Attachment B-2

OMB No. 2040-0042 Approval Expires 12/31/2011

United States Environmental Protection Agency

Underground Injection Control Permit Application

(Collected under the authority of the Safe Drinking Water Act. Sections 1421, 1422, 40 CFR 144)

I. EPA ID Number		
	T/A	C
U		

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

Owner Name: West Bay Exploration Company

Street Address: 13685 South West Bay Shore Drive, Suite #200

Phone Number: (231) 946-0200

City: Traverse City | State: MI | ZIP CODE: 49684

III. Operator Name and Address

Owner Name: West Bay Exploration Company

Street Address: 13685 South West Bay Shore Suite #200

Phone Number: (231) 946-0200

City: Traverse City | State: MI | ZIP CODE: 49684

IV. Commercial Facility

[ ] Yes
[x] No

V. Ownership

[x] Private
[ ] Federal
[ ] Other

VI. Legal Contact

[x] Owner
[ ] Operator

VII. SIC Codes

1311

VIII. Well Status *(Mark "x")*

[ ] A. Operating — Date Started mo day year:

[ ] B. Modification/Conversion [x] C. Proposed

IX. Type of Permit Requested *(Mark "x" and specify if required)*

[x] A. Individual [ ] B. Area

Number of Existing Wells	Number of Proposed Wells	Name(s) of field(s) or project(s)
0	1	Napoleon

X. Class and Type of Well *(see reverse)*

A. Class(es) (enter code(s))	B. Type(s) (enter code(s))	C. If class is "other" or type is code 'x,' explain	D. Number of wells per type (if area permit)
II	D		

XI. Location of Well(s) or Approximate Center of Field or Project

XII. Indian Lands (Mark 'x')

[ ] Yes
[x] No

Latitude Deg	Min	Sec	Longitude Deg	Min	Sec	Township and Range 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: Ann M Bath for Timothy Brock - Agent for WBE

D. Date Signed: 3/20/11

EPA Form 7520-6 (Rev. 12-08)

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

Class	**Attachments**
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 - U derground Injection Control (UIC) ermit 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, dry holes, 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 USDW (CLASS II)** - For Class II wells, submit geol 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** - mit evidence such as a surety bond or financ tatement 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

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.

Name of USDW	Measured Top of USDW	Measured Base of USDW
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'

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)*(SG of Inj. Fluid + 0.05)]*Upper Depth of Inj. Zone} – 14.7

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

P_{max} = 682 psig

Attachment I

Formation Testing Program:

No formation testing is planned for this well.

Attachment J

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

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:

Well Name	EPA Permit Number	State Permit Number	Location	Township	County
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:

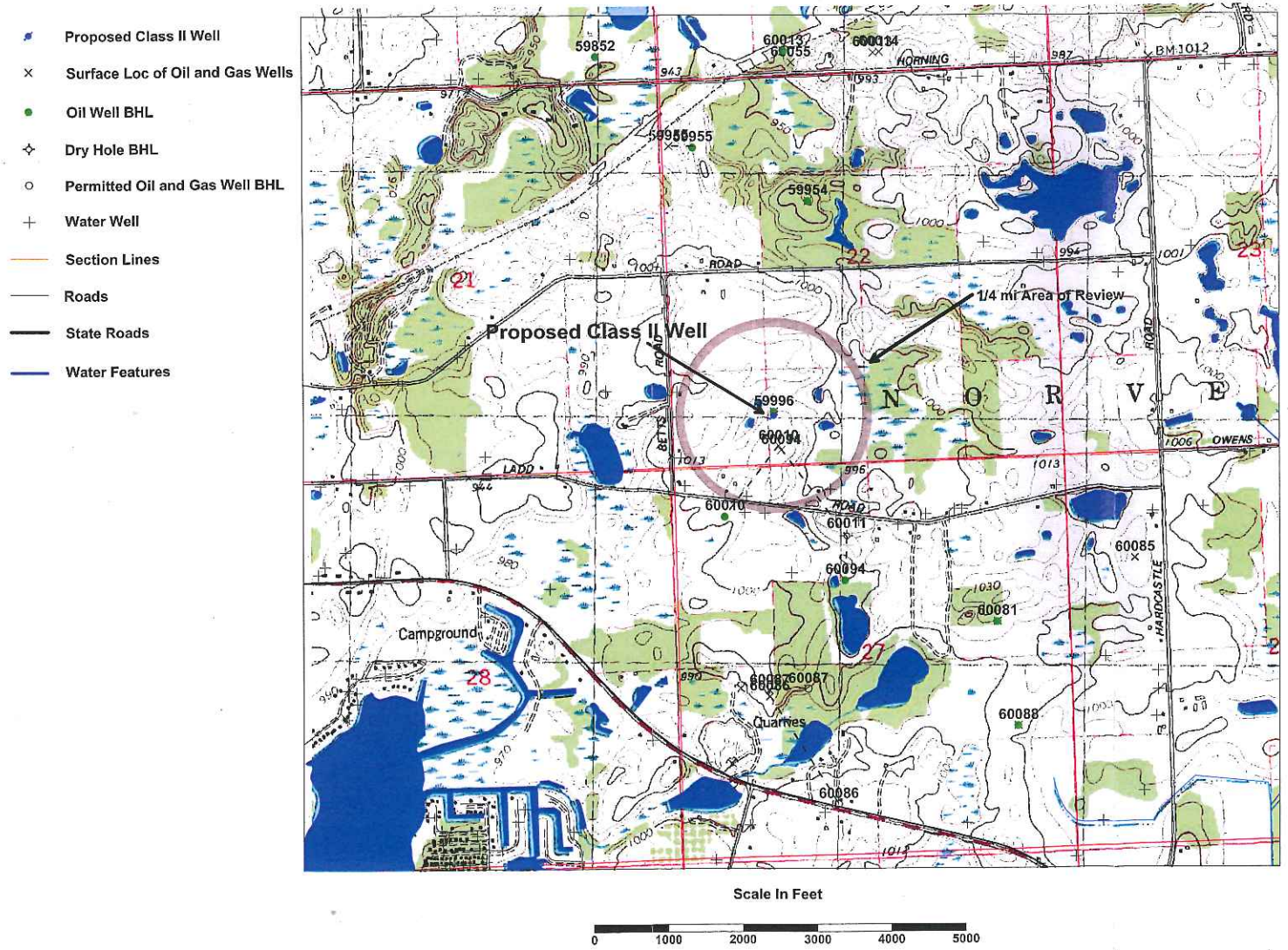
Well Name	State Permit Number	Location	Field	County
ADAMS 1-21	60144	NW/NE/SE 21 4S 2E	Napoleon	JACKSON
BRADLEY ET AL 1-27	60088	SW/NE/SE/27 4S 2E	Napoleon	JACKSON
CANNING 1-15	60013	SW/SW/SE 15 4S 2E	Napoleon	JACKSON
COCHRANE 1-13A	60112	NE/NE/SE 13 3S 1E	Napoleon	JACKSON
COCHRANE 3-13	60089	SE/SW/NE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

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 AL1-30	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.

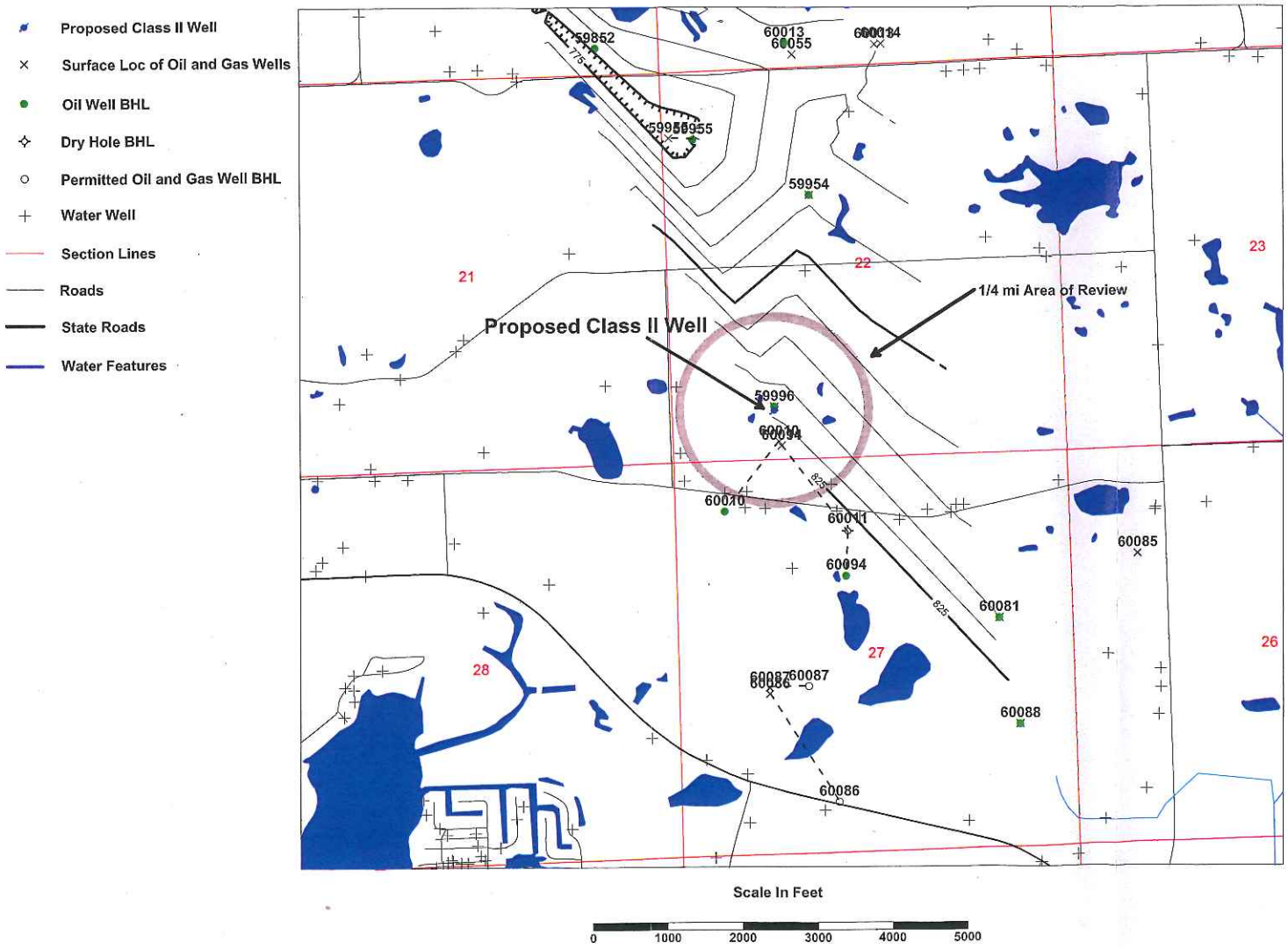
Attachment
"L"

West Bay Exploration Compa. y
Locator Map for West Bay 22 SWD
Attachment B



West Bay Exploration Compa..y

Attachment E
Subsea Top of Base of USDW



DEQ MICHIGAN DEPART NT OF ENVIRONMENTAL QUALITY - OFFICE OF OLOGICAL SURVEY

APPLICATION FOR PERM. 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

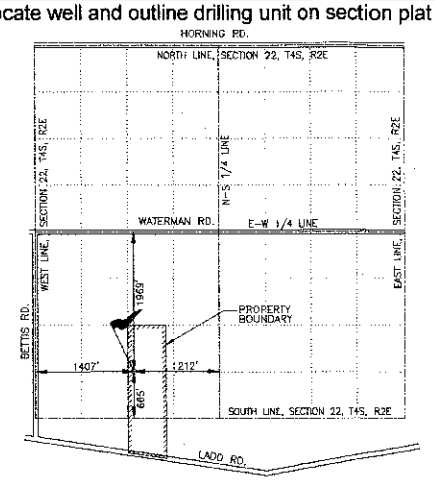
1b. Part 625 Mineral Wells
☐ Waste Disposal
☐ Brine Production
☐ Processed brine disposal
☐ Storage
☐ Test, fee sched. on rev.

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 ☒ Blanket ☐ Single well

5. ☐ Attached ☒ 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.
☒ Yes ☐ 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? ☒ No ☐ Yes If yes, complete line15. 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
☒ Rotary ☐ Cable ☐ Combination

18. Is sour oil or gas expected?
☒ No ☐ Yes ☐ H_2S 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 ¾"	11 ¾"	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 ½'	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% CaCl2, (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.

27. Application prepared by (print or type): Ann M Baker — Phone: (231) 946-0200

28. Signature: Ann M Baker — Date: 4/18/11

DEQ Cashier use only.

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

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

DEQ MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY - OFFICE OF GEOLOGICAL SURVEY

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: West Bay Exploration Company

Well name and number: West Bay 22 SWD

1a. Surface location: NW 1/4 of SE 1/4 of SW 1/4 of section 22 T 4S R 2E — Township: Norvell — County: Jackson

1b. If this is a directional well, bottom hole location will be ____ 1/4 of ____ 1/4 of ____ 1/4 of section ____ T ____ R ____ — 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)

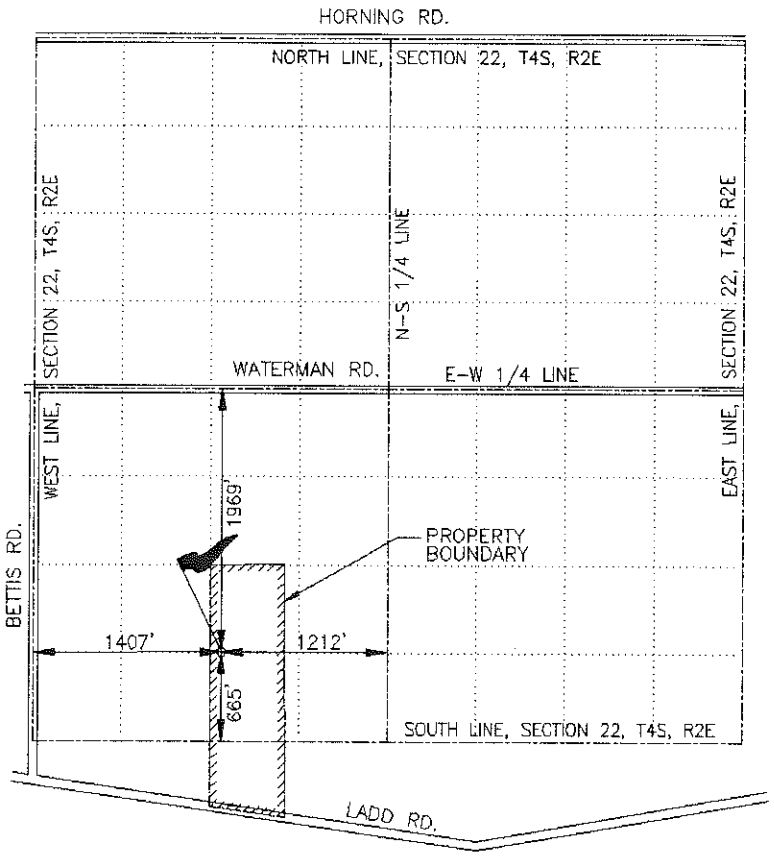
____ ft. from nearest (N/S) ____ drilling unit line

____ 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

PLAT BELOW REPRESENTS ONE FULL SECTION (1 MILE SQUARE) N ↑



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	Company	Date of survey
Stephen V. Vallier, P.S.	Westshore Consulting	09/28/2010
Address: 2534 Black Creek Road, Muskegon, MI 49444		Phone: 231-777-3447

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

STATE OF MICHIGAN — Stephen V. Vallier — PROFESSIONAL SURVEYOR — No. 25428 — LICENSED PROFESSIONAL SURVEYOR

Date: 3/17/11

EQP 7200-2 (rev. 01/2005) ENCLOSE WITH APPLICATION TO DRILL OR DEEPEN

DEQ MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY – OFFICE OF GEOLOGICAL SURVEY

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
b. Number of surface facility sites N/A , acres
c. New access roads N/A feet, acres
d. Flow line(s) trenched in off well site* N/A feet, acres
e. Flow line(s) plowed in off well site* 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

DEQ MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY – OFFICE OF GEOLOGICAL SURVEY

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

1. Applicant's name	Well name and number	Intended use of well
West Bay Exploration Company	West Bay 22 SWD	Brine Disposal

2. Mineral ownership, check each category of mineral owners in drilling unit or Antrim Uniform Spacing Plan

☒ Private ☐ State ☐ Federal ☐ Other, identify

3. Applicable spacing order and drilling unit size

☐ S.O. 14-9-94 N. Mich. Antrim, 80 acres
☐ S.O. 1-73 Niagaran, 80 acres
☐ R 324.301 General rule, 40 acres
☐ S.O. 3-3-95 S. Mich. Antrim, 40 acres
☐ S.O. 2-81 Oakland Co. Niagaran, 40 acres
☐ S.O. 1-86 P.D.C., 640 acres
☒ Field Spacing or Unitization Order (identify below)

Order #18-2007 applies

☐ Antrim USP (identify name, number of acres, and number of drilled and permitted wells)

☐ Administrative exception requested per R324.303 (2). See instructions for applying for an administrative spacing exception
☐ Exception to spacing requested, petition for hearing filed
☐ Non-producing well, no drilling unit

4. Applicant's right to drill and produce

☒ Yes ☐ No Are all mineral interests in the drilling unit under lease and controlled by the applicant/permittee?
If no, ☐ petition filed for compulsory pooling **OR** ☐ certified efforts to obtain leases are attached (if allowed by spacing order)
☐ Not applicable, no drilling unit.
☒ Yes ☐ No Has applicant obtained all contractual rights needed to locate the well where it is proposed?
If no, ☐ what additional approvals are needed? _____

5. Special considerations

☐ Replacement well for permit no. _____ or ☐ Existing well pad
☐ Yes ☒ No Is well expected to encounter H_2S?
☐ Yes ☒ No Is well located in a city, township, or village with a population greater than 70,000?
☐ Other (describe) _____

B. IMPACTS AS A RESULT OF DRILLING

1. Access route dimensions

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 round 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.

2. Well site dimensions

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.

3. Is well site located in residentially zoned area? ☐ Yes ☒ No If yes, R324.407(3) and R324.505 apply.

4. Are drain tiles present? ☐ Yes ☒ No If yes, identify where they exist on attached plat or project map. How will they be handled if they are encountered? .

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

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.

(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 <20,000 GPD Type III is a public water supply which is neither type I or II.)

(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_2S 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 ≥ 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 <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 accidential 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

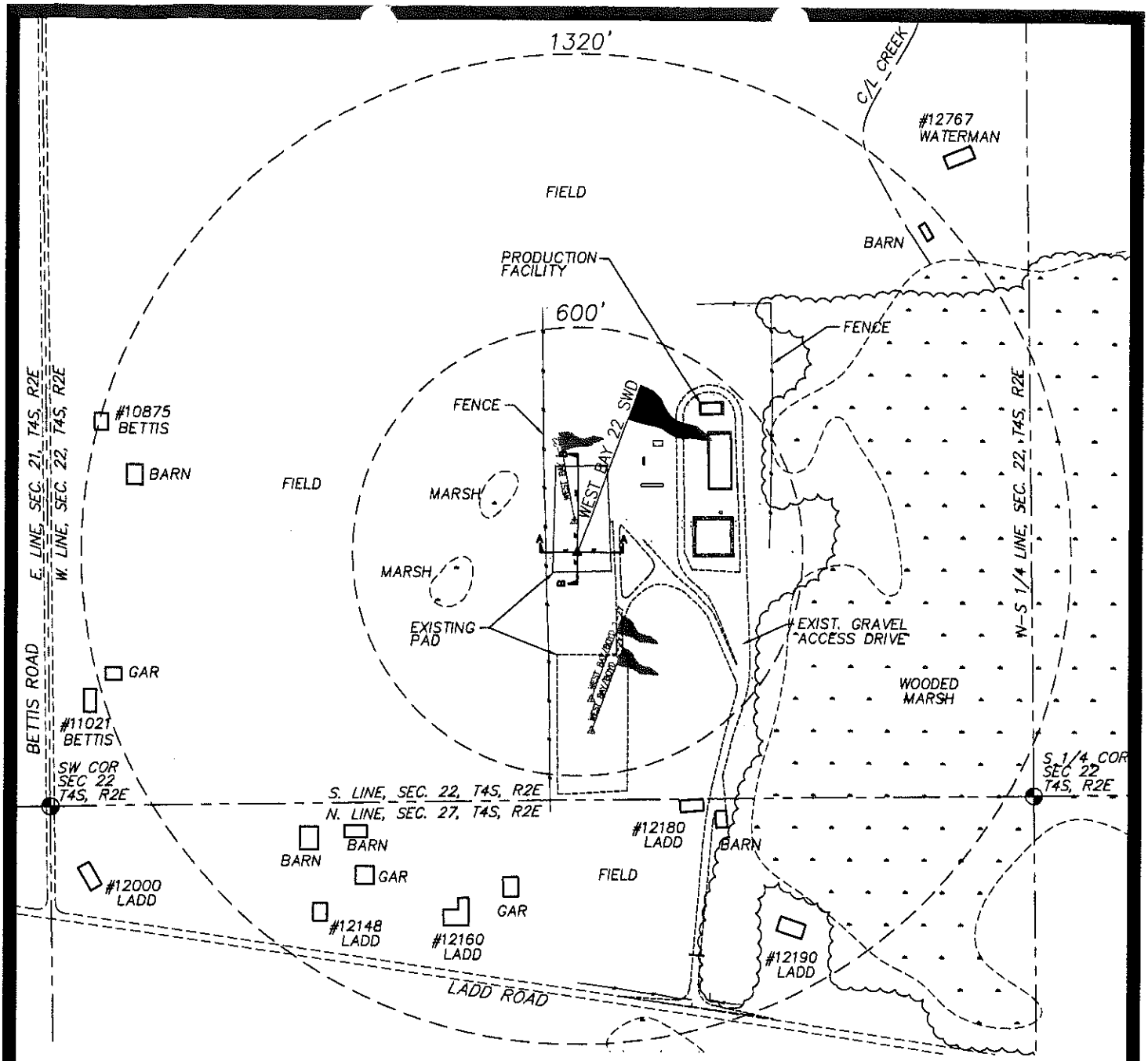
Why were they rejected in favor of the proposed location?

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.		4/5/11
Name and title (printed or typed)	Authorized Signature	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

0 200' 400'

SCALE: 1" = 400'

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

www.WestshoreConsulting.com

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

C:\Land Projects 2004\323-131\dwg\323-131 SWD 3-16-11.dwg 3/17/2011 4:38:18 PM EDT

DEQ MICHIGAN DEPAR NT OF ENVIRONMENTAL QUALITY - OFFICE OF OLOGICAL SURVEY

WELLHEAD BLOWOUT CONTROL SYSTEM

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

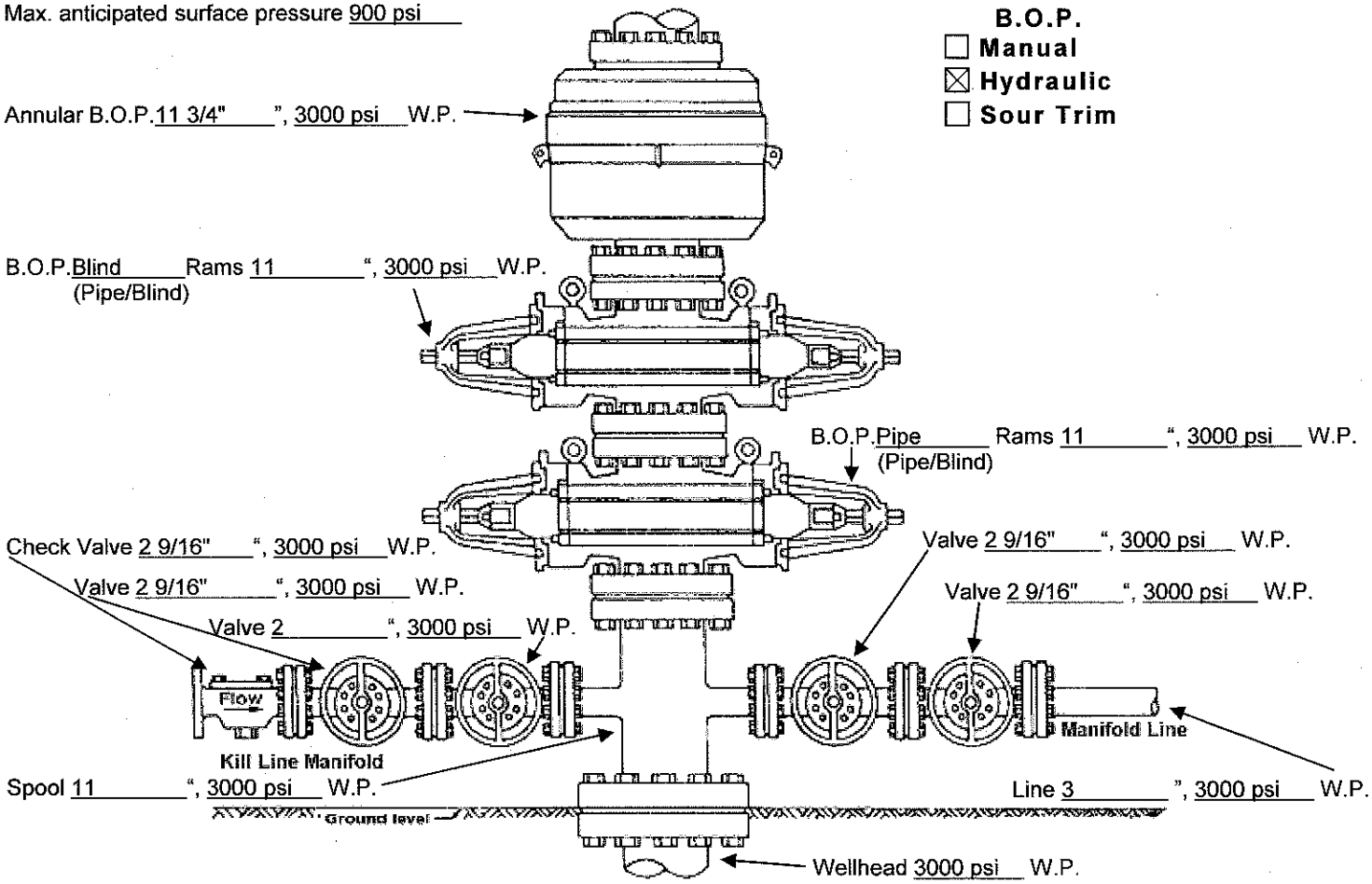
This information is required by authority of Part 615 Supervisor of Wells or Part 625 Mineral Wells, Act 451 PA 1994, as amended, in order to obtain a permit.

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

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

DEQ MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY - OFFICE OF GEOLOGICAL SURVEY

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.**

1. 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.
2. 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.
3. 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.
4. 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 & depth
GLACIAL DRIFT, 155'
MARSHALL SS, 155'-226'

Base of freshwater, name & 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

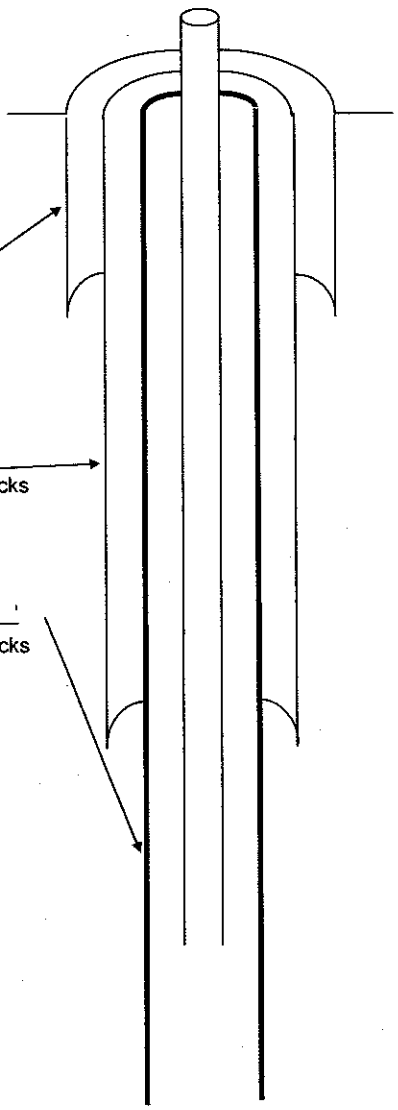
Long string casing 5-1/2 "x 2680 '
Amount of cement 425 sacks
T.O.C. SURFACE

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

EQP 7200-14 (rev. 8/2004) Enclose with *APPLICATION FOR PERMIT TO DRILL* or *APPLICATION TO CHANGE WELL STATUS*

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
	ANION		
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
	CATION		
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
	OTHER		
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

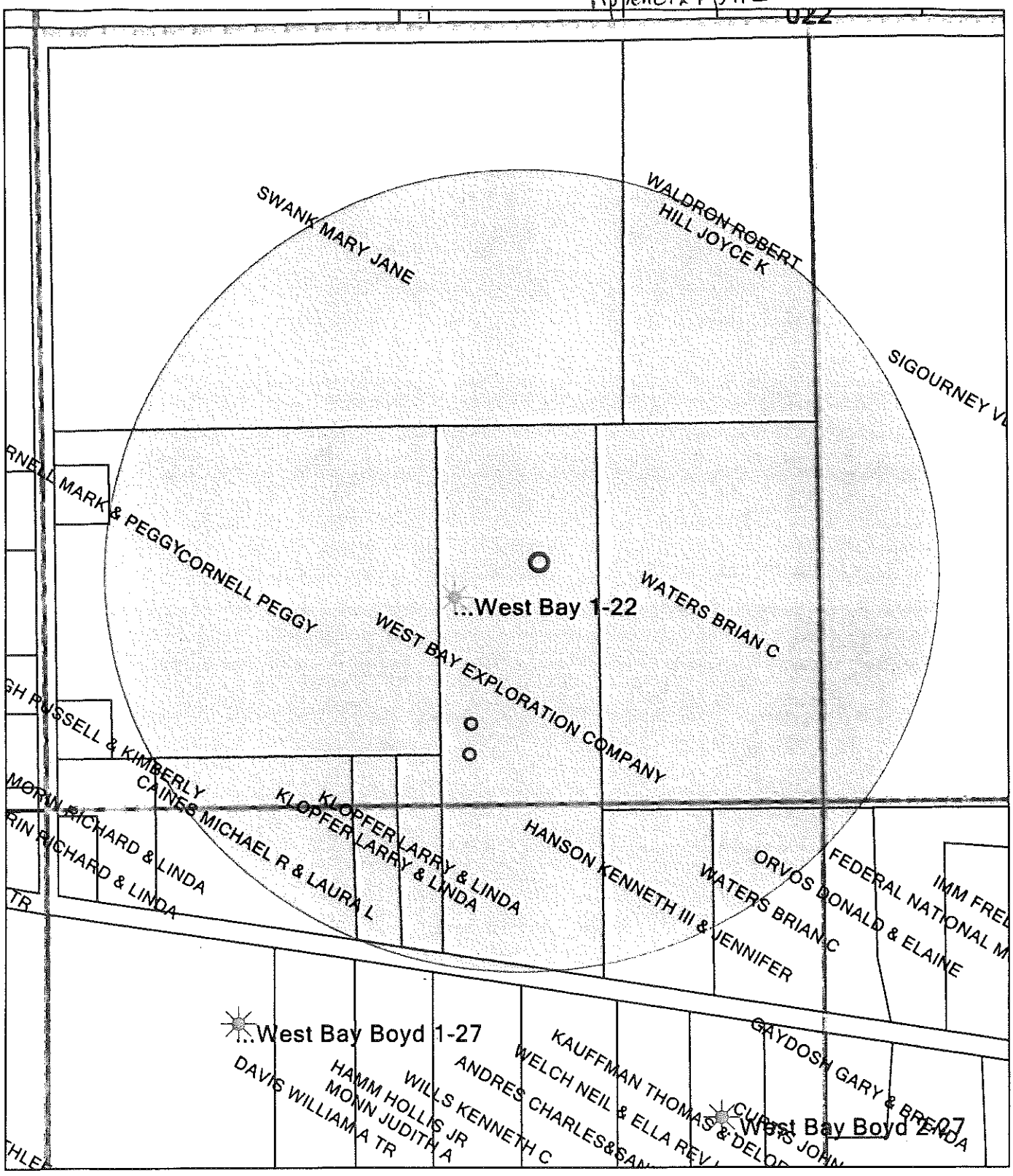
Mary Jane Swank
12101 Waterman
Brooklyn, MI 49230

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

Appendix I p 1/2



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