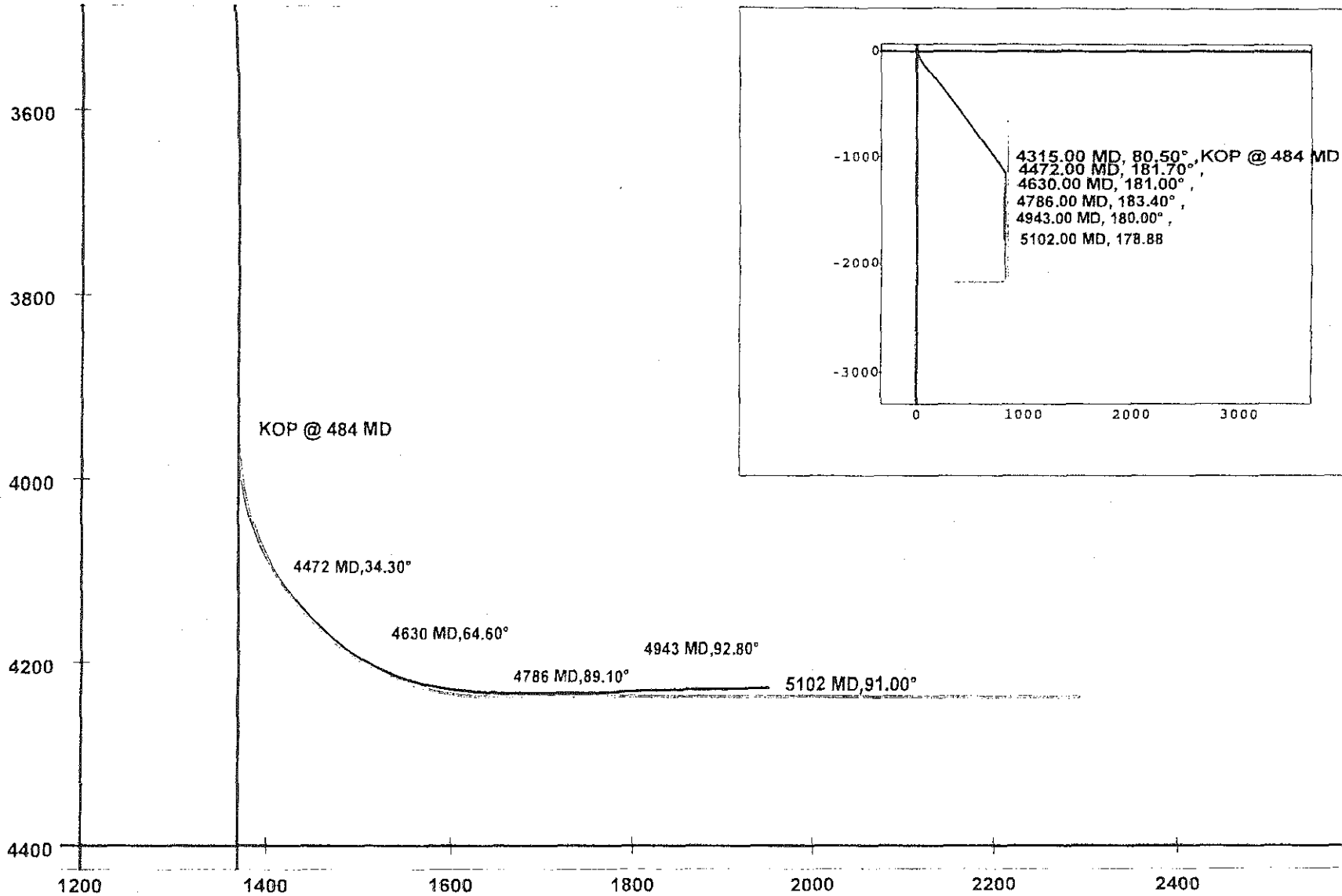
Measured Depth FT	Incl Angle Deg	Drift Direction Deg	True Vertical Depth	N-S FT	E-W FT	Vertical Section FT	CLOSURE		Dogleg Severity Deg/100
							Distance FT	Direction Deg	
4974.00	91.40	179.30	4229.82	-1647.71	812.92	1829.77	1837.34	153.74	5.05
5036.00	90.70	178.20	4228.68	-1709.69	814.28	1888.09	1893.69	154.53	2.10
5092.00	90.95	178.88	4227.87	-1765.66	815.70	1940.84	1944.98	155.20	1.29
<b>PROJECTED TD @ 5102 MD</b>									
5102.00	91.00	179.00	4227.70	-1775.66	815.89	1950.24	1954.13	155.32	1.29

Job Number: DR100134  
Company: WEST BAY EXPLORATION  
Lease/Well: WEST BAY/ BOYD 2-27 HD1  
Location: NORVELL TWP., JACKSON CO.  
Rig Name: MCCONNELL & SCULLY  
State/Country: MICHIGAN / USA

Declination: 6.37 DEGREES WEST  
File name: C:\WINSERVE\PENDING\20  
Date/Time: 24-May-10 / 12:17



Directional Drilling Contractors, LLC





## RECORD OF WELL COMPLETION

By authority of Part 615 or Part 625 of Act 451 PA 1994, as amended. Non-submission and/or falsification of this information may result in fines and/or imprisonment.

(Submit 3 copies within 60 days of well completion.)

Part 615 Oil/Gas Well  Part 625 Mineral Well

Permit number/deepening permit no. 60094	API number 21-075-60011
Type of well (after completion) oil	
Well name & number West Bay Boyd #2-27 HD 1	

Name and address of permittee West Bay Exploration 13685 S. West Bay Shore Drive Suite 200, Traverse City Mi. 49684					
Directionally drilled (check one) <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		Previous permit numbers		Total depth of well M.D. 5102' T.V.D. 4228'	
Surface location SW ¼ of SE ¼ of SW ¼ Section 22 T 4S R 2E			Subsurface location (if directionally drilled) NE ¼ of SE ¼ of NW ¼ Section 27 T 4S R 2E		
Township Napoleoni		County Jackson		Township Napoleon	
Footages: North/South 186' Ft. from South line and 1440' Ft. from West line of Sec.		Footages: North/South 1590' Ft. from North line and 2256' Ft. from West line of Sec.			
Part 615 - oil/gas wells			Part 625 - mineral wells		
Date well completed oil & Gas	Producing formation(s) Black River	Injection formation(s)	Date of first injection	Disposal formation(s)	Solution formation(s)

## COMPLETION INTERVALS(S)

Date	Number holes	Perforation or open hole interval	Open	
			Yes	No
5/25/10	open hole	4311-5102'	X	

## STIMULATION BY ACID OR FRACTURING

Date	Interval treated	Materials and amount used

## PRODUCTION TEST DATA

Oil Bbls/day	Gravity °API	Condensate Bbls/day	Gas MCF/day	Water Bbls/day	H <sub>2</sub> S Grains/100 ft <sup>3</sup>	B.H.P. and depth
200	43		98			

CERTIFICATION "I state that I am authorized by said owner. This report was prepared under my supervision and direction. The facts stated herein are true, accurate and complete to the best of my knowledge."

Name and title (print or type) Timothy L. Baker	Signature 	Date 05/30/10
--	---------------	------------------

Submit to: OFFICE OF GEOLOGICAL SURVEY  
MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY  
PO BOX 30256  
LANSING MI 48909-7756



12148 LADD

Geological Survey No.                     

# MICHIGAN DEPARTMENT OF PUBLIC HEALTH WATER WELL AND PUMP RECORD

W 7871  
PERMIT NUMBER

<b>1 LOCATION OF WELL</b>					
County <b>JACKSON</b>	Township Name <b>NORVELL</b>	Fraction <b>SE 1/4 NE 1/4 NE 1/4</b>	Section <b>27</b>	Town Number <b>4 S</b>	Range Number <b>2 E</b>

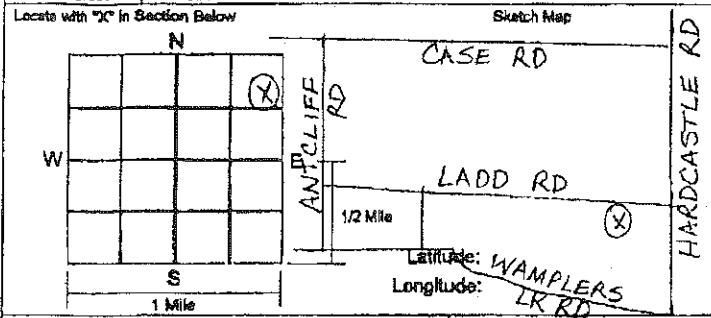
Distance and Direction From Road Intersection

**12148 LADD  
BROOKLYN MI 49230**

Street Address City Of Well location

**3 OWNER OF WELL: ROBERT A. BRISTLE**  
12148 LADD  
BROOKLYN MI 49230

Address Same as Well Location?



**4 WELL DEPTH: 188 ft.**      Date Completed: **8/6/99**      **NEW WELL**

**5 DRILLING METHOD: ROTARY**

**6 USE: DOMESTIC**

**7 CASING: PLASTIC**  
Diameter 5" to 173 ft. depth      Height: ABOVE Surface 1'  
Grouted Drill Hole Diameter 8" to 173 ft. depth      Weight SDR 21  
Drive Shoes?

2 FORMATION DESCRIPTION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
SAND	20	20
YELLOW CLAY	8	28
GRAY CLAY	24	52
GRAVEL	3	55
GRAY CLAY	112	167
SAND ROCK	21	188
PUMPING LEVEL		
EST WITH AIR		
100+ GPM		

**8 SCREEN:** Type: NONE      Diameter \* Nominal

**FITTINGS:**

**9 STATIC WATER LEVEL:** 52 ft. below land surface      Flow?

**10 PUMPING LEVEL:** below land surface  
52 ft. after 2 hrs. pumping at 12 G.P.M.

**11 WELL HEAD COMPLETION: PITLESS ADAPTOR**

**12 WELL GROUTED?**   
EZ SEAL From 0 to 173 ft.  
19 bags of cement.

**13 NEAREST SOURCE OF CONTAMINATION:**  
Type SEPTIC Distance 150 ft. Direction S  
Well disinfected upon completion?   
Old Well Plugged?

**14 PUMP:** Manufacturers name RED JACKET  
Model number 75CONSWI-126BC HP 3/4 VOLTS 230V  
Length of Drop Pipe 75 ft. capacity 12 G.P.M.  
Type SUBMERSIBLE  
**PRESSURE TANK:**  
Manufacturers Name AMTROL (OWNERS)  
Model Number WX 202 Capacity 6.2 Gallons

RECEIVED SEP 09 1999

RECEIVED  
MICH DEPT OF ENVTL & NATURAL QUALITY

OCT 08 1999

Drinking Water & Ground Water Protection  
Ground Water, Public Use Section  
WELL CONSTRUCTION UNIT

**CRIBLEY OFFICE NOTES**

WELLS AWC 6-1 1" PVC 75  
CDCW14574P18609

**15 REMARKS, ELEVATION, SOURCE OF DATA, ETC.**

NO LINER

**16 WATER WELL CONTRACTOR'S CERTIFICATION:**  
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

**17 RIG OPERATOR'S NAME**      **KEN PEARCE**

**Cribley Drilling Co., Inc.**      **81-0524**  
REGISTERED BUSINESS NAME      REGISTRATION NO.

D87d 2/89

Address: **6300 Dexter Chelsea Rd., Dexter, MI 48130**  
Signed: *Jack A. Clark*      Date: **8/17/99**  
AUTHORIZED REPRESENTATIVE

**IMPORTANT: File with deed.**

GEOLOGICAL SURVEY COPY

Authority: Act 368 PA 1878  
Completion: Required  
Penalty: Conviction of a violation of any provision is a misdemeanor

W 313-481-7901

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY  
DRINKING WATER & RADIOLOGICAL PROTECTION DIVISION

WATER WELL AND PUMP RECORD

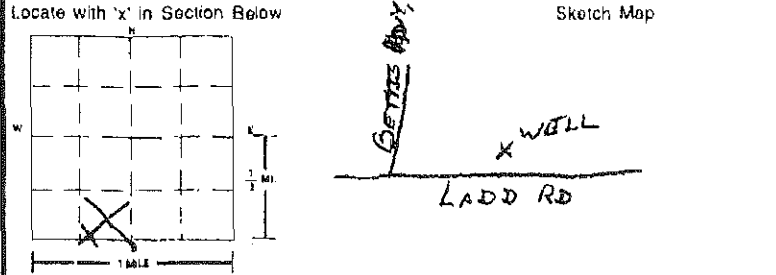
Completion is required under authority of Part 127 Act 368 PA 1978  
Failure to comply is a misdemeanor

TAX NO:

PERMIT NO: W-4119

1. LOCATION OF WELL  
County JACKSON Township Name NORVELL Fraction SW 1/4 SE 1/4 SW 1/4 Section No. 22 Town No. 415 Range No. 2E

Distance and Direction from Road Intersection  
1/4 MILE EAST OF BETTYS HWY,  
ON N. SIDE OF LADD RD.



3. OWNER OF WELL LARRY KLOPFER  
Address 12160 LADD RD.  
BROOKLYN, MI  
Address Same as Well Location  Yes  No

4. WELL DEPTH: 114 ft. Date Completed 5-20-98  
 New Well  
 Replacement Well

5.  Cable Tool  Rotary  Driven  Dug  
 Hollow Rod  Auger/Bored  Jetted

6. USE:  Household  Type I Public  Type III Public  
 Irrigation  Type IIa Public  Heat Pump  
 Test Well  Type IIb Public

7. CASING:  Steel  Threaded  Plastic  Welded  
 Other  
Height: Above/Below Surface: 1 ft

Diameter: 5 in. to 108 ft. depth  
BORE HOLE: Diameter: 8 in. to 114 ft. depth  
Weight: AVC lbs./ft.  
 Drive Shoe  
 Shalo Packer

8. SCREEN:  Not Installed  Gravel-Packed  
Type JONASON Diameter 4"  
Slot/Gauze 220 Length: 65  
Set Between 108 ft. and 114 ft.  
FITTINGS:  K-Packer  Bremer Check  
 Blank Above Screen 1 ft. Other THREAD ON

9. STATIC WATER LEVEL:  
30 ft. Below Land Surface  Flowing

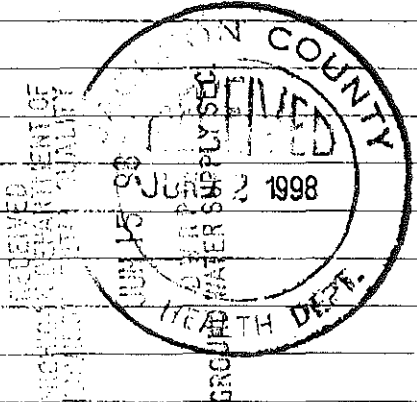
10. PUMPING LEVEL: Below Land Surface  
50 ft. After 2 hrs. Pumping at 12 G.P.M.  
 Plunger  Baller  Air  Test Pump

11. WELL HEAD COMPLETION:  
 Pitless Adapter  12" Above Grade  
 Basement Offset  Well House

12. WELL GROUTED?  No  Yes From 0 to 108 ft.  
 Neat Cement  Bentonite  Other  
No. of Bags 5 1/2 Additives BENTSEAL

13. NEAREST SOURCE OF POSSIBLE CONTAMINATION:  
Type SEPTIC Distance 50+ ft. Direction NORTH  
Type \_\_\_\_\_ Distance \_\_\_\_\_ ft. Direction \_\_\_\_\_

2. FORMATION DESCRIPTION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
<u>SAND</u>	<u>27</u>	<u>27</u>
<u>CLAY</u>	<u>64</u>	<u>91</u>
<u>GRAVEL + CLAY</u>	<u>12</u>	<u>103</u>
<u>SAND + GRAVEL</u>	<u>11</u>	<u>114</u>



15. ABANDONED WELL PLUGGED?  Yes  No  
Casing Diameter \_\_\_\_\_ in. Depth \_\_\_\_\_ ft.  
PLUGGING MATERIAL:  Neat Cement  Bentonite Slurry  
 Cement/Bentonite Slurry  Concrete Grout  Bentonite Chips  
No. of Bags \_\_\_\_\_ Casing Removed?  Yes  No

14. PUMP:  Not Installed  Pump Installation Only  
Manufacturer's Name MYERS  
Model Number JS12A HP 1/2 Volts 230  
Length of Drop Pipe 80 ft. Capacity 10 G.P.M.  
TYPE:  Submersible  Jet  Other  
PRESSURE TANK:  
Manufacturer's Name WEL-X-TROL  
Model Number WX-202 Capacity 20 Gallons

16. REMARKS: (Elevation, Source of Data, etc.)

17. DRILLING MACHINE OPERATOR:  
 Employee  Subcontractor  
Name CHARLES F. TORNOW

18. WATER WELL CONTRACTOR'S CERTIFICATION:  
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.  
GORDON & SONS INC. 2039  
REGISTERED BUSINESS NAME REGISTRATION NO.  
Address 3768 M-50 TIPTON, MI 49287  
Signed Philip R. Gode Date 5-20-98  
AUTHORIZED REPRESENTATIVE

<b>1 LOCATION OF WELL</b>			Fraction <u>SW 1/4 SW 1/4 SE 1/4</u> Section Number <u>22 21</u> Town Number <u>T4S</u> Range Number <u>R2E</u> E/W	
County <u>Jackson</u> Township Name <u>Norvell</u>			Distance And Direction From Road Intersection <u>1/2 mi E Bettis &amp; Ladd Roads</u> <u>12180 Ladd Rd</u>	
Street Address & City of Well Location Locate with "X" in Section Below			3 OWNER OF WELL: <u>Harry Haligus</u> Address <u>12180 Ladd Road</u> <u>Brooklyn, MI 49230</u> Address Same As Well Location? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Sketch Map: 			4 WELL DEPTH: (completed) <u>180</u> ft Date of Completion <u>11/30/83</u>	
			5 <input type="checkbox"/> Cable tool <input checked="" type="checkbox"/> Rotary <input type="checkbox"/> Driven <input type="checkbox"/> Dug <input type="checkbox"/> Hollow rod <input type="checkbox"/> Auger <input type="checkbox"/> Jetted <input type="checkbox"/>	
2 FORMATION DESCRIPTION			6 USE: <input checked="" type="checkbox"/> Domestic <input type="checkbox"/> Type I Public <input type="checkbox"/> Type III Public <input type="checkbox"/> Irrigation <input type="checkbox"/> Type IIa Public <input type="checkbox"/> Heat pump <input type="checkbox"/> Test Well <input type="checkbox"/> Type IIb Public <input type="checkbox"/>	
			7 CASING Diameter <input type="checkbox"/> Steel <input type="checkbox"/> Threaded <input checked="" type="checkbox"/> Plastic <input type="checkbox"/> Welded Height Above/SINK Surface <u>1</u> ft Weight <u>2</u> lbs/ft <u>5</u> in. to <u>156</u> ft depth Grouted Drift Hole Diameter <u>8</u> in. to <u>156</u> ft depth Drive Shoe <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
THICKNESS OF STRATUM   DEPTH TO BOTTOM OF STRATUM Sand and gravel   21   21 Sand, gravel and shale   89   110 Dirty shale, sand and gravel   24   134 Sand, gravel and shale   14   148 Sandstone   32   180			8 SCREEN: <input checked="" type="checkbox"/> Not installed Type _____ Diameter _____ Slot/Gauze _____ Length _____ Set between _____ ft and _____ ft FITTINGS <input type="checkbox"/> K-Packer <input type="checkbox"/> Lead Packer <input type="checkbox"/> Bremer Check <input type="checkbox"/> Blank above screen _____ ft. Other _____	
			9 STATIC WATER LEVEL: <u>43</u> ft. below land surface <input type="checkbox"/> Flow	
RECEIVED Mich. Dept. of Public Health JUN 7 1984 Bureau of Environmental and Occupational Health - G.W.C.			10 PUMPING LEVEL: below land surface <u>44</u> ft. after <u>1</u> hrs. pumping at <u>15</u> G.P.M. _____ ft. after _____ hrs. pumping at _____ G.P.M.	
			11 WELL HEAD COMPLETION <input type="checkbox"/> Pileless adapter <input checked="" type="checkbox"/> 12" above grade <input type="checkbox"/> Basement offset <input type="checkbox"/> Approved pit	
USE A 2ND SHEET IF NEEDED			12 WELL GROUTED? <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes From <u>1</u> to <u>156</u> ft. <input type="checkbox"/> Neat cement <input checked="" type="checkbox"/> Bentonite <input type="checkbox"/> Other _____ No. of bags of cement <u>1</u> Additives _____	
			13 Nearest source of possible contamination Type _____ Distance _____ ft. Direction _____ Well disinfected upon completion? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
16. Remarks, elevation, source of data, etc			14 PUMP: <input checked="" type="checkbox"/> Not installed <input type="checkbox"/> Pump installation Only Manufacturer's name _____ Model number _____ HP _____ Volts _____ Length of Drop Pipe _____ ft. capacity _____ G.P.M. TYPE <input type="checkbox"/> Submersible <input type="checkbox"/> Jet PRESSURE TANK: Manufacturer's name _____ Model number _____ Capacity _____ Gallons	
			16. WATER WELL CONTRACTOR'S CERTIFICATION: This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief. <u>Tox &amp; Boley Well Drilling, Inc.</u> <u>167 - 1517</u> REGISTERED BUSINESS NAME REGISTRATION NO. Address <u>6655 Brooklyn Rd., Jackson, MI 49201</u> Signed <u>Thomas L. Melville</u> Date <u>5/14/84</u> AUTHORIZED REPRESENTATIVE	

Probably  
12215 Ladd Rd



# Water Well And Pump Record

Completion is required under authority of Part 127 Act 368 PA 1978.

Failure to comply is a misdemeanor.



Import ID:

Tax No:		Permit No: 11701		County: Jackson		Township: Norvell		
Well ID: 38000006689				Town/Range:	Section:	Well Status:	WSSN:	Source ID/Well No:
				04S 02E		27		Active
Elevation:				Distance and Direction from Road Intersection:				
Latitude: 42.10084738				4 MILE E OF LADD RD & BETTIS RD				
Longitude: -84.18260323				Well Owner: NEIL WELCH				
Method of Collection: Interpolation-Map				Well Address:			Owner Address:	
				1215 LADD RD			305 CASS AVE JACKSON, MI 49203	

Drilling Method: Rotary	Pump Installed: Yes	Pump Installation Only: No
Well Depth: 196.00 ft.	Pump Installation Date:	HP: 0.50
Well Use: Household	Manufacturer: Aermotor	Pump Type: Submersible
Well Type: New	Model Number: A-12-50	Pump Capacity: 12 GPM
Date Completed: 8/1/2003	Drop Pipe Length: 65.00 ft.	Pump Voltage:
Casing Type: PVC plastic	Drop Pipe Diameter:	Drilling Record ID:
Casing Joint: Unknown	Draw Down Seal Used: No	
Casing Fitting: Shale packer/trap	Pressure Tank Installed: Yes	
Diameter: 5.00 in. to 168.00 ft. depth	Pressure Tank Type: Unknown	
	Manufacturer: Well-Mate	
Borehole: 8.00 in. to 168.00 ft. depth	Model Number: WM-6	Tank Capacity: 5.0 Gallons
4.75 in. to 196.00 ft. depth	Pressure Relief Valve Installed: No	

Static Water Level: 43.00 ft. Below Grade (Not Flowing)	Unrestricted Flow Rate:	Yield Test Method: Test pump	Formation Description		Thickness	Depth to Bottom
			Clay Sand Gravel	8.00	8.00	
Well Yield Test:	Pumping level 47.00 ft. after 1.00 hrs. at 20 GPM		Sand & Gravel W/Stones	4.00	12.00	
			Sand & Gravel	25.00	37.00	
Screen Installed: No	Intake: Bedrock Well		Clay	18.00	55.00	
			Clay Sand Gravel	31.00	86.00	
			Sand & Gravel Silty	19.00	105.00	
			Clay Sand Gravel	50.00	155.00	
			Sand & Gravel	7.00	162.00	
			Gray Sandstone	34.00	196.00	

Well Grouted: Yes	Grouting Method: Unknown	Geology Remarks:	
Grouting Material	Bags	Additives	Depth
Bentonite slurry	16.00	None	0.00 ft. to 168.00 ft.
Wellhead Completion: Pitless adapter			

Nearest Source of Possible Contamination:			Drilling Machine Operator Name: TBUKHOLDER/MSEXTON	
Type	Distance	Direction	Employment: Employee	
Septic tank	50 ft.	Southwest	Contractor Type: Water Well Drilling Contractor Reg No: 167	
			Business Name: FOX & BOLEY WELL DRILLING, INC	
			Business Address:	
<b>Water Well Contractor's Certification</b>				
This well was drilled under my supervision and this report is true to the best of my knowledge and belief.				
Signature of Registered Contractor				Date

General Remarks:  
Other Remarks:

**ATTENTION WELL OWNER: FILE WITH DEED**



# Water Well And Pump Record



Completion is required under authority of Part 127 Act 368 PA 1978.  
Failure to comply is a misdemeanor.

Import ID:

<b>Tax No:</b>	<b>Permit No:</b> 8613	<b>County:</b> Jackson	<b>Township:</b> Norvell
<b>Well ID:</b> 38000004062	<b>Town/Range:</b> 04S 02E	<b>Section:</b> 27	<b>Well Status:</b> Active
	<b>WSSN:</b>		
	<b>Source ID/Well No:</b>		
<b>Distance and Direction from Road Intersection:</b> 2/10 MI E. OF LADD RD. & BETTIS RD			
<b>Well Owner:</b> HOLLIS HAMM			
<b>Well Address:</b> 12161 LADD RD. BROOKLYN, MI 49230		<b>Owner Address:</b> 12161 LADD RD. BROOKLYN, MI 49230	
<b>Method of Collection:</b> Address Matching-House Number			

<b>Drilling Method:</b> Rotary	<b>Well Use:</b> Household	<b>Pump Installed:</b> Yes	<b>Pump Installation Only:</b> No
<b>Well Depth:</b> 212.00 ft.	<b>Date Completed:</b> 7/7/2000	<b>Pump Installation Date:</b>	<b>HP:</b> 1.00
<b>Well Type:</b> New	<b>Height:</b>	<b>Manufacturer:</b> Aermotor	<b>Pump Type:</b> Submersible
<b>Casing Type:</b> PVC plastic		<b>Model Number:</b> A+20-100	<b>Pump Capacity:</b> 20 GPM
<b>Casing Joint:</b> Other		<b>Drop Pipe Length:</b> 65.00 ft.	<b>Pump Voltage:</b>
<b>Casing Fitting:</b> Drive shoe		<b>Drop Pipe Diameter:</b>	<b>Drilling Record ID:</b>
<b>Diameter:</b> 5.00 in. to 176.00 ft. depth		<b>Draw Down Seal Used:</b> No	
<b>Borehole:</b> 8.00 in. to 176.00 ft. depth		<b>Pressure Tank Installed:</b> Yes	
		<b>Pressure Tank Type:</b> Unknown	
		<b>Manufacturer:</b> Well-Mate	
		<b>Model Number:</b> WM-14WB	<b>Tank Capacity:</b> 14.0 Gallons
		<b>Pressure Relief Valve Installed:</b> No	

<b>Static Water Level:</b> 45.00 ft. Below Grade (Not Flowing) <b>Unrestricted Flow Rate:</b> <b>Well Yield Test:</b> Pumping level 46.00 ft. after 1.00 hrs. at 20 GPM	<b>Yield Test Method:</b> Test pump	<b>Formation Description</b>	<b>Thickness</b>	<b>Depth to Bottom</b>
		Sand & Gravel	2.00	2.00
		Clay	7.00	9.00
		Sand & Gravel	6.00	15.00
		Clay	4.00	19.00
		Clay Sand Gravel	65.00	84.00
		Sand & Gravel	11.00	95.00
		Sand & Gravel	13.00	108.00
		Clay Sand Gravel	22.00	130.00
		Gray Sandstone	2.00	132.00
		Clay Sand Gravel	20.00	152.00
		Sand Gravel Clay	8.00	160.00
		Sand & Gravel	11.00	171.00
		Gray Sandstone	27.00	198.00

<b>Screen Installed:</b> No	<b>Intake:</b> Bedrock Well	(Continued On Page 2)	
<b>Well Grouted:</b> Yes	<b>Grouting Method:</b> Unknown	<b>Geology Remarks:</b>	
<b>Grouting Material:</b> Bentonite slurry	<b>Bags:</b> 18.00	<b>Additives:</b> Other	<b>Depth:</b> 0.00 ft. to 175.00 ft.

<b>Wellhead Completion:</b> Pilless adapter
---

<b>Nearest Source of Possible Contamination:</b>	<b>Drilling Machine Operator Name:</b> TBURKHOLDER/HHARRIS
<b>Type:</b> None	<b>Employment:</b> Employee
<b>Distance:</b>	
<b>Direction:</b>	
(Continued on page 2)	

**General Remarks:**

**Other Remarks:** Casing Joint: GLUED, Grouting Additive 1-QUICK-GROUT/BENSEAL



MAR 30 1973

**WATER WELL RECORD**  
ACT 294 PA 1965

MICHIGAN DEPARTMENT  
OF  
PUBLIC HEALTH

<b>1 LOCATION OF WELL</b>									
County <b>Jackson</b>	Township Name <b>Norvell</b>	Fraction <b>SW<sup>1</sup>/<sub>4</sub> SW<sup>1</sup>/<sub>4</sub> SW<sup>1</sup>/<sub>4</sub></b>	Section Number <b>22</b>	Town Number <b>T45 N/S.</b>	Range Number <b>R2E E/W.</b>				
Distance And Direction from Road Intersections <b>NE corner Bettis &amp; Ladd Roads</b>						<b>3 OWNER OF WELL:</b> Joseph Natter Address <b>1005 Lakeview Brooklyn, Michigan 49230</b>			
Street address & City of Well Location <b>Ladd Road</b>									
Locate with "X" in section below		Sketch Map:				<b>4 WELL DEPTH:</b> (completed) Date of Completion <b>180</b> ft. <b>2/7/73</b>			
						<b>5</b> <input checked="" type="checkbox"/> Cable tool <input type="checkbox"/> Rotary <input type="checkbox"/> Driven <input type="checkbox"/> Dug <input type="checkbox"/> Hollow rod <input type="checkbox"/> Jetted <input type="checkbox"/> Bored <input type="checkbox"/> _____			
						<b>6 USE:</b> <input checked="" type="checkbox"/> Domestic <input type="checkbox"/> Public Supply <input type="checkbox"/> Industry <input type="checkbox"/> Irrigation <input type="checkbox"/> Air Conditioning <input type="checkbox"/> Commercial <input type="checkbox"/> Test Well			
				<b>7 CASING:</b> Threaded <input type="checkbox"/> Welded <input checked="" type="checkbox"/>		Height: Above/Surface <b>1</b> ft. Weight <b>11</b> lbs./ft. Drive Shoe? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>			

2 FORMATION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
Sand	15	15
Shale and gravel	110	125
Shale	8	137
Gravel	8	145
Shale	10	155
Gravel	6	161
Shale	4	165
Sandstone	15	180

<b>8 SCREEN:</b> Type: <u>none</u> Dia.: _____ Slot/Gauze _____ Length _____ Set between _____ ft. and _____ ft. Fittings: _____	
<b>9 STATIC WATER LEVEL</b> <u>45</u> ft. below land surface	
<b>10 PUMPING LEVEL</b> below land surface <u>50</u> ft. after <u>2</u> hrs. pumping <u>20</u> g.p.m. _____ ft. after _____ hrs. pumping _____ g.p.m.	
<b>11 WATER QUALITY</b> in Parts Per Million: Iron (Fe) _____ Chlorides (Cl) _____ Hardness _____ Other _____	
<b>12 WELL HEAD COMPLETION:</b> <input type="checkbox"/> In Approved Pit <input checked="" type="checkbox"/> Pitless Adaptor <input type="checkbox"/> 12" Above Grade	
<b>13 Well Grouted?</b> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Neat Cement <input type="checkbox"/> Bentonite <input type="checkbox"/> _____ Depth: From _____ ft. to _____ ft.	
<b>14 Nearest Source</b> of possible contamination <u>none</u> feet _____ Direction _____ Type _____ Well disinfected upon completion <input type="checkbox"/> Yes <input type="checkbox"/> No	
<b>15 PUMP:</b> <input checked="" type="checkbox"/> Not installed <b>as yet</b> Manufacturer's Name _____ Model Number _____ HP _____ Volts _____ Length of Drop Pipe _____ ft. capacity _____ G.P.M. Type: <input type="checkbox"/> Submersible <input type="checkbox"/> Jet <input type="checkbox"/> Reciprocating	

16 Remarks, elevation, source of data, etc.

ADDED INFO. BY DRILLER, ITEM NO. \_\_\_\_\_

CORRECTED BY \_\_\_\_\_

ADDITION \_\_\_\_\_

17 WATER WELL CONTRACTOR'S CERTIFICATION:  
 This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

**For Brothers Drillers, Inc. 167**  
REGISTERED BUSINESS NAME REGISTRATOR NO.

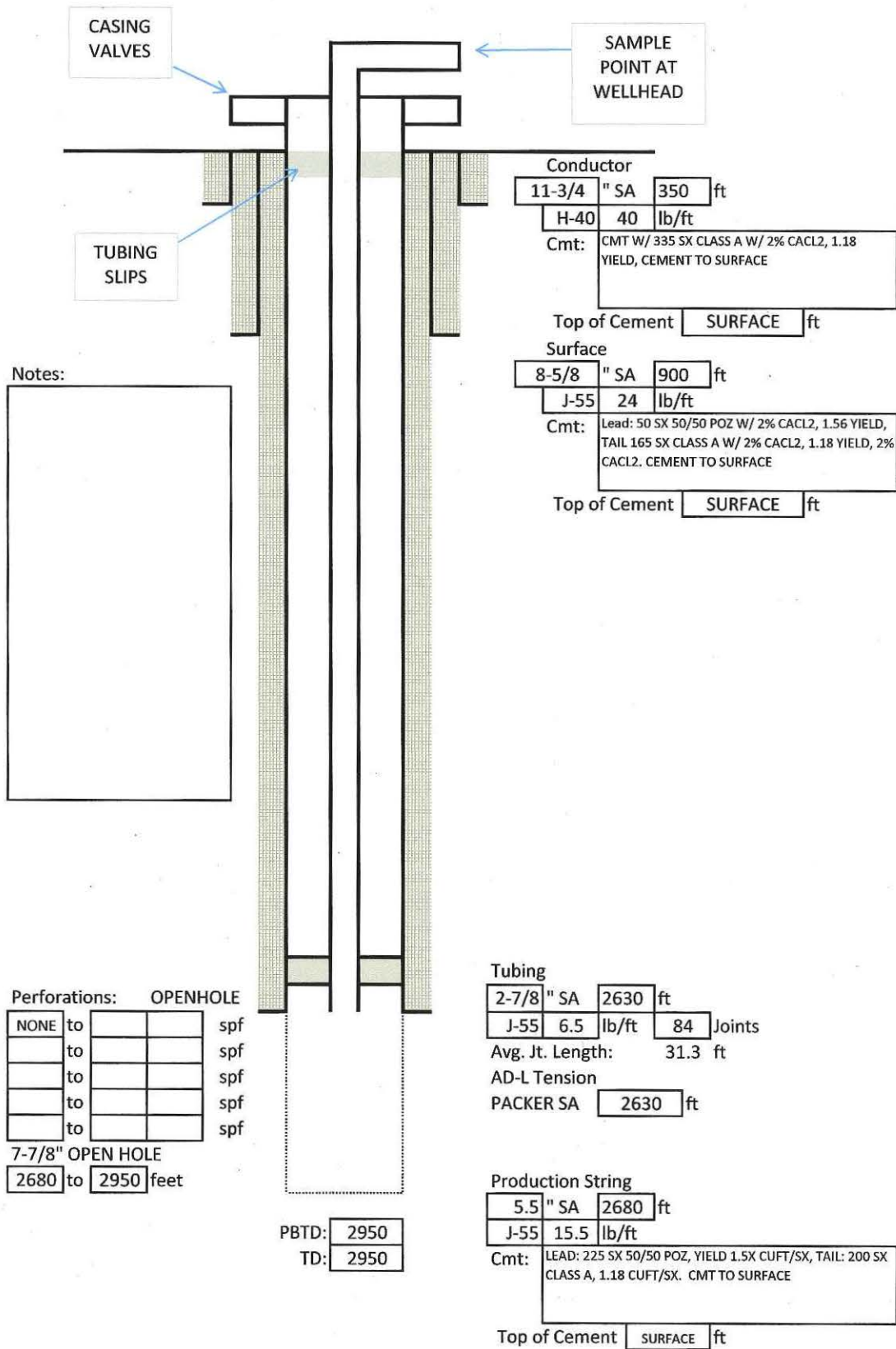
Address **6655 Brooklyn Road, Jackson, Michigan 49201**

Signed *Sherrill Taylor* Date **2/20/73**  
AUTHORIZED REPRESENTATIVE

**Attachment  
"M"**

### Wellbore Sketch

Well: WEST BAY 22 SWD KB: TBD Permit#: TBD  
 Operator: West Bay Exploration Company GL: TBD  
 Surf. Loc.: NW /Q NE /Q SW /Q Sec. 22 T 4S R 2E



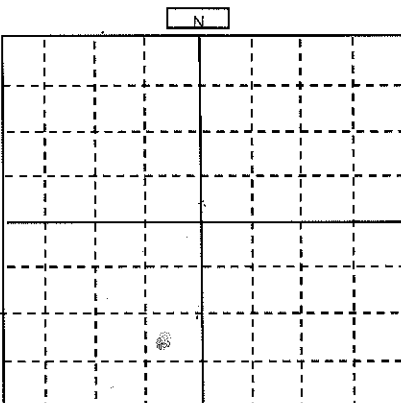


**Attachment  
"Q"**

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
WASHINGTON, D.C. 20460

**PLUGGING AND ABANDONMENT PLAN**

<b>Name and Address of Facility</b> West Bay 22 SWD	<b>Name and Address of Owner/Operator</b> West Bay Exploration Company 13685 West Bay Shore Drive Suite 200 Traverse City, MI 49684
--	--

Locate Well and Outline Unit on Section Plat - 640 Acres  	State <b>Michigan</b>	County <b>Jackson</b>	Permit Number
Surface Location Description <b>SW 1/4 of NE 1/4 of SE 1/4 of SW 1/4 of Section 22 Township 4S Range 2E</b>			
Locate well in two directions from nearest lines of quarter section and drilling unit Surface Location _____ 665 ft. From (N/S) _____ S _____ Line of Quarter Section And _____ 1407 ft. From (E/W) _____ W _____ Line of Quarter Section			
<b>TYPE OF AUTHORIZATION</b> <input checked="" type="checkbox"/> Individual Permit <input type="checkbox"/> Area Permit <input type="checkbox"/> Rule  Number of Wells _____ 1  Lease Name _____ <b>WEST BAY</b>		<b>WELL ACTIVITY</b> <input type="checkbox"/> Class I <input type="checkbox"/> Hazardous <input type="checkbox"/> Nonhazardous <input checked="" type="checkbox"/> Class II <input checked="" type="checkbox"/> Brine Disposal <input type="checkbox"/> Enhanced Recovery <input type="checkbox"/> Hydrocarbon Storage <input type="checkbox"/> Class III  Well Number <b>22 SWD</b>	

CASING AND TUBING RECORD AFTER PLUGGING					METHOD OF EMPLACEMENT OF CEMENT PLUGS			
SIZE	WT (LB/FT)	TO BE PUT IN WELL (FT)	TO BE LEFT IN WELL (FT)	HOLE SIZE				
11-3/4	42	350	350	14-3/4	<input checked="" type="checkbox"/> Balance Method <input type="checkbox"/> Dump Bailer Method <input type="checkbox"/> Two Plug Method <input checked="" type="checkbox"/> Other			
8-5/8	24	900	900	10-3/4				
5-1/2	15.5	2,680	2,680	7-7/8				

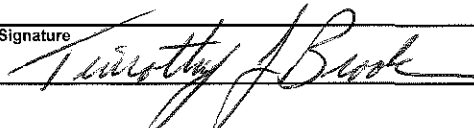
CEMENT TO PLUG AND ABANDON DATA:							
	Plug #1	Plug #2	Plug #3	Plug #4	Plug #5	Plug #6	Plug #7
Size of Hole or Pipe in Which Plug Will Be Placed (inches)	7/78	5	5	5			
Depth to Bottom of Tubing or Drill Pipe (ft)	2,630	2,630	1,000	350			
Sacks of Cement To Be Used (each plug)	83	25	25	40			
Slurry Volume To Be Pumped (cu. Ft.)	98	27	27	47			
Calculated Top of Plug (ft.)	2,630	2430	800	0			
Measured Top of Plug (if tagged, ft.)	2,630	2430	800	0			
Slurry Weight (Lb./Gal.)	15.6	15.6	15.6	15.6			
Type of Cement or Other Material (Class III)	CLASS A	CLASS A	CLASS A	CLASS A			

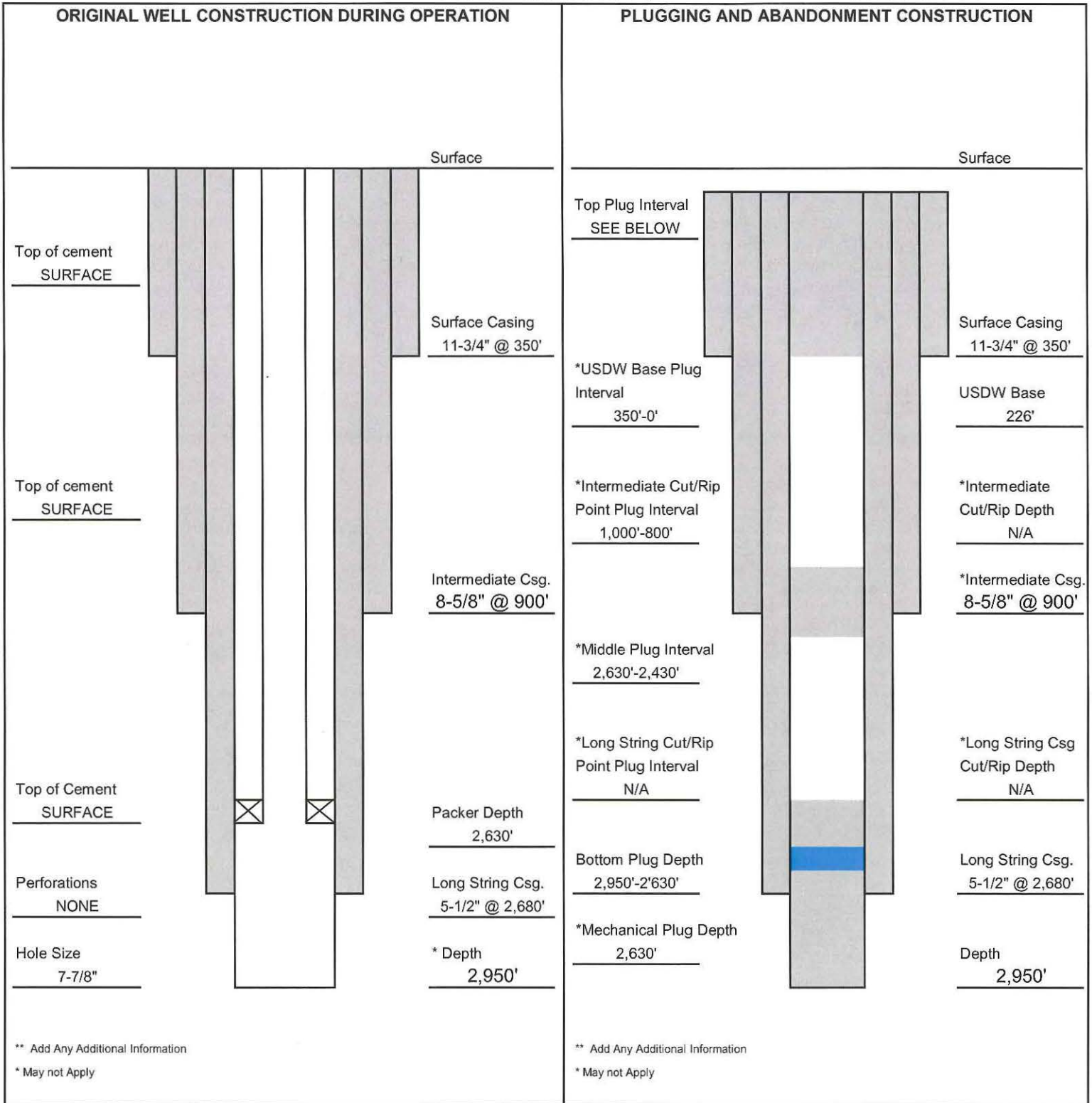
LIST ALL OPEN HOLE AND/OR PERFORATED INTERVALS AND INTERVALS WHERE CASING WILL BE VARIED (if any)			
From	To	From	To
2,950'	2,680'		
			OPEN HOLE

Estimated Cost to Plug Wells			
RIG	4815	MISC COSTS	2700
CEMENT	6970	CONTING	1055
RETAINER	3000	TOTAL	21300
SITE COST	3000	SEE ATTACHED WORKSHEET	

**CERTIFICATION**

I certify under the penalty of law that I have 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) <b>TIMOTHY J BROCK, AGENT</b>	Signature 	Date Signed <b>1/24/2011</b>
---	---	---------------------------------



**LIST OF ALL OPEN AND/OR PERFORATED INTERVALS AND INTERVALS WHERE CASING WILL BE VARIED**

Specify Open Hole/ Perforations/ Varied Casing	From	To	Formation Name
OPEN HOLE	2,680	2,950	NIAGARAN

**COST ESTIMATE FOR PLUGGING AND ABANDONMENT**

Permittee:	West Bay Exploration Company
Well Name:	West Bay 22 SWD
EPA Permit Number:	Proposed Well
Party Providing Cost Estimate:	Brock Engineering, LLC
Total Cost Estimate:	\$21,300
Date of Cost Estimate:	1/24/2011

**Plug Locations Required for Proper P&A:**

Plug Identifier*	Plug Top	Plug Bottom	Zone Being Protected (such as USDW, gas, rip point etc.)
Examples: 7" casing shoe 2700'-2600', surface, perforations 2100'-1900			
BELOW RETAINER	2630	2950	INJECTION ZONE
ABOVE RETAINER	2430	2630	BASE OF LONG STRING
ACROSS BASE OF 8-5/8	800	1000	BASE OF INTERMEDIATE CASING
BASE OF USDW TO SURFACE	0	350	BASE OF USDW

Have any intervals/sections of the wellbore been plugged previously? If so, give the location of the plugs, the circumstances that required the plug and how the plug was set.

NO

**Plugging and Abandonment Normal Costs**

**1. Rig Costs**

Travel	1	miles @	175	per mile =	\$175
Labor (Super & Crew)		hrs @		per hour =	
Equipment Costs (Rig cost, drilling package, etc.)	20	hrs @	232	per hour =	\$4,640
Miscellaneous Site Costs (Tubing work string rental, water storage, flow tanks, mud pit, etc.)		hrs @		per hour =	
Well Head Cutting				=	
Cement Tagging		feet @		per foot =	
Pulling Casing/Tubing		hrs @		per hour =	

**2. Cement Costs**

Pump Truck & Operator (Including Set Up)	8	hrs @	340	per hour =	\$2,720
Tank Truck & Operator	8	hrs @	90	per hour =	\$720
Type Cement CLASS A	175	sacks @	10	per sack =	\$1,750
Type Cement		sacks @		per sack =	
Type Cement		sacks @		per sack =	
Cement Retainer(s)	1	retainer(s) @	3000	each =	\$3,000
List Retainers					
Cement Additives (high temperature/pressure)				=	
Balance Plug inc. fluids and testing		plugs @		per plug =	
List Plugs:	MILEAGE AND TRANSPORTATION NOPLACE ELSE TO PUT ON THIS FORM				
Surface Plug inc. fluids and testing				=	\$1,780

3. Wireline Service

Transportation		hrs @		per hour =	
Labor		hrs @		per hour =	
Service Charges				=	
Perf/Squeeze		shots @		per shot =	
Cut/pull Casing		rips @		per rip =	
Cement Retainer(s)		retainer(s) @		each =	
List Retainers					
TOC Log				=	
Depth charge for gage rings, junk basket		feet @		per foot =	
Specialized tools for fluid sampling				=	

4. Site Preparations & Costs

General Site Engineering & Plan Development				=	
Owner/Operator Site Supervisor				=	\$1,700
Backhoe & Operator	4	hrs @	80	per hour =	\$320
Dozer & Operator	3	hrs @	80	per hour =	\$240
Road Construction and Improvement Costs				=	
Pit Liner				=	\$500

5. Transportation & Miscellaneous

Special Land Use Costs (Zoning & Permits)				=	
Winch truck w/driver (wages & mileage)	4	hrs @	100	per hour =	\$400
Water truck w/ driver (wages & mileage)		hrs @		per hour =	
Vacuum Truck w/ driver (wages & mileage)		hrs @		per hour =	
2 axle rig-up truck driver & crew wages & mileage)		hrs @		per hour =	
1 axle truck w/ driver (wages & mileage)		hrs @		per hour =	
Hot oiler (equip, labor & mileage)		hrs @		per hour =	
Welder (equip, labor & mileage)	4	hrs @	75	per hour =	\$300
Packer Fluid per specs		bbl @		per bbl =	
Hydraulic Jacks		hrs @		per hour =	
Bridge Plug				=	
Waste Disposal Costs				=	\$2,000
Tool Rental (Describe; examples: Casing Ripper, Collar Buster, etc.)				=	
Tool 1				=	
Tool 2				=	
Tool 3				=	

6. Remediation Costs (mostly applicable to shallow wells)

Sample Analysis (fluid or soil)		=	
Soil Removal		=	
Site Assessment Study Costs		=	
System Removal Costs		=	
Disposal System Modification Costs		=	
Installation of Monitoring Well Costs		=	
# Wells:			
Type:			
Depth:			
Construction:			

SUBTOTAL:		=	\$20,245
Contingency:	5.0 %	=	\$1,012
INITIAL TOTAL		=	\$21,257
Inflation factor		=	1.00
TOTAL AMOUNT, Rounded to \$100		=	\$21,300

**Attachment  
"R"**



Copy - orig. M. 9/17/05

**BOND FOR CONFORMANCE**

OIL AND GAS OPERATIONS BOND	
Bond number <u>08784181</u>	
<input type="checkbox"/> Single	<input checked="" type="checkbox"/> Blanket
\$ _____	\$ <u>250,000</u>
Well name and number _____	
Attach initial well list	

By authority of Part 615, Supervisor of Wells, Act 451 PA 1994, as amended. Non-submission and/or falsification of this information may result in fines and/or imprisonment.

West Bay Exploration Company, 13685 South West Bay Shore, Suite #200, Traverse City, MI 49684

(name and address of Principal)

\_\_\_\_\_ in the State of Michigan \_\_\_\_\_ as Principal and

Fidelity and Deposit Company of Maryland, PO Box 1227, Baltimore, Maryland 21203

(name and address of Surety)

a corporation organized and existing under the laws of the State of Maryland and duly authorized to transact business in the State of Michigan, as Surety, are held and firmly bound unto the State of Michigan in the penal sum of

Two Hundred Fifty Thousand & No/100 Dollars (\$250,000.00)----- Dollars.

The Principal named is about to commence and prosecute to final completion well(s) and operations authorized by permits issued or to be issued under Part 615, Act 451 PA 1994, as amended.

"Final completion" means the time when locating, drilling, deepening, converting, operating, producing, reworking, plugging, and proper site restoration have been performed on a well in a manner approved by the supervisor, including the filing of the mandatory records, and when the conformance bond has been released.

When the Principal complies with the provisions of the applicable provisions of Part 615, Act 451 PA 1994, as amended, in the final completion of the well(s), the Surety's obligations can be terminated otherwise this obligation remains in full force and effect. The Surety's liability herein is co-extensive with that of the Principal and the State of Michigan has the same remedies against the Surety as against the Principal.

This bond is executed and accepted subject to the following condition: The liability of this bond is set forth in R 324.211, R 324.213, R 324.214, and R 324.215 of the rules promulgated under section 61506 of Part 615, Supervisor of Wells, Act 451 PA 1994, as amended. (See reverse side of bond)

The Surety, by execution of the bond, accepts the liability covered by prior bond(s) Replaces Continental Casualty Bond #265000022

(number(s) and company)

and gives notice to the Supervisor of Wells of the need for terminating the prior bond(s) as listed herein with such termination to be effective as of the time that this bond becomes effective.

Signed, sealed and dated the 16th day of September, 2005

West Bay Exploration Company  
(Principal)

Fidelity and Deposit Company of Maryland  
(Surety)

By [Signature]  
(Signature)

By [Signature]  
(Signature)

**Gary L. Gottschalk, Vice-President**

**Brigitte Burgess  
Attorney-In-Fact**

(Name and title)

(Name and title)

When the Principal or Surety executes this bond by an agent, power of attorney or other evidence of authority must accompany the bond.

DEQ USE ONLY

Permit number		Issue date
Type of well	Current true vertical depth	Purpose of bond

MAIL TO:  
OFFICE OF GEOLOGICAL SURVEY  
MICHIGAN DEPT OF ENVIRONMENTAL QUALITY  
PO BOX 30256  
LANSING, MI 48909-7756

Excerpts from General Rules governing oil and gas operations (effective 9/20/96)

**R 324.211 Liability on conformance bond.**

*Rule 211.*

(1) The liability on the conformance bond is conditioned upon compliance with the act, these rules, permit conditions, instructions, or orders of the supervisor. Subject to the provisions in R 324.213, liability shall cover all operations of the permittee as follows:

- (a) Through transfer of the permit for the subject well pursuant to R 324.206(6).
- (b) Through final completion approved by the supervisor of the subject well.
- (c) Otherwise as approved by the supervisor.

(2) The supervisor shall look to the conformance bond for immediate compliance with, and fulfillment of, the full conditions of the act, these rules, permit conditions, instructions, or orders of the supervisor. All expenses incurred by the supervisor in achievement of compliance with, and fulfillment of, all conditions of the act, these rules, permit conditions, instructions, or orders of the supervisor shall be paid by the permittee or the surety or from cash or securities on deposit. The claim shall be paid within 30 days of notification to the permittee or surety that expenses have been incurred by the supervisor. If the claim is not paid within 30 days, the supervisor, acting for and on behalf of the state, may bring suit for the payment of the claim.

**R 324.212 Conformance bond amounts.**

*Rule 212.*

A person who drills or operates a well shall file a conformance bond with the supervisor for the following amounts, as applicable:

(a) Single well conformance bonds shall be filed in the following amounts, as applicable:

- (i) \$10,000.00 for wells up to and including 2,000 feet deep; true vertical depth.
- (ii) \$20,000.00 for wells deeper than 2,000 feet, but not deeper than 4,000 feet, true vertical depth.
- (iii) \$25,000.00 for wells deeper than 4,000 feet, but not deeper than 7,500 feet, true vertical depth.
- (iv) \$30,000.00 for wells deeper than 7,500 feet, true vertical depth.

(b) A person may file single well conformance bonds in an amount equal to 1/2 of the amount specified in subdivision (a) of this rule for wells where well completion operations have not commenced. A person may not file single well conformance bonds under this subdivision for more than 5 wells. A person shall file single well conformance bonds in the full amount specified in subdivision (a) of this rule or file a blanket conformance bond as specified in subdivision (c) of this rule or submit a statement of financial responsibility pursuant to R 324.210 before the commencement of well completion operations on any well.

(c) Blanket conformance bonds may be filed as an alternative to single well conformance bonds. If a blanket conformance bond is utilized, then the permittee shall provide the supervisor with a list of wells covered by the blanket conformance bond. A maximum of 100 wells may be covered by a blanket conformance bond. If the permittee has more than 100 wells in a category, then the additional wells may be covered by single well conformance bonds or additional blanket conformance bonds. Blanket conformance bonds shall be filed in the following amounts, as applicable:

- (i) \$100,000.00 for wells up to and including 2,000 feet deep, true vertical depth.
- (ii) \$200,000.00 for wells deeper than 2,000 feet, but not deeper than 4,000 feet, true vertical depth.
- (iii) \$250,000.00 for wells deeper than 4,000 feet, true vertical depth.

(d) A person shall not be required to file a blanket conformance bond or bonds in an aggregate amount of more than \$250,000.00. When the aggregate amount of the conformance bonds is \$250,000.00, the permittee may file 1 blanket conformance bond of \$250,000.00 to cover all of his or her wells.

**R 324.213 Cancellation of conformance bonds issued by a surety.**

*Rule 213.*

(1) A surety company may cancel a conformance bond acquired pursuant to these rules upon 90 days' notice to the supervisor of the effective date of cancellation. However, the surety company shall retain liability for all violations of the act, these rules, permit conditions, instructions, or orders of the supervisor that occurred during the time the conformance bond was in effect.

(2) Forty days before the effective date of cancellation, as provided in subrule (1) of this rule, a permittee shall secure a conformance bond from another surety company authorized to do business in the state of Michigan, deposit cash or other securities, or bring the well to final completion. Failure to comply with this subrule shall be cause for the immediate suspension of any or all components of the operations on the well.

(3) A surety company shall remain liable until the violations have been corrected and the corrections are accepted by the supervisor for all violations of the act, these rules, permit conditions, instructions, or orders of the supervisor that occurred at the well during the time the conformance bond was in effect before the effective date of cancellation.

**R 324.214 Limitation of additional liability of blanket conformance bonds.**

*Rule 214.*

A surety company may refuse to accept liability for additional wells under a blanket conformance bond by giving 10 days' notice by registered mail to the supervisor. Subject to the provisions of R 324.213, the blanket conformance bond shall continue in full force and effect as to all other wells covered by the blanket conformance bond for which permits were granted or transferred to the permittee before the effective date of the notice.

**R 324.215 Release of conformance bonds; release of well from blanket conformance bond.**

*Rule 215.*

(1) A conformance bond shall be released or a well shall be released from a blanket conformance bond, subject to the provisions of R 324.213, by the supervisor or authorized representative of the supervisor if a permittee disposes of the well and the permit for the well has been transferred to a new person pursuant to R 324.206(6) or if the well has been plugged and proper site restoration has been performed pursuant to R 324.1003, including the filing of the mandatory records.

(2) The release of the conformance bond or the release of a well from a blanket conformance bond does not release a permittee from liability for any violations of the act, these rules, permit conditions, instructions, or orders of the supervisor which occurred during the time the conformance bond was in effect and which have not been corrected and accepted by the supervisor.

(3) A conformance bond filed to comply with a permit that has become terminated shall be released if there is final completion.



**Power of Attorney  
FIDELITY AND DEPOSIT COMPANY OF MARYLAND  
COLONIAL AMERICAN CASUALTY AND SURETY COMPANY**

KNOW ALL MEN BY THESE PRESENTS: That the FIDELITY AND DEPOSIT COMPANY OF MARYLAND, and the COLONIAL AMERICAN CASUALTY AND SURETY COMPANY, corporations of the State of Maryland, by THEODORE G. MARTINEZ, Vice President, and ERIC D. BARNES, Assistant Secretary, in pursuance of authority granted by Article VI, Section 2, of the By-Laws of said Companies, which are set forth on the reverse side hereof and are hereby certified to be in full force and effect on the date hereof, does hereby nominate, constitute and appoint Diane KERN, Janet L. JENKINS, Stuart F. DESELMS, William A. GRANT, Jeffrey W. HOLMES, Brigitte BURGESS and Michelle RICHIE, all of Tulsa, Oklahoma, EACH its true and lawful agent and Attorney-in-Fact, to make, execute, seal and deliver, for, and on its behalf as surety, and as its act and deed, any and all bonds and undertakings, and the execution of such bonds or undertakings in pursuance of these presents, shall be as binding upon said Companies, as fully and amply, to all intents and purposes, as if they had been duly executed and acknowledged by the regularly elected officers of the Company at its office in Baltimore, Md., in their own proper persons. This power of attorney revokes that issued on behalf of Diane KERN, Carol OSBORNE, Janet L. JENKINS, Stuart F. DESELMS, William A. GRANT, Jeffrey W. HOLMES, Brigitte BURGESS, Colleen THAYER, Christy THOMPSON, dated May 30, 2003.

The said Assistant Secretary does hereby certify that the extract set forth on the reverse side hereof is a true copy of Article VI, Section 2, of the By-Laws of said Companies, and is now in force.

IN WITNESS WHEREOF, the said Vice-President and Assistant Secretary have hereunto subscribed their names and affixed the Corporate Seals of the said FIDELITY AND DEPOSIT COMPANY OF MARYLAND, and the COLONIAL AMERICAN CASUALTY AND SURETY COMPANY, this 11th day of January, A.D. 2005.

ATTEST:

**FIDELITY AND DEPOSIT COMPANY OF MARYLAND  
COLONIAL AMERICAN CASUALTY AND SURETY COMPANY**



*Eric D. Barnes*

Eric D. Barnes Assistant Secretary

*Theodore G. Martinez*

By:

Theodore G. Martinez

State of Maryland }  
City of Baltimore } ss:

On this 11th day of January, A.D. 2005, before the subscriber, a Notary Public of the State of Maryland, duly commissioned and qualified, came THEODORE G. MARTINEZ, Vice President, and ERIC D. BARNES, Assistant Secretary of the FIDELITY AND DEPOSIT COMPANY OF MARYLAND, and the COLONIAL AMERICAN CASUALTY AND SURETY COMPANY, to me personally known to be the individuals and officers described in and who executed the preceding instrument, and they each acknowledged the execution of the same, and being by me duly sworn, severally and each for himself depose and saith, that they are the said officers of the Companies aforesaid, and that the seals affixed to the preceding instrument is the Corporate Seals of said Companies, and that the said Corporate Seals and their signatures as such officers were duly affixed and subscribed to the said instrument by the authority and direction of the said Corporations.

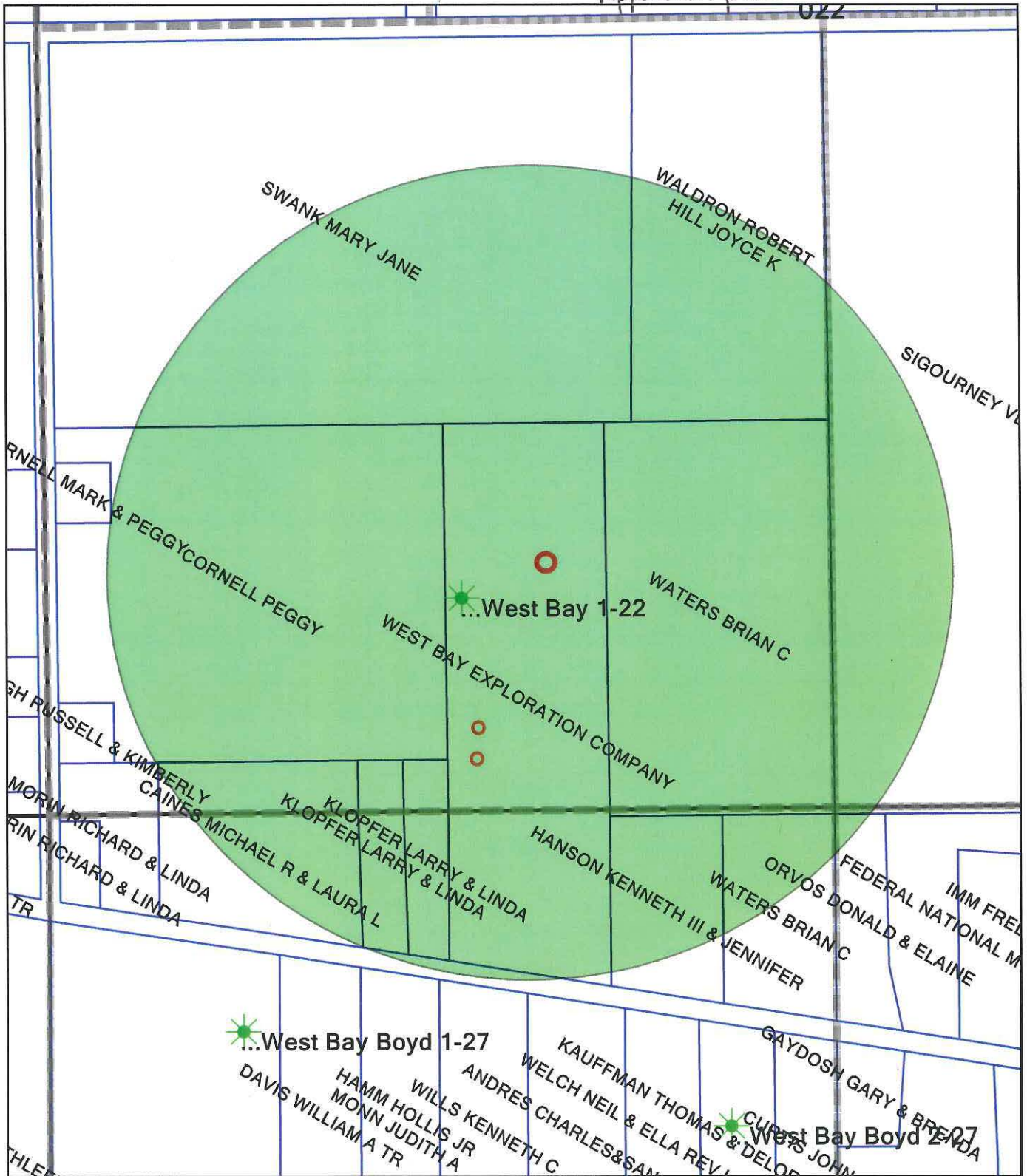
IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed my Official Seal the day and year first above written.



*Constance A. Dunn*

Constance A. Dunn Notary Public  
My Commission Expires: July 14, 2007

**Appendix  
"1"**



West Bay Exploration Company		
SWD 1/4 Mile Area of review		
January 25, 2011	16:25:23	
link map 9-14-10.gm		KWaterson

¼ mile area of review owners

Larry and Linda Klopfer  
12160 Ladd Rd  
Brooklyn, MI 49230

Michael and Laura Caines  
12148 Ladd Rd  
Brooklyn, MI 49230

Peggy Cornell  
10875 Bettis Rd  
Brooklyn, MI 49230

Robert Waldron and Joyce Hill  
12767 Waterman Rd  
Brooklyn, MI 49230

Brian Waters  
20310 Schwab  
Brooklyn, MI 49230

Mary Jane Swank  
12101 Waterman  
Brooklyn, MI 49230

West Bay Exploration Company  
13685 S West Bay Shore, Suite 200  
Traverse City, MI 49684

Kenneth and Jennifer Hanson  
12190 Ladd Rd  
Brooklyn, MI 49230

Donald and Elaine Orvos  
12536 Ladd Rd  
Brooklyn, MI 49230

**Appendix  
"2"**

# West Bay Exploration company

13685 S. West Bay Shore / Suite 200  
Traverse City, MI 49684  
231-946-0200 / Fax: 231-946-8180

5555 N. Hogback Road  
Fowlerville, MI 48836  
517-223-4011 / Fax: 517-223-4020

April 18, 2011

Mr. Brian Conway  
State Historic Preservation Officer  
State Historic Preservation Office  
Michigan Historical Center  
702 West Kalamazoo Street  
P.O. Box 30740  
Lansing, MI 48909-8240

**Re: National Historic Register Request**  
New Underground Injection Well Location:  
Well Name: West Bay 22 SWD  
T4S, R2E, Sec. 22, NW¼; NE¼, SW¼ (655' SL, 1,407' WL)  
(Jackson County)

Dear Mr. Conway:

In order to apply for a United States Environmental Protection Agency (USEPA) permit for an underground injection well, the USEPA regulations require a determination that the injection well will not impact any properties listed or eligible for listing in the National Register of Historic Places. The well is/will be located as shown on the enclosed attachment. Please review this well location to make a determination in this matter. Please contact our office in writing with your determination so that we may forward the information to the USEPA.

Should you have any questions or requires any additional information regarding this location, please feel free to call me at (231) 946-0200.

Sincerely yours,



Ann Baker

Enclosure

**Appendix  
"4"**



MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY - OFFICE OF GEOLOGICAL SURVEY

**RECORD OF WELL DRILLING OR DEEPENING**

Required by authority of Part 615 Supervisor of Wells or Part 625 Mineral Wells, of Act 451 PA 1994, as amended. Non-submission and/or falsification of this information may result in fines and/or imprisonment.

Permit number/Deepening number  
59996

(Submit 3 copies within 60 days of drilling completion.)

Part 615 Oil/Gas Well  Part 625 Mineral Well

Name and address of permittee West Bay Exploration 13685 S. West Bay Shore Suite 200 Traverse City Mi. 49684		API number 21-075-59996	
Name and address of drilling contractor Advanced Enerav Services P.O. Box 85 South Boardman Mi. 49680		Well name and number West Bay #1-22	
Date drilling began 01/11/2010		Surface location NW 1/4 of SE 1/4 of SW 1/4 Section 22 T4S R2E	
Date drilling completed 01/27/2010		Township Norvell	
Total depth of well Driller 4370' Log 4369'		County Jackson	
Formation at total depth Black River		Footages North/South East/West 567' ft. from N line and 575' ft. from E line of sec.	
Elevations K.B. 1028.24 ft. R.F. ft. R.T. 1027 ft. Grd 1015.27 ft		Directionally drilled (check one) <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
		Previous permit numbers	
		Subsurface location (if directionally drilled) 1/4 of 1/4 of 1/4 Section T R	
		Township County	
		Footages North/South East/West ft. from line and ft. from line of sec.	
		Feet drilled - cable tools from to	
		Feet drilled - rotary tools from surf to 4370'	

Casing, Casing Liners and Cementing, Operating Strings					Water Fill Up (F.U.) or Lost Circulation (L.C.) (X)				
Size	Where set	Cement	T.O.C.	Ft. pulled	Formation	F.U.	L.C.	Depth	Amount
11 3/4"	419'	150 lite/150 A	surface		Niagaran		x	2920	partial
8 5/8"	3112'	600 lite/200 A	surface						
5 1/2"	4151'	80 Halcem	1998'						
		300 Halcem							

Gross Pay Intervals				All Other Oil and Gas Shows Observed or Logged								
Formation	Oil or Gas	From	To	Where Observed (X)								
Formation	Oil or Gas	Depth	Sam- ples	Odor	Pits	Mud Line	Gas Log	Fill Up				
Trenton/Black River	both	3966'	4290'									

Depth Correction		Deviation Survey			Plugged Back	
Depth	Correction	Run at	Degrees	Yes	No	Operations Depth
						FFR 16 2010

Geophysical / Mechanical Logs (list each type run)		
Brand	Log types	Logged intervals
Baker Atlas	CDL/CNL/GR	TD-Surf
	DLL/MLL/GR	TD-Min

Notice: Report complete sample and formation record, coring record, and drill stem test information on reverse side.

CERTIFICATION "I state that I am authorized by said owner. This report was prepared under my supervision and direction. The facts stated herein are true, accurate and complete to the best of my knowledge."

Date 02/15/2010	Name and title (print) Timothy L. Baker	Signature 
--------------------	--	---------------

Submit to: OFFICE OF GEOLOGICAL SURVEY,  
MICHIGAN DEPT OF ENVIRONMENTAL QUALITY  
PO BOX 30256, LANSING, MI 48909-7756





MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY - OFFICE OF GEOLOGICAL SURVEY

**RECORD OF WELL COMPLETION**

By authority of Part 615 or Part 625 of Act 451 PA 1994, as amended. Non-submission and/or falsification of this information may result in fines and/or imprisonment.

(Submit 3 copies within 60 days of well completion.)

Part 615 Oil/Gas Well  Part 625 Mineral Well

Permit number/deepening permit no. 59996	API number 21-075-59996-00-00
Type of well (after completion) Oil & Gas	
Well name & number West Bay 1-22	

Name and address of permittee  
West Bay Exploration  
13685 S. West Bay Shore #200  
Traverse City, MI 49684

Directionally drilled (check one) <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Previous permit numbers	Total depth of well M.D. 4370 T.V.D.
--	-------------------------	---

Surface location NW ¼ of SE ¼ of SW ¼ Section 22 T 4S R 2E	Subsurface location (if directionally drilled) ¼ of ¼ of ¼ Section T R
---	---

Township Norvell	County Jackson	Township	County
---------------------	-------------------	----------	--------

Footages: North/South 750 Ft. from South line and 1400 Ft. from West line of Sec.	Footages: North/South Ft. from line and East/West Ft. from line of Sec.
--	---

Date well completed 2/5/2010	Part 615 - oil/gas wells Producing formation(s) Black River	Injection formation(s)	Date of first injection	Part 625 - mineral wells Disposal formation(s)	Solution formation(s)
---------------------------------	---	------------------------	-------------------------	---	-----------------------

**COMPLETION INTERVALS(S)**

Date	Number holes	Perforation or open hole interval	Open	
			Yes	No
1/30/2010	60	4224-4254'	X	

**STIMULATION BY ACID OR FRACTURING**

Date	Interval treated	Materials and amount used
1/30/2010	4224-4254'	500 gallons 28% Hcl Acid
2/4/2010	4224-4254;	6000 gallons 28% Hcl Acid w/ 20 Ball sealers

Operations Office  
FEB 16 2010

**PRODUCTION TEST DATA**

Mailed

Oil Bbls/day	Gravity °API	Condensate Bbls/day	Gas MCF/day	Water Bbls/day	H <sub>2</sub> S Grains/100 ft <sup>3</sup>	B.H.P. and depth
200	47		90	0	NA	1768 @ 4239

CERTIFICATION "I state that I am authorized by said owner. This report was prepared under my supervision and direction. The facts stated herein are true, accurate and complete to the best of my knowledge."

Name and title (print or type) Timothy L. Baker Operations Manager	Signature <i>Timothy L. Baker</i>	Date 2/16/2010
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Submit to: OFFICE OF GEOLOGICAL SURVEY  
MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY  
PO BOX 30256  
LANSING MI 48909-7756



## RECORD OF WELL DRILLING OR DEEPENING

Required by authority of Part 615 Supervisor of Wells or Part 625 Mineral Wells, of Act 451 PA 1994, as amended. Non-submission and/or falsification of this information may result in fines and/or imprisonment.

Permit number/Deepening number

60010

(Submit 3 copies within 60 days of drilling completion.)

 Part 615 Oil/Gas Well  Part 625 Mineral Well

Name and address of permittee		API number	
West Bay Exploration 13685 S. West Bay Shore Suite 200 Traverse City Mi. 49684		21-075-60010	
Name and address of drilling contractor		Well name and number	
Advanced Energy Services P.O. Box 85 South Boardman Mi. 49680		West Bay & Boyd #1-27	
Date drilling began		Surface location	
01/30/2010	Date drilling completed	SW 1/4 of SE 1/4 of SW 1/4 Section 22 T4S R2E	
	02/14/2010	Township	
Total depth of well		County	
Driller 4495 Log 4490	Formation at total depth	Norvell	
	Black River	Footages North/South East/West	
Elevations		Directionally drilled (check one)	
K.B. 1043 ft. R.F.	ft. R.T. 1042 ft. Grd 1029 ft	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
		Previous permit numbers	
		Subsurface location (if directionally drilled)	
		NW 1/4 of NW 1/4 of NW 1/4 Section 27 T 4S R 2E	
		Township	
		County	
		Norvell	
		Jackson	
		Footages North/South East/West	
		679' ft. from N line and 661' ft. from W line of sec.	
		Feet drilled - cable tools	
		Feet drilled - rotary tools	
		from to from surf to TD	

Casing, Casing Liners and Cementing, Operating Strings					Water Fill Up (F.U.) or Lost Circulation (L.C.) (X)				
Size	Where set	Cement	T.O.C.	Ft. pulled	Formation	F.U.	L.C.	Depth	Amount
11 3/4"	426'	150 lite/150 A	surface		Niagaran		x	3220	Partial
8 5/8"	3333'	650 lite/200 A	surface		Trenton/Black River		x	4267	Full
5 1/2"	4151'	80 Halcem	2580'						
		250 Halcem	'						

Gross Pay Intervals				All Other Oil and Gas Shows Observed or Logged							
Formation	Oil or Gas	From	To	Where Observed (X)							
Formation	Oil or Gas	Depth	Sam- ples	Odor	Pits	Mud Line	Gas Log	Fill Up			
Trenton/Black River	both	4273'	TD								

Depth Correction		Deviation Survey			Plugged Back		
Depth	Correction	Run at	Degrees	Yes	No	Depth	
see	attached	directional					

Geophysical / Mechanical Logs (list each type run)		
Brand	Log types	Logged intervals
Baker Atlas	CNL/GR/CCL (Unable to run open hole)	4487'-Surf
	SBT/GR/CCL	4487'-2100'

Notice: Report complete sample and formation record, coring record, and drill stem test information on reverse side.

CERTIFICATION "I state that I am authorized by said owner. This report was prepared under my supervision and direction. The facts stated herein are true, accurate and complete to the best of my knowledge."

Date	Name and title (print)	Signature
02/19/2010	Timothy L. Baker	

Submit to: OFFICE OF GEOLOGICAL SURVEY,  
MICHIGAN DEPT OF ENVIRONMENTAL QUALITY  
PO BOX 30256, LANSING, MI 48909-7756



## RECORD OF WELL COMPLETION

By authority of Part 615 or Part 625 of Act 451 PA 1994, as amended. Non-submission and/or falsification of this information may result in fines and/or imprisonment.

(Submit 3 copies within 60 days of well completion.)

Part 615 Oil/Gas Well  Part 625 Mineral Well

Permit number/deepening permit no. 60010	API number 21-075-60010-00-00
Type of well (after completion) Oil & Gas	
Well name & number West Bay Boyd 1-27	

Name and address of permittee West Bay Exploration 13685 S. West Bay Shore Dr #200 Traverse City, MI 49684					
Directionally drilled (check one) <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		Previous permit numbers		Total depth of well M.D. T.V.D.	
Surface location SW ¼ of SE ¼ of SW ¼ Section 27 T 4S R 2E			Subsurface location (if directionally drilled) NW ¼ of NW ¼ of NW ¼ Section 27 T 4S R 2E		
Township Norvell		County Jackson		Township Norvell	
Footages: North/South 271 Ft. from South line and 1440 Ft. from West line of Sec.		Footages: North/South 600 Ft. from North line and 660 Ft. from West line of Sec.		East/West	
Part 615 - oil/gas wells			Part 625 - mineral wells		
Date well completed 2/20/10	Producing formation(s) Black River	Injection formation(s)		Date of first injection	Disposal formation(s) Solution formation(s)

## COMPLETION INTERVALS(S)

Date	Number holes	Perforation or open hole interval	Open	
			Yes	No
2/19/2010	Open Hole	O.H. 4495-4525	X	

## STIMULATION BY ACID OR FRACTURING

Date	Interval treated	Materials and amount used
2/20/2010	4495-4525	5000 gal 28% Hcl Acid

## PRODUCTION TEST DATA

Oil Bbls/day	Gravity °API	Condensate Bbls/day	Gas MCF/day	Water Bbls/day	H <sub>2</sub> S Grains/100 ft <sup>3</sup>	B.H.P. and depth
200	47		95	0	0	TBD

CERTIFICATION "I state that I am authorized by said owner. This report was prepared under my supervision and direction. The facts stated herein are true, accurate and complete to the best of my knowledge."

Name and title (print or type) Timothy L. Baker Operations Manager	Signature 	Date 2-23-10
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Submit to: OFFICE OF GEOLOGICAL SURVEY  
MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY  
PO BOX 30256  
LANSING MI 48909-7756



## RECORD OF WELL DRILLING OR DEEPENING

Required by authority of Part 615 Supervisor of Wells or Part 625 Mineral Wells, of Act 451 PA 1994, as amended. Non-submission and/or falsification of this information may result in fines and/or imprisonment.

Permit number/Deepening number

60011

(Submit 3 copies within 60 days of drilling completion.)

API number

21-075-60011

Well name and number

West Bay &amp; Boyd #2-27

 Part 615 Oil/Gas Well  Part 625 Mineral Well

Name and address of permittee

West Bay Exploration  
13685 S. West Bay Shore  
Suite 200  
Traverse City Mi. 49684

Surface location

SW 1/4 of SE 1/4 of SW 1/4 Section 22 T4S R2E

Township

Norvell

County

Jackson

Footages North/South

East/West

186' ft. from S line and 1440' ft. from W line of sec.

Directionally drilled (check one)

 Yes  No

Previous permit numbers

Subsurface location (if directionally drilled)

SE 1/4 of NE 1/4 of NW 1/4 Section 27 T 4S R 2E

Name and address of drilling contractor

Advanced Energy Services  
P.O. Box 85  
South Boardman Mi.  
49680

Township

Norvell

County

Jackson

Footages North/South

East/West

963' ft. from N line and 2264' ft. from W line of sec.

Date drilling began

02/15/2010

Date drilling completed

03/03/2010

Total depth of well

Driller 4845 Log 4846

Formation at total depth

Black River

Elevations

K.B. 1042.6 ft. R.F. ft. R.T. 1041 ft. Grd 1029.2 ft

Feet drilled - cable tools

from to

Feet drilled - rotary tools

from surf to TD

## Casing, Casing Liners and Cementing, Operating Strings

## Water Fill Up (F.U.) or Lost Circulation (L.C.) (X)

Size	Where set	Cement	T.O.C.	Ft. pulled	Formation	F.U.	L.C.	Depth	Amount
11 3/4"	424'	150 lite/150 A	surface		Niagaran		x	3300	Partial
8 5/8"	3417'	650 lite/200 A	surface						
5 1/2"	4842'	75 Halcem	3300"						
		150 Halcem							

## Gross Pay Intervals

## All Other Oil and Gas Shows Observed or Logged

Formation	Oil or Gas	From	To	Formation	Oil or Gas	Depth	Sam- ples	Odor	Pits	Mud Line	Gas Log	Fill Up
Black River	both	4510'	4590'									

## Depth Correction

## Deviation Survey

## Plugged Back

Depth	Correction	Run at	Degrees	Yes	No	Depth
see	attached	directional				

## Geophysical / Mechanical Logs (list each type run)

Brand	Log types	Logged intervals
Baker Atlas	CNL/ZDL/GR	4846'-Surf
	DLL/MLL/GR	4846'-3417

Notice: Report complete sample and formation record, coring record, and drill stem test information on reverse side.

CERTIFICATION "I state that I am authorized by said owner. This report was prepared under my supervision and direction. The facts stated herein are true, accurate and complete to the best of my knowledge."

Date	Name and title (print)	Signature
06/20/2010	Timothy L. Baker	

Submit to: OFFICE OF GEOLOGICAL SURVEY,  
MICHIGAN DEPT OF ENVIRONMENTAL QUALITY  
PO BOX 30256, LANSING, MI 48909-7756

**FORMATION F JORD**

Attach additional sheets if necessary

API number

Permit number/Deepening number

60011

Elevation used

Geologist name

Tops taken from

1043

Fowler/Baker/Vancyck

Driller's log

Sample log

Electric log

From	To	Formation (type, color, hardness)	From	To	Formation (type, color, hardness)
Note: if well directionally drilled, add true vertical depth formation tops where appropriate					
surf	222(log)	Drift- Unconsolidated sand and gravel			
222	290	Shale& Siltstone- brn-gy-Grn, silty at top organic at base			
290	1230	Shale-Coldwater- Md-dk Brn-Blk, Silty, incr organic at base			
1230	1370	Sunbury Sh/Berea siltstone-Sh, Md Brn-Blk Silty, pyr. mixed w/siltstone, SSO-Lt md brn, Arg			
1370	15	Antrim-Dk Brn-Blk, Pyrand incr organic at base, SG incr toward base			
1554	1622	Traverse Fm- Limestone, Dk Brn-md Brn, Dns, Pyr, Dolomite, Md Gy-Gy, Dns			
1622	1744	Traverse Limestone-Md Brn-lt Brn Vfxln, Hd,			
1744	1978	Shale intbd w Dolomite and Lmst, Md Brn-Gy, Vfxln, Dns, Pos Dundee@1728'-Brn-Lt brn, Poor Samp, Pos Cvgs			
1978	2200	Detroit River- Anhydrite and Dolomite/Limestone, Lt-Md Brn Dns, Vfxln in pt, NS			
2200	2416	Bass Island/Bois Blanc- Dolomite, Anhydrite & Limestone AA			
2416	2685	G-Unit-Dolomite-Arg, Hd grading to Anhydrite- Lt-md Gy Brn			
2685	2766	C Shale-Gy-rdBrn, W/Dolomite and Anhydrite, Lt gy-Brn-bf Poor Samp. I			
2766	2972	B Evap-Anhydrite Wh-Lt Gy W/Dolomite-Vfxln, Lt-md Gy, Intbd at base with Anhy. AA	If well was cored, attach core description		
2972	3160	Dolo & Lmst-Wh-lt Gy, Dns, Anhydritic @3110'-Wh, Dns	DRILL STEM TEST DATA		
3160	3386	Niagaran-Dolomite, AA, Md Gy, Vfxln Intbd W/Anhydrite AA, V porous 2880'-3300'			
3386	3884	Clinton/Cinn-Dolomite, Arg, hd, dk gy, grd to lt gy intbd w/Lmst, Lt-md gy Dns			
3884	4212	Utica- Shale, Gy-Grn, Gummy-Hd			
4212	4526	Trenton-Dolo, Lt -Md Gy, Dns, W/ Lmst @ 4236'-4526' Lt-Md Gy Brn, Vfxln,			
4526	TD	Black River- Dolomite, Md Brn-GyBrn, SO&G@4590'			



Directional Drilling Contractors, LLC.

Job Number: DR100040  
 Company: WEST BAY EXPLORATION  
 Lease/Well: WEST BAY/ BOYD 2-27  
 Location: NORVELL TWP., JACKSON CO.  
 Rig Name: ADVANCED # 2  
 RKB:  
 G.L. or M.S.L.:

State/Country: MICHIGAN / USA  
 Declination: 6.33 DEGREES WEST  
 Grid:  
 File name: C:\WINSERVE\ASDRIL~1\2010\BOYD227.SVY  
 Date/Time: 04-Mar-10 / 10:03  
 Curve Name: WESTBAY/BOYD 2-27 ( as drilled )

Directional Drilling Contractors  
 SURVEY REPORT

WINSERVE SURVEY CALCULATIONS  
 Minimum Curvature Method  
 Vertical Section Plane 144.40  
 Vertical Section Referenced to Wellhead  
 Rectangular Coordinates Referenced to Wellhead

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	True Vertical Depth	N-S FT	E-W FT	Vertical Section FT	CLOSURE Distance FT	Direction Deg	Dogleg Severity Deg/100
<b>KOP @ 484 MD</b>									
484.00	.00	.00	484.00	.00	.00	.00	.00	.00	.00
486.00	.70	169.10	486.00	-.01	.00	.01	.01	169.05	35.00
516.00	1.80	164.20	515.99	-.65	.17	.62	.67	165.64	3.68
546.00	3.20	162.10	545.96	-1.90	.55	1.86	1.97	163.79	4.68
576.00	4.70	161.00	575.89	-3.85	1.21	3.84	4.04	162.59	5.01
606.00	6.10	159.30	605.76	-6.51	2.17	6.56	6.86	161.54	4.70
636.00	7.70	157.80	635.54	-9.86	3.49	10.05	10.46	160.48	5.37
667.00	9.10	156.80	666.21	-14.04	5.25	14.47	14.98	159.51	4.54
697.00	10.70	157.80	695.76	-18.80	7.23	19.49	20.14	158.95	5.36
728.00	12.80	157.80	726.11	-24.64	9.62	25.63	26.45	158.68	6.77
757.00	14.90	157.80	754.26	-31.07	12.24	32.39	33.39	158.50	7.24
788.00	17.30	157.50	784.04	-39.02	15.51	40.75	41.99	158.32	7.75
818.00	19.80	156.10	812.48	-47.78	19.28	50.08	51.53	158.03	8.46
848.00	22.10	154.30	840.50	-57.52	23.78	60.61	62.24	157.53	7.96
878.00	24.20	152.90	868.08	-68.08	29.03	72.25	74.01	156.90	7.24
907.00	26.50	151.50	894.29	-79.06	34.83	84.55	86.39	156.22	8.20
937.00	28.90	150.10	920.85	-91.22	41.64	98.41	100.28	155.47	8.29
968.00	31.00	148.00	947.71	-104.49	49.60	113.84	115.67	154.61	7.57
1008.00	31.60	144.80	981.89	-121.79	61.10	134.60	136.26	153.36	4.42
1038.00	31.70	142.70	1007.43	-134.48	70.41	150.34	151.80	152.37	3.69
1068.00	31.70	141.70	1032.95	-146.94	80.07	166.09	167.34	151.41	1.75
1097.00	31.90	141.70	1057.60	-158.93	89.54	181.35	182.42	150.60	.69
1126.00	32.20	142.00	1082.18	-171.03	99.05	196.73	197.64	149.92	1.17

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	True Vertical Depth	N-S FT	E-W FT	Vertical Section FT	C L O S U R E		Dogleg Severity Deg/100
							Distance FT	Direction Deg	
1156.00	32.10	141.70	1107.58	-183.59	108.91	212.67	213.46	149.32	.63
1177.00	32.30	142.00	1125.35	-192.39	115.82	223.85	224.56	148.95	1.22
1207.00	32.40	142.00	1150.69	-205.04	125.71	239.89	240.50	148.49	.33
1237.00	32.70	141.70	1175.98	-217.73	135.68	256.02	256.54	148.07	1.14
1267.00	33.00	142.00	1201.18	-230.53	145.73	272.27	272.73	147.70	1.14
1297.00	32.60	141.70	1226.40	-243.31	155.77	288.51	288.90	147.37	1.44
1327.00	32.10	141.30	1251.74	-255.87	165.76	304.54	304.87	147.06	1.81
1356.00	32.40	141.30	1276.27	-267.95	175.44	319.99	320.27	146.79	1.03
1385.00	32.40	141.70	1300.75	-280.11	185.11	335.51	335.75	146.54	.74
1415.00	31.80	141.70	1326.17	-292.62	194.99	351.44	351.63	146.32	2.00
1446.00	31.80	141.70	1352.51	-305.44	205.11	367.75	367.92	146.12	.00
1476.00	30.90	140.60	1378.13	-317.60	214.90	383.34	383.47	145.92	3.56
1506.00	30.20	140.60	1403.97	-329.38	224.58	398.55	398.66	145.71	2.33
1536.00	30.20	142.00	1429.90	-341.15	234.02	413.62	413.70	145.55	2.35
1566.00	30.40	143.10	1455.80	-353.17	243.22	428.75	428.82	145.45	1.97
1596.00	30.80	143.10	1481.62	-365.38	252.39	444.01	444.08	145.37	1.33
1626.00	31.00	143.40	1507.36	-377.73	261.61	459.42	459.47	145.29	.84
1656.00	31.70	143.40	1532.98	-390.26	270.91	475.02	475.07	145.23	2.33
1688.00	31.90	143.10	1560.18	-403.77	281.00	491.88	491.93	145.16	.80
1719.00	32.30	142.40	1586.44	-416.88	290.97	508.35	508.38	145.09	1.76
1750.00	32.30	142.40	1612.65	-430.00	301.08	524.90	524.93	145.00	.00
1782.00	32.40	142.40	1639.68	-443.57	311.53	542.01	542.04	144.92	.31
1813.00	32.20	142.40	1665.88	-456.70	321.63	558.57	558.59	144.84	.65
1845.00	32.40	141.70	1692.93	-470.18	332.15	575.65	575.67	144.76	1.33
1876.00	33.10	141.30	1719.00	-483.30	342.59	592.40	592.41	144.67	2.36
1908.00	33.40	141.00	1745.76	-496.97	353.60	609.92	609.92	144.57	1.07
1939.00	33.10	142.00	1771.69	-510.27	364.18	626.89	626.90	144.48	2.02
1970.00	32.60	143.10	1797.73	-523.62	374.40	643.70	643.70	144.43	2.51
2001.00	32.60	143.10	1823.85	-536.97	384.43	660.40	660.40	144.40	.00
2031.00	32.60	143.40	1849.12	-549.92	394.10	676.56	676.56	144.37	.54
2064.00	32.90	144.80	1876.88	-564.38	404.57	694.41	694.41	144.37	2.47
2096.00	33.20	144.80	1903.70	-578.64	414.63	711.86	711.86	144.38	.94
2127.00	33.40	144.80	1929.61	-592.55	424.44	728.88	728.88	144.39	.65
2158.00	33.70	144.10	1955.44	-606.49	434.40	746.01	746.01	144.39	1.58
2189.00	34.00	144.10	1981.19	-620.48	444.52	763.28	763.28	144.38	.97
2221.00	33.30	143.80	2007.83	-634.81	454.96	781.01	781.01	144.37	2.25
2252.00	32.30	143.10	2033.88	-648.31	464.96	797.80	797.80	144.35	3.45
2285.00	32.20	143.10	2061.79	-662.39	475.53	815.41	815.41	144.33	.30
2317.00	32.50	143.10	2088.83	-676.08	485.81	832.52	832.53	144.30	.94
2348.00	32.40	143.40	2114.99	-689.41	495.76	849.15	849.16	144.28	.61
2379.00	32.40	144.10	2141.16	-702.80	505.59	865.76	865.77	144.27	1.21
2411.00	32.10	145.90	2168.22	-716.79	515.38	882.84	882.84	144.28	3.14
2442.00	31.80	146.20	2194.53	-730.40	524.54	899.23	899.23	144.32	1.09
2474.00	31.20	145.20	2221.81	-744.21	533.96	915.95	915.95	144.34	2.49
2506.00	31.60	144.80	2249.13	-757.87	543.53	932.62	932.62	144.35	1.41

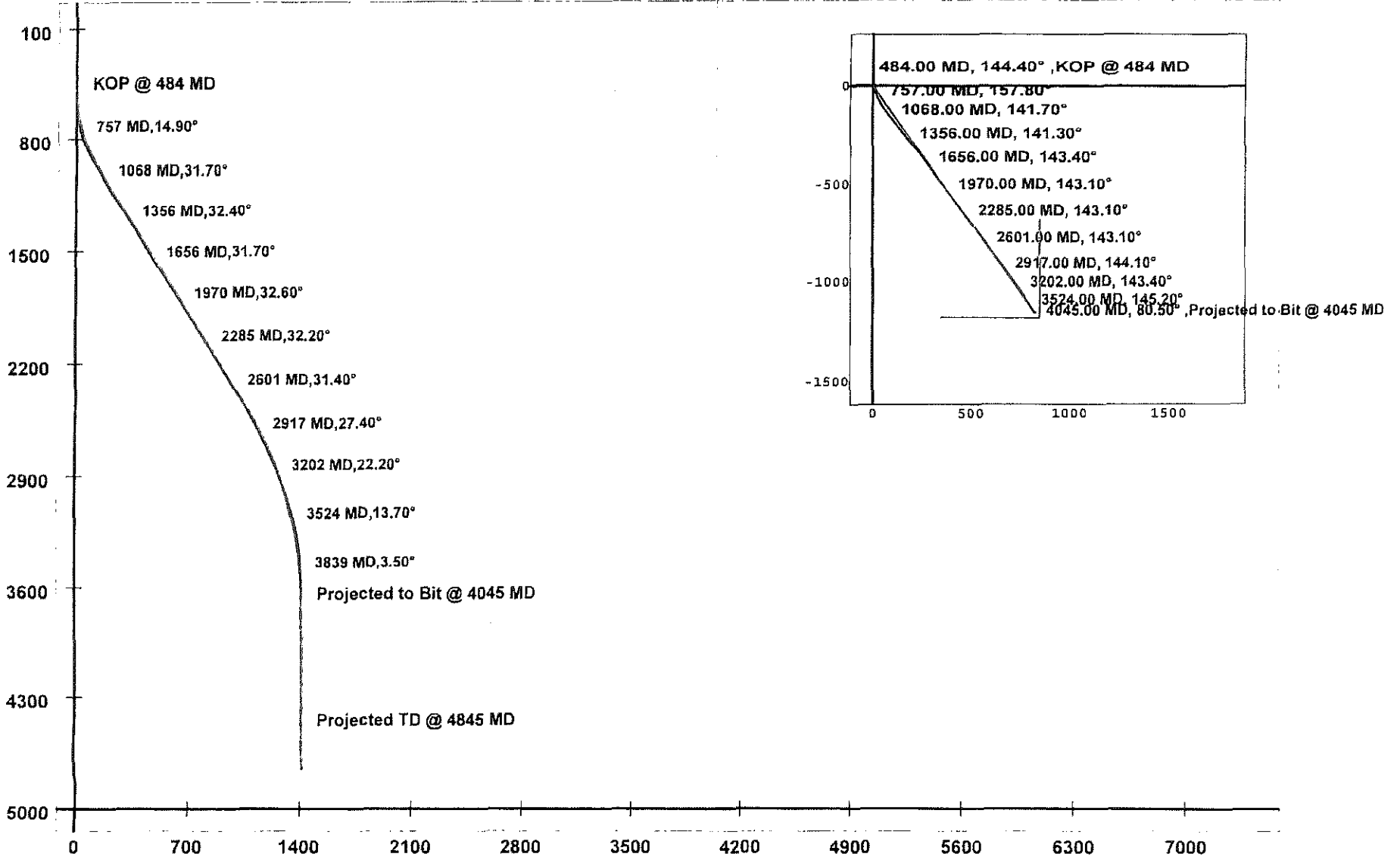
Measured Depth FT	Incl Angle Deg	Drift Direction Deg	True Vertical Depth	N-S FT	E-W FT	Vertical Section FT	CLOSURE		Dogleg Severity Deg/100
							Distance FT	Direction Deg	
2538.00	31.50	144.10	2276.40	-771.49	553.26	949.36	949.36	144.35	1.19
2569.00	31.40	143.40	2302.84	-784.53	562.82	965.54	965.54	144.34	1.22
2601.00	31.40	143.10	2330.16	-797.89	572.80	982.21	982.21	144.33	.49
2632.00	31.70	144.10	2356.57	-810.95	582.42	998.42	998.43	144.31	1.95
2664.00	31.60	144.10	2383.81	-824.55	592.27	1015.22	1015.22	144.31	.31
2696.00	31.20	143.80	2411.13	-838.03	602.08	1031.89	1031.89	144.30	1.34
2727.00	30.90	143.80	2437.69	-850.93	611.52	1047.88	1047.88	144.30	.97
2759.00	30.60	143.80	2465.19	-864.13	621.19	1064.24	1064.24	144.29	.94
2791.00	30.30	143.40	2492.77	-877.19	630.81	1080.45	1080.45	144.28	1.13
2823.00	29.60	142.40	2520.50	-889.93	640.45	1096.42	1096.42	144.26	2.69
2855.00	28.70	143.10	2548.45	-902.34	649.88	1112.00	1112.01	144.24	3.01
2886.00	27.90	143.40	2575.74	-914.11	658.68	1126.70	1126.70	144.22	2.62
2917.00	27.40	144.10	2603.20	-925.71	667.18	1141.08	1141.09	144.22	1.92
2949.00	27.20	144.50	2631.64	-937.63	675.75	1155.76	1155.76	144.22	.85
<b>TOP NIAGRINE</b>									
2972.00	26.34	144.22	2652.17	-946.05	681.78	1166.12	1166.12	144.22	3.79
2981.00	26.00	144.10	2660.25	-949.27	684.11	1170.08	1170.09	144.22	3.79
3013.00	25.60	143.40	2689.06	-960.50	692.34	1184.01	1184.02	144.22	1.57
3044.00	25.10	143.40	2717.08	-971.15	700.26	1197.28	1197.29	144.21	1.61
3075.00	25.00	143.40	2745.16	-981.69	708.08	1210.40	1210.41	144.20	.32
3107.00	24.90	143.80	2774.17	-992.56	716.09	1223.90	1223.91	144.19	.61
3139.00	24.30	143.10	2803.27	-1003.26	724.02	1237.22	1237.23	144.18	2.08
3171.00	23.00	143.10	2832.58	-1013.52	731.73	1250.05	1250.06	144.17	4.06
3202.00	22.20	143.40	2861.20	-1023.07	738.86	1261.96	1261.98	144.16	2.61
3233.00	21.70	144.50	2889.95	-1032.44	745.68	1273.55	1273.56	144.16	2.09
3264.00	20.80	145.50	2918.84	-1041.64	752.13	1284.79	1284.80	144.17	3.13
3296.00	20.20	146.60	2948.82	-1050.93	758.38	1295.99	1296.00	144.18	2.23
3327.00	19.40	147.70	2977.99	-1059.75	764.08	1306.48	1306.48	144.21	2.85
3358.00	18.80	148.40	3007.28	-1068.36	769.45	1316.60	1316.60	144.24	2.07
3368.00	18.80	148.40	3016.74	-1071.10	771.14	1319.81	1319.82	144.25	.00
3430.00	17.50	149.10	3075.66	-1087.61	781.16	1339.07	1339.07	144.31	2.13
3460.00	16.30	148.40	3104.36	-1095.07	785.68	1347.77	1347.77	144.34	4.06
3492.00	15.10	146.60	3135.17	-1102.37	790.33	1356.41	1356.41	144.36	4.05
3524.00	13.70	145.20	3166.16	-1108.97	794.79	1364.37	1364.37	144.37	4.51
3556.00	12.70	144.10	3197.32	-1114.93	799.01	1371.67	1371.67	144.37	3.22
3587.00	11.40	143.40	3227.63	-1120.15	802.84	1378.14	1378.14	144.37	4.22
3619.00	10.60	143.80	3259.04	-1125.06	806.46	1384.25	1384.25	144.37	2.51
3650.00	9.20	144.80	3289.58	-1129.39	809.58	1389.58	1389.58	144.37	4.55
3682.00	7.70	146.20	3321.23	-1133.26	812.24	1394.28	1394.28	144.37	4.73
3713.00	6.60	145.90	3351.99	-1136.46	814.40	1398.14	1398.14	144.37	3.55
3744.00	5.80	144.80	3382.81	-1139.22	816.30	1401.48	1401.48	144.38	2.61
3776.00	5.10	145.50	3414.67	-1141.71	818.04	1404.52	1404.52	144.38	2.20
3808.00	4.50	145.90	3446.55	-1143.92	819.55	1407.20	1407.20	144.38	1.88
3839.00	3.50	143.40	3477.48	-1145.69	820.79	1409.36	1409.36	144.38	3.27
3870.00	2.60	141.30	3508.43	-1147.00	821.80	1411.01	1411.01	144.38	2.93



Measured Depth FT	Incl Angle Deg	Drift Direction Deg	True Vertical Depth	N-S FT	E-W FT	Vertical Section FT	C L O S U R E		Dogleg Severity Deg/100
							Distance FT	Direction Deg	
3902.00	2.30	143.40	3540.40	-1148.08	822.63	1412.38	1412.38	144.38	.98
3934.00	1.70	141.00	3572.38	-1148.96	823.31	1413.49	1413.49	144.38	1.89
3965.00	.60	142.70	3603.38	-1149.45	823.70	1414.11	1414.11	144.37	3.55
3997.00	.30	80.50	3635.38	-1149.57	823.89	1414.32	1414.32	144.37	1.66
<b>Projected to Bit @ 4045 MD</b>									
4045.00	.30	80.50	3683.38	-1149.53	824.13	1414.43	1414.43	144.36	.00
<b>Projected TD @ 4845 MD</b>									
4845.00	.30	80.50	4483.37	-1148.84	828.27	1416.27	1416.28	144.21	.00

Job Number: DR100040  
 Company: WEST BAY EXPLORATION  
 Lease/Well: WEST BAY/ BOYD 2-27  
 Location: NORVELL TWP., JACKSON CO.  
 Rig Name: ADVANCED # 2  
 State/Country: MICHIGAN / USA

Declination: 6.33 DEGREES WEST  
 File name: C:\WINSERVE\ASDRIL~1\2010  
 Date/Time: 04-Mar-10 / 10:01





## RECORD OF WELL COMPLETION

By authority of Part 615 or Part 625 of Act 451 PA 1994, as amended. Non-submission and/or falsification of this information may result in fines and/or imprisonment.

(Submit 3 copies within 60 days of well completion.)

Part 615 Oil/Gas Well  Part 625 Mineral Well

Permit number/deepening permit no. 60011		API number 21-075-60011	
Type of well (after completion) oil			
Well name & number West Bay Boyd #2-27			
Name and address of permittee West Bay Exploration 13685 S. West Bay Shore Drive Suite 200, Traverse City Mi. 49684			
Directionally drilled (check one) <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		Previous permit numbers	
Total depth of well M.D. 4845'		T.V.D. 4483'	
Surface location SW ¼ of SE ¼ of SW ¼ Section 27 T 4S R 2E		Subsurface location (if directionally drilled) SE ¼ of NE ¼ of NW ¼ Section 27 T 4S R 2E	
Township Napoleon		County Jackson	
Footages: North/South 186' Ft. from South line and 1440' Ft. from West line of Sec.		Footages: North/South 963' Ft. from North line and 2264' Ft. from West line of Sec.	
Part 615 - oil/gas wells		Part 625 - mineral wells	
Date well completed D&A	Producing formation(s) D&A	Injection formation(s)	Date of first injection
			Disposal formation(s)
			Solution formation(s)

## COMPLETION INTERVALS(S)

Date	Number holes	Perforation or open hole interval	Open	
			Yes	No
3/11/10	52	4592-4605		x
3/15/10	28	4507-4514		x

## STIMULATION BY ACID OR FRACTURING

Date	Interval treated	Materials and amount used
3/12/10	4592-4605	500 gal 28% Hcl acid
3/15/10	4507-4514	500 gal 28% Hcl acid

## PRODUCTION TEST DATA

Oil Bbls/day	Gravity °API	Condensate Bbls/day	Gas MCF/day	Water Bbls/day	H <sub>2</sub> S Grains/100 ft <sup>3</sup>	B.H.P. and depth
0				100		

CERTIFICATION "I state that I am authorized by said owner. This report was prepared under my supervision and direction. The facts stated herein are true, accurate and complete to the best of my knowledge."

Name and title (print or type) Timothy L. Baker	Signature 	Date 7/29/10
--	---------------	-----------------

Submit to: OFFICE OF GEOLOGICAL SURVEY  
MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY  
PO BOX 30256  
LANSING MI 48909-7756

**RECORD OF WELL PLUGGING  
OR CHANGE OF WELL STATUS**

Required by authority of Part 615 Supervisor of Wells or  
Part 625 Mineral Wells of Act 451 PA 1994, as amended  
Non-submission and/or falsification of this information  
may result in fines and/or imprisonment.

- Part 615 Oil/Gas Well       Plugging  
 Part 625 Mineral Well       Change of Well Status

Permit number 60094	Well name and number West Bay Boyd #2-27		
API number 21-075-60011			
Name and address of permittee West Bay Exploration 13685 S West Bay Shore Drive Suite 200, Traverse City Mi. 49684			
Name and address of contractor/service company McConnell & Scully 146 W. Main St. Homer, Mi. 49245		Type of well Oil \$ Gas	Field name
		Surface location SW 1/4 SE 1/4 SW 1/4 Sec 22 T 4S R 2E	
		Township Napoleon	County Jackson
		Date plugging/change started 05/14/10	Date plugging/change completed 05/21/10

DEQ employee issuing plugging permit or approving Change of Well Status.

Walt Danyluk

Date issued

05/03/10

Any change of well status which results in a change of production or a change in injectivity must include production or injection test records. All records must include a narrative or daily chronology and signed certification noted on reverse.

**WELL PLUGGING**  
(Hole conditions after plugging)

CASING

Casing size	Where set	Amount casing pulled	Depth casing cut/perfed; or windows milled
11 3/4"	424	0	NA
8 5/8"	3417	0	NA
5 1/2"	4842	0	window milled to facilitate lateral under permit # 60094

PLUGS

Depth of plug Bottom      Top	Make and type of bridge or plug	Cement plugs: type, amount of cement & mix water	Additives, type and percent	Volume and types of spacers/flushes	Wait time	Tagged
						Top? Y/N
4571      4570	Bakerl	Mechanical				Y
4322      4321	Baker	Mechanical				Y

Check if NORM or other materials were left or reinserted into wellbore. If so, describe materials fully in the Daily Chronology section on reverse.

Check if cores were taken and attach core descriptions

Mail completed original and three copies to the appropriate DEQ district office within 60 days after completion of plugging/change of a Part 615 oil/gas well or within 30 days of a Part 625 mineral well.

OFFICE OF GEOLOGICAL SURVEY  
MICHIGAN DEPT OF ENVIRONMENTAL QUALITY  
PO BOX 30256  
LANSING, MI 48909-7756

COMPLETE BOTH SIDES

API number 21-075-60011 Permit number 60094

**CHANGE OF WELL STATUS**

Change was to:  Convert current zone to:  Remediate well:  Plugback (recomplete as)  Redrill:

Production  Perf and test existing zone  New production zone  Horizontal drain hole

Disposal  Repair casing/cement  Disposal  Collapsed casing

Secondary recovery  Other \_\_\_\_\_  Secondary recovery  Underream open hole

Storage  Storage  Storage

Other \_\_\_\_\_  Other \_\_\_\_\_  Other \_\_\_\_\_

**Well casing record - BEFORE change**

Casing		Cement		Perforations			Acid or fracture treatment record
Size	Depth	Sacks	Type	From	To	If plugged, HOW?	
11 3/4"	424'	150/150	lite/A				
8 5/8"	3417'	650/200	lite/A				
5 1/2"	4842'	75/150	Halcm/A	4592	4605		500 gal 28% Hcl acid
				4507	4514		500 gal 28% Hcl acid

**Well casing record - AFTER change (Indicate additions and changes only, complete test record)**

Casing		Cement		Perforations			Acid or fracture treatment record
Size	Depth	Sacks	Type	From	To	If plugged, HOW?	
				4592	4605	CIBP	
				4507	4514	CIBP	

**BEFORE CHANGE**

**AFTER CHANGE**

Total depth 4842	Completed Fm Black River	Well completed for Oil & Gas		Total depth 4583	Completed Fm Black River	Well completed for Oil & Gas	
BOPD 0	MCFGPD	Inj Rate	Pressure	BOPD 200	MCFGPD 98	Inj Rate	Pressure 460

**DAILY PRODUCTION TEST RECORD**

**DAILY INJECTION TEST RECORD**  Injection well  Brine disposal

Date	Oil (bbls)	Water (bbls)	Gas (Mcf)	Pressure		Date	Bbls water or Mcf gas	Pressure		Specific gravity of water
				Tubing	Casing			Beginning	Ending	
5/25/10	231	0	68	520	620					
5/26/10	178	0	96	482	688					
5/27/10	196	0	100	492	690					
5/28/10	211	0	100	460	691					
5/29/10	188	0	100	457	688					
5/30/10	195	0	100	453	688					
5/31/10	195	0	100	447	688					

**DAILY CHRONOLOGY**

Describe in detail the daily chronology of change/plugging, include days shut down. Describe exceptions to issued plugging instructions. Describe tools, tubing, etc. left in hole and any logs run. Include dates pits filled, surface restored etc. Use additional pages as needed.

Date	Narrative
5/14/10	MIRU set CIBP @ 4321' Mill Window & Kick off at 4310 under permit # 60094 land lateral at 4267', 2140' South of surface and 824' East TOH Run tbg to T.D.
5/21/10	Test Well

NOTICE: Under Part 615 Supervisor of Wells or Part 625 Mineral Wells, Act 451 PA 1994, as amended, a well owner has continuing liability for the integrity of a plugged well.

CERTIFICATION "I state that I am authorized by said owner. This report was prepared under my supervision and direction. The facts stated herein are true, accurate and complete to the best of my knowledge."

Name and title (printed or typed) *Timothy L. Baker - Operations Mgr* Authorized signature *[Signature]* Date *5/21/10*

NOTE: Bonds cannot be terminated until plugging is completed, cellar, rat and mouse holes, and pits filled, site leveled and cleaned and records filed.



## REC ID OF WELL DRILLING OR DEE, NING

Required by authority of Part 615 Supervisor of Wells or Part 625 Mineral Wells, of Act 451 PA 1994, as amended. Non-submission and/or falsification of this information may result in fines and/or imprisonment.

Permit number/Deepening number  
60094

(Submit 3 copies within 60 days of drilling completion.)

Part 615 Oil/Gas Well  Part 625 Mineral Well

Name and address of permittee		API number	
West Bay Exploration 13685 S. West Bay Shore Suite 200 Traverse City Mi. 49684		21-075-60011	
Name and address of drilling contractor		Well name and number	
Advanced Energy Services P.O. Box 85 South Boardman Mi. 49680		West Bay & Boyd #2-27 HD 1	
Date drilling began		Surface location	
05/15/2010	Date drilling completed	SW 1/4 of SE 1/4 of SW 1/4 Section 22 T4S R2E	
05/21/2010	Township		
Total depth of well	Formation at total depth	County	
Driller 5102 Log NA	Black River	Norvell Jackson	
Elevations	Footages North/South East/West		
K.B. 1042.6 ft. R.F. ft. R.T. 1041 ft. Grd 1029.2 ft	186' ft. from S line and 1440' ft. from W line of sec.		
Directionally drilled (check one)		Previous permit numbers	
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
Subsurface location (if directionally drilled)			
NE 1/4 of SE 1/4 of NW 1/4 Section 27 T 4S R 2E			
Township		County	
Norvell		Jackson	
Footages North/South East/West		1590' ft. from N line and 2256' ft. from W line of sec.	
Feet drilled - cable tools		Feet drilled - rotary tools	
from to		from surf to TD	

Casing, Casing Liners and Cementing, Operating Strings					Water Fill Up (F.U.) or Lost Circulation (L.C.) (X)				
Size	Where set	Cement	T.O.C.	Fl. pulled	Formation	F.U.	L.C.	Depth	Amount
11 3/4"	424'	150 lite/150 A	surface						
8 5/8"	3417'	650 lite/200 A	surface						
5 1/2"	4842'	75 Halcem	3300"						
		150 Halcem							
		(PN 60011)							

Gross Pay Intervals				All Other Oil and Gas Shows Observed or Logged							
Formation	Oil or Gas	From	To	Where Observed (X)							
Formation	Oil or Gas	Depth	Sam- ples	Odor	Pits	Mud Line	Gas Log	Fill Up			
Black River	both	4310'	5102'								

Depth Correction		Deviation Survey		Plugged Back		
Depth	Correction	Run at	Degrees	Yes	No	Depth
see	attached	directional				

Geophysical / Mechanical Logs (list each type run)		
Brand	Log types	Logged intervals
Unable to run logs in lateral		

Notice: Report complete sample and formation record, coring record, and drill stem test information on reverse side.

CERTIFICATION "I state that I am authorized by said owner This report was prepared under my supervision and direction. The facts stated herein are true, accurate and complete to the best of my knowledge."

Date	Name and title (print)	Signature
06/22/2010	Timothy L. Baker	

Submit to: OFFICE OF GEOLOGICAL SURVEY,  
MICHIGAN DEPT OF ENVIRONMENTAL QUALITY  
PO BOX 30256, LANSING, MI 48909-7756

# FORMATION REC RD

Attach additional sheets if necessary

API number

Permit number/Deepening number

60094

Elevation used

Geologist name

Tops taken from

1043

Fowler/Baker/Vancytle

Driller's log

Sample log

Electric log

From	To	Formation (type, color, hardness)	From	To	Formation (type, color, hardness)
<p>Note: if well directionally drilled, add true vertical depth formation tops where appropriate</p>					
surf	222(log)	Drift- Unconsolidated sand and gravel			
222	290	Shale& Siltstone- brn-gy-Grn, silty at top organic at base			
290	1230	Shale-Coldwater- Md-dk Brn-Blk, Silty, incr organic at base			
1230	1370	Sunbury Sh/Berea siltstone-Sh, Md Brn-Blk Silty, pyr. mixed w/siltstone, SSO-Lt md brn, Arg			
1370	15	Antrim-Dk Brn-Blk, Pyrand incr organic at base, SG incr toward base			
1554	1622	Traverse Fm- Limestone, Dk Brn-md Brn, Dns, Pyr, Dolomite, Md Gy-Gy, Dns			
1622	1744	Traverse Limestone-Md Brn-lt Brn Vfxln, Hd,			
1744	1978	Shale intbd w Dolomite and Lmst, Md Brn-Gy, Vfxln, Dns, Pos Dundee@1728'-Brn-Lt brn, Poor Samp, Pos Cvgs			
1978	2200	Detroit River- Anhydrite and Dolomite/Limestone, Lt-Md Brn Dns, Vfxln in pt, NS			
2200	2416	Bass Island/Bois Blanc- Dolomite, Anhydrite & Limestone AA			
2416	2685	G-Unit-Dolomite-Arg, Hd grading to Anhydrite- Lt-md Gy Brn			
2685	2766	C Shale-Gy-rdBrn, W/Dolomite and Anhydrite, Lt gy-Brn-bf Poor Samp. I			
2766	2972	B Evap-Anhydrite Wh-Lt Gy W/Dolomite-Vfxln, Lt-md Gy, Intbd at base with Anhy. AA	If well was cored, attach core description		
2972	3160	Dolo & Lmst-Wh-lt Gy, Dns, Anhydritic @3110-Wh, Dns	DRILL STEM TEST DATA		
3160	3386	Niagaran-Dolomite, AA, Md Gy, Vfxln Intbd W/Anhydrite AA, V porous 2880'-3300'			
3386	3884	Clinton/Cinn-Dolomite, Arg, hd, dk gy, grd to lt gy intbd w/Lmst, lt-md gy Dns			
3884	4212	Utica- Shale, Gy-Grn, Gummy-Hd			
4212	4526	Trenton-Dolo, Lt -Md Gy, Dns, W/ Lmst @ 4236'-4526' Lt-Md Gy Brn, Vfxln,			
4526	TD	Black River- Dolomite, Md Brn-GyBrn, SO&G@4590'			
	Under PN 60011				

4311

5102

discriptions of rock cuttings after  
drilling window  
Dolomite- Lt Gy - Lt Brn, fxln,so &G,  
G cut & Flu ,Tr Frac,Partial loss of  
returns

LIST ATTACHMENTS

OFFICE OF GEOLOGICAL SURVEY USE ONLY

Reviewed by

Date of review





Directional Drilling Contractors, LLC.

Job Number: DR100134

Company: WEST BAY EXPLORATION

Lease/Well: WEST BAY/ BOYD 2-27 HD1

Location: NORVELL TWP., JACKSON CO.

Rig Name: MCCONNELL & SCULLY

RKB:

G.L. or M.S.L.:

State/Country: MICHIGAN / USA

Declination: 6.37 DEGREES WEST

Grid:

File name: C:\WINSERVE\PENDING\2010\BOYD227.SVY

Date/Time: 24-May-10 / 12:20

Curve Name: WEST BAY/BOYD 2-27 HD1 (as drilled)

Directional Drilling Contractors  
SURVEY REPORT

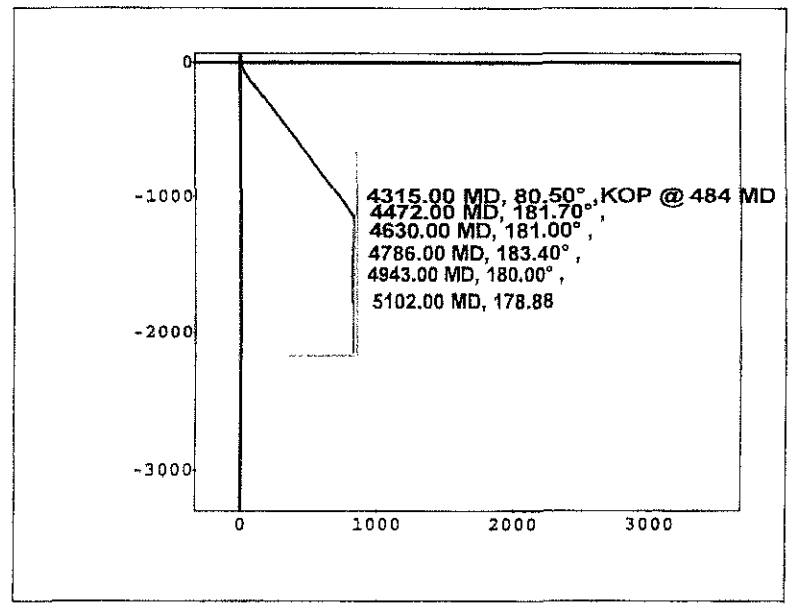
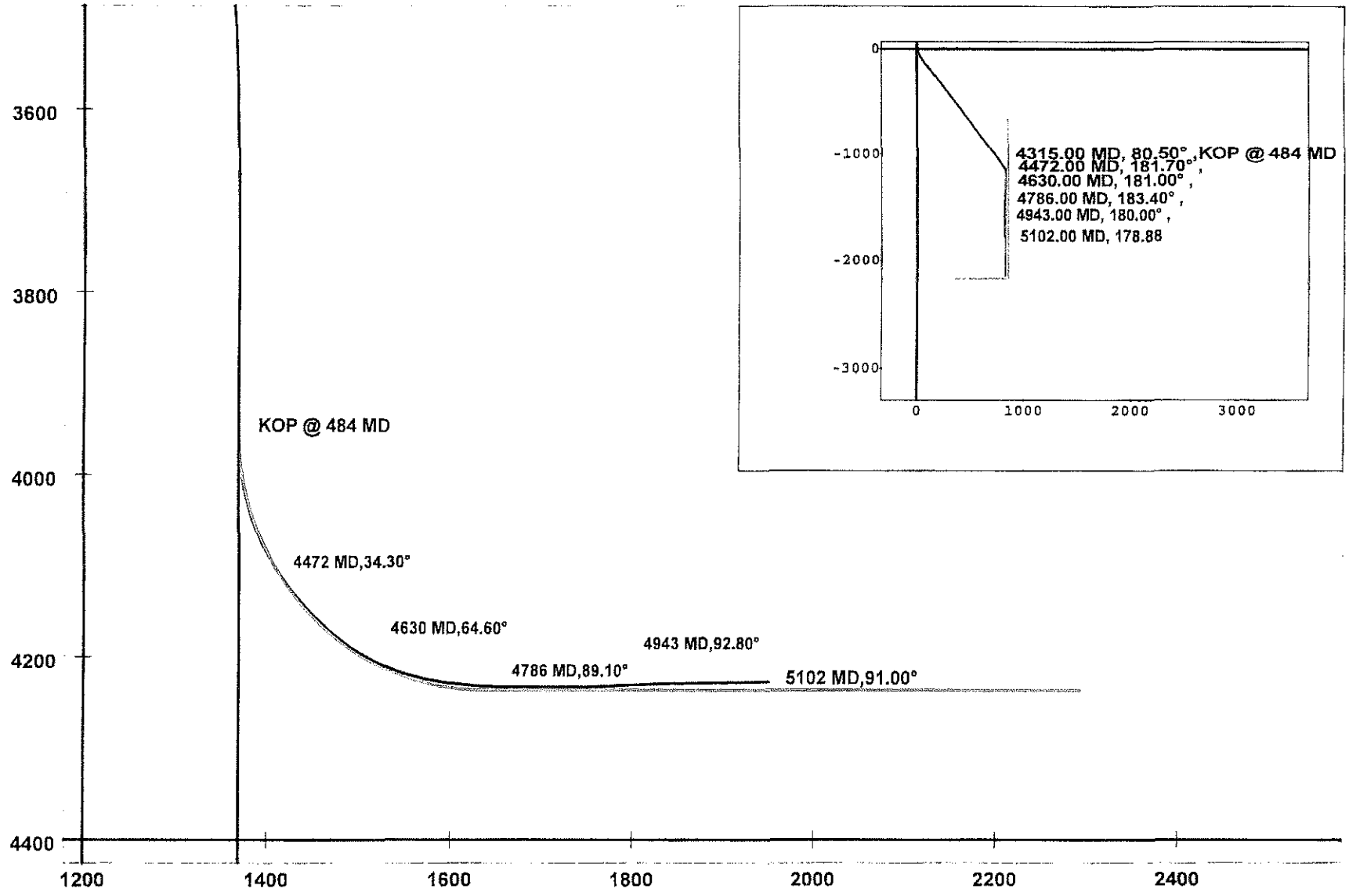
WINSERVE SURVEY CALCULATIONS  
Minimum Curvature Method  
Vertical Section Plane 158.94  
Vertical Section Referenced to Wellhead  
Rectangular Coordinates Referenced to Wellhead

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	True Vertical Depth	N-S FT	E-W FT	Vertical Section FT	CLOSURE		Dogleg Severity Deg/100
							Distance FT	Direction Deg	
<b>KOP @ TIE @ 4315 MD</b>									
4315.00	.30	80.50	3953.37	-1149.29	825.53	1369.17	1415.05	144.31	.00
4346.00	5.20	164.10	3984.33	-1150.63	826.00	1370.59	1416.41	144.33	16.69
4379.00	11.30	164.50	4016.97	-1155.19	827.27	1375.30	1420.86	144.39	18.49
4409.00	18.00	173.60	4045.98	-1162.63	828.57	1382.72	1427.67	144.52	23.55
4440.00	25.90	180.70	4074.72	-1174.18	829.03	1393.66	1437.36	144.78	26.84
4472.00	34.30	181.70	4102.38	-1190.21	828.67	1408.49	1450.28	145.15	26.30
4503.00	40.00	181.70	4127.08	-1208.92	828.12	1425.75	1465.35	145.59	18.39
4535.00	45.80	181.70	4150.51	-1230.68	827.47	1445.83	1483.00	146.08	18.12
4567.00	51.30	181.40	4171.68	-1254.65	826.83	1467.96	1502.59	146.61	17.20
4598.00	57.90	180.70	4189.63	-1279.90	826.37	1491.36	1523.49	147.15	21.37
4630.00	64.60	181.00	4205.01	-1307.94	825.95	1517.37	1546.90	147.73	20.95
4662.00	72.30	183.10	4216.76	-1337.66	824.87	1544.72	1571.54	148.34	24.82
4693.00	79.20	184.90	4224.39	-1367.61	822.77	1571.92	1596.03	148.97	22.96
4722.00	83.30	184.50	4228.80	-1396.17	820.42	1597.73	1619.38	149.56	14.20
4754.00	86.60	184.50	4231.61	-1427.94	817.92	1626.48	1645.61	150.20	10.31
4786.00	89.10	183.40	4232.81	-1459.84	815.72	1655.46	1672.28	150.80	8.53
4817.00	89.90	182.40	4233.08	-1490.80	814.15	1683.78	1698.63	151.36	4.13
4848.00	89.60	180.70	4233.22	-1521.79	813.31	1712.40	1725.49	151.88	5.57
4880.00	90.20	180.00	4233.28	-1553.79	813.12	1742.19	1753.69	152.38	2.88
4911.00	92.70	180.70	4232.49	-1584.77	812.93	1771.04	1781.11	152.84	8.37
4943.00	92.80	180.00	4230.96	-1616.74	812.73	1800.80	1809.52	153.31	2.21

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	True Vertical Depth	N-S FT	E-W FT	Vertical Section FT	CLOSURE		Dogleg Severity Deg/100
							Distance FT	Direction Deg	
4974.00	91.40	179.30	4229.82	-1647.71	812.92	1829.77	1837.34	153.74	5.05
5036.00	90.70	178.20	4228.68	-1709.69	814.28	1888.09	1893.69	154.53	2.10
5092.00	90.95	178.88	4227.87	-1765.66	815.70	1940.84	1944.98	155.20	1.29
<b>PROJECTED TD @ 5102 MD</b>									
5102.00	91.00	179.00	4227.70	-1775.66	815.89	1950.24	1954.13	155.32	1.29

Job Number: DR100134  
Company: WEST BAY EXPLORATION  
Lease/Well: WEST BAY/ BOYD 2-27 HD1  
Location: NORVELL TWP., JACKSON CO.  
Rig Name: MCCONNELL & SCULLY  
State/Country: MICHIGAN / USA

Declination: 6.37 DEGREES WEST  
File name: C:\WINSERVE\PENDING\20  
Date/Time: 24-May-10 / 12:17





## RECORD OF WELL COMPLETION

By authority of Part 615 or Part 625 of Act 451 PA 1994, as amended. Non-submission and/or falsification of this information may result in fines and/or imprisonment.

(Submit 3 copies within 60 days of well completion.)

Part 615 Oil/Gas Well  Part 625 Mineral Well

Permit number/deepening permit no. 60094	API number 21-075-60011
Type of well (after completion) oil	
Well name & number West Bay Boyd #2-27 HD 1	

Name and address of permittee West Bay Exploration 13685 S. West Bay Shore Drive Suite 200, Traverse City Mi. 49684					
Directionally drilled (check one) <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		Previous permit numbers		Total depth of well M.D. 5102' T.V.D. 4228'	
Surface location SW ¼ of SE ¼ of SW ¼ Section 22 T 4S R 2E			Subsurface location (if directionally drilled) NE ¼ of SE ¼ of NW ¼ Section 27 T 4S R 2E		
Township Napoleoni		County Jackson		Township Napoleon	
County Jackson		Township Napoleon		County Jackson	
Footages: North/South 186' Ft. from South line and 1440' Ft. from West line of Sec.			Footages: North/South 1590' Ft. from North line and 2256' Ft. from West line of Sec.		
Part 615 - oil/gas wells			Part 625 - mineral wells		
Date well completed oil & Gas		Producing formation(s) Black River		Injection formation(s)	
				Date of first injection	
				Disposal formation(s)	
				Solution formation(s)	

## COMPLETION INTERVALS(S)

Date	Number holes	Perforation or open hole interval	Open	
			Yes	No
5/25/10	open hole	4311-5102'	X	

## STIMULATION BY ACID OR FRACTURING

Date	Interval treated	Materials and amount used

## PRODUCTION TEST DATA

Oil Bbls/day	Gravity °API	Condensate Bbls/day	Gas MCF/day	Water Bbls/day	H <sub>2</sub> S Grains/100 ft <sup>3</sup>	B.H.P. and depth
200	43		98			

CERTIFICATION "I state that I am authorized by said owner. This report was prepared under my supervision and direction. The facts stated herein are true, accurate and complete to the best of my knowledge."

Name and title (print or type) Timothy L. Baker	Signature 	Date 05/30/10
--	---------------	------------------

Submit to: OFFICE OF GEOLOGICAL SURVEY  
MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY  
PO BOX 30256  
LANSING MI 48909-7756

12148 LADD

Geological Survey No.  

**MICHIGAN DEPARTMENT OF PUBLIC HEALTH  
WATER WELL AND PUMP RECORD**

  W 7671  
PERMIT NUMBER

<b>1 LOCATION OF WELL</b>		
County <b>JACKSON</b>	Township Name <b>NORVELL</b>	Fraction <b>SE 1/4 NE 1/4 NE 1/4</b>
		Section <b>27</b>
		Town Number <b>4 S</b>
		Range Number <b>2 E</b>
Distance and Direction From Road Intersection  <b>12148 LADD BROOKLYN MI 49230</b> <small>Street Address City of Well location</small>		
Locate with "X" in Section Below <small>Sketch Map</small>		
<b>3 OWNER OF WELL: ROBERT A. BRISTLE</b> 12148 LADD BROOKLYN MI 49230 <input type="checkbox"/> Address Same as Well Location? <input checked="" type="checkbox"/>		
<b>4 WELL DEPTH:</b> 188 ft.		<b>Date Completed:</b> 8/6/99 <b>NEW WELL</b>
<b>5 DRILLING METHOD:</b> ROTARY		
<b>6 USE:</b> DOMESTIC		
<b>7 CASING:</b> PLASTIC Diameter 5" to 173 ft. depth		<b>Height:</b> ABOVE Surface 1'
Grouted Drill Hole Diameter 9" to 173 ft. depth		<b>Weight SDR 21</b>
<b>8 SCREEN:</b> Type: NONE Diameter " Nominal		
<b>FITTINGS:</b>		
<b>9 STATIC WATER LEVEL:</b> 52 ft. below land surface <b>Flow?</b> <input type="checkbox"/>		
<b>10 PUMPING LEVEL:</b> below land surface 52 ft. after 2 hrs. pumping at 12 G.P.M.		
<b>11 WELL HEAD COMPLETION:</b> PITLESS ADAPTOR		
<b>12 WELL GROUTED?</b> <input checked="" type="checkbox"/> EZ SEAL From 0 to 173 ft. 19 bags of cement.		
<b>13 NEAREST SOURCE OF CONTAMINATION:</b> Type SEPTIC Distance 150 ft. Direction S Well disinfected upon completion? <input checked="" type="checkbox"/> Old Well Plugged? <input type="checkbox"/>		
<b>14 PUMP:</b> Manufacturers name RED JACKET Model number 75CNSWI-12SBC HP 3/4 VOLTS 230V Length of Drop Pipe 75 ft. capacity 12 G.P.M. Type SUBMERSIBLE <b>PRESSURE TANK:</b> Manufacturers Name AMTROL (OWNERS) Model Number WX 202 Capacity 6.2 Gallons		
<p><b>RECEIVED SEP 09 1999</b></p> <p><b>RECEIVED</b></p> <p>MICH DEPT OF ENVIRONMENTAL QUALITY</p> <p><b>OCT 08 1999</b></p> <p><small>Drinking Water &amp; Foundation Protection Ground Water Protection Division WELL CONSTRUCTION UNIT</small></p>		
<small>CRIBLEY OFFICE NOTES</small>		
WELLS AWC 5-1 1" PVC 75 CDCW14574P18808		

<b>15 REMARKS, ELEVATION, SOURCE OF DATA, ETC.</b>  NO LINER	<b>16 WATER WELL CONTRACTOR'S CERTIFICATION:</b> <small>This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.</small> <b>Cribley Drilling Co., Inc.</b> <span style="float: right;"><b>81-0524</b></span> <small>REGISTERED BUSINESS NAME</small> <span style="float: right;"><small>REGISTRATION NO.</small></span> Address: 8300 Dexter Chevrolet Rd., Dexter, MI 48130 Signed: <i>Jack A. Clark</i> <span style="float: right;">Date: 8/17/99</span> <small>AUTHORIZED REPRESENTATIVE</small>
<b>17 RIG OPERATOR'S NAME</b>  KEN PEARCE	

D67d 2/89

**IMPORTANT: File with dect.**

**GEOLOGICAL SURVEY COPY**

Authority: Act 368 PA 1978  
Completion: Required  
Penalty: Conviction of a violation of any provision is a misdemeanor

H 313-675-8958  
W 313-481-7901

**DEQ MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY**  
**DRINKING WATER & RADIOLOGICAL PROTECTION DIVISION**

**WATER WELL AND PUMP RECORD**

Completion is required under authority of Part 127 Act 368 PA 1978

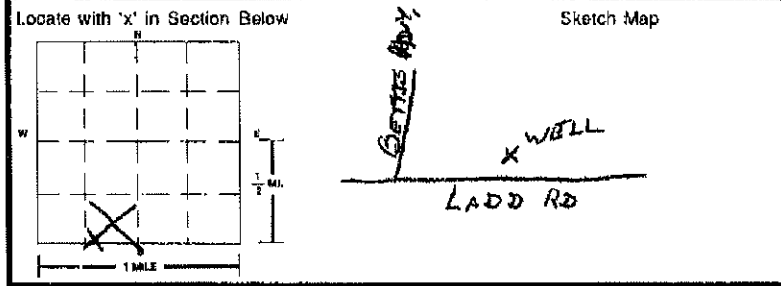
Failure to comply is a misdemeanor

TAX NO:

PERMIT NO: **W-4119**

1. LOCATION OF WELL  
County **JACKSON** Township Name **NORWELL** Fraction **S<sup>1</sup>/<sub>4</sub> S<sup>1</sup>/<sub>4</sub> S<sup>1</sup>/<sub>4</sub> S<sup>1</sup>/<sub>4</sub>** Section No. **22** Town No. **45** Range No. **2E**

Distance and Direction from Road Intersection  
**1/4 MILE EAST OF BETTIE'S HWY. ON N. SIDE OF LADD RD.**



3. OWNER OF WELL **LARRY KLOPPER**  
Address **12160 LADD RD. BROOKLYN, MI**  
Address Same as Well Location  Yes  No

4. WELL DEPTH: **114** ft. Date Completed **5/20/98**  
 New Well  Replacement Well

5.  Cable Tool  Rotary  Driven  Dug  
 Hollow Rod  Auger/Bored  Jetted

6. USE:  Household  Type I Public  Type III Public  
 Irrigation  Type IIa Public  Heat Pump  
 Test Well  Type IIb Public

7. CASING:  Steel  Threaded  Plastic  Welded  
 Other  
Height: Above/Below Surface: **1** ft  
Diameter: **5** in. to **108** ft. depth Weight: **PVC** lbs/ft.  
BORE HOLE: Diameter: **8** in. to **114** ft. depth  Drive Shoe  Shaft Packer

8. SCREEN:  Not Installed  Gravel-Packed  
Type **JOHNSON** Diameter **4"**  
Slot/Gauze **20** Length: **6 FT**  
Set Between **108** ft. and **114** ft.  
FITTINGS:  K-Packer  Bremer Check  Blank Above Screen  Other **THREAD ON**

9. STATIC WATER LEVEL: **30** ft. Below Land Surface  Flowing

10. PUMPING LEVEL: Below Land Surface **50** ft. After **2** hrs. Pumping at **12** G.P.M.  
 Plunger  Bailor  Air  Test Pump

11. WELL HEAD COMPLETION:  Pitless Adapter  12" Above Grade  
 Basement Offset  Well House

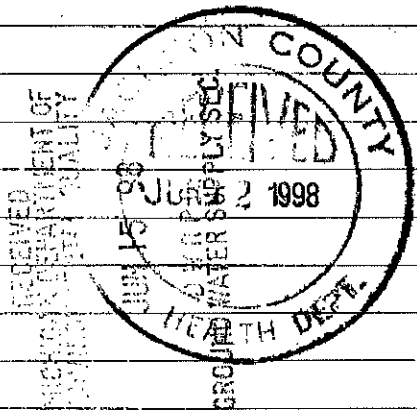
12. WELL GROUTED?  No  Yes From **0** to **108** ft.  
 Neat Cement  Bentonite  Other  
No. of Bags **5 1/2** Additives **BELSEAL**

13. NEAREST SOURCE OF POSSIBLE CONTAMINATION:  
Type **SEPTIC** Distance **50+** ft. Direction **NORTH**  
Type \_\_\_\_\_ Distance \_\_\_\_\_ ft. Direction \_\_\_\_\_

14. PUMP:  Not Installed  Pump Installation Only  
Manufacturer's Name **MYERS**  
Model Number **JS12A** HP **1/2** Volts **230**  
Length of Drop Pipe **80** ft. Capacity **10** G.P.M.  
TYPE:  Submersible  Jet  Other  
PRESSURE TANK:  
Manufacturer's Name **WEL-X-TROL**  
Model Number **WX-202** Capacity **20** Gallons

2. FORMATION DESCRIPTION

FORMATION DESCRIPTION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
<b>SAND</b>	<b>27</b>	<b>27</b>
<b>CLAY</b>	<b>64</b>	<b>91</b>
<b>GRAVEL + CLAY</b>	<b>12</b>	<b>103</b>
<b>SAND + GRAVEL</b>	<b>11</b>	<b>114</b>



USE A 2ND SHEET IF NEEDED

15. ABANDONED WELL PLUGGED?  Yes  No  
Casing Diameter \_\_\_\_\_ in. Depth \_\_\_\_\_ ft.  
PLUGGING MATERIAL:  Neat Cement  Bentonite Slurry  
 Cement/Bentonite Slurry  Concrete Grout  Bentonite Chips  
No. of Bags \_\_\_\_\_ Casing Removed?  Yes  No

16. REMARKS: (Elevation, Source of Data, etc.)

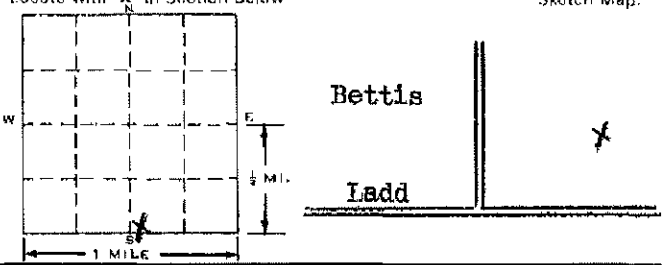
17. DRILLING MACHINE OPERATOR:  
 Employee  Subcontractor  
Name **CHARLES F. TORNOW**

18. WATER WELL CONTRACTOR'S CERTIFICATION:  
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.  
**GARDNER & SONS INC.** **3039**  
REGISTERED BUSINESS NAME REGISTRATION NO.  
Address **3768 M-50 TIRTON, MI 49287**  
Signed **Philip R. Gode** Date **5-20-98**  
AUTHORIZED REPRESENTATIVE

**WATER WELL AND PUMP RECORD**

PART 127 ACT 368, P.A. 1978

PERMIT NUMBER

<b>1 LOCATION OF WELL</b>		Fraction <u>SW 1/4 SW 1/4 SE 1/4</u> Section Number <u>(22) 21</u> Town Number <u>T4S N/S</u> Range Number <u>R2E E/W</u>																			
County <u>Jackson</u> Township Name <u>Norvell</u>		Distance And Direction From Road Intersection <u>1/2 mi E Bettis &amp; Ladd Roads</u> <u>12180 Ladd Rd</u> Street Address & City of Well Location																			
Locate with "X" in Section Below 		3 OWNER OF WELL: <u>Harry Haligus</u> Address <u>12180 Ladd Road</u> <u>Brooklyn, MI 49230</u> Address Same As Well Location? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No																			
<b>2 FORMATION DESCRIPTION</b> <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 70%;">FORMATION DESCRIPTION</th> <th style="width: 15%;">THICKNESS OF STRATUM</th> <th style="width: 15%;">DEPTH TO BOTTOM OF STRATUM</th> </tr> </thead> <tbody> <tr> <td>Sand and gravel</td> <td style="text-align: center;">21</td> <td style="text-align: center;">21</td> </tr> <tr> <td>Sand, gravel and shale</td> <td style="text-align: center;">89</td> <td style="text-align: center;">110</td> </tr> <tr> <td>Dirty shale, sand and gravel</td> <td style="text-align: center;">24</td> <td style="text-align: center;">134</td> </tr> <tr> <td>Sand, gravel and shale</td> <td style="text-align: center;">14</td> <td style="text-align: center;">148</td> </tr> <tr> <td>Sandstone</td> <td style="text-align: center;">32</td> <td style="text-align: center;">180</td> </tr> </tbody> </table>		FORMATION DESCRIPTION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM	Sand and gravel	21	21	Sand, gravel and shale	89	110	Dirty shale, sand and gravel	24	134	Sand, gravel and shale	14	148	Sandstone	32	180	4 WELL DEPTH: (completed) <u>180</u> ft Date of Completion <u>11/30/83</u> 5 <input type="checkbox"/> Cable tool <input checked="" type="checkbox"/> Rotary <input type="checkbox"/> Driven <input type="checkbox"/> Dug <input type="checkbox"/> Hollow rod <input type="checkbox"/> Auger <input type="checkbox"/> Jetted <input type="checkbox"/> _____ 6 USE: <input checked="" type="checkbox"/> Domestic <input type="checkbox"/> Type I Public <input type="checkbox"/> Type III Public <input type="checkbox"/> Irrigation <input type="checkbox"/> Type IIa Public <input type="checkbox"/> Heat pump <input type="checkbox"/> Test Well <input type="checkbox"/> Type IIb Public <input type="checkbox"/> _____ 7 CASING Diameter <input type="checkbox"/> Steel <input type="checkbox"/> Threaded <input type="checkbox"/> Welded <input checked="" type="checkbox"/> Plastic <input type="checkbox"/> _____ <u>5</u> in. to <u>156</u> ft depth Grouted Drill Hole Diameter <u>8</u> in. to <u>156</u> ft. depth _____ in. to _____ ft. depth Height Above/Surface <u>1</u> ft Weight <u>2</u> lbs./ft. Drive Shoe <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
		FORMATION DESCRIPTION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM																	
		Sand and gravel	21	21																	
		Sand, gravel and shale	89	110																	
		Dirty shale, sand and gravel	24	134																	
Sand, gravel and shale	14	148																			
Sandstone	32	180																			
8 SCREEN: <input checked="" type="checkbox"/> Not installed Type _____ Diameter _____ Slot/Gauze _____ Length _____ Set between _____ ft and _____ ft. FITTINGS <input type="checkbox"/> K-Packer <input type="checkbox"/> Lead Packer <input type="checkbox"/> Bremer Check <input type="checkbox"/> Blank above screen _____ ft. Other _____																					
9 STATIC WATER LEVEL: <u>43</u> ft. below land surface <input type="checkbox"/> Flow																					
10 PUMPING LEVEL: below land surface <u>44</u> ft. after <u>1</u> hrs. pumping at <u>15</u> G.P.M. _____ ft. after _____ hrs. pumping at _____ G.P.M.																					
11 WELL HEAD COMPLETION <input type="checkbox"/> Piless adapter <input checked="" type="checkbox"/> 12" above grade <input type="checkbox"/> Basement offset <input type="checkbox"/> Approved pit																					
12 WELL GROUTED? <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes From <u>1</u> to <u>156</u> ft. <input type="checkbox"/> Neat cement <input checked="" type="checkbox"/> Bentonite <input type="checkbox"/> Other _____ No. of bags of cement <u>1</u> Additives _____																					
13 Nearest source of possible contamination Type _____ Distance _____ ft. Direction _____ Well disinfected upon completion? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No																					
14 PUMP: <input checked="" type="checkbox"/> Not Installed <input type="checkbox"/> Pump Installation Only Manufacturer's name _____ Model number _____ HP _____ Volts _____ Length of Drop Pipe _____ ft. capacity _____ G.P.M. TYPE: <input type="checkbox"/> Submersible <input type="checkbox"/> Jet PRESSURE TANK: Manufacturer's name _____ Model number _____ Capacity _____ Gallons																					
15. Remarks, elevation, source of data, etc. RECEIVED Mich. Dept. of Public Health JUN 7 1984 Bureau of Environmental and Occupational Health - SWCS		16. WATER WELL CONTRACTOR'S CERTIFICATION: This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief. Fox & Boley Well Drilling, Inc. 167 - 1517 REGISTERED BUSINESS NAME REGISTRATION NO. Address <u>6655 Brooklyn Rd., Jackson, MI 49201</u> Signed <u>Thomas L. Melville</u> Date <u>5/14/84</u> AUTHORIZED REPRESENTATIVE																			

770hally  
12215 Ladd Rd



# Water Well And Pump Record

Completion is required under authority of Part 127 Act 368 PA 1978.



Failure to comply is a misdemeanor.

Import ID:

<b>Tax No:</b>	<b>Permit No:</b> 11701	<b>County:</b> Jackson		<b>Township:</b> Norvell	
<b>Well ID: 38000006689</b>	<b>Town/Range:</b> 04S 02E	<b>Section:</b> 27	<b>Well Status:</b> Active	<b>WSSN:</b>	<b>Source ID/Well No:</b>
	<b>Distance and Direction from Road Intersection:</b> .4 MILE E OF LADD RD & BETTIS RD				
	<b>Well Owner:</b> NEIL WELCH				
	<b>Well Address:</b> 1215 LADD RD		<b>Owner Address:</b> 305 CASS AVE JACKSON, MI 49203		
<b>Elevation:</b>					
<b>Latitude:</b> 42.10084738					
<b>Longitude:</b> -84.18260323					
<b>Method of Collection:</b> Interpolation-Map					

<b>Drilling Method:</b> Rotary	<b>Well Use:</b> Household	<b>Pump Installed:</b> Yes	<b>Pump Installation Only:</b> No
<b>Well Depth:</b> 196.00 ft.	<b>Date Completed:</b> 8/1/2003	<b>Pump Installation Date:</b>	<b>HP:</b> 0.50
<b>Well Type:</b> New	<b>Height:</b>	<b>Manufacturer:</b> Aermotor	<b>Pump Type:</b> Submersible
<b>Casing Type:</b> PVC plastic		<b>Model Number:</b> A-12-50	<b>Pump Capacity:</b> 12 GPM
<b>Casing Joint:</b> Unknown		<b>Drop Pipe Length:</b> 65.00 ft.	<b>Pump Voltage:</b>
<b>Casing Fitting:</b> Shale packer/trap		<b>Drop Pipe Diameter:</b>	<b>Drilling Record ID:</b>
<b>Diameter:</b> 5.00 in. to 168.00 ft. depth		<b>Draw Down Seal Used:</b> No	
<b>Borehole:</b> 8.00 in. to 168.00 ft. depth 4.75 in. to 196.00 ft. depth		<b>Pressure Tank Installed:</b> Yes	<b>Tank Capacity:</b> 5.0 Gallons
		<b>Pressure Tank Type:</b> Unknown	
		<b>Manufacturer:</b> Well-Mate	
		<b>Model Number:</b> WM-6	
		<b>Pressure Relief Valve Installed:</b> No	

<b>Static Water Level:</b> 43.00 ft. Below Grade (Not Flowing) <b>Unrestricted Flow Rate:</b> <b>Well Yield Test:</b> Pumping level 47.00 ft. after 1.00 hrs. at 20 GPM	<b>Yield Test Method:</b> Test pump	<b>Formation Description</b>	<b>Thickness</b>	<b>Depth to Bottom</b>
		Clay Sand Gravel	8.00	8.00
		Sand & Gravel W/Stones	4.00	12.00
		Sand & Gravel	25.00	37.00
		Clay	18.00	55.00
		Clay Sand Gravel	31.00	86.00
		Sand & Gravel Silty	19.00	105.00
		Clay Sand Gravel	50.00	155.00
		Sand & Gravel	7.00	162.00
		Gray Sandstone	34.00	196.00

<b>Screen Installed:</b> No	<b>Intake:</b> Bedrock Well	<b>Geology Remarks:</b>
<b>Well Grouted:</b> Yes	<b>Grouting Method:</b> Unknown	
<b>Grouting Material:</b> Bentonite slurry	<b>Bags:</b> 16.00	
	<b>Additives:</b> None	
	<b>Depth:</b> 0.00 ft. to 168.00 ft.	

<b>Wellhead Completion:</b> Pitless adapter
---

<b>Nearest Source of Possible Contamination:</b>	<b>Drilling Machine Operator Name:</b> TBURKHOLDER/MSEXTON
<b>Type:</b> Septic tank	<b>Employment:</b> Employee
<b>Distance:</b> 50 ft.	
<b>Direction:</b> Southwest	

<b>Contractor Type:</b> Water Well Drilling Contractor	<b>Reg No:</b> 167
<b>Business Name:</b> FOX & BOLEY WELL DRILLING, INC	
<b>Business Address:</b>	

<b>Water Well Contractor's Certification</b>	
This well was drilled under my supervision and this report is true to the best of my knowledge and belief.	
<b>Signature of Registered Contractor</b>	<b>Date</b>

<b>General Remarks:</b>
<b>Other Remarks:</b>

**ATTENTION WELL OWNER: FILE WITH DEED**





# Water Well And Pump Record



Completion is required under authority of Part 127 Act 368 PA 1978.

Failure to comply is a misdemeanor.

Import ID:

<b>Tax No:</b>	<b>Permit No:</b> 8613	<b>County:</b> Jackson		<b>Township:</b> Norvell	
<b>Well ID:</b> 38000004062	<b>Town/Range:</b> 04S 02E	<b>Section:</b> 27	<b>Well Status:</b> Active	<b>WSSN:</b>	<b>Source ID/Well No:</b>
	<b>Distance and Direction from Road Intersection:</b> 2/10 MI E. OF LADD RD. & BETTIS RD				
	<b>Well Owner:</b> HOLLIS HAMM				
<b>Elevation:</b>	<b>Well Address:</b>		<b>Owner Address:</b>		
<b>Latitude:</b> 42.10158183	12161 LADD RD.		12161 LADD RD.		
<b>Longitude:</b> -84.18806133	BROOKLYN, MI 49230		BROOKLYN, MI 49230		
<b>Method of Collection:</b> Address Matching-House Number					

<b>Drilling Method:</b> Rotary	<b>Well Use:</b> Household	<b>Pump Installed:</b> Yes	<b>Pump Installation Only:</b> No
<b>Well Depth:</b> 212.00 ft.	<b>Date Completed:</b> 7/7/2000	<b>Pump Installation Date:</b>	<b>HP:</b> 1.00
<b>Well Type:</b> New	<b>Height:</b>	<b>Manufacturer:</b> Aermotor	<b>Pump Type:</b> Submersible
<b>Casing Type:</b> PVC plastic		<b>Model Number:</b> A+20-100	<b>Pump Capacity:</b> 20 GPM
<b>Casing Joint:</b> Other		<b>Drop Pipe Length:</b> 65.00 ft.	<b>Pump Voltage:</b>
<b>Casing Fitting:</b> Drive shoe		<b>Drop Pipe Diameter:</b>	<b>Drilling Record ID:</b>
<b>Diameter:</b> 5.00 in. to 176.00 ft. depth		<b>Draw Down Seal Used:</b> No	
<b>Borehole:</b> 8.00 in. to 176.00 ft. depth		<b>Pressure Tank Installed:</b> Yes	
		<b>Pressure Tank Type:</b> Unknown	
		<b>Manufacturer:</b> Well-Mate	
		<b>Model Number:</b> WM-14WB	<b>Tank Capacity:</b> 14.0 Gallons
		<b>Pressure Relief Valve Installed:</b> No	

<b>Static Water Level:</b> 45.00 ft. Below Grade (Not Flowing) <b>Unrestricted Flow Rate:</b> <b>Well Yield Test:</b> Pumping level 46.00 ft. after 1.00 hrs. at 20 GPM	<b>Yield Test Method:</b> Test pump	<b>Formation Description</b>	<b>Thickness</b>	<b>Depth to Bottom</b>
		Sand & Gravel	2.00	2.00
		Clay	7.00	9.00
		Sand & Gravel	6.00	15.00
		Clay	4.00	19.00

<b>Screen Installed:</b> No <b>Intake:</b> Bedrock Well	Clay Sand Gravel	65.00	84.00
	Sand & Gravel	11.00	95.00
	Sand & Gravel	13.00	108.00
	Clay Sand Gravel	22.00	130.00
	Gray Sandstone	2.00	132.00
	Clay Sand Gravel	20.00	152.00
	Sand Gravel Clay	8.00	160.00
	Sand & Gravel	11.00	171.00
	Gray Sandstone	27.00	198.00

<b>Well Grouted:</b> Yes	<b>Grouting Method:</b> Unknown	<b>(Continued On Page 2)</b>		
<b>Grouting Material:</b> Bentonite slurry	<b>Bags:</b> 18.00	<b>Additives:</b> Other	<b>Depth:</b> 0.00 ft. to 175.00 ft.	<b>Geology Remarks:</b>

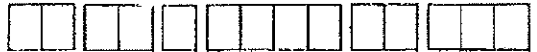
<b>Wellhead Completion:</b> Pitless adapter	
---	--

<b>Nearest Source of Possible Contamination:</b>	<b>Drilling Machine Operator Name:</b> TBURKHOLDER/HHARRIS
<b>Type:</b> None	<b>Employment:</b> Employee
<b>Distance:</b>	
<b>Direction:</b>	

<b>(Continued on page 2)</b>	
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<b>General Remarks:</b>
<b>Other Remarks:</b> Casing Joint:GLUED, Grouting Additive 1:QUICK-GROUT/BENSEAL

**ATTENTION WELL OWNER: FILE WITH DEED**



MAR 30 1973

**WATER WELL RECORD**  
ACT 294 PA 1965

MICHIGAN DEPARTMENT  
OF  
PUBLIC HEALTH

<b>1 LOCATION OF WELL</b>					
County <b>Jackson</b>	Township Name <b>Norvell</b>	Fraction <b>SW<sup>1</sup>/<sub>4</sub> SW<sup>1</sup>/<sub>4</sub> SW<sup>1</sup>/<sub>4</sub></b>	Section Number <b>22</b>	Town Number <b>T4S N/S.</b>	Range Number <b>R2E E/W.</b>

Distance And Direction from Road Intersections  
**NE corner Bettis & Ladd Roads**

Street address & City of Well Location  
**Ladd Road**

Locate with "X" in section below

**3 OWNER OF WELL:**  
Address **Joseph Natter**  
**1005 Lakeview**  
**Brooklyn, Michigan 49230**

**4 WELL DEPTH:** (completed) Date of Completion  
**180** ft. **2/7/73**

**5**  Cable tool  Rotary  Driven  Dug  
 Hollow rod  Jotted  Bored

**6 USE:**  Domestic  Public Supply  Industry  
 Irrigation  Air Conditioning  Commercial  
 Test Well

**7 CASING:** Threaded  Welded  Height: Above/Below  
Diam. \_\_\_\_\_ Surface **1** ft.  
Weight **11** lbs./ft.  
Drive Shoe? Yes  No

2 FORMATION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
Sand	15	15
Shale and gravel	110	125
Shale	8	137
Gravel	8	145
Shale	10	155
Gravel	6	161
Shale	4	165
Sandstone	15	180

**8 SCREEN:**  
Type: none Dia.: \_\_\_\_\_  
Slot/Gauze \_\_\_\_\_ Length \_\_\_\_\_  
Set between \_\_\_\_\_ ft. and \_\_\_\_\_ ft.  
Fittings: \_\_\_\_\_

**9 STATIC WATER LEVEL**  
**45** ft. below land surface

**10 PUMPING LEVEL** below land surface  
**50** ft. after **2** hrs. pumping **20** g.p.m.  
\_\_\_\_\_ ft. after \_\_\_\_\_ hrs. pumping \_\_\_\_\_ g.p.m.

**11 WATER QUALITY** in Parts Per Million:  
Iron (Fe) \_\_\_\_\_ Chlorides (Cl) \_\_\_\_\_  
Hardness \_\_\_\_\_ Other \_\_\_\_\_

**12 WELL HEAD COMPLETION:**  In Approved Pit  
 Pitless Adaptor  12" Above Grade

**13 Well Grouted?**  Yes  No  
 Neat Cement  Bentonite   
Depth: From \_\_\_\_\_ ft. to \_\_\_\_\_ ft.

**14 Nearest Source of possible contamination**  
**none** feet \_\_\_\_\_ Direction \_\_\_\_\_ Type \_\_\_\_\_  
Well disinfected upon completion  Yes  No

**15 PUMP:**  Not installed **as yet**  
Manufacturer's Name \_\_\_\_\_  
Model Number \_\_\_\_\_ HP \_\_\_\_\_ Volts \_\_\_\_\_  
Length of Drop Pipe \_\_\_\_\_ ft. capacity \_\_\_\_\_ G.P.M.  
Type:  Submersible  Jet  Reciprocating

**16 Remarks, elevation, source of data, etc.**

ADDED INFO. BY DRILLER, ITEM 211

CORRECTED BY \_\_\_\_\_

ADDITION BY \_\_\_\_\_

**17 WATER WELL CONTRACTOR'S CERTIFICATION:**  
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

**For Brothers Drillers, Inc.** REGISTRATION NO. **167**

Address **6655 Brooklyn Road, Jackson, Michigan 49201**

Signed *[Signature]* Date **2/20/73**  
AUTHORIZED REPRESENTATIVE

**Appendix  
"5"**



# APPENDIX 5

SPL Inc.  
 459 Hughes Drive  
 Traverse City, MI 49686  
 Phone: (231) 947-5777  
 Fax: (231) 947-1072

## GENERAL WATER ANALYSIS

WorkOrder: T10080299 LANTIS 2-30 WELL

Lab ID: T10080299001 Date/Time Received: 8/26/2010 10:51 Matrix: Water  
 Sample ID: LANTIS 2-30 WELL Date/Time Collected: 8/19/2010 12:30

Method	Parameters	Results	Analyzed
<b>ANION</b>			
EPA 310.1	Alkalinity, CO <sub>3</sub> <sup>2-</sup> as CaCO <sub>3</sub>	ND mg/l	09/02/2010 14:19 by MD
EPA 310.1	Alkalinity, HCO <sub>3</sub> <sup>-</sup> as CaCO <sub>3</sub>	230 mg/l	09/02/2010 14:19 by MD
EPA 325.2	Chloride	174000 mg/l	09/10/2010 16:27 by MD
EPA 375.4	Sulfate	315 mg/l	09/09/2010 14:20 by MD
EPA 376.2	Sulfide	ND mg/l	09/09/2010 15:49 by JS
<b>CATION</b>			
EPA 200.8	Calcium	28400 mg/l	09/09/2010 21:40 by JS
EPA 200.8	Magnesium	4870 mg/l	09/09/2010 22:39 by JS
EPA 200.8	Potassium	3000 mg/l	09/09/2010 22:39 by JS
EPA 200.8	Sodium	37600 mg/l	09/09/2010 21:40 by JS
EPA 200.8	Barium	2.25 mg/l	09/09/2010 22:39 by JS
EPA 200.8	Iron	81.4 mg/l	09/09/2010 22:39 by JS
<b>OTHER</b>			
EPA 150.1	pH	6.1 SU	09/03/2010 11:59 by MD
EPA 120.1	Resistivity	0.0460 ohm-meter	09/03/2010 00:37 by MD
ASTM D1429	Specific Gravity	1.193	09/08/2010 14:39 by JS
	Total dissolved solids (calculated) =	248498.65	



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EPA 310.1	Alkalinity, HCO3- as CaCO3	230 mg/l	09/02/2010 14:19 by MD
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