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37 U.S. EPA-Region 5 Updated Fact Sheet, June 2017 6/20/2017		35	Lilly Simmons & Bill Tong	Certificate of Service and Mailing List for Public Notice and Fact Sheet	2/10/2017
37 U.S. EPA-Region 5 Updated Fact Sheet, June 2017 6/20/2017		36	U.S. EPA-Region 5		6/20/2017
38 U.S. EPA-Region 5 Second comment period notification letter, sent to Office of Fed. Agency Prog., ACHP 6/21/2017	2			Updated Fact Sheet, June 2017	6/20/2017
		38	U.S. EPA-Region 5	Second comment period notification letter, sent to Office of Fed. Agency Prog., ACHP	6/21/2017

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39	U.S. EPA-Region 5	Second comment period notification letter, sent to U.S. Fish & Wildlife Service	6/21/2017
40	U.S. EPA-Region 5	Second comment period notification letter, sent to Michigan SHPO	6/21/2017
41	U.S. EPA-Region 5	Second comment period notification letter, sent to Michigan DNR, Forestry Resources	6/21/2017
42	U.S. EPA-Region 5	Second comment period notification letter, sent to Michigan DNR, Wildlife Division	6/21/2017
43	U.S. EPA-Region 5	Second comment period notification letter, sent to Michigan DNR, Fisheries Division	6/21/2017
44	U.S. EPA-Region 5	Second comment period notification letter, sent to Harrison District Library	6/21/2017
45	U.S. EPA-Region 5	Certificate of Service and Mailing List for second comment period notification	6/21/2017
46	U.S. EPA-Region 5	EPA advertisement of Public Hearing, Clare Country Review, June 23, 2017, Page 3B	6/21/2017
47	U.S. EPA-Region 5	Attendance sheet for July 25, 2017 EPA public hearing at Clare High School	7/25/2017
48	Clare County Review	Article by Pat Maurer, "Injection well raises concerns" about July 25 public hearing	7/27/2017
49	U.S. EPA-Region 5	EPA Notification letter of extension of comment period to August 18, 2017	7/27/2017
50	Bill Tong & Lilly Simmons	Certificate of Service and Mailing List for extension of public comment to 8/18/17	7/28/2017
51	U.S. EPA-Region 5	Notification of extension of comment period to August 18, 2017, to ACHP	7/28/2017
52	U.S. EPA-Region 5	Notification of extension of comment period to August 18, 2017, to USFWS	7/28/2017
53	U.S. EPA-Region 5	Notification of extension of comment period to August 18, 2017, to MDNR Forestry	7/28/2017
54	U.S. EPA-Region 5	Notification of extension of comment period to August 18, 2017, MDNR Wildlife	7/28/2017
55	U.S. EPA-Region 5	Notification of extension of comment period to August 18, 2017, MDNR Fisheries	7/28/2017
56	U.S. EPA-Region 5	Notification of extension of comment period to August 18, 2017, Michigan SHPO	7/28/2017
57	U.S. EPA-Region 5	Notification of extension of comment period to August 18, 2017, Harrison Dist. Library	7/28/2017
58	Jane Rose Reporting	Official Transcript of July 25, 2017 Public Hearing on Draft Permit for Holcomb 1-22 Well	8/8/2017
59	U.S. EPA-Region 5	Chronological compilation of All Verbatim (Raw) Comments & Draft Responses (60 pg.)	3/12/2018
60	U.S. EPA-Region 5	Final Response to Comments on Draft Permit for Holcomb 1-22 Well (18 pg.)	6/20/2018

Email Comments on Draft Permit

	From	Subject	Date Received Size
61	Kirby North Ancona	FW: UIC Class II Public Notice: MI-035-2R-0034	2/12/2017 0:00 236 KB
62	Tong, William	FW: UIC public notice per 124.10e MI-035-2R-0034	2/14/2017 0:00 9 KB
63	Jeffery Loman	Comments on Proposed Class II Permit MI-035-2R-0034 (Holcomb 1-22, Permit # MI-03	2/27/2017 0:00 40 KB
64	Wes Raymond	comments re: permit MI-035-2R-0034	3/15/2017 0:00 39 KB
65	Kirby North Ancona	Holcomb1-22 well permit issues	7/17/2017 0:00 192 KB
66	Sheryl Judd	Public Comment: Proposed injection well in Clare County	7/26/2017 0:00 69 KB
67	Deb Sherrod	Public Comment: Proposed Injection Well in Clare County	7/27/2017 70 KB
68	Stephanie Terpening	Clare county, MI injection well comment	7/27/2017 71 KB
69	Wayne Terpening	Holcomb #1-22 Injection Well Permit Application MI-035-2R-0034	7/27/2017 0:00 68 KB
70	Rep. Jason Wentworth (District 97)	RE: Clare county, MI injection well comment MI-035-2R-0034	7/27/2017 0:00 84 KB
71	Leigh Clarke	Letter for Public Comment Regarding Proposed Underground Injection Permit, Holcomb	7/27/2017 0:00 252 KB
72	Sue Rees	Please do NOT vote for the injection well in Dodge City in Clare County	7/31/2017 0:00 60 KB
73	Sue Rees	Injection in Dodge city	7/31/2017 0:00 63 KB
74	Rebecca Terpening	Public Notice: Public Hearing for Draft Class II Permit MI-035-2R-0034	8/1/2017 0:00 63 KB
75	Tong, William	Transcriptions of post-hearing handwritten comments (includes PDF scans of original doc	8/7/2017 0:00 1 MB
76	Snooks	public comment regarding Holcomb 1-22 injection well	8/8/2017 0:00 49 KB
77	R5-R1605@epa.gov	PDF scan of post card comment from Matthew Stephenson	8/10/2017 0:00 300 KB
78	Linda Secco	Townline and Athey Hamilton Township, mi	8/10/2017 48 KB
79	R5-R1605@epa.gov	PDF scan of post card comment from Michael and Diane Prior	8/11/2017 1 MB
80	terrynmic@charter.net	Holcomb 1-22 well	8/14/2017 45 KB
81	Bryan Cummings	Objection Holcomb #1-22 well	8/15/2017 69 KB

- 82 Andrew Verhage
- 83 Rick Fanslau
- 84 gxcube@verizon.net
- 85 Emerson Addison
- 86 Letha Raymond
- 87 Martin Johnson
- 88 Stephanie Terpening
- 89 LuAnne Kozma
- 90 Paul J. Mooradian

Holcomb 1-22 well MI-035-2R-0034 Holcomb 1-22 well,#MI-035-2R-0034 Fwd: Holcomb 1-22 well, #MI-035-2R-0034 Holcomb 1-22 well, #MI-035-2R-0034 Public Comment - Permit Number: MI-035-2R-0034. Holcomb 1-22 well, Hamilton Twp, C Re: Holcomb 1-22 well, #MI-035-2R-0034 Holcomb 1-22 well, #MI-035-2R-0034 RE: Holcomb 1-22 weel, #MI035-2R-0034 Holcomb Well

Permit Writer

8/15/2017 56 KB

8/17/2017 46 KB

8/17/2017 52 KB

8/18/2017 125 KB

8/18/2017 184 KB

8/18/2017 49 KB

8/18/2017 58 KB

8/18/2017 209 KB

8/19/2017 52 KB

Date Signed

Review of Geographic Factors related to UIC Permit Issuance August 18, 2016

Applicant	Muskegon Development Company
Well Name	Holcomb #1-22
Permit Writer	Bill Tong
Permit No.	MI-035-2R-0034; MDEQ #59345
Latitude/Longitude	44.0308, -84.6595 based on GeoWebFace data, Clare County
Bedrock	The well site is near the border between the Jurassic Red Beds and the Saginaw Formation. These may be USDWs.
Coastal Zone Management Area	The site is not within the Michigan Coastal Zone Management Area.
EJ	EJSCREEN: there is one parameter > 20%: Low Income Population is 56%.
Field Rules?	Not applicable
Public notice map	g:/UIC/Technical/Permits/Maps/035r0034.gif
Traverse USDW?	This site is not in the area in Michigan in which the Traverse Limestone can be an Underground Source of Drinking Water.
Tribal land?	There are no federally-recognized tribal lands in Clare County. The site is 15 miles from the Saginaw Chippewa Indian Tribe land in Isabella Co.
Wild & Scenic River?	There are no federally-recognized Wild & Scenic Rivers in Clare County.
WHPA?	The site is 5.1 miles from the Skeels Christian School Type 2 Provisional WHPA.
Nearest Public Water Supply	7.6 miles from the 8.1 miles from the City of Harrison, PWSID MI0003030; Gladwin Nursing and Rehabilitation Community; PWSID MI0062653
Nearest Private Water Supply	None shown nearby
Other notes	

Bedrock from the MDNR Michigan Bedrock Geology shapefile, dated 8/12/16.



EJSCREEN Report (Version 2016)

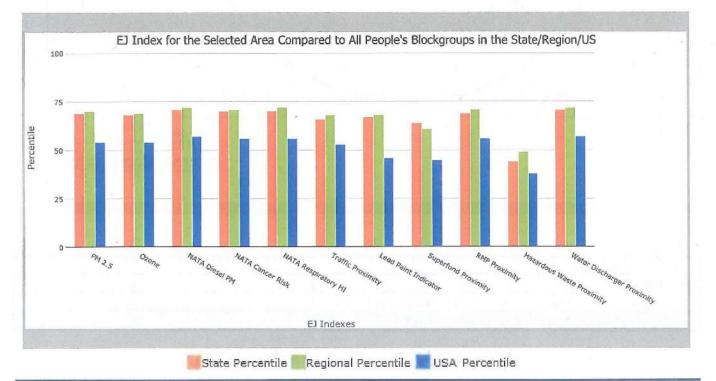


3 mile Ring Centered at 44.030800,-84.659500, MICHIGAN, EPA Region 5

Approximate Population: 1,577 Input Area (sq. miles): 28.27

MI-035-2R-0034

Selected Variables	State Percentile	EPA Region Percentile	USA Percentile					
Selected VariablesPercentilePercentilePercentileEJ Index soEJ Index for PM2.5697054EJ Index for Ozone686954EJ Index for NATA* Diesel PM717257EJ Index for NATA* Air Toxics Cancer Risk707156EJ Index for NATA* Respiratory Hazard Index707256EJ Index for Traffic Proximity and Volume666853EJ Index for Superfund Proximity646145EJ Index for RIMP Proximity697156EJ Index for RIMP Proximity697156EJ Index for RIMP Proximity697156EJ Index for RIMP Proximity697156EJ Index for Hazardous Waste Proximity444938								
EJ Index for PM2.5	69	70	54					
EJ Index for Ozone	68	69	54					
EJ Index for NATA [*] Diesel PM	71	72	57					
EJ Index for NATA* Air Toxics Cancer Risk	70	71	56					
EJ Index for NATA* Respiratory Hazard Index	70	72	56					
EJ Index for Traffic Proximity and Volume	66	68	53					
EJ Index for Lead Paint Indicator	67	68	46					
EJ Index for Superfund Proximity	64	61	45					
EJ Index for RIMP Proximity	69	71	56					
EJ Index for Hazardous Waste Proximity	44	49	38					
EJ Index for Water Discharger Proximity	71	72	57					



This report shows the values for environmental and demographic indicators and EJSCREEN indexes. It shows environmental and demographic raw data (e.g., the estimated concentration of ozone in the air), and also shows what percentile each raw data value represents. These percentiles provide perspective on how the selected block group or buffer area compares to the entire state, EPA region, or nation. For example, if a given location is at the 95th percentile nationwide, this means that only 5 percent of the US population has a higher block group value than the average person in the location being analyzed. The years for which the data are available, and the methods used, vary across these indicators. Important caveats and uncertainties apply to this screening-level information, so it is essential to understand the limitations on appropriate interpretations and applications of these indicators. Please see EJSCREEN documentation for discussion of these issues before using reports.

August 18, 2016

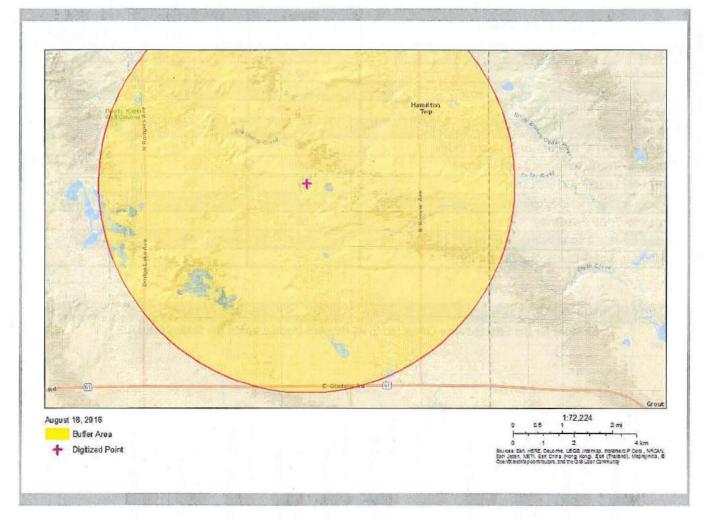


EJSCREEN Report (Version 2016)



3 mile Ring Centered at 44.030800,-84.659500, MICHIGAN, EPA Region 5

Approximate Population: 1,577 Input Area (sq. miles): 28.27 MI-035-2R-0034



Sites reporting to EPA	
Superfund NPL	0
Hazardous Waste Treatment, Storage, and Disposal Facilities (TSDF)	, 0
National Pollutant Discharge Elimination System (NPDES)	0



EJSCREEN Report (Version 2016)



3 mile Ring Centered at 44.030800,-84.659500, MICHIGAN, EPA Region 5

Approximate Population: 1,577

Input Area (sq. miles): 28.27

MI-035-2R-0034

Selected Variables	Value	State Avg.	%ile in State	EPA Region Avg.	%ile in EPA Region	USA Avg.	%ile in USA
Environmental Indicators	100157						
Particulate Matter (PM 2.5 in µg/m³)	8.21	9.76	8	10.6	3	9.32	24
Ozone (ppb)	46.8	50.3	7	50.3	13	47.4	41
NATA [*] Diesel PM (µg/m ³)	0.153	0.726	6	0.931	<50th	0.937	<50th
NATA [*] Cancer Risk (lifetime risk per million)	21	31	7	34	<50th	40	<50th
NATA* Respiratory Hazard Index	0.62	1.3	6	1.7	<50th	1.8	<50th
Traffic Proximity and Volume (daily traffic count/distance to road)	5.1	570	16	370	12	590	11
Lead Paint Indicator (% Pre-1960 Housing)	0.3	0.39	49	0.39	46	0.3	60
Superfund Proximity (site count/km distance)	0.046	0.14	35	0.12	39	0.13	39
RMP Proximity (facility count/km distance)	0.044	0.32	10	0.51	4	0.43	6
Hazardous Waste Proximity (facility count/km distance)	0.026	0.069	42	0.069	36	0.072	36
Water Discharger Proximity (facility count/km distance)	0.023	0.25	1	0.31	0	0.31	2
Demographic Indicators			and the second				
Demographic Index	30%	30%	66	29%	67	36%	51
Minority Population	5%	24%	24	24%	26	37%	13
Low Income Population	56%	35%	81	33%	84	35%	81
Linguistically Isolated Population	1%	2%	66	2%	62	5%	48
Population With Less Than High School Education	15%	11%	74	11%	73	14%	63
Population Under 5 years of age	6%	6%	58	6%	54	6%	51
Population over 64 years of age	22%	15%	84	14%	85	14%	85

* The National-Scale Air Toxics Assessment (NATA) is EPA's ongoing, comprehensive evaluation of air toxics in the United States. EPA developed the NATA to prioritize air toxics, emission sources, and locations of interest for further study. It is important to remember that NATA provides broad estimates of health risks over geographic areas of the country, not definitive risks to specific individuals or locations. More information on the NATA analysis can be found at: https://www.epa.gov/national-air-toxics-assessment.

For additional information, see: www.epa.gov/environmentaljustice

EISCREEN is a screening tool for pre-decisional use only. It can help identify areas that may warrant additional consideration, analysis, or outreach. It does not provide a basis for decision-making, but it may help identify potential areas of EJ concern. Users should keep in mind that screening tools are subject to substantial uncertainty in their demographic and environmental data, particularly when looking at small geographic areas. Important caveats and uncertainties apply to this screening-level information, so it is essential to understand the limitations on appropriate interpretations and applications of these indicators. Please see EISCREEN documentation for discussion of these issues before using reports. This screening tool does not provide data on every environmental impact and demographic factor that may be relevant to a particular location. EISCREEN outputs should be supplemented with additional information and local knowledge before taking any action to address potential EJ concerns.

August 18, 2016

MUSKEGON DEVELOPMENT COMPANY

1425 South Mission Road, Mount Pleasant, Michigan 48858 (989) 772-4900 (Fax) (989) 773-4094

August 9th, 2016

Anna Miller Underground Injection Control Branch UIC Section U.S. EPA-Region 5 77 West Jackson Blvd. Chicago, IL 60604-3590

RECEIVED

AUG 1 1 2016 UIC BRANCH EPA, REGION 5

Attention: WU-16J

Dear Ms. Miller:

Enclosed is an Underground Injection Control permit application for the Holcomb 1-22 well. The application is to convert the existing producing oil well to water injection for the purpose of secondary recovery. Muskegon Development Company is Operator of the well.

The Holcomb 1-22 is located in Section 22, T19N-R3W, Clare County, MI, and is a part of our Smith Creek Unit.

Thank you.

Sincerely, emp

Bennett E. Myler, Geologist Muskegon Development Company

Encl.

MI · 035-2R-0034 Permit Writer - Bill Tong

Holeson 1-22 Muskegon Development Company irred. Address Phone Number Wirk, NC4, NW4, Scotion 22 Phone Number Street Address (98) 772-4900 WM, ND24, NW4, Scotion 22 State If yok-RD3W State N. Commercial Facility V. Ownership V. Commercial Facility V. Ownership V. Commercial Facility V. Ownership Vil. Ball Contact Vil. Silc Codes Weil Status (Mark "x") Image of the stated Owner Image of the stated Image of the state state of the state of the state of the state					OMB No.	2040-0042	Approv	al Expires 12	/31/2018	-
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PROPOSED CONVERSION TO WATER INJECTION WELL HOLCOMB 1-22 HAMILTON TOWNSHIP, CLARE COUNTY, MICHIGAN T19N-R03W, SECTION 22 <u>MICHIGAN PERMIT # 59345</u>

Muskegon Development Company is submitting the following application to convert the Holcomb 1-22 well to water injection for the purpose of enhanced oil recovery from the Richfield formation. The productive Richfield zone is from 4948' to 5010'. The injection zone is the same interval.

The proposed injection well has production pipe with sufficient cement to provide external mechanical integrity. The surface casing is $9\frac{5}{8}$ " pipe set at 792' and cemented to surface. An intermediate string of 7" casing is set at 4,082' and cemented with 150 sacks. The production pipe is $4\frac{1}{2}$ " casing set at 5201' and cemented with 200 sacks. The Richfield formation is completed in casing with perforations at 4948-4954', 4966-4976', 4990-5000', and 5004-5010.



ATTACHMENT A: AREA OF REVIEW

The area of review includes the area within 1/4 mile of the Holcomb 1-22 wellbore.

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ATTACHMENT B: MAP OF WELLS/AREA OF REVIEW

Maps displaying the Holcomb 1-22 well and surrounding area are presented in the appendix. The maps show the well is located in a wooded area with a few residents nearby. There are no hazardous waste treatment or disposal facilities within the area of review. There are no mines, quarries or known faults within the area of review.

The following wells have penetrated the injection zone and are within the area of review:

Well Name 1. Fanslau 1-22

2. Miller 1-22

Permit # 58365 48189 (Plugged)

Location

NE/4, NW/4, NW/4, Section 22, T19N-R03W NW/4, SE/4, NW/4, Section 22, T19N-R03W

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ATTACHMENT C:

WELL DATA

See appendix for state completion logs which contain all pertinent well data.

CORRECTIVE ACTION PLAN

The Holcomb 1-22 injection well will be monitored for rate, tubing pressure, and casing pressure. If an unexplained change in the performance of the well occurs, the well will be shut in. The problem will be identified and the appropriate authorities will be notified.



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ATTACHMENT E: NAME AND DEPTH OF U.S.D.W.'S

The underground source of drinking water in the area is the Glacial Drift. The drift in this area extends from the surface to a depth of approximately 464'. It is an unconsolidated formation of clay, gravel and sand.

The Hydrogeologic Atlas of Michigan, Western Michigan University, 1981, is the reference used to determine the depth to the lowest U.S.D.W.

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ATTACHMENT G: GEOLOGICAL DATA ON INJECTION AND CONFINING ZONES

The Richfield Formation is part of the Detroit River Group and consists of alternating zones of dolomitic limestone and anhydrite, with zones ranging from 5' to 15' thick. The top of the Richfield occurs near 4948' and has an average thickness of approximately 180'.

The injection interval will be the Richfield Formation from 4948' to 5010'. The Richfield is immediately confined uphole by approximately 85' of the Massive Anhydrite and then approximately 850' of Detroit River anhydrite and salt. The Richfield Formation is underlain by the Amherstburg Limestone.

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ATTACHMENT H: OPERATING DATA

INJECTION RATES AND VOLUMES

The proposed average injection rate is 150 barrels of water per day. The maximum anticipated rate should be no greater than 350 barrels of water per day.

INJECTION PRESSURES

The proposed average injection pressure is 3,250 psig. The maximum injection pressure will be 3,345 psig based on a fracture gradient of 1.112 psi/ft. This fracture pressure gradient was determined from an ISIP observed during an acid treatment performed on the nearby Fanslau 1-22 well in May of 2016. A graph and job ticket is included in the appendix.

NATURE OF THE ANNULUS FLUID

The annulus fluid will be fresh water mixed with TECHNI-HIB[™] 606W, or equivalent. This chemical works as a corrosion inhibitor and oxygen scavenger, and will be used at the recommended volume. The casing tubing annulus pressure will be monitored weekly for the purpose of insuring mechanical integrity.

SOURCE AND ANALYSIS OF INJECTION FLUID

The injection fluid will be fresh water. The source of the injection fluid will be the glacial drift. Analysis of a representative sample taken from a water well within ¹/₄ mile of where the supply well will be located is included in the appendix.



ATTACHMENT I: FORMATION TESTING PROGRAM

FLUID PRESSURE

The average bottom hole pressure of the Richfield formation in this area is estimated to be around 1300 psig, based on a bottom hole pressure bomb test conducted on the nearby Fanslau 1-22 well in May of 2016.

FRACTURE PRESSURE

In May 2016, the nearby Fanslau 1-22 well was treated with acid and flushed with fresh water. The top of the injection interval was 4968'. It was concluded that a surface pressure of 3374 psia would be needed to fracture the Richfield formation in the Fanslau 1-22, yielding a 5526 psia formation fracture pressure and a 1.112 psi/ft fracture gradient.

PHYSICAL CHARACTERISTICS

The productive Richfield formation in this area consists of dolomitic beds with matrix porosity of 10 to 15 percent.



ATTACHMENT J: STIMULATION PROGRAM

The only stimulations that are anticipated for this well are periodic acid stimulations. A sample workover procedure is included in the appendix.

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ATTACHMENT K: INJECTION PROCEDURES

INJECTION PUMP

The injection pump will be a National Oilwell Varco 30T-2 Triplex Plunger Pump, or equivalent. The manufacturer's literature is included in the appendix.

WATER TANK

The water supply storage tank will be located next to the injection pump. It will be an API approved steel tank. Fresh water will be produced into this tank and then pumped into the injection well.

SAFETY SWITCH

A high/low pressure safety switch will be installed at the pump. Low pressure due to a leak in the system will cause the pump to automatically shut down. High pressure due to a restriction in the system will also cause the pump to automatically shut down.

TUBING/PACKER

API round external upset thread 2 3/8" tubing will be used with a Baker Model AD-1 packer set near 4898'. All literature is included in the appendix.

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ATTACHMENT L: WELL CONSTRUCTION

Well information for the subject injection well, and all other wells in the area of review, is reported on the State Completion logs.

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ATTACHMENT M: CONSTRUCTION DETAILS

An illustration of the well construction and well head equipment is presented in the appendix.

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ATTACHMENT O: PLANS FOR WELL FAILURE

If a well failure is detected, the well will be shut in until the faulty equipment is replaced and the well returned to a safe operating condition. If the failure and operating pose no environmental hazard, then nothing further will be done.

In the case of casing leaks or some other major failure, the well will be shut in and the appropriate authorities notified. The well will remain shut in until the condition is corrected. This correction may involve squeezing off the leak with cement, replacing the faulty casing, or other actions as the situation dictates. The well will not be returned to active status until its integrity has been determined.



ATTACHMENT P: MONITORING PROGRAM

This project shall be monitored throughout its entire life. All EPA monitoring guidelines and minimum reporting requirements shall be followed.

- A) Injection fluid analysis and report by an independent laboratory shall be completed once within the first year of authorization and thereafter annually.
- B) The injection pressure and annulus pressure will be monitored weekly and reported monthly.
- C) The flow rate will be monitored weekly and reported monthly.
- D) The cumulative injected volume shall be monitored weekly and reported monthly.
- E) There will be a quarterly annulus fill up to test well integrity.

A summary of the monthly reports shall be sent to the EPA at the end of the year.



ATTACHMENT Q:

PLUGGING AND ABANDONMENT PROCEDURES

- 1. Move in Service Unit.
- 2. Pull tubing and packer.
- 3. Set Bridge Plug at +/- 4898'.
- 4. Run in hole with dump bailer and dump 5 sacks of cement on top of plug.
- 5. Free-point, cut and pull 4 1/2" casing at about 3164'.
- 6. Run tubing 50' below top of 4 1/2" casing and spot 35 sx Class A cement.
- 7. Free-point, cut and pull 7" casing at about 2650'.
- 8. Pull tubing to 50' below top of 7" casing and spot 65 sx Class A cement.
- 9. Pull tubing to 842' and place a cement plug from 842' to surface with 335 sx Class A cement.
- 10. Cut off casing 3' below ground level and cap with welded steel plate.
- 11. Clean and level location.

ESTIMATED COSTS FOR PLUGGING THE HOLCOMB 1-22 WELL

Cement service and cement	\$7,000.00
Service Rig	10,000.00
Wireline Service	6,000.00
Site Supervision	1,800.00
Water	1,500.00
Trucking	_1,500.00
TOTAL COST	\$27,800.00



ATTACHMENT R: NECESSARY RESOURCES

Attached in the appendix is a copy of Muskegon Development Company's most recent financial statement.



ATTACHMENT U: DESCRIPTION OF BUSINESS

Muskegon Development Company is a Michigan Corporation dedicated to the exploration and production of oil and gas in the State of Michigan. We are the oldest continuously operating independent oil company in the State of Michigan, having served the State from 1927-2016.



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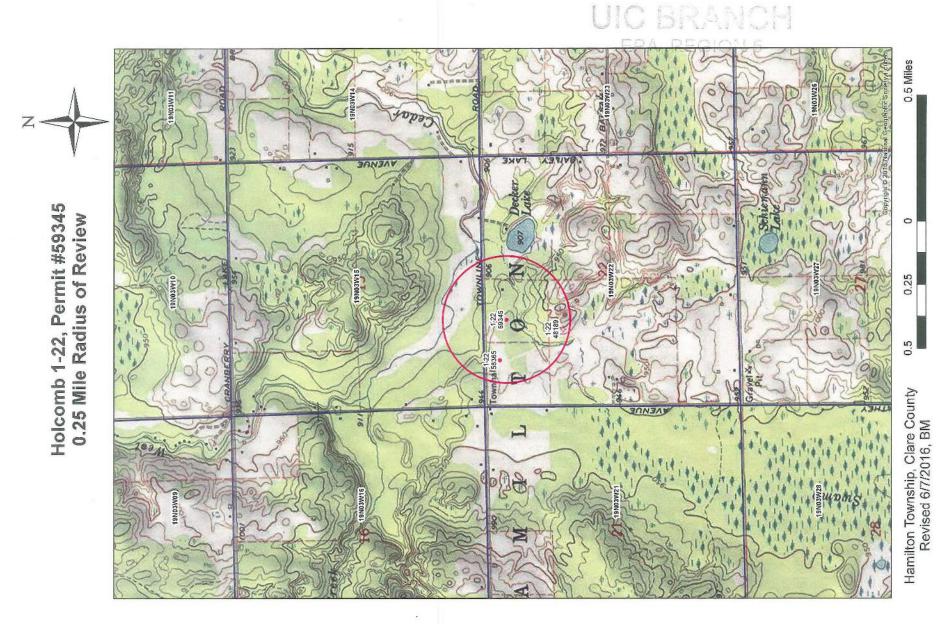
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APPENDIX

Topographic map with Area of Review outlined Field map displaying wells within Area of Review Proposed completion sketch for the Holcomb 1-22 Typical stimulation procedure for the Holcomb 1-22 National 30T-2 Triplex pump specifications Surface construction sketch for the Holcomb 1-22 Plugging and Abandonment Plan for the Holcomb 1-22 TECHNI-HIB[™] 606W specifications Baker Packer Model AD-1 specifications API Round Thread tubing specifications Form VII-10 Muskegon Development Company Financial Statement Analysis of injection water Maximum injection pressure determination Copy of letter to Michigan State Historic Preservation Office regarding site review Copy of State Well Records and Well Information for Wells within the Area of Review List of landowners within the Area of Review Endangered or Threatened Species Review



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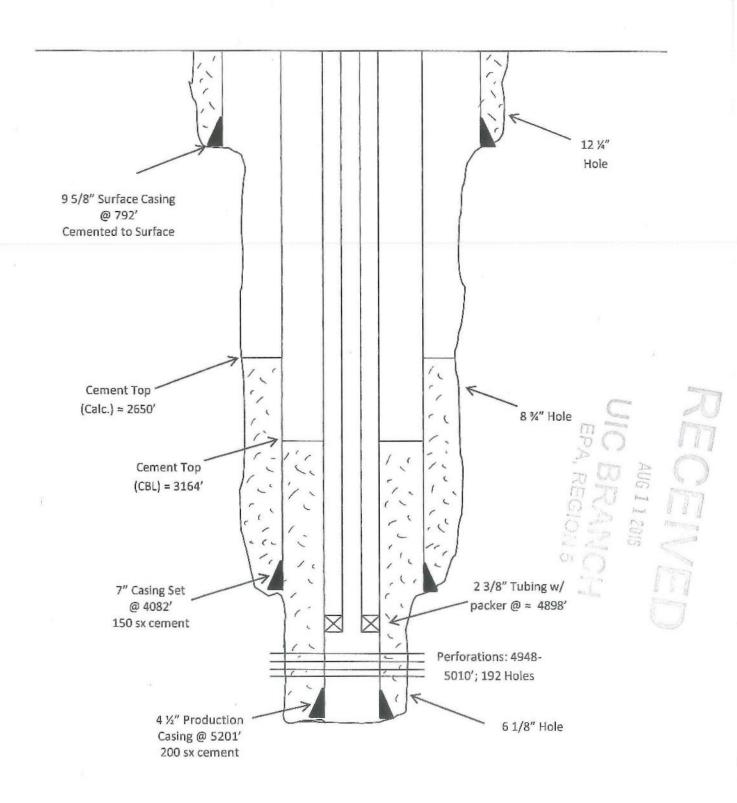


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WELL CONSTRUCTION

Holcomb 1-22

Permit # 59345



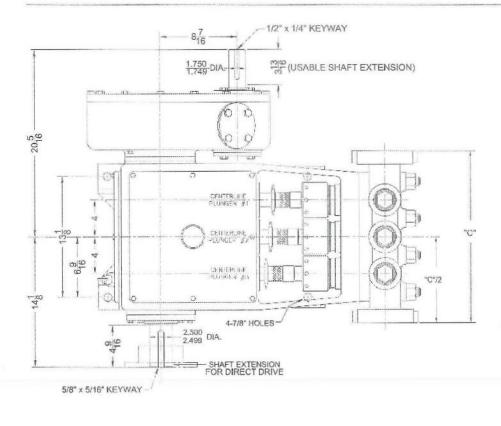
TYPICAL STIMULATION PROCEDURE

HOLCOMB 1-22

- 1. Move in Service Unit.
- 2. Swab tubing until fluid level is close to seating nipple.
- 3. Pump acid down tubing.
- 4. Displace acid to seating nipple with appropriate volume of fresh water.
- 5. Shut in well for 30 minutes.
- 6. Return well to injection.

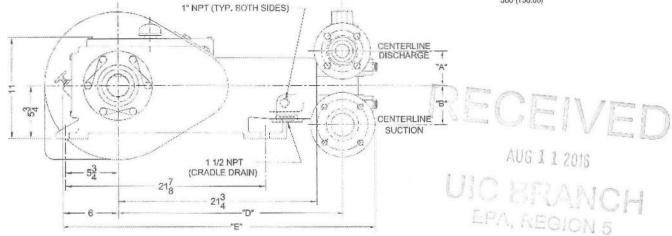


30T-2 Triplex Plunger Pump



Specifications

Pump Size (maximum plunger size x stroke length in.(mm) 2 1/4 x 2 (57.2 x 50.8) Rated bhp at 500 rpm (kw): 30 (22.4) Rated plunger load pounds(Kg): 3565 (1617) Maximum discharge pressure: psi(kPa) L model: 2000 (13,788) H model: 5000 (34,470) Crankshaft extension: in.(mm) Diameter: 2.5/2.499 (63.5/63.4746) Length: 4 9/16 (115.9) Keyway (width x depth): 5/8 x 5/16 (15.88 x 7.94) Maximum recommended sheave in.(mm): 37.5 (952.5) Minimum recommeded sheave in.(mm): 20 (508) For larger sizes: Contact Factory Pinion shaft extension, if gear reducer is supplied in.(mm) For belt or chain drive: **Contact Factory** For direct drive: Diameter: 1.75/1.749 (44.5/44.425) Length: 3 13/16 (96.8) Keyway (width x depth): 1/2 x 1/4 (12.7 x 6.4) Accessory gear reduction unit ratio: 3.50:1, 3.83:1, 4.2:1 Oil Capacity gallons (L) Crankcase: 1.2 (4.5) Gear Reducer: 2/3 (2.5) Weight, pump only on wood shipping skids pounds (Kg): 640 (290) Gear reducer, approximate pounds (Kg): 300 (136.08)



Pump Model	Flange Cor	inections		Dimens	sions in I	nches (mm	1)
	Discharge Connection Sizes	Suction Connection Sizes	А	В	С	D	E
30T-2L Threaded	1 1/2 (38.10) FNPT	2 1/2 (63.5) FNPT	3 3/4	4 1/4	15 3/4	24 9/16	32 7/8
30T-2L Flanged	1 1/2 (38.10) API-2000 RJ	2 1/2 (63.5) ANSI-150 FF	3 3/4	4 1/4	18 1/4	24 9/16	34 1/16
30T-2H	1 (25.4) ANSI-2500 RJ	2 (50.8) ANSI-300 FF	3 5/8	4	17 1/2	24 5/16	33 9/16

30T-2 Triplex Plunger Pump

Performance Data

PUMP	English Units						200 * RPM		RPM	350			RPM	450 RPM		500 RPM	
007.04	Plunger Dia. In.	Plunger Area Sq. In.	BPD per RPM	GPM per RPM	Max. Press. PSI	BPD	GPM	BPD	GPM	BPD	GPM	BPD	GPM	BPD	GPM	BPD	GPM
30T-2L	2.250	3.9761	3.5410	0.1033	897	709	20.66	1063	30.99	1240	36.16	1417	41.32	1594	46.49	1771	51.65
	2.000	3.1416	2.7980	0.0816	1135	560	16.32	840	24.48	980	28.56	1120	32.64	1260	36.72	1399	40.80
	1,750	2.4053	2.1430	0.0625	1482 -	429	12.50	643	18.75	751	21.88	858	25.00	965	28.13	1072	31.25
	1.500	1.7671	1.5737	0.0459	2000	315	9.18	473	13.77	551	16.07	630	18.36	709	20.66	787	22.95
30T-2H	1.500	1.7671	1.5737	0.0459	2000	315	9.18	473	13.77	551	16.07	630	18.36	709	20.66	787	22.95
	1.375	1.4849	1.3234	0.0386	2401	265	7.72	398	11.58	464	13.51	530	15.44	596	17.37	662	19.30
	1.250	1.2272	1.0937	0.0319	2905	219	6.38	329	9.57	383	11.17	438	12.76	493	14.36	547	15.95
	1.125	0.9940	0.8846	0.0258	3586	177	5.16	266	7.74	310	9.03	354	10.32	399	11.61	443	12.90
	1.000	0.7854	0.6994	0.0204	4539	140	4.08	210	6.12	245	7.14	280	8.16	315	9.18	350	10.20
	0.938	0.6910	0.6137	0.0179	5000	123	3.58	185	5.37	215	6.27	246	7.16	277	8.06	307	8.95
		sepower Requ					2.0		8.0	2	1.0		24		27		30

PUMP		Metric Units					200 * RPM		RPM	350 RPM		400 RPM		450 RPM		500 RPM	
	Plunger Dia. mm	Plunger Area cm²	Mº/Hr per RPM	L/Sec. per RPM	Max. Press. kPa				L/Sec.	MP/Hr	L/Sec.	MV/Hr	L/Sec.	M ³ /Hr	L/Sec.	M%Hr	L/Sec.
30T-2L	57	25.652	0.0235	0.0065	6185	4.69	1.30	7.04	1.96	8.21	2.28	9.38	2.61	10.56	2.93	11.73	3.26
	51	20.268	0.0185	0.0051	7826	3.71	1.03	5.56	1.54	6.49	1.80	7.41	2.06	8.34	2.32	9.27	2.57
	44	15.518	0.0142	0.0039	10218	2.84	0.79	4.26	1.18	4.97	1.38	5.68	1.58	6.39	1.77	7.10	1.97
	38	11.401	0.0104	0.0029	13790	2.08	0.58	3.13	0.87	3.65	1.01	4.17	1.16	4.69	1.30	5.21	1.45
30T-2H	38	11.401	0.0104	0.0029	13790	2.08	0.58	3.13	0.87	3.65	1.01	4.17	1.16	4.69	1.30	5.21	1.45
	35	9.580	0.0088	0.0024	16554	1.75	0.49	2.63	0.73	3.07	0.85	3.51	0.97	3.94	1.10	4.38	1.22
	32	7.917	0.0072	0.0020	20029	1.45	0.40	2.17	0.60	2.54	0.70	2.90	0.81	3.26	0.91	3.62	1.01
	29	6.413	0.0059	0.0016	24725	1.17	0.33	1.76	0.49	2.05	0.57	2.34	0.65	2.64	0.73	2.93	0.81
	25	5.067	0.0046	0.0013	31295	0.93	0.26	1.39	0.39	1.62	0.45	1.85	0.51	2.08	0.58	2.32	0.64
	24	4.458	0.0041	0.0011	34474	0.81	0.23	1.22	0.34	1.42	0.40	1.63	0.45	1.83	0.51	2.03	0.56
		Kilowatts Required						13.4		1	5.7	18		20		22	

Volumetric Rate is based on 100% Volumetric Efficiency. Brake Horsepower/Kilowatts Required is based on 90% Mechanical Efficiency. * For operation below 200 RPA), auxiliary lubrication system required. Not all plunger sizes are shown. Contact National-Oilwell for additional information.

The information and data on this sheet is accurate to the best of our knowledge and belief, but are intended for general information only. Applications suggested for the materials are described only to help readers nake their own evaluations and datalsians, and are nation guarantoes nor to be construed as express or implied warranties of subsolity for these or other applications. National Oliwell makes no warrasty either express or implied boyond that stipulated in National Oliwell Standard Terms and Conditions of Sale.

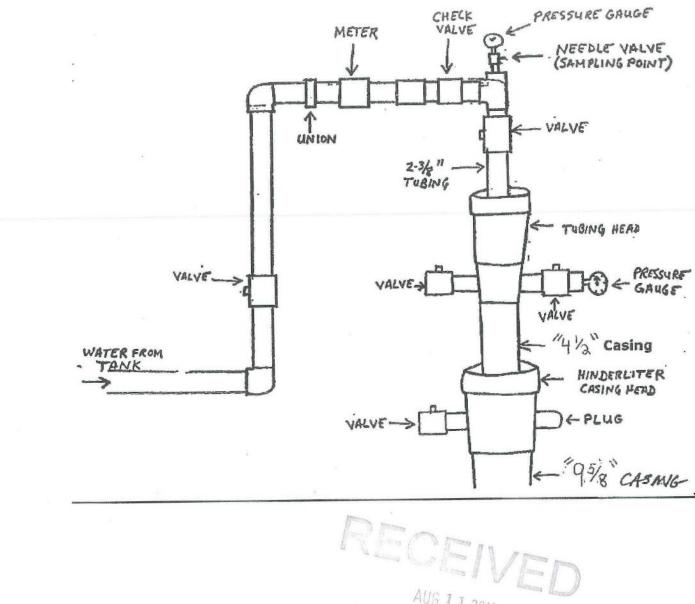
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Authorized Distributor:

NATIONAL OILWELL VARCO

www.nov.com • mission.sales@nov.com 10000 Richmond, Houston, Texas 77042 (713)346-7500 (phone) • (713)346-7366 (fax)

Injection Well Surface Construction



AUG 1 I 2016 UIC LIRANCH EPA, REGION 5

TECHNI-HIBTM 606W Corrosion Inhibitor

Product Information



ANTE

Description

TECHNI-HIB 606W corrosion inhibitor is a water-soluble combination of a cationic filming corrosion inhibitor and sulfite-based oxygen scavenger.

Uses

TECHNI-HIB 606W corrosion inhibitor has been developed for use as a packer fluid inhibitor, hydrostatic test inhibitor and general purpose filming corrosion inhibitor for water injection systems, water disposal operations, power water pumping systems and high water/oil ratio producing oil wells where a small amount of oxygen is present.

Application

TECHNI-HIB 606W corrosion inhibitor can be injected continuously into a system at a rate of 60 to 120 ppm (1 to 2 quarts per 100 barrels of water). When used as a packer fluid inhibitor, 2500 to 5000 ppm (10 to 20 gallons per 100 barrels of water) is required. When used as a hydrostatic test fluid inhibitor, TECHNI-HIB 606W corrosion inhibitor injected at a rate of 500 to 3500 ppm is typically recommended dependent on conditions.

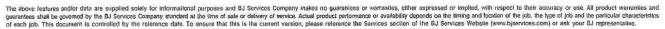
Technical Data			
Specific Gravity @ 60°F	0.96 - 1.008	SOLUBILI	TIES:
Pounds Per Gallon @ 60°F	8.0 - 8.4	Fresh Water	Soluble
Freeze Point	-40°F	2% Brine	Soluble
Flash Point(TCC)	85°F	15% Brine	Soluble
pH	6 - 6.5	Crude Oil	Insoluble
Appearance	Dark Brown Liquid		

Safety Precautions

WARNING! FLAMMABLE. Keep away from heat, sparks, and open flame. Keep container closed when not in use. Do not breathe vapors, use with adequate ventilation. Avoid contact with eyes, skin, and clothing.

References

TECHNI-HIB 606W corrosion inhibitor is available in 55-gallon drums and bulk quantities. Refer to Material Safety Data Sheet for additional information and first aid.



AUG 1 1 2016

CRRANCH



Casing		Packer						
OD		Weight *	Size	No	Nom ID		Max Gage Ring OD	
in.	nint	lb/ft	0120	in.	mm	in.	nsm	
4	101.6	9.5-11.6	41A	1.890	48.1	3.281	83.3	
4-1/2 114.3	114.2	12.6-15.1	41B	1.890	48.1	3.609	91.7	
	174.5	9.5-13.5	43A	1.090	40.1	3.786	96.2	
5	127.0	15-18	43B	1.890	48.1	4.140	105.2	
	127.0	11.5-15	430	1.090		4.265	108.3	
5-1/2		26	43C	1.890	48.1	4.265	108.3	
	139.7	20-23	45A2	1.953	49.6	4.515	114.7	
	138.7	15.5-20	4544			4.656	118.3	
		13-15.5	45B			4.796	121.8	
5-3/4	146.1	22.5	458	1.953	49.6	4.796	121.8	
6		26	458	1.953	49.6	4.796	121.8	
	152.4	20-23	45C			5.077	129.0	
		15-18	450			5.171	131.3	
		34	45E2	1.052	49.6	5.421	137.7	
6-5/8	169.3	26-32	45E4	- 1.953		5.499	139.7	
	100.3	24	47A2	- 2.409	61.2	5.671	144.0	
		17-20	47A4			5.827	148.0	
		38	47A2		61.2	5.671	144.0	
		32-35	47A4			5.827	148.0	
7	177.8	26-29	47B2	2.409		5.983	152.0	
		20-26	47B4	-		6.093	154.8	
		17-20	47C2			6.281	159.5	
		33.7-39	47C4	2.409	61.2	6.468	164.3	
7-5/8	193.7	24-29.7	47D2			6.687	169.9	
		20-24	47D4			6.827	173.4	
		40-49	49A2		76.2	7.327	186.1	
8-5/B	219.1	32-40	49A4	3.000		7.546	191.7	
		20-28	498			7.796	198.0	
9-5/8	and the second	4753.5	51A2		101.6	8.218	208.7	
	244.5	40-47	51A4	4.000		8.437	214.3	
		29.3-36	51B			8.593	218.3	
10-3/4	273.1	32.7-55.5	53A	4.000	101.6	9.515	241.7	
11-3/4	298.5	38-60	53B	4.000	101.6	10.515	261.1	
12-3/4	323.9	48-53	55A	4.000	101.6	11.625	295.3	
13-3/8	339.7	48-72	558	4.000	101.6	12.000	304.8	

SPECIFICATION GUIDES

AD-1" Tension Packer, Product Family No. H73908

ADL-1" Tension Packer, Product Family No. H73912

Casing		Packer							
OD		Weight •	Size	Nom ID		Gage Ring OD			
in.	mm	ib/ft	size	in.	mm	in.	тт		
5-1/2	139.7	13–17	45B x 2.90	2.903	73.7	4.750	120.7		
6 152.4	23-26	45C x 2.90	2.903	3 73.7	5.000	127.0			
	132,4	18-20	45D x 2.90	2.903	/3./	5.218	132.5		
7 177.8	-	(77.0	23–29	478 x 4.12	4 100	4 405	104.8	5.983	152.0
	177.0	17-20	47C2 x 4.12	4.125 104.1	104.5	6.281	159.5		
8-5/8	219.1	24-32	49A4 x 4.00	4.000	101.6	7.615	193.4		

When selecting a packer for a casing weight common to two weight ranges (same OD), choose the packer size shown for the lighter of the two weight ranges.
 Example: for 7-in. (177.8 mm) 20 lb/ft casing use packer size 47C2. Under certain circumstances the other packer size may be run, such as when running in mixed casing strings. Repair kits, including items as packing elements, seal strings, etc., are available for redressing retrievable packers. Contact your Baker Hughes representative. Use only on Baker Hughes repair.

Retrievable Packer Systems

AD-1 and ADL-1 Tension Packers

Product Family Nos. H73908 and H73912

APPLICATION

The AD-1[™] tension packer is a compact, economical, retrievable packer. Primarily used in waterflood applications, it can also be used for production, treating operations, and when a set-down packer is impractical. And because the AD-1 is tension-set, it is ideally suited for shallow wells where set-down weight is not available.

Advantages

- Uses Baker Hughes rugged rocker-type slips
- Bore-through-the-packer mandrel is larger than drift
- Simple, low-cost packer for fluid injection
- Three release methods ensure retrievability
- Uses proven one-piece packing element

Additional Information

The ADL-1¹⁰ tension packer is a large-bore version of the AD-1 and offers the same features and benefits; running and retrieving operations are also the same.



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TUBING TABLES

		Di	mensional &	Grade Desi	gnators				Inter	rnal Yield Pre	ssure
OD Size	T& Non-Upset	Weight C Upset	PE Non-Upset	NOM Body Wall	NOM ID	Drift Diameter	Product Grade	Collapse Resistance	Pipe Body	12 00.00	Suttress Thd Upset Special Clr
in.	lb/ft	lb/ft	lb/ft	in.	In.	In.		psi	psi	psi	psi
1.900	5.15		5.13	0.300	1.300	1.206	T95	25,260	26,250		
1.900	5.15		5.13	0.300	1.300	1.206	USS C95	25,260	26,250		
2.063			3.18	0.156	1.751	1.657	H40	5,590	5,290		
2.063			3.18	0.156	1.751	1.657	J55	7,690	7,280		
2.063			3.18	0.156	1.751	1.657	L80	11,180	10,590		
2.063			3.18	0.156	1.751	1.657	N80 Type 1	11,180	10,590	44	
2.063			3.18	0.156	1.751	1.657	N80	11,180	10,590		
2.063			3.18	0.156	1.751	1.657	C90	12,420	11,910		
2.063			3.18	0.156	1.751	1.657	R95	12,980	12,570		
2.063			3.18	0.156	1.751	1.657	T95	12,980	12,570		
2.063			3.18	0.156	1.751	1.657	USS C95	12,980	12,570		
2.063	4.50		4.42	0.225	1.613	1.519	H40	7,770	7,630		
2.063	4.50		4,42	0.225	1.613	1.519	J55	10,690	10,500		
2.063	4.50		4.42	0.225	1.613	1.519	L80	15,550	15,270		
2.053	4.50		4.42	0.225	1.613	1.519	N80 Type 1	15,550	15,270		
2.063	4,50		4.42	0.225	1.613	1.519	N80	15,550	15,270	22	
2.063	4.50		4.42	0.225	1.613	1.519	C90	17,490	17,180		
2.063	4.50		4.42	0.225	1.613	1.519	R95	18,460	18,130		
2.063	4.50		4.42	0.225	1.613	1.519	T95	18,460	18,130		
2.063	4.50		4.42	0.225	1.613	1.519	USS C95	18,460	18,130		
2.063	4,50		4.42	0.225	1.613	1.519	P110 SR16	21,380	20,990		1
2.063	4.50		4.42	0.225	1.613	1.519	P110	21,380	20,990		
2.375	4.00		3.94	0.167	2.041	1,947	H40	5,230	4,920	4920	4920
2.375	4.00		3,94	0.167	2.041	1,947	J55	7,190	6,770	6770	6770
2.375	4.00		3.94	0.167	2.041	1.947	L80	9,980	9,840	9840	9840
2.375	4.00		3.94	0.167	2.041	1.947	N80 Type 1	9,980	9,840	9840	9840
2.375	4.00		3.94	0.167	2.041	1.947	N80	9,980	9,840	9840	9840
2.375	4.00		3.94	0.167	2.041	1.947	C90	10,940	11,070	11070	11070
2.375	4.00		3.94	0.167	2.041	1.947	R95	11,410	11,690	11690	11690
2.375	4.00		3.94	0.167	2.041	1.947	T95	11,410	11,690	11690	11690
2.375	4.00		3.94	0.167	2.041	1.947	USS C95	11,410	11,690	11690	11690
2.375	4,60	4.70	4,44	0.190	1.995	1.901	H40	5,890	5,600	5600	5600
2.375	4.60	4.70	4.44	0.190	1.995	1.901	J55	8,100	7,700	7700	7700
2.375	4.60	4.70	4.44	0.190	1.995	1.901	L80	11,780	11,200	11200	11200
2.375	4.60	4.70	4.44	0.190	1.995	1.901	N80 Type 1	11,780	11,200	11200	11200
2.375	4.60	4.70	4.44	0.190	1.995	1.901	N80	11,780	11,200	11200	11200
2.375	4.60	4.70	4.44	0.190	1.995	1.901	C90	13,250	12,600	12600	12600
2.375	4.60	4.70	4.44	0.190	1.995	1.901	R95	13,980	13,300	13300	13300
2.375	4.60	4.70	4,44	0.190	1.995	1.901	T95	13,980	13,300	13300	13300
2.375	4.60	4.70	4,44	0.190	1.995	1.901	USS C95	13,980	13,300	13300	13300
2.375	4.60	4.70	4,44	0.190	1.995	1.901	P110 SR16	16,130	15,400	15400	15400
2.375	4.60	4.70	4.44	0.190	1.995	1.901	P110	16,130	15,400	15400	15400
2.375	5.80	5.95	5.76	0.254	1.867	1.773	J55	10,510	10,290	10290	9310
2.375	5.80	5.95	5.76	0.254	1.867	1.773	L80	15,280	14,970	14970	13550
2.375	5.80	5.95	5.76	0.254	1.867	1.773	N80 Type 1	15,280	14,970	14970	13550
2.375	5.80	5.95	5.76	0.254	1.867	1.773	N80	15,280	14,970	14970	13550

									ANTER STATUS	The state	
1				Tens				sure	I Vield Pres	Interna	
Ductile Rupture			Coupled Join			Yield					
Capped		Round Thread		1999 1997 1997 1997 1997 1997 1997 1997	Improved B	Pipe	Ion Mises		509 - C	ound Thread	1
End	t eue	Upse	NUE	Upset	Non-	Body	Capped	Open	2000000	Upset	NÜE
	Special Clr	Regular	Regular	Special Clr	Regular		End	End	Special Clr	Regular	Non-Upset
psi	lb	lb	lb	lb	lb	lb	psi	psi	psi	psi	psi
32,050						143,300	26,080	25,010			
32,050						143,300	26,080	25,010			
5,900						37,400	5,690	5,230			
7,420						51,400	7,830	7,200			
11,540						74,800	11,390	10,470			
10,020						74,800	11,390	10,470			
12,150						74,800	11,390	10,470			
13,510			44			84,200	12,810	11,780			
12,860						88,800	13,530	12,430			
14,240						88,800	13,530	12,430			
14,240						88,800	13,530	12,430			
8,690						52,000	7,960	7,460			
10,950						71,400	10,940	10,260			
17,100						103,900	15,920	14,920			
14,780						103,900	15,920	14,920		- **	**
18,000						103,900	15,920	14,920			
20,080						116,900	17,910	16,780			
19,060						123,400	18,900	17,720			
21,160						123,400	18,900	17,720			
21,160						123,400	18,900	17,720			
22,840						142,900	21,880	20,510			
25,350						142,900	21,880	20,510			
5,460			30,100	46,300	46,300	46,300	5,320	4,870			4,920
6,880			41,400	63,700	63,700	63,700	7,320	6,700			6,770
10,690			60,200	92,600	92,600	92,600	10,640	9,750 9,750			9,840
9,290			60,200	92,600	92,600 92,600	92,600	10,640	9,750			9,840 9,840
11,250			60,200	92,600		92,600 104,200	10,840				
12,510 11,910			67,800 71,500	104,200 110,000	104,200 110,000			10,970 11,580			11,070
13,180			71,500	110,000	110,000	110,000	12,640	11,580			11,690
13,180			71,500	110,000	110,000	110,000	12,640	11,580			11,690
6,250	52,200	52,200	36,000	52,200	52,200	52,200	6,000	5,530	5,600	5,600	5,600
7,880	71,700	71,700	49,400	71,700	71,700	71,700	8,250	7,600	7,700	7,700	7,700
12,250	104,300	104,300	71,900	104,300	104,300	104,300	12,000	11,060	11,200	11,200	11,200
10,630	104,300	104,300	71,900	104,300	104,300	104,300	12,000	11,060	11,200	11,200	11,200
12,900	104,300	104,300	71,900	104,300	104,300	104,300	12,000	11,060	11,200	11,200	11,200
14,350	117,400	117,400	80,900	117,400	117,400	117,400	13,500	12,440	12,600	12,600	12,600
13,660	123,900	123,900	85,400	123,900	123,900	123,900	14,250	13,140	13,300	13,300	13,300
15,120	123,900	123,900	85,400	123,900	123,900	123,900	14,250	13,140	13,300	13,300	13,300
15,120	123,900	123,900	85,400	123,900	123,900	123,900	14,250	13,140	13,300	13,300	13,300
16,370	143,400	143,400	98,900	143,400	143,400	143,400	16,500	15,210	15,400	15,400	15,400
18,120	143,400	143,400	98,900	143,400	143,400	143,400	16,500	15,210	15,400	15,400	15,400
10,720	93,100	93,100	70,800	93,100	93,100	93,100	10,750	10,070	7,860	10,220	10,290
16,740	135,400	135,400	103,000	135,400	135,400	135,400	15,640	14,640	11,440	14,860	14,970
14,470	135,400	135,400	103,000	135,400	135,400	135,400	15,640	14,640	11,440	14,860	14,970
17,620	135,400	135,400	103,000	135,400	135,400	135,400	15,640	14,640	11,440	14,860	14,970

<u>VII-10</u>

INFORMATION REQUIRED OF CLASS II INJECTION WELL OPERATORS SEEKING BLANKET OR FINANCIAL STATEMENT COVERAGE

Company Name: Muskegon Development Company

Date Company Started: 1927 Public: ____

Private: X

The following information on production fields should be supplied. The information should cover:

(1) The field(s) associated with the injection wells in this financial responsibility application;

(2) At least one currently producing field that the applicant has operated for more than five years; and

(3) At least one field with an estimated remaining operating life exceeding five years.

Field Name	Field Location	Date Production Started	Number of Producing Wells	Number of Injection Wells	Wells Plugged	Estimated Remaining Operating Life of Field
1. Smith Creek Field	Hamilton Twp., Clare Co.	2007	3	0 (1 proposed)	0	20 years
2. Kawkawlin Central Unit	Kawkawlin Twp., Bay Co.	2000 (Unit)	37	19	1	20 years
3. Lower Chub Project	Chester Twp., Otsego Co.	1991	19	1	0	10 years
4. Williams Unit	Williams Twp., Bay Co.	1982	17	8	3	7 years
5. Caulkins Lake Project	Charlton Twp., Otsego Co.	1990	30	2	0	11 years

I certify that the information provided above is correct.

Signature of Professional Engineer:

Macha

Michael A. Mesbergen

Date: __June 7, 2016

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Registration Number State of Michigan: 6201027199

Muskegon Development Company

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Statement of Stockholder's Equity	5
Notes to Financial Statements	6-10



Plante & Moran, PLLC Suite 300 600 East Front Strant Traverse City, MI 49686 Tel: 281.947,7800 Fax: 231.947,0348 plantemetan.com

Independent Auditor's Report

To the Board of Directors Muskegon Development Company

We have audited the accompanying financial statements of Muskegon Development Company (the "Company"), which comprise the statement of assets, liabilities, and stockholder's equity - income tax basis as of December 31, 2015 and 2014 and the related income tax basis statements of revenue and expenses and stockholder's equity for the years then ended, and the related notes to the financial statements.

Management's Responsibility for the Financial Statements

Management is responsible for the preparation and fair presentation of these financial statements in accordance with the basis of accounting the Company uses for income tax purposes; this includes determining that the basis of accounting used for income tax purposes is an acceptable basis for the preparation of the financial statements in the circumstances. Management is also responsible for the design, implementation, and maintenance of internal control relevant to the preparation and fair presentation of financial statements that are free from material misstatement, whether due to fraud or error.

Auditor's Responsibility

Our responsibility is to express an opinion on these financial statements based on our audits. We conducted our audits in accordance with auditing standards generally accepted in the United States of America. Those standards require that we plan and perform the audits to obtain reasonable assurance about whether the financial statements are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements. The procedures selected depend on the auditor's judgment, including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the entity's preparation and fair presentation of the financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the entity's internal control. Accordingly, we express no such opinion. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of significant accounting estimates made by management, as well as evaluating the overall presentation of the financial statements.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

Opinion

In our opinion, the financial statements referred to above present fairly, in all material respects, the assets and liabilities of Muskegon Development Company as of December 31, 2015 and 2014 and its revenue and expenses for the years then ended in accordance with the basis of accounting the Company uses for income tax purposes described in Note I.





To the Board of Directors Muskegon Development Company

Basis of Accounting

We draw attention to Note 1 to the financial statements, which describes the basis of accounting. The financial statements are prepared on the basis of accounting the Company uses for income tax purposes, which is a basis of accounting other than accounting principles generally accepted in the United States of America. Our opinion is not modified with respect to this matter.

Plante i Moran, PLLC

June 29, 2016

AUG 1 1 2015 UIC BRANCH EPA, REGION 5

Muskegon Development Company

Statement of Assets, Liabilities, and Stockholder's Equity **Income Tax Basis**

	D	ecember 31, 2015	D	ecember 31, 2014
Assets				
Current Assets				
Cash and cash equivalents	\$	17,409,691	\$	24,932,781
Accounts receivable:				
Trade		3,283,300		6,846,063
Joint interest billing		1,885,660		1,382,763
Related party (Note 4)		5,267,915		5,224,538
Inventory		1,155,271		875,854
Total current assets		29,001,837		39,261,999
Proved Oil And Gas Properties - Net		33,376		38,271
Property and Equipment - Net (Note 2)		1,088,287		1,225,817
Certificates of Deposit		304,622		303,834
Other Assets		30,375		10,293
Total assets	\$	30,458,497	\$	40,840,214
Liabilities and Stockholder	's Equi	ty		
Current Liabilities				
Trade accounts payable	\$	1,812,124	\$	3,790,786
Undistributed oil and gas revenue		3,588,278		5,008,346
Related party payables (Note 4)		6,080,099		10,799,182
Accrued payroll and payroll taxes	-	107,093	_	148,807
Total current liabilities		í I,587,594		19,747,121
Plugging Fund Payable		1,548,783		1,459,451
Stockholder's Equity				
Common stock - No par value		1,252,355		1,252,355
Additional paid-in capital		3,163		3,163
Retained earnings		16,066,602		18,378,124
Total stockholder's equity		17,322,120		19,633,642
Total liabilities and stockholder's equity	\$	30,458,497	\$	40,840,214

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Muskegon Development Company

Statement of Revenue and Expenses Income Tax Basis

		Year E	Inde	d
	De	ecember 31,	De	ecember 31,
		2015		2014
Net Sales				
Management and operator fees	\$	4,146,343	\$	4,067,539
Oil and gas production sales		1,005,932		1,465,392
Equipment rental fees		768,768		768,768
Gain on sale of property and equipment		38,222		186,924
Total revenue		5,959,265		6,488,623
Operating Expenses				
General and administrative expenses		3,586,629		3,500,176
Lease operating expenses		596,441		1,203,695
Exploration and geological expenses		580,523		601,298
Depreciation, depletion, and amortization		489,765		468,605
Total operating expenses		5,253,358		5,773,774
Income from Operations		705,907		714,849
Other Income (Expense)				
Interest income		28,844		36,028
Other (expense) income		(46,273)	-	95,572
Total other (expense) income		(17,429)		131,600
Net Income	\$	688,478	\$	846,449

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	 Common Stock	 lditional -in Capital	_	Retained Earnings	/	Total
Balance - January 1, 2014	\$ 1,252,355	\$ -	\$	17,531,675	\$	18,784,030
Net income	-	-		846,449		846,449
Cash contributions	 -	 3,163	_	-	_	3,163
Balance - December 31, 2014	1,252,355	3,163		18,378,124		19,633,642
Net income		-		688,478		688,478
Dividends declared	-	-	_	(3,000,000)		(3,000,000)
Balance - December 31, 2015	\$ 1,252,355	\$ 3,163	\$	16,066,602	\$	17,322,120

Statement of Stockholder's Equity Income Tax Basis

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Monday, July 18, 2016

Fibertec Project Number: Project Identification: Submittal Date: 73682 Amended Smith Creek - Supply Water / 06/13/2016

Mr. Bennett Myler Muskegon Development Company 1425 S. Mission Mt. Pleasant, MI 48858

Dear Mr. Myler,

Thank you for selecting Fibertec Environmental Services as your analytical laboratory. The samples you submitted have been analyzed in accordance with NELAC standards and the results compiled in the attached report. Any exceptions to NELAC compliance are noted in the report. These results apply only to those samples submitted. Please note TO-15 samples will be disposed of 14 days after the reporting date. All other samples will be disposed of 30 days after the reporting date.

This report has been amended to correct units on all parameters to mg/L. This report has also been amended to correct the alkalinity results based on updated lab information.

If you have any questions regarding these results or if we may be of further assistance to you, please contact me at (517) 699-0345.

Sincerely,

Amanda R

By Amanda Petrovsky at 11:23 AM, Jul 18, 2016

For Daryl P. Strandbergh Laboratory Director

Enclosures



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1914 Holloway Drive 11766 E. Grand River 8660 S. Mackinaw Trail Holt, MI 48842 Brighton, MI 48116 Cadillac, MI 49601 T: (517) 699-0345 T: (810) 220-3300 T: (231) 775-8368 F: (517) 699-0388 F: (810) 220-3311 F: (231) 775-8584

lab@fibertec.us

Parameter(s)	Result	Q	Ur	iits	Reporting Limit	Dilution	Prepa P. Date	ration P. Batch	A. Date	Analysis A. Batch	Ini
Sulfide Method: HACH 8131						uot ID: cription:	73682-001A Supply Water		round Wate		
1. Sulfate	12		m	g/L	1	1.0	06/17/16	PW16F16B	06/17/16	WT16F17A	A NR
Parameter(s)	Result	Q	nesue setti	a statute to	Reporting Limit	Dilution	Prepa P. Date	P. Batch	A. Date	Analysis A. Batch	Ini
Inorganic Anions by Method: EPA 9056A	IC					uot ID: cription:	73682-001 Supply Water		round Wate	38 	
1. Iron	U		mj	g/L	2.5	500	06/17/16	PT16F17C	06/17/16	T416F17A	JL
Parameter(s)	Result	Q	Ur	iits	Reporting Limit	Dilution	Prepa P. Date	ration P. Batch	A. Date	Analysis A. Batch	In
an an in the second	(Total Recoverable)/EPA 6020A						Supply Water				
Trace Elements by IC	CP/MS, Total Recoverable				Alia	uot ID:	73682-001C	Matrix: G	round Wate	1	
5. Sodium			m	g/L	3	100	06/17/16	PT16F17B	06/17/16	T416F17A	JL
4. Potassium	2		m	g/L	1	100	06/17/16	PT16F17B	06/17/16	T416F17A	
3. Magnesium	20		materia and	g/L	1	100	06/17/16	PT16F17B	06/17/16		
2. Calcium	71			g/L	3	100	06/17/16	PT16F17B	06/17/16	T416F17A T416F17A	
Parameter(s)	Result	Q		nits g/L	Reporting Limit	Dilution 100	P. Date 06/17/16	P. Batch PT16F17B	A. Date 06/17/16	A. Batch	In
Developed and A		~				D 11 11	Prepa			Analysis	
Trace Elements by IC Method: EPA 3005A	CP/MS, Dissolved (Dissolved)/EPA 6020A					uot ID: cription:	73682-001B Supply Water	Matrix: G	round Wate	ər	
1. Specific Gravity	1.000		N	A	0.000	1.0	NA	NA	06/14/16	NA	C
Parameter(s)	Result	Q	Ur	iits	Reporting Limit	Dilution	Prepa P. Date	ration P. Batch	A. Date	Analysis A. Batch	In
Method: ASTM D142	9-08D				Des	cription:	Supply Water				
a de la companya de l	D°F (Analysis Performed in Cadilla	ic)			Aliq	uot ID:	73682-001D	Matrix: G	round Wate	er.	-
Definitions:	Q: Qualifier (see definitions at end	of rep	ort) N.	A: Not A	applicable ‡:Pa	rameter n	ot included in NEL	AC Scope of A	nalysis.		
Sample Comments:											
Client Project No:	NA		Samp	ole Matri	ix Groun	d Water		Collec	t Time:	12:30	
Client Project Name:	Smith Creek - Supply Water		Samp	ole No:	1			Collect	t Date:	06/13/16	
Client Identification:	Muskegon Development Company		Sam	ole Desc	cription: Supply	/ Water		Chain	of Custody:	42531.422	2
environmenta services	1	L			Project Number					Date: 07/1	
Fibertec				1995 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 -	al Laboratory F				(Page: 2 of	82 4

1914 Holloway Drive 11766 E. Grand River 8660 S. Mackinaw Trail Holt, MI 48842 Brighton, MI 48116 Cadillac, MI 49601 T: (517) 699-0345 T: (810) 220-3300 T: (231) 775-8368 F: (517) 699-0388 F: (810) 220-3311 F: (231) 775-8584

lab@fibertec.us

	1914 Holloway Drive		Holt,	MI 48842		T: (517) 699	9-0345	F: (517) 699-0388		
‡ 1.pH		7,95		pH Units	-1.00	1.0	NA	NA	06/13/16 14:0	3 NA	CA
Parameter(s)		Result	Q	Units	Reporting Limit	Dilution	Prepa P. Date	ration P. Batch	A. Date	nalysis A. Batch	Ini
pH, Electrometric (A Method: SM 4500-H·	nalysis Performed in Ca + B-2000	idillac)				uot ID: scription:	73682-001D Supply Water	Matrix:	Ground Water		
‡ 1. Chloride		21		mg/L	10	1.0	NA	NA	06/17/16	NA	CA
Parameter(s)		Result	Q	Units	Reporting Limit	Dilution	and the second states of the	P. Batch	A. Date	nalysis A. Batch	Ini
Chloride by Titrimet Method: SM 4500-Cl	ry (Analysis Performed i T B-1997	in Cadillac)				uot ID: cription:	73682-001D Supply Water		Ground Water		
			12 (1)	ingr.		the and should be					
Parameter(s) ‡ 1. Total Dissolved	Polido	Result 250	Q	Units mg/L	Reporting Limit	Dilution 10		P. Batch	A. Date 06/29/16	A. Batch	lni EA
Method: SM 2540 C-						S	Supply Water Prepa			nalysis	
Residue. Filterable (TDS) (Analysis Perform	ed in Cadilla	ac)		Alio	uot ID:	73682-001D	Matrix:	Ground Water		
Parameter(s) ‡ 1.Resistivity		Result 13	Q	Units ohm-m	Reporting Limit	Dilution 1.0	P. Date NA	P. Batch NA	A. Date 06/14/16	A. Batch NA	Ini CA
				11.20			Prepa			nalysis	
Resistivity at 25°C (Method: SM 2510 B-	Analysis Performed in C	adillac)				juot ID:	73682-001D Supply Water	Matrix:	Ground Water		
1. Specific Condu	ctance	790		µmho/cm	1.0	1.0	NA	NA	06/14/16	NA	CA
Parameter(s)		Result	Q	Units	Reporting Limit	Dilution	Prepa P. Date	ration P. Batch	A. Date	nalysis A. Batch	Ini
Specific Conductan Method: SM 2510 B-	ce at 25°C (Analysis Per 1997	formed in C	adill	ac)		uot ID: cription:	73682-001D Supply Water		Ground Water		
‡ 2. Carbonate Alka	linity	U		mg CaCO3/L	20	1.0	NA	NA	06/17/16	WD16F17	A RK
1. Bicarbonate Alk	and the second se	190	G	mg CaCO3/L	20	1.0	NA	NA	06/17/16	WD16F17	10000000
Parameter(s)		Result	Q	Units	Reporting Limit	Dilution	Prepa	ration P. Batch	A. Date	nalysis A. Batch	Ini
Alkalinity by Titrimer Method: SM 2320 B-	(107)					uot ID:	73682-001 Supply Water	Matrix:	Ground Water		
Definitions:	Q: Qualifier (see definit	ions at end o	of rep	oort) NA: Not	Applicable ‡: Pa	arameter n	ot included in NEL	AC Scope of	Analysis.		
Sample Comments:				ei :							
Client Project No:	NA			Sample Mat	rix: Groun	d Water		Colle	ect Time:	12:30	
Client Identification: Client Project Name:	Muskegon Developme Company Smith Creek - Supply 1			Sample Des Sample No:	cription: Supply	y Water			n of Custody: ect Date:	42531.42	2
										Abata Marca - Nava	
Fibertec environmento service	ıl.		1	Laboratory	Project Numb ample Number	er: 73682				ge: 3 of ite: 07/*	i 4 18/16
				Analytic	al Laboratory I	Report			Or	der: 736	82

11766 E. Grand River 8660 S. Mackinaw Trail Brighton, MI 48116 Cadillac, MI 49601 T: (517) 699-0345 T: (810) 220-3300 T: (231) 775-8368 F: (517) 699-0388 F: (810) 220-3311 F: (231) 775-8584

lab@fibertec.us



Analytical Laboratory Report Laboratory Project Number: 73682 Order: 73682 Page: 4 of 4 Date: 07/18/16

Definitions/ Qualifiers:

- A: Spike recovery or precision unusable due to dilution.
- B: The analyte was detected in the associated method blank.
- E: The analyte was detected at a concentration greater than the calibration range, therefore the result is estimated.
- J: The concentration is an estimated value.
- M: Modified Method
- U: The analyte was not detected at or above the reporting limit.
- X: Matrix Interference has resulted in a raised reporting limit or distorted result.
- W: Results reported on a wet-weight basis.
- *: Value reported is outside QC limits

Exception Summary:

L- : Recovery in the associated laboratory sample (LCS) exceeds the lower control limit. Results may be biased low.





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Central Michigan Cementing Services

1934 Commercial Drive • Mt. Pleasant, MI USA 48858 Phone: 989/775-0940 • Fax: 989/775-0943

20

JOB DESCRIPTION FORM

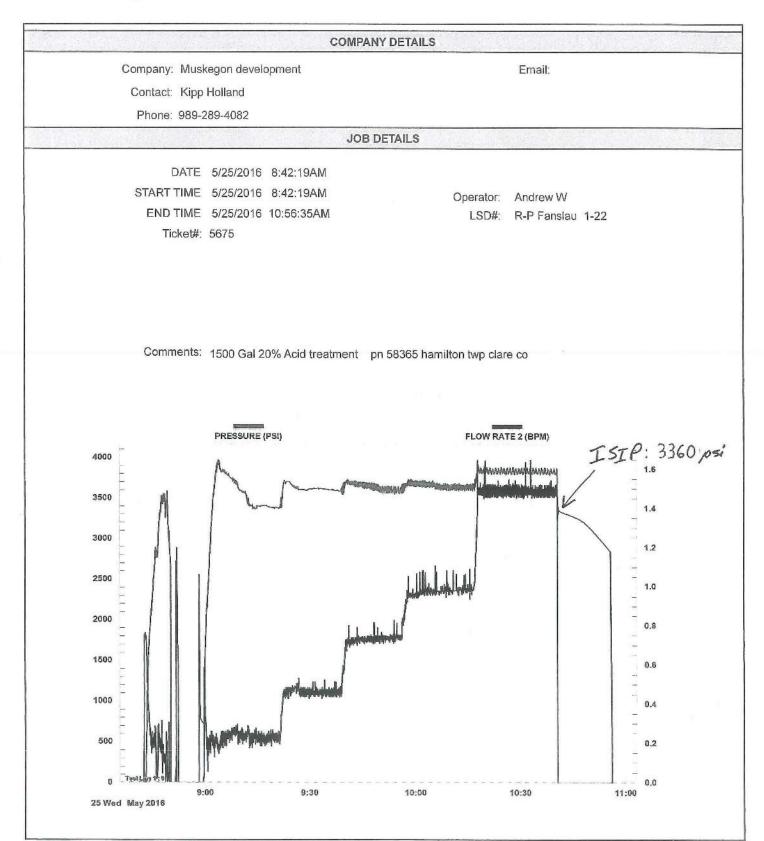
OMPANY Muskegon Develope	itest	_ DATE5	25-16	JOB #
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COUNTY Clare	SECTION 58 365	TWP	lomiltov.	STATE
CONTRACTOR Kip Howland				
OB DESCRIPTION Treat Perfs w/ 1.	500 6 Als 20% A	1CL		an director
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OBIG Roll Hole W/ 50B	BLS FW			
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0832 SPOT ACTO 19.7 8	BLS & Set PACKEr	13		
0835 Start Treating . 25	SBP- 3. SOOPJI			
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0730 150 APM 3,610 PSI	318815 12			<u></u>
0938 Start Flush Incre	wolfte .75 Bp.	3,6501	T20	
0955 3,600 PSI 128811	Flush in Increas	e Rate	1.0 Bpm	_
1064 20BBLS Flushics 1.0	BAR 3, 200 PSZ			
1014 " BOBBLS Flushing 1.0				
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IJIP 3,675 PJI				
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	Party and the states	1 1	and the second second	

CEMENTER DD Stahl

OPERATOR Dave Davis & Andrew Weber

JOB REPORT

Central Michigan Cementing Services



Muskegon Development Company Smith Creek Fracture Pressure Gradient Calculation

1

Well	Permit #	Location Description	Top of Treated Interval (ft)	Treatment Date	ISIP From Chart (psig)	ISIP From Chart (psia)	Fluid Gradient (psi/ft)	Hydrostatic Pressure (psia)	Formation Fracture Pressure (psia)	Frac Gradient (psi/ft)
Fanslau 1-22 *	58365	NE/4, NW/4, NW/4, Section 22, T19N-R3W, Clare County	4968	5/25/2016	3360	3374.7	0.433	2151	5526	1.112

* Note: ISIP was observed after flushing tubular volume with fresh water.

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STATE OF MICHIGAN MICHIGAN STATE HOUSING DEVELOPMENT AUTHORITY STATE HISTORIC PRESERVATION OFFICE

KEVIN ELSENHEIMER EXECUTIVE DIRECTOR

GOVERNOR

July 25, 2016

LISA PERENCHIO EPA REGION 5 77 WEST JACKSON BLVD WU 16J CHICAGO IL 60604

ALIG - 1 2018

RE: ER04-92 Muskegon Development Company Well Projects - Holcomb 1-22, Sec. 22, T19N, R3W, Hamilton Township, Clare County (EPA)

Dear Ms. Perenchio:

Under the authority of Section 106 of the National Historic Preservation Act of 1966, as amended, we have reviewed the above-cited undertaking at the location noted above. Based on the information provided for our review, it is the opinion of the State Historic Preservation Officer (SHPO) that <u>no historic properties are affected</u> within the area of potential effects of this undertaking.

This letter evidences the EPA's compliance with 36 CFR § 800.4 "Identification of historic properties," and the fulfillment of the EPA's responsibility to notify the SHPO, as a consulting party in the Section 106 process, under 36 CFR § 800.4(d)(1) "No historic properties affected." If the scope of work changes in any way, or if artifacts or bones are discovered, please notify this office immediately.

We remind you that federal agency officials or their delegated authorities are required to involve the public in a manner that reflects the nature and complexity of the undertaking and its effects on historic properties per 36 CFR § 800.2(d). The National Historic Preservation Act also requires that federal agencies consult with any Indian tribe and/or Tribal Historic Preservation Officer (THPO) that attach religious and cultural significance to historic properties that may be affected by the agency's undertakings per 36 CFR § 800.2(c)(2)(ii).

The State Historic Preservation Office is not the office of record for this undertaking. You are therefore asked to maintain a copy of this letter with your environmental review record for this undertaking.

If you have any questions, please contact Brian Grennell, Cultural Resource Management Specialist, at 517-335-2721 or by email at GrennellB@michigan.gov. **Please reference our project number in all communication with this office regarding this undertaking.** Thank you for this opportunity to review and comment, and for your cooperation.

Sincerely,

Brian G. Grennell

Cultural Resource Management Specialist

for Brian D. Conway State Historic Preservation Officer

SAT:BGG

Copy: Bennett Myler, Muskegon Development Company



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Wells Within Area of Review (1/4 Mile)

Permit #	Well Name	Location	Section	TWN-RNG	Completion Date	Elevation (Ft.)	Richfield Top
59345	Holcomb 1-22	NW/4, NE/4, NW/4	22	T19N-R3W	9/20/2008	946	4948
58365	Fanslau 1-22	NE/4, NW/4, NW/4	22	T19N-R3W	3/13/2008	951	4950
48189	Miller 1-22	NW/4, SE/4. NW/4	22	T19N-R3W	5/6/1994 (Plugged)	967	4992

Permit #	Well Name	Total Depth (Ft.)	Surface Casing Size (in.)	Surface Casing Depth (Ft.)	Surface CSG Cmt Vol (sx)	Hole Size (in.)	Est. TOC
59345	Holcomb 1-22	5201	9.625	792	500	12.25	Surface
58365	Fanslau 1-22	5200	9.625	791	450	12.25	Surface
48189	Miller 1-22	5220	9.625	808	400	12.25	Surface

Permit #	Well Name	Prod. CSG Size (in.)	Prod. Casing Depth (Ft.)	Prod. CSG Cmt. Vol. (sx)	Hole Size (in.)	Calc. Cmt. Top (Ft.)	Ft. of Cmt. Above RF
59345	Holcomb 1-22	4.5	5201	200	6.125	3164	1784
58365	Fanslau 1-22	4.5	5197	175	6.125	3169	1780
48189	Miller 1-22	*	*	*	*	*	*

*See Plugging Record

RUE N AUG 1 1 2015 Returned and a second

BA I	IUGHES		IMPENSATE	DN	C-DENSILOG ™ EUTRON LOG Y LOG	
Baker Atla	as	C.SHP.				
FILE NO;	COMPANY	Contraction of the second s	HORE PETROLEUM	<u>, ШС.</u>		
API NO:	FIELD	HAMILTO	and the second se		a tra de la competencia de la	
21-035-59345	COUNTY	CLARE		STAT	TE MICHIGAN	
Ver. 3.87 THANK YOUI	LOCATION: NW/4, NE/4, H 490' FNL & H HAWILTON TWP SEC 22	828' FWL,	n rge <u>0.3</u> W		OTHER SERVICES	
PERMANENT DATUM LOG MEASURED FROM DRILL. MEAS. FROM	G.L. K.B. KELLY BUSHI	12.6 FT	10N <u>933.3 FT</u> ABOVE P.D.		ELEVATIONS: KB 945.6 FT DF 944.4 FT GL 933.3 FT	
DATE	06-	SEP-2008	na da anti-a da anti-a da anti-a da bara			
RUN TRIP	1		aleman	1	<u>ar.</u> 1	
SERVICE ORDER	559	1849		pept	MARN	
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BOTTOM LOGGED INTER	the second s	12 FT	GEEN I CO			
TOP LOGGED INTERVAL CASING DRILLER	the second se	100 FT 7 IN 04078 FT		0		
CASING LOGGER	the second se	16 FT				
BIT SIZE	and the second se	25 IN				
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RMF AT MEAS. TEMP.	division of the second	4 OHIM	085 DEGF		0	
RMC AT MEAS, TEMP.	and the second se	4 DHWW	085 DEGF		0	
SOURCE OF RMF	RMC C.					
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TIME SINCE CIRCULATIO	A COMPANY OF THE OWNER	RS.				
MAX, RECORDED TEMP.	Contract of the American Street Stree	DEGF	1.05 101 04.05		n anna a chuire ann an thug a sa chuirte ann an chuireannach	
EQUIP. NO. LOCA	Contraction of the state of the party of the state of the	No. of Concession, Name of Street, or other	NT. PLSNT.	<u> </u>		
RECORDED BY		WIN BROWN	and a state of the second s	1465	OTHE POST I HAR	
WITNESSED BY	I MK.	WARK AND	INCASUN	LWN, d	OHN COLLINS	

IN MAKING INTERPRETATIONS OF LOGS DUR EMPLOYEES WILL GIVE CUSTOMER THE BENEFIT OF THEIR BEST JUDGEMENT. BUT SINCE ALL INTERPRETATIONS ARE OPINIONS BASED ON INFERENCES FROM ELECTRICAL OR OTHER MEASUREMENTS, WE CANNOT, AND WE DO NOT GUARANTEE THE ACCURACY OR CORRECTNESS OF ANY INTERPRETATION. WE SHALL NOT BE LIABLE OR RESPONSIBLE FOR ANY LOSS, COST, DAMAGES, DR EXPENSES WHATSOEVER INCURRED OR SUSTAINED BY THE CUSTOMER RESULTING FROM ANY INTERPRETATION MADE BY ANY OF OUR EMPLOYEES.

BOREHOLE	REHOLE RECO	RD		0	CASING RECORD	0	
BIT SIZE	FROM	TO	SIZE	WEIGHT	GRADE	FROM	2
19999 [N	0 FT	78 FI	13.375 N			0 FT	182
12.25 M	78 FT	792 FT	9.625 N			0 FT	1 792 F
8.75 W	792 FT	4090 FT	7 14			0 FT	4078 1
B.125 N	4090 FT	5202 FT				A second second second second second	all a strategy and a strategy at the second

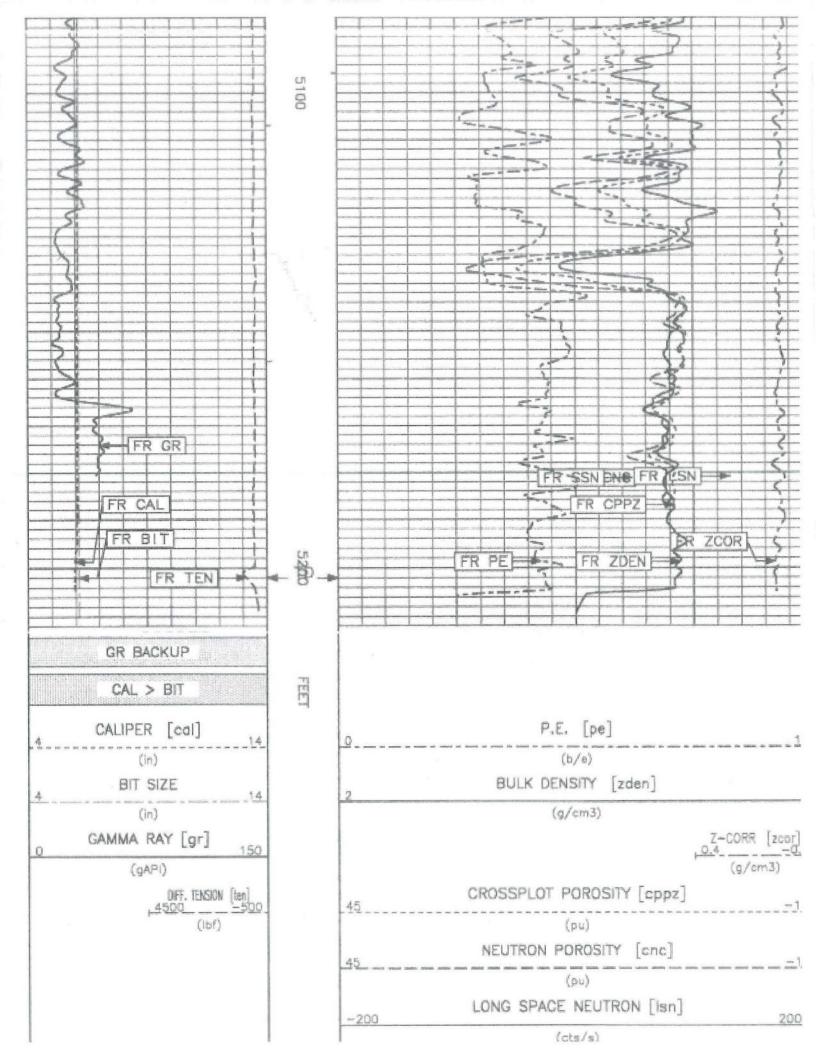
KELLY BUSHING WAS USED AS DEPTH REFERENCE POINT. 2.5 *** RUN 1 TRP

REMARKS

CNC AND PORZ WERE RUN ON A LIMESTONE MATRIX.

EVOL = CEMENT VOLUME CORRECTED FOR 4 1/2" CASING.

mm	Amerika Amerika A		
CLEICE OL ORDORICH SOMEL 2.1VLE OL WILLINGTON		P1	006>
		Rich Part	
	-ny-n-n-n-kanden	-ALAN-1-AstAsiatha	and all book







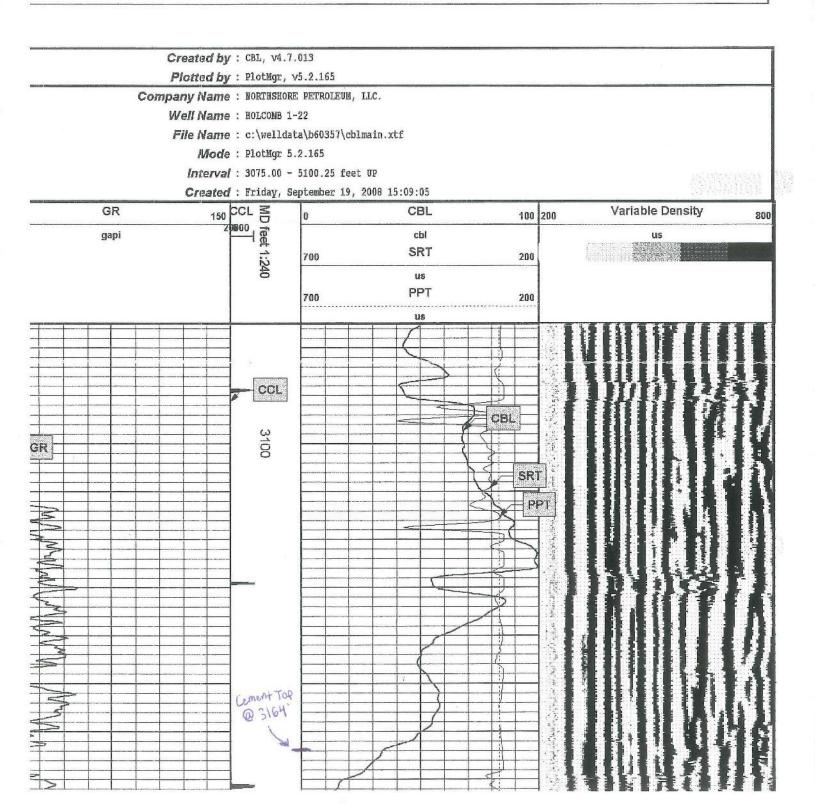
Baker Atlas

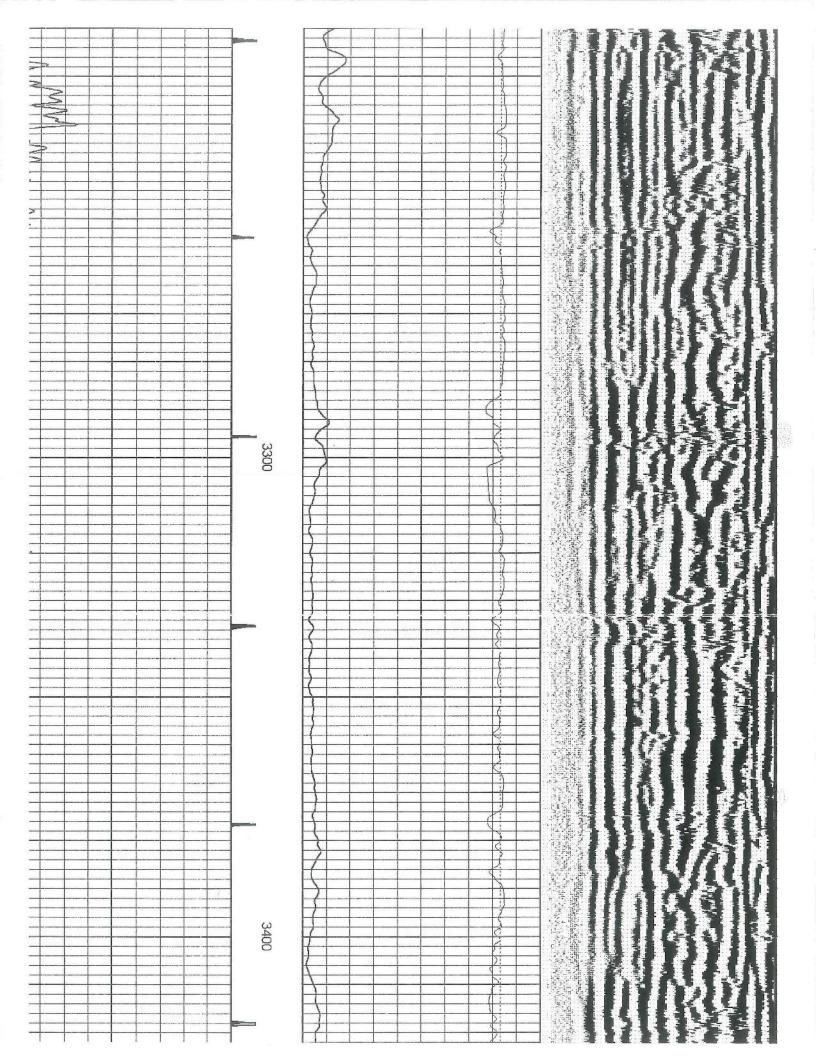
File No:	Company	NORTHSHOR	E PETROLEU	A, LLC.	
	Well	HOLCOMB 1	-22		
API No:	Field	HAMI LTON			
21-035-59345	County	CLARE		State	MICHIGAN
THANK YOU!	Location NW/4, NE/	A 11777 / A			Other Services
IDAMA IVU:	10 10 10 10 10				TEMP/NOISE
	A REALIST CONTRACTOR	& 1826' FWL		1	PERF
	HAMILTON	CO.			
	SEC 22	TWP 19	N RGE	03W	
Permanent Datum	G.L.	Elevation	933.3 1	Et	Elevations
Log Measured From	K.B.	12.6 ft	Above P. I).	KB 945.9 ft
Drill Measured From	KELLY B	TISHTNC	-	20	DF 944.4 ft
in an and a state	areddidd i'r dd 	er er leb de Alber			GL 933.3 ft
D. J.	-				
Date Run		L9 SEP 2008			na
Service Order		DNE	i di nativi da		
Depth Driller		560357			e li stance e considerate activitation
the second se		5202 ft			
Depth Logger Bottom Logged Interval		5101 ft			
Top Logged Interval	and the second se	5097 ft		_	
Time Started		3100 ft			
Time Finished		11:00			
Operator Rig Time	and the second se	<u>13:00</u> ?			
Type of Fluid in Hole		2 VATER			
Fluid Density		VAIER			
Salinity		va. VA			
Fluid Level		500 £t			
Logged Cement Top		100 TP			
Wellhead Pressure	I.) psi		+	
Maximum Hole Deviation		NA NA			
Nominal Logging Speed		35 fpm		1	
Maximum Recorded Tem					
Reference Log		L-DEN/ NEU			
Reference Log Date		5 SEP 2008			
Equipment No. Loca		the second se	MT.PLEASAN	7	
Recorded By		TASON SERVOCE			
Witnessed By	1	WR. LARRY AND			

DEPTH OFFSETS

(for Acquired Curves)

SERIES	DEPTH OFFSET	ACQUI	RED CUR	VES			
1311XA	-11.000	GR					
2421XA	-11.000	NEU					
2302XA	-9.500	CCL	ACCL				
1412XA	0.000	CBL	SRT	SATT	BI	PPT	SIG
SYSTEM	0.000	TTEN	TEN				





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MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY - OFFICE OF GEOLOGICAL SURVEY RECORD OF WELL DRILLING OR DEEPENING

- 10. Miles - 2

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	KECORD OF WELL I	DRILLING OR DEEPENING				
	pervisor of Wells or Part 625 Mineral V					
amended. Non-submission and/or f	alsification of this information may resu	It in fines and/or imprisonment. 59345				
4		API number				
(Submit 3 copies within 6	0 days of drilling completion.)	21-035-59345-00-00				
		Well name and number				
Part 615 Oil/Gas We	II 🗌 Part 625 Mineral Well	HOLCOMB 1-22				
Name and address of permittee		Surface location				
Northshore Petroleum, LLC		NW 1/4 of NE 1/4 of NW 1/4 Section 22 T19N R3W				
4406 Grand Cavman Dr.		Township County				
Sugar Land, Texas 77479		Hamilton Clare				
		Footages North/South East/West				
Name and address of drilling contra-	ctor	490 ft. from North line and 1826 ft. from West line of sec.				
Arrow Drilling Services		Directionally drilled (check one) Previous permit numbers				
4030 Columbus Dr.		Yes No none				
Kalkaska, MI 49646		Subsurface location (if directionally drilled)				
		1/4 of 1/4 of 1/4 Section T R				
Date drilling began	Date drilling completed	Township County				
August 22, 2008	Sept. 5, 2008					
Total depth of well	Formation at total depth	Footages North/South East/West				
Driller 5200 ft Log 5202 ft	Amherstburg	ft. from line and ft. from line of sec.				
Elevations		Feet drilled - cable tools Feet drilled - rotary tools				
K.B. 945.6 ft. R.F. 944.4 ft.	R.T. ft. Grd 933.3 ft	from n/a to n/a from Surface to 5200 ft				

Cas	sing, Casing Lin	ers and Cementing	, Operating Sti	rings	Water Fill Up (F.U.) or Lost Circulation (L.C.) (X)) (X)
Size	Where set	Cement	T.O.C.	Ft. pulled	Formation	F.U.	L.C.	Depth	Amount
9.625"	792 ft	500 sxs	Surface		Dundee		X	3884 ft	
7.0"	4082 ft	150 sxs	3375 ft						
4.5"	5201 ft	200 sxs	3744 ft						

Gr	oss Pay Interva	Is		All Other Oil and Gas Shows Observed or Logged							142084	
Formation	Oil or Gas	From	То					Whe	ere Obs	erved (X	5)	
Richfield	Oil	4948	5010	Formation	Oil or Gas	Depth	Sam- ples	Odor	Pits	Mud Line	Gas Log	Fill Up
				See attached								
				sheet					<u> </u>			
				N								L

Depth C	Correction	Dev	iation Survey		Plu	igged Back
Depth	Correction	Run at	Degrees	Yes	No	Depth
		2080 ft	1-1/2 dea			
		2530 ft	1 dea			
		3050 ft	3/4 dea			
		3570 ft	1/2.dea			

		Geophysical / Mechanical Logs (list each	type run)
Bra	nd	Log types	Logged intervals
Baker Atlas		Z-Densilog-Comp. Neutron-Gamma	100 - 5202 ft
Baker Atlas		Dual Laterolog-Micro-Laterolog Gamma	4776 - 5202 ft
Notice: Report compl	ete sample and forma	tion record, coring record, and drill stem test informat	ion on reverse side.
CERTIFICATION "Is accurate and complete	state that I am authoriz te to the best of my kn	ted by said owner. This report was prepared under moviedge."	ny supervision and direction. The facts stated herein are true,
Date	Name and title (p	rint)	Signature
Nov. 10, 2008	Mark W. Andr		- Millin Mi
EQP 7200-5 (rev. 8/	Submit to: 2004)	OFFICE OF GEOLOGICAL SURVEY, MICHIGAN DEPT OF ENVIRONMENTAL QUALT PO BOX 30256, LANSING, MI 46909-7756	DEC 2 6 2008

1

API number FORMATION RECORD Permit number/Deepening number Attach additional sheets if necessary 59345 Elevation used Geologist name Tops taken from 945.6 ft Driller's log Sample log Electric log Allen Bentz / Mark Andreason Formation Formation From To (type, color, hardness) From (type, color, hardness) To 5200 ft AMHERSTBURG 5142 ft Note: if well directionally drilled, add true vertical depth formation tops where appropriate (TD)FORMATION -GLACIAL DRIFT 464 ft Limestone, dk brn-Surface 923 ft SAGINAW FORMATION - Shale, brn, argill & foss 464 ft It grey, frm, sl. calc. 981 ft PARMA SANDSTONE - Sandstone, 923 ft It. brn to clr, sub rnd, calc cement 1238 ft MICHIGAN FORMATION - Shale, 981 ft It -med grey, sdst interbeds at top, calc. interbeds at base, Triple Gyp @ 1028ft, Brown Lime @1098 ft. 1314 ft STRAY SANDSTONE - Sandstone 1238 ft clr, frosted, vf-mg, strong gas show 1530 ft MARSHALL SANDSTONE -1314 ft Sandstone, clr, fg-mg, sub-rnd 2472 ft COLDWATER SHALE - Shale, If well was cored, attach core description 1530 ft med-dk grey, sli calc, pyr. DRILL STEM TEST DATA 2506 ft SUNBURY SHALE - Shale, blk None 2472 ft 2522 ft BEDFORD SHALE - Shale, It gry 2506 ft 3034 ft ANTRIM SHALE - Shale, dk brn-blk 2522 ft calc at places, gas shows 3068 ft TRAVERSE FORMATION - Shale, 3034 ft grey - brn, limest interbeds 3716 ft TRAVERSE LIMESTONE - Limest. 3068 ft It gry - It brn, vf-fxlyn, foss, dns, hd 3782 ft BELL SHALE - Shale, m-dk grey 3716 ft 4044 ft **DUNDEE LIMESTONE - Limest.**, 3782 ft from 3782-3834 ft, It brn, vfxyln, oil odor, Dolomite from 3834-4044 per logs, no returns, no cuttings 4044 ft 4149 ft DETRIOT RIVER ANHYDRITE interbedded dol and anhydrites LIST ATTACHMENTS 4648 ft **DETROIT RIVER SALTS - Massive** Z-Densilog-Comp Neutron-Gamma Log 4149 ft Dual Laterolog-Micro-Laterolog-Gamma Log salt beds w/interbed dol & anhydrite SOUR ZONE - Introdded Dolomite, 4878 ft 4648 ft brn & Limest., dk. gy, & anhydrite, oil/gas shws at 4686-94 & 4810-22 4966 ft MASSIVE ANHYDRITE - Anhydrite, 4878 ft milky-transl, numerous thin brn, vfx limestone & dolomite beds. 4966ft 514Zft RICHFIELD ZONE - Dolomite, brn, OFFICE OF GEOLOGICAL SURVEY USE ONLY Reviewed by vf-mx and Limestone, brn-lt brn, vfx, beds, oil shows in dolomite beds, Date of review anhydrite interbeds in upper half.



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

Name and address of permittee Northshore Petroleum, LLC 4406 Grand Cayman Dr. Sugar Land, Texas 77479 Permit number/deepening permit no. API number 59345 21-011-59345-00-00 Type of well (after completion) OIL PRODUCER Well name & number HOLCOMB 1-22

Sugar Land, Texas 77	479						
Directionally drilled (check of Yes No	ne) Previous p	ermit numbers	Total depth of well M.D. 5200	T.V.	D. 5200		
Surface location			Subsurface location (if	directionally dr	illed)		
NW % of NE % of NV	V 1/4 Section 22	т 19N R 3W	1/4 of 1/4	of ¼Se	ection	Т	R
Township Hamilton	County Clare		Township		County		
Footages: North/South	1	East/West	Footages: North/	South		East/West	
490 Ft. from North lin	e and 1826 Ft. from	m West line of Sec.	Ft. from	line and	Ft. fc	om	line of Sec.
P	art 615 - oil/gas wells			Part 625 - m	nineral wells		
	oducing formation(s) chfield	Injection formation(s)	Date of first injection	Disposal for	mation(s)	Solution f	formation(s)

COMPLETION INTERVALS(S)

Date Number holes			Open			
		Perforation or open hole interval	Yes	No		
		4,948-54', 4,966-76', 4,990-5,000', 5,004-10'	X			
.000						
				1		

STIMULATION BY ACID OR FRACTURING

Date	Interval treated	Materials and amount used
9/20/08	4,948-54', 4,966-76', 4,990-5,000', 5,004-	2,000 gals. 20% NE-HCI
9/29/08	4,948-54', 4,966-76'	2,000 gals. 20% NE-HCI
	10	1

PRODUCTION TEST DATA

Oil	Gravity	Condensate	Gas	Water	H ₂ S	B.H.P. and depth
Bbls/day	°API	Bbls/day	MCF/day	Bbls/day	Grains/100 ft ³ .	
20	41.1	NA	15 (est.)	16	NA	2,183 psia @ 5000 ft

CERTIFICATION "I state that I am authoriz stated herein are true, accurate and complete	ed by said owner. This report was prepared under my supervision ate to the best of my knowledge."	on and direction. The facts
Name and title (print or type) Mark W. Andreason, COO	Signature	Date November 10, 2008
Submit to:	OFFICE OF GEOLOGICAL SURVEY MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY PO BOX 30256 LANSING MI 48909-7756	

DEQ

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY - OFFICE OF GEOLOGICAL SURVEY RECORD OF WELL DRILLING OR DEEPENING

	pervisor of Wells or Part 625 Mineral National National Nation of this information may rest	
(Submit 3 copies within 6	0 days of drilling completion.)	API number 21-035-58365-00-00 Well name and number
Part 615 Oil/Gas We Name and address of permittee	II 🔲 Part 625 Mineral Well	R & P FANSLAU #1-22 Surface location
Northshore Petroleum, LLC 4406 Grand Cavman Dr. Sugar Land, Texas 77479		NE 1/4 of NW 1/4 of NW 1/4 Section 22 T19N R3W Township County Hamilton Clare Footages North/South East/West
Name and address of drilling contract Bigard & Huggard Drilling, Inc 5580 Venture Way Mt, Pleasant, Michigan 48858	5	330 ft. from North line and 987 ft. from West line of sec. Directionally drilled (check one) Previous permit numbers Image: Subsurface location (if directionally drilled) none 1/4 of 1/4 of 1/4 Section T
Date drilling began September 20, 2007	Date drilling completed September 27, 2007	Township County
Total depth of well Driller 4135 ft Log 4129 ft	Formation at total depth Detroit River Anhydrite	Footages North/South East/West ft. from line and ft. from line of sec.
Elevations K.B. 951 ft. R.F. 950 ft. R.T.	ft. Grd 939 ft	Feet drilled - cable tools Feet drilled - rotary tools from n/a to n/a from Surface to 4135 ft

Cas	ling, Casing Lin	ers and Cementing	, Operating Str	ings	Water Fill U	p (F.U.) or L	ost Circ	ulation (L.C.	.) (X)
Size	Where set	Cement	T.O.C.	Ft. pulled	Formation	F.U.	L.C.	Depth	Amount
9.625"	791 ft	450 sacks	Surface						
7.0"	4114.ft	450 sacks	801 ft						enter Marcate
									i
		-			8			1	

Gross Pay Intervals			Ai	Other Oil an	d Gas Sho	ws Obse	erved or	Logged	1			
Formation	Oil or Gas	From	To	1	T			Whe	ere Obs	erved (X	0	
Dundee	Oil	3840	4032	Formation	Oil or Gas	Depth	Sam- ples	Odor	Pits	Mud Line	Gas Log	Fill Up
				See attached								
			ļ	sheet							-	
						1	-					

Depth Correction		Deviation Survey		Plugged Back			
Depth	Correction	Run at	Degrees	Yes	No	Depth	
		720 ft	1.5 dea				
		1309 ft	1 deg				
		2899 ft	1.5 dea				
		3146 ft	1 dea				

		Logged intervals		
Baker Atlas	Z-Densilog-Comp. Neutron-Gamma	Surface - 4126 ft		
Baker Atlas	Dual Laterolog-Micro-Laterolog Gamma	790 - 4126 ft		
Baker Atlas	Circumferential Borehole Imager (CBIL)	3250-3470, 3750-4060		

CERTIFICATION "J 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

Date	Name and title (pi
October 4, 2007	Mark W. Andr
	Submit to:

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

OCT 0 9 2007

15

FORMATION RECORD Attach additional sheets if necessary Geologist name

Jim Sanborn / Mark Andreason

Elevation used

951 ft KB

API number
Tops taken from
Driller's log

Permit number/Deepening number 58365

		Formation			Formation
From	То	(type, color, hardness)	From	То	(type, color, hardness)
Note: if wel	I directionally di	rilled, add true vertical depth formation tops			3404-3424.
where appro			3700 ft	3762 ft	BELL SHALE -
Surface	490 ft	GLACIAL DRIFT			Shale, med-dk gy
490 ft	922 ft	SAGINAW FORMATION - Shale,	3762 ft	4041 ft	DUNDEE FM - Ls
		grey, firm to soft and thin & thick			tan-buff, fxyln w/
		beds of Sandstone, clear to white,	F		abunt dd oil stn &
		fine-coarse grained, friable to cmt'd.			flor 3762-3842; Ls
922 我	946 ft	PARMA SANDSTONE - Sandstone,			grading to Dol, tar
		clear, fgr, abundant pyrite.			to It brn, fxyin, gd
946 ft	975 ft	BAYPORT LIMESTONE - Limest.,			suc, intrxlyn & vug
		It grey, vfxlyn, hard, dense, mixed	2		por, gd cut& >40%
		w/ Sandstone, fgr, clear, well-srtd.			brite yel gold flor
975 ft	1243 ft	MICHIGAN FORMATION - Shale,			3842-4020 ft.
	1	med-dk grey, frm-hd w/ stringers of	4041 ft	4135 ft (TD)	DET. RIVR ANHY
		Limestone and Sandstone; Triple			Anhy & Dol intrbed
		Gyp Mbr @ 1040 ft, interbedded	lf well	was cored, attach cor	e description
		shale, med-dk gry and anhy; Brown		DRILL STEM TEST I	DATA
		Lime Mbr @ 1104 ft, interbed Ist	None		a prove products (here)
		w/ scat gold flor and shale.			
1243 ft	1311 ft	STRAY SANDSTONE - Sandstone,			
	1	clr to tan, frosted sub-rnd grains, yel			
		gold flor; Limest w/ shale stringers			
		from 1270-1311 ft.	1		
1311 ft	1534 ft	MARSHALL SANDSTONE - Sandst			
		clr - white frosted grns, pp flor at top			
		fgr, poory cemented, shaly at base.			
1534 ft	2472 ft	COLDWATER SHALE - Shale, It to			
		med gry to bluish gry, firm, hard,			
		slightly pyritic and calc in part.			
2472 ft	2505 ft	SUNBURY SHALE - Shale, dk gry -			
	00000	black, firm, hard, brittle, v. carb.			generation of a
2505 ft	2520 ft	BEDFORD SHALE - Shale, gry to		LIST ATTACHMEN	and the second se
		dk brn, dense, brit, argill.		p Neutron-Gamma Lo licro-Laterolog-Gamm	
2520 ft	3030 ft	ANTRIM SHALE - Shale, blk-dk gry,		Borehole Imager (CBI	
		frm, hard, brittle, v carb., tr spores		serence integer (essi	-/
		w/ gld flor, v, calc and silty at base;			
		Lachine Mbr @ 2825 ft; Paxton Mbr			
		@ 2915 ft; Norwood Mbr @ 2976 ft.			
3030 ft	3054 ft	TRAVERSE FORMATION - Shale,			
		It gry grn, soft, silty and calc.			
3054 ft	3700 ft	TRAVERSE LIMESTONE - Limest.,		F GEOLOGICAL SUF	VEY USE ONLY
		dk brn to brn and crmy wh to tan,	Reviewed by		
		typically vf-fxlyn, hd, dense, shale			
		beds incr at base; micropor-vuggy	Date of review		
	1	15-30% flor & cut 3270-3302 &	and the second se		

DEQ

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY - OFFICE OF GEOLOGICAL SURVEY RECORD OF WELL DRILLING OR DEEPENING

	pervisor of Wells or Part 625 Mineral alsification of this information may res	in the second seco
(Submit 3 copies within 6	0 days of drilling completion.)	API number <u>21-035-58365-00-00</u> Well name and number
Part 615 Oil/Gas We Name and address of permittee	II 🔲 Part 625 Mineral Well	R & P FANSLAU #1-22 (Deepening) Surface location
Northshore Petroleum, LLC 4406 Grand Cavman Dr. Sugar Land, Texas 77479	8.	NE 1/4 of NW 1/4 of NW 1/4 Section 22 T19N R3W Township County Hamilton Clare Footages North/South East/West
Name and address of drilling contra Bidard & Huddard Drillind, Ind 5580 Venture Way Mt. Pleasant, Michidan 48858	÷.	330 ft. from North line and 987 ft. from West line of sec. Directionally drilled (check one) Previous permit numbers □ Yes No none Subsurface location (if directionally drilled) 1/4 of 1/4 of 1/4 Section T
Date drilling began February 17, 2007	Date drilling completed February 22, 2007	Township County
Total depth of well Driller 5200 ft Log 5118 ft	Formation at total depth Amherstburg Fm.	Footages North/South East/West ft. from line and ft. from line of sec.
Elevations K.B. 951 ft. R.F. 950 ft. R.T.	ft. Grd 939 ft	Feet drilled - cable tools Feet drilled - rotary tools from n/a to n/a from 4135 ft to 5200 ft

Cas	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
9,625"	791.ft	450 sacks	Surface_						
7.0"	4114 ft	450 sacks	801 ft						
4.5"	5197 ft	175 sacks	3704 ft			_			

Gross Pay Intervals			All Other Oil and Gas Shows Observed or Logged						-			
Formation	Oil or Gas	From	To					Whe	ere Obs	erved (X	3	
Sour Zone	Oil/Gas	4679	4684	Formation	Oil or	Depth	Sam-			Mud	Gas	Fill
Sour Zone	Oil/Gas	4752	4756		Gas		ples	Odor	Pits	Line	Log	Up
Richfield	Oil/Gas	4966	5014	See attached								
				sheet			-					

Depth C	Correction	Dev	lation Survey		Plu	lgged Back
Depth Correction		Run at	Degrees	Yes	No	Depth
		4679 ft	0.75 dea			
		5160 ft	1.5 dea			
	1					ener suit te

	Geophysical / Mechanical Logs (list	t each type run)
E	rand Log types	Logged intervals
Baker Atlas	Z-Densilog-Comp. Neutron-Gamma	4111 - 5118 ft
Baker Atlas	Dual Laterolog-Micro-Laterolog Gam	ma 4111 - 5118 ft
CERTIFICATION	plete sample and formation record, coring record, and drill stem test info I state that I am authorized by said owner. This report was prepared un lete to the best of my knowledge."	and the second
Date	Name and title (print)	Signature
February 26, 2	08 Mark W. Andreason, CEO	Signature
EQP 7200-5 (rev.	Submit to: OFFICE OF GEOLOGICAL SURVEY, MICHIGAN DEPT OF ENVIRONMENTAL Q	

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FORMATION RECORD Attach additional sheets if necessary		API number	Permit numb 58365	er/Deepening number
Elevation used	Geologist name	Tops taken from		
951 ft KB	Jim Sanborn / Mark Andreason	Driller's log	Sample log	Electric log

		Formation			Formation
From	То	(type, color, hardness)	From	То	(type, color, hardness)
Note: if well where approp		led, add true vertical depth formation tops			
4148 ft	4640 ft	DETROIT RIVER SALT - Salt beds			
4640 ft	4878 ft	w/ anhydrite & dolomite interbeds SOUR ZONE - Intrbdded Dolomite, brn & Limest., dk. gy, & anhydrite, crm, micro-suc por, w/ oil staining,			
	1000.6	flor & cut, and sour odor in dolomite beds at 4679-92, 4752-70, and 4830-56.			
4878 ft	4966 ft	MASSIVE ANHYDRITE - Anhydrite w/ thin dolomite intrbds			
4966 ft	5150 ft	RICHFIELD ZONE - Dolomite, vf- fxyln, tan to brn, interxyln-suc por, abridt vis oil, good flor & cut from			
		4968-5016. Some anhydrite intrbds	If well was	cored, attach core	description
		at top. Denser dolomites and incr		ILL STEM TEST DA	TA
5150 ft	5200 ft	lime % toward base. AMHERSTBURG FM Limestone,	None		means of the Large Com
	(TD)	dk - med brn, vfxln, hd, dns, fossils			
					×
			i.		
				IST ATTACHMENT	S
			Z-Densilog-Comp N Dual Laterolog-Micro		Log
				EOLOGICAL SURV	EV LISE ONLY
			Reviewed by		
			Date of review		



MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY – OFFICE OF GEOLOGICAL SURVEY RECORD OF WELL COMPLETION

	art 615 or Part 625 of an-submission and/or f		Permit number/deep 58365	ening permit no.	API number 21-035-58		00
	ay result in fines and/o	Type of well (after co OIL PRODUCEF					
	ies within 60 days of w il/Gas Well 🔲 Part 6	Well name & numbe R. & P. FANSLA	£		<u> - </u>		
Name and address of per Northshore Petroleu 4406 Grand Caymar Sugar Land, Texas 7	m, LLC 1 Dr.						
Directionally drilled (chec	k one) Previous	permit numbers	Total depth of well M.D. 5,200	T.V	.D. 5,200		
Surface location			Subsurface location				
NE % of NW % of N		<u>T19N R3W</u>		14 of% S	ection	T	R
Township Hamilton	County		Township		County		
Footages: North/So	outh	East/West	Footages: Nor	th/South		East/West	
330 Ft. from North	line and 987 Ft. fr	om West line of Sec.	Ft. from	line and	Ft. in	om	line of Sec.
	Part 615 - oil/gas well)		Part 625 - r	nineral wells		
	Producing formation(s) Richfield	Injection formation(s)	Date of first injection	Disposal fo	rmation(s)	Solution	formation(s)

COMPLETION INTERVALS(S)

			0	pen
Date	Number holes	Perforation or open hole interval	Yes	No
12/13/07	248	3,868-3,930' - 4 spf (Squeezed)		X
1/7/08	40	3,818-3,828' - 4 spf (Squeezed)		X
3/13/08	144	4,968-4,978'; 4,996-5,002'	X	
		5,006-5,014' - 6 spf		
	· · · · · · · · · · · · · · · · · · ·			

STIMULATION BY ACID OR FRACTURING

Date	Interval treated	Materials and amount used
12/13/07	3,868-3,930'	500 gals. 20% HCI - (interval made only water)
3/13/08	4,968-4,978'; 4,996-5,002'	500 gals. 20% HCI
	5,006-5,014'	
		<u></u>

PRODUCTION TEST DATA

Oil	Gravity	Condensate	Gas	Water	H ₂ S	B.H.P. and depth
Bbls/day	°API	Bbls/day	MCF/day	Bbls/day	Grains/100 ft ³ .	
90	41.2		81 (est.)	0	69.1	2,612 psia - 5,030'

stated herein are true, accur	rate and comple	ed by said owner. This report was prepared under my super te to the best of my knowledge."	vision and direction. The face
Name and title (print or type) Mark W. Andreason		Signature	Date April 16, 2008
	Submit to:	OFFICE OF GEOLOGICAL SURVEY MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALI PO BOX 30256	TY
EQP 7130 (rev. 8/2004)		LANSING MI 48909-7756	APR 2 2 2008

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Dart Oil & Gas Corporation 600 Dart Rd., P.O. Box 177 Hamilton Clare converse mornsport Masson, MI 48854-0177 Box 177 Signame Mornsport Seatymest Seatymest Mass and access or BELLING CONTRACTOR MCLachian Drilling Company P.O. Box 548 Signame Mornsport Seatymest Seatymest Seatymest Seatymest Evary, MI 49631-0548 Date Belling Contractors Date Belling Contractors 02-08-94 Date Belling Contractors 02-08-94 Obst Contractors 02-18-94 Date Belling Contractors 100% 2001 Clare Clare Date Belling Contractors 10% 2001 Elevations 10% 10% 10% 10% Date Belling Contractors 10% 2001 Box 10000 Date Belling Contractors 10% 2001 Seatymest 10% 10% 10% 10% Date Belling Contractors 10% 2001 From NA To Elevations 10% 10% 10% 10% 10% 10% Date Belling Contractors 10% 2001 Seatymest 10% 2001 Seatymest 10% 2001 Bate of Wissen 10% 2001 Bate of Wisse	NON-SUBMISSION AND/OR FALSIFICATION OF THIS INFORMATION MAY RESULT IN						SUR			of	NW 14	Sec	tion 2	2т	191	k 3	W
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MASON, MI 43554-0177 990t, from S Line and 990t, from E Line of W. Sec. Mollachlan Drilling Company Pro. Box 548 Subsynthet Location of Western Board 100 Subsynthet Location of Western Older Board 100 Subsynthet Location of Western Double Board 100 Double Board 100																	
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P.O. Box 548 TOWNSHP COUNTY Clars Evart, MI 49631-0548 Namilton Olars County Clars OR BONL COMPETED OVACONS MALE DATE WELL COMPETED DATE WELL COMPETED DATE WELL COMPETED 990f. from S Line and 980 from. K Line of % Sec. O2-08-94 02-18-94 06-06-94 990f. from S Line and 980 from. K Line of % Sec. D'B220' 5220' Amherstburg Dundee From NA Fee omlise - Case tools. D'B220' 5220' Amherstburg Dundee From NA Form O To 5220' DATE OF PREFINECTION NA NA NA ELEVATIONS ELEVATIONS Size WHERE SET CEMENT FT. 2ULED DATE MUMBER NETEVAL PERFORATED VERS NO 95/B'' 805' 400 sx Class A D-3-594 4 3860' - 3852' VES NO 6 1/2'' 4013' 600 sx Howo Lt, 180 sx Class A D-3-594 4 3860' - 3852' VES NO Stravy G Gas Gas IZ2N' X ELEVATION A VES NO SOUS Stravy G Gas Gas I	and some the set of th																
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Date Date <t< td=""><td></td><td></td><td></td><td>0540</td><td></td><td></td><td>TOW</td><td></td><td>1ton</td><td></td><td>1</td><td>COUN</td><td>TY</td><td>01</td><td>000</td><td></td><td>1</td></t<>				0540			TOW		1ton		1	COUN	TY	01	000		1
02-08-94 02-18-94 05-06-94 99 ØFt. from. S Line and 99% from. E Line of Va Sec. TOTUL DEPTH OF WELL 10% 22 01 ' 922 01 FORMATIONA TO. MADE XT STUDY FORMATIONA TO. DUITE OF PRATERIALS FORMATIONA TO. PROD. FORMATIONA FORMATIONA TO. PROD. FORMATIONA FORMATIONA TO. PROD. FORMATIONA FORMATIONA TOTUL OPENATIONA FORMATIONA FORMATIONA FORMATIONA TOTUL OPENATIONA FORMATIONA TOTUL OPENATIONA FORMATIONA TOTUL OPENATIONA FORMATIONA TOTUL OPENATIONA TOTUL OPENATIONA <t< td=""><td>second in the second second</td><td></td><td></td><td>14.44</td><td>Leave Merry</td><td>CONSISTER</td><td>-</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>	second in the second			14.44	Leave Merry	CONSISTER	-										
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BRAND (X) LOG TYPES LOGGED INTERVALS DEPTH CORRECTION RUN AT DEGREES YES NO DEPTH -Sehlumberger Hallburton CNL/GR 176-5220 4261' 4256' 950' 3/4°	L		100						CORRECTIO	NM .	DEVIATI				11005		or
Sehlumberger Hallburton CNL/GR 176-5220 4261' 4256 950' 3/4° Birdweit Hallburton CAI, 792-5220 2324' 1° Palliburton LDT 1094'- M44, 2338-5220 3357' 1° Halliburton DLI,/MIL/GR 1086-(482, 2840-5220) 5220' 3/4°	· · · · · · · · · · · · · · · · · · ·				-		π		r	- 1		-				-	
Birdwett Halluburton CAI, 792-5220 2324 1° 9 Halliburton LDT 1094- W44, 2838-5220 3357 1° 8 Halliburton DLL/MIL/GR 1096- (482, 2840-5220) 5220 3/4°	the second secon		1	A CARDINAL PROPERTY AND A CARD			⊣ŀ	Statement and the second se	NAME AND ADDRESS OF TAXABLE PARTY.		No. of Concession, Name			TEO	INU	DE	rin
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R Halliburton DLL/MLL/GR 1086-1482, 2840-5220 5220 5220 3/4°		_			1094-1	194,2838-5220				-		_	1°	I-	1	1	
	R Hallib													1			
PRODUCTION TEST DATA						PRODUCTIO		EST DATA									

OIL - Bbis/day GRAVITY - API COND. Bbis/day NA NA NA NA NA NA NA NA NA	ains/100 cu. ft. B.H.P. AND DEPTH
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I AM RESPONSIBLE FOR THIS REPORT. THE INFORMATION IS COMPLETE AND CORRECT.

2.13.95 NAME AND TITLE (PRINT) David W. Farner, Petroleum Engineer Midw. famu

NOTICE: REPORT COMPLETE SAMPLE AND FORMATION RECORD, CORING RECORD AND DRILL STEM TEST INFORMATION ON REVERSE SIDE. PA 7200-5 Rev 8185

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FORMATION RECORD

#48189

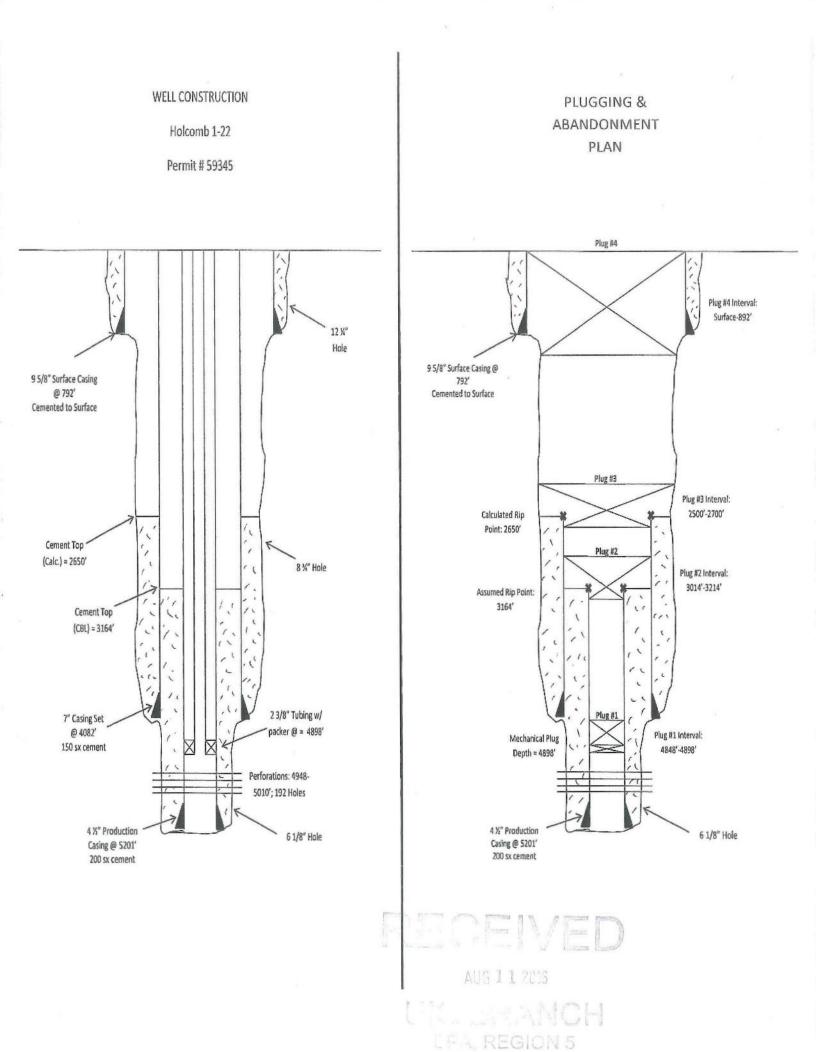
Mill ELEVATION USED.	er 1-22	(ATTACH ADDITIONA			VECES	SARY	}		•	010	
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EPA Forr	n 7520-14 (Rev	. 12-11)							(10			



Muskegon Development Company

Financial Report December 31, 2015



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AUG 1 1 2016 UIO LINGAL ICH EPA, REGION 5

List of Landowners Within 1320' of Holcomb 1-22 Hamilton Township, Clare County, T19N-R03W

Section	Short Legal Description	Owner Name	Owner's Street Address	City, State Zip
15	W/2 SE SW	Oblinsky, Frank & Nancy	9321 East Townlake Road	Harrison, Michigan 48625
15	W/2 E/2 SE SW	Burtka Trust, Richard A. & Eveline E.	3360 12th Street	Wyandotte, Michigan 48192
15	E/2 E/2 SE SW	Molinari, James & Lydia Magda	9463 East Townline Lake Road	Harrison, Michigan 48625
15	SW SW except 300-05 & 300-06	Roe, Herman L. II & Marilyn K.	5600 Cribbins Road	North Street, Michigan 48049
15	W/2 SW SE & W/2 W/2 E/2 SW SE	Scott, Paul & Shawn	10447 Lewis Road	Clio, Michigan 48420
22	N/2 NW NW	Fanslau Trust, Robert A. & Pearl	9062 East Townline Lake Road	Harrison, Michigan 48625
22	S/2 NW NW	Fanslau, Frederick & Katherine	200 North Occidental Road, Apt 23	Tecumseh, Michigan 49286
22	W/2 NE NW	Weaver, Vernon & Miranda	9326 East Townline Lake Road	Harrison, Michigan 48625
22	E/2 NE NW	Driver, Ronald E.	9478 East Townline Lake Road	Harrison, Michigan 48625
22	W/2 NW NE	Primemark Properties LLC	437 North Larch	Lansing, Michigan 48912
22	N 330' of SW NW	Miller, Alvin B.	10860 Strasburg	Erie, Michigan 48133
22	S 990' of SW NW	Cover, Willis & Pamela E.	9161 Balsam Road	Harrison, Michigan 48625
22	E/2 S/2 NW	Troyer, Levi & Naomi	2593 North Bailey Lake Avenue	Harrison, Michigan 48625
22	S/2 NE	Troyer, Levi & Naomi	2593 North Bailey Lake Avenue	Harrison, Michigan 48625

MUSKEGON DEVELOPMENT COMPANY

 1425 South Mission Road, Mount Pleasant, Michigan 48858

 (989) 772-4900
 (Fax) (989) 773-4094

June 13th, 2016

Anna Miller Underground Injection Control Branch U.S. Environmental Protection Agency – Region 5 Mail Code WU-16J 77 W. Jackson Blvd. Chicago, IL, 60604-3590

Dear Ms. Miller,

I have reviewed the potential impact to endangered species caused by conversion of the existing Holcomb 1-22 producing well to a water injection well. The Holcomb 1-22 well is located in Clare County, MI, which contains habitat for two threatened or endangered species (1): The Northern Long-Eared Bat and the Kirtland's Warbler.

Clare County is a potential habitat for the threatened Northern Long-Eared Bat during spring and summer time. It typically roosts and forages in upland forests (2). The Long-Eared Bat hibernates in caves and mines during late-Autumn and winter. The Kirtland's Warbler is an endangered species that is found in Clare County (3). They typically nest in the low-hanging branches of Jack Pine trees, and migrate to the Bahamas in late-Autumn.

The project area is contained within a 75 ft. radius circle centered at the well. The project area contains little to no vegetation.

It is my determination that conversion of the Holcomb 1-22 well to water injection is not likely to adversely affect the Northern Long-Eared Bat or the Kirtland's Warbler. The project area does not contain any trees that would provide shelter for either threatened or endangered animals.

Please contact me at (989) 772-4900 or <u>bennettmyler@muskegondevelopment.com</u> if you have any questions. Thank you.

Sincerley,

Burt Maln

Bennett Myler, Geologist

(1) <u>http://www.fws.gov/midwest/endangered/lists/michigan-cty.html</u>

(2) <u>http://www.fws.gov/midwest/endangered/mammals/nleb/index.html</u>

(3) http://www.fws.gov/midwest/endangered/birds/Kirtland/kiwafctsht.html



N



GOVERNOR

RE:

STATE OF MICHIGAN MICHIGAN STATE HOUSING DEVELOPMENT AUTHORITY STATE HISTORIC PRESERVATION OFFICE

KEVIN ELSENHEIMER EXECUTIVE DIRECTOR

July 25, 2016

LISA PERENCHIO EPA REGION 5 77 WEST JACKSON BLVD WU 16J CHICAGO IL 60604

> ER04-92 Muskegon Development Company Well Projects - Holcomb 1-22, Sec. 22, T19N, R3W, Hamilton Township, Clare County (EPA)

Dear Ms. Perenchio:

Under the authority of Section 106 of the National Historic Preservation Act of 1966, as amended, we have reviewed the above-cited undertaking at the location noted above. Based on the information provided for our review, it is the opinion of the State Historic Preservation Officer (SHPO) that <u>no historic properties are affected</u> within the area of potential effects of this undertaking.

This letter evidences the EPA's compliance with 36 CFR § 800.4 "identification of historic properties," and the fulfillment of the EPA's responsibility to notify the SHPO, as a consulting party in the Section 106 process, under 36 CFR § 800.4(d)(1) "No historic properties affected." If the scope of work changes in any way, or if artifacts or bones are discovered, please notify this office immediately.

We remind you that federal agency officials or their delegated authorities are required to involve the public in a manner that reflects the nature and complexity of the undertaking and its effects on historic properties per 36 CFR § 800.2(d). The National Historic Preservation Act also requires that federal agencies consult with any Indian tribe and/or Tribal Historic Preservation Officer (THPO) that attach religious and cultural significance to historic properties that may be affected by the agency's undertakings per 36 CFR § 800.2(c)(2)(ii).

The State Historic Preservation Office is not the office of record for this undertaking. You are therefore asked to maintain a copy of this letter with your environmental review record for this undertaking.

If you have any questions, please contact Brian Grennell, Cultural Resource Management Specialist, at 517-335-2721 or by email at GrennellB@michigan.gov. Please reference our project number in all communication with this office regarding this undertaking. Thank you for this opportunity to review and comment, and for your cooperation.

Sincerely,

Drian Brian G. Grennell

Cultural Resource Management Specialist

for Brian D. Conway State Historic Preservation Officer

SAT:BGG

Copy: Bennett Myler, Muskegon Development Company



UIC BRANCH EPA, REGION 5

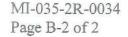


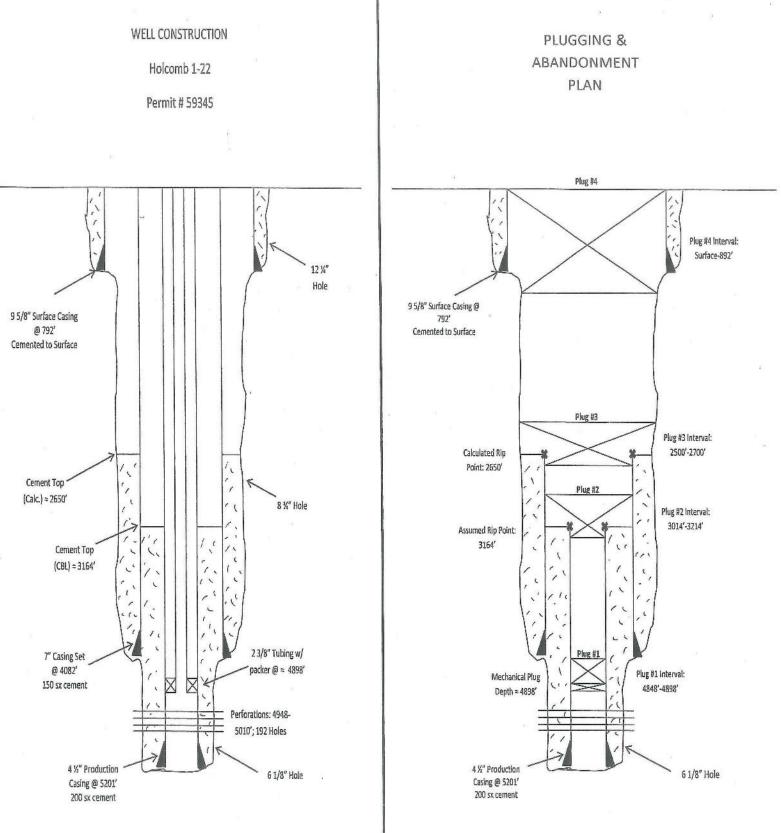
State Historic Preservation Office Michigan Library and Historical Center

• 702 West Kalamazoo Street
• PO BOX 30740
• Lansing, Michigan 48909-8240 www.michigan.gov/shpo
• 517.373.1630
• FAX 517.335.0348
• TTY 800.382.4568

MI-035-2R-0034 Page B-1 of 2

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UIC Permit Application Completeness Review Checklist

Source of information: <u>G:\UIC\Reporting, Tracking, & Communications\Quality System-Quality Assurance (SOPs)\SOPs-</u> <u>UIC\Permits\Permitting SOP & Info\Form 7520-6 0 508c.pdf</u>

Complete this form, save the file, and print a hard copy for inclusion with the signoff package for the completeness letter to be sent to the permit applicant.

Permit Writer: Bill Tong. Bill Tong	Date Received: August 19, 2016	Date Completed: August 19, 2016
Permittee: Muskegon Development Company	Well Name: Holcomb 1-22	Permit #: MI-035-2R-0034

√=yes X=no	Permit Application	Description
\checkmark	Signed by William C. Myler, Jr., company president	Permit Application has been signed by an authorized company official? (If not, a letter requesting an authorized signature must be sent before resuming review of the permit application)
1	Attachment 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. (For Class I wells, the area of review is a radius of 2 miles)
(Central	Class I:	Required
	Class II:	Required
	Class III:	Required
Class V:		Not Applicable
1	Attachment 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: Class III:		In addition to requirements for Class I, include pertinent information known to the applicant. This requirement does not apply to existing Class II wells.
		In addition to requirements for Class I, include public water systems and pertinent information known to the applicant.
	Class V:	Required (see Class V Permit Application Guidelines for details)

√=yes X=no	Permit Application	Description
V	Attachment 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 no 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.
	Class V:	Not applicable
NA	Attachment 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.)
	Class I:	Maps and cross sections indicating the vertical and lateral limits of all USDWs within the AOR, their position relative to the injection formation, and the direction of water movement, where known, in every USDW which may be affected by the proposed injection
	Class II:	Not applicable
	Class III:	Maps and cross sections indicating the vertical limits of all USDWs within the AOR, their position relative to the injection formation, and the direction of water movement, where known, in every USDW which may be affected by the proposed injection.
4	Class V:	Required (see Class V Permit Application Guidelines for details)
1	Attachment E	NAME AND DEPTH OF USDWs (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.
Class I:		Not Required
19	Class II:	Required
		Not Required

NA	Attachment 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.				
ţi.	Class I:	Required				
	Class II:	Not Required				
	Class III:	Required				
	Class V:	Required (see Class V Permit Application Guidelines for details)				
√	Attachment G	GEOLOGICAL DATA ON INJECTION & 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.				
	Class I:	Not Required				
	Class II:	Required				
Class III:		Not Required				
	Class V:	Not Applicable				
~	Attachment 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.				
	Class I:	Required				
Section of	Class II:	Required				
Class III: Class V:		Required				
		Required (see Class V Permit Application Guidelines for details)				
1	Attachment I	FORMATION TESTING PROGRAM - Describe the proposed formation testing program				
	Class I:	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.				
	Class II:	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.)				

Class III:		Testing program 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.)					
4	Class V:	Not Applicable					
\checkmark	Attachment J	STIMULATION PROGRAM - Outline any proposed stimulation program.					
	Class I:	Required					
	Class II:	Required					
1	Class III:	Required					
	Class V:	Not Applicable					
1	Attachment K	INJECTION PROCEDURES - Describe the proposed injection procedures including pump, surge, tank, etc.					
	Class I:	Required					
	Class II:	Required					
Class III:		Required					
	Class V:	Required (see Class V Permit Application Guidelines for details)					
1	Attachment 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.					
	Class I:	Required per 40 C.F.R. § 146.12. Request and submission of justifying data must be made to use an alternative to packer					
	Class II:	Required per 40 C.F.R. § 146.22.					
	Class III:	Required per 40 C.F.R. § 146.32.					
	Class V:	Not Applicable					
\checkmark	Attachment M	CONSTRUCTION DETAILS - Submit schematic or other appropriate drawings of the surface and subsurface construction details of the well.					
	Class I:	Required					
Class II: Class III:		Required					
		Required					
	Class V:	Required (see Class V Permit Application Guidelines for details)					
NA	Attachment N	CHANGES IN INJECTED FLUID - Discuss expected changes in pressure, native fluid displacement, and direction of movement of injection fluid. (Class III wells only.)					
	Class I:	Not Required					
	Class II:	Not Required					
13.4	Class III:	Required					

	Class V:	Not Applicable				
~	Attachment 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.				
	Class I:	Required				
		Proposed plans, if any				
	Class III:	Required				
	Class V:	Not Applicable				
~	Attachment 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.				
	Class I:	Required				
Class II:		Required				
	Class III:	Required				
	Class V:	Required (see Class V Permit Application Guidelines for details)				
\checkmark	Attachment 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 wells 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.				
	Class I:	Required				
	Class II:	Required for new Class II wells.				
	Class III:	Required; in addition, demonstrate adequate protection of USDWs.				
Class V:		Required (see Class V Permit Application Guidelines for details)				
7	Attachment 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.				
	Class I:	Required				
	Class II:	Required				

NA	Attachment 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 producing, such as general description of the mining zone, analysis of the amenability of the mining zone to the proposed method, and timetable for proposed development must also be included. For additional information on aquifer exemptions, see 40 CFR §§ 144.7 and 146.04.				
	Class I:	Required				
	Class II:	Required				
	Class III:	Required				
	Class V:	Not Applicable				
\checkmark	Attachment T	EXISTING EPA PERMITS - List program and permit number of any existing EPA permits, for example, NPDES, PSD, RCRA, etc.				
	Class I:	Required				
	Class II:	Required				
	Class III:	Required				
	Class V:	Required (see Class V Permit Application Guidelines for details)				
\checkmark	Attachment U	DESCRIPTION OF BUSINESS - Give a brief description of the nature of the business.				
emb	Class I:	Required				
	Class II:	Required for new Class II wells				
113 14	Class III:	Required				
	Class V:	Required				



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY REGION 5 77 WEST JACKSON BOULEVARD CHICAGO, IL 60604-3590

AUG 2 3 2016

REPLY TO THE ATTENTION OF: WU-16J

CERTIFIED MAIL 7015 0640 0004 5965 0811 RETURN RECEIPT REQUESTED

Bennett Myler Muskegon Development Company 1425 South Mission Road Mount Pleasant, Michigan 48858

Re: Completeness Review of Underground Injection Control Permit Application Number MI-035-2R-0034 for the Holcomb 1-22 Injection Well

Dear Mr. Myler:

On August 11, 2016, we received from Muskegon Development Company a permit application for the Holcomb 1-22 Class II secondary recovery injection well. Title 40 of the Code of Federal Regulations (40 CFR) Section 124.3(c) requires us to perform a completeness review of the application. We have reviewed the application and determined that the application is complete.

We are proceeding with the evaluation of the information provided in the application for technical soundness and compliance with applicable federal regulations. If additional information is necessary to clarify, modify, or supplement the information you provided, we will notify you. When we determine that the information you provided is sufficient for a permitting decision, a draft decision will be made and a statement of basis will be prepared and supplied to you as well as the public for comment.

If you have any questions, please feel free to contact Bill Tong of my staff at (312) 886-9380 or tong.william@epa.gov.

Sincerely,

Stephen M. Jann, Chief Underground Injection Control Branch

cc:

Mark Snow, Michigan DEQ Sam Williams, AEG Group



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY REGION 5 77 WEST JACKSON BOULEVARD CHICAGO, IL 60604-3590

OCT 1 3 2016

Reply to the attention of: WU-16J

CERTIFIED MAIL 7015 0640 0004 5965 0927 RETURN RECEIPT REQUESTED

Bennett Myler Muskegon Development Company 1425 South Mission Road Mount Pleasant, Michigan 48858

Re: Third Party Estimate for Plugging Costs for Holcomb 1-22 Injection Well, Permit #MI-035-2R-0034

Dear Mr. Myler:

To facilitate the completion of our review of the permit application for the Holcomb 1-22 well, please be aware that EPA requires that the estimate of total plugging liability costs are to be based on contracted costs for plugging and abandonment operations by a third party, not on "in-house" cost estimates. The estimates should be based on a "turn-key" plugging operation, including all related costs of these procedures.

Please submit an amended Attachment Q to the permit application which includes third party cost estimates for plugging the Holcomb 1-22 well.

If you have any questions, please feel free to contact Bill Tong of my staff at (312) 886-9380 or tong.william@epa.gov.

Sincerely.

Stephen M. Jann, Chief Underground Injection Control Branch

cc:

Mark Snow, Michigan DEQ Sam Williams, AEG Group

MUSKEGON DEVELOPMENT COMPANY

 1425 South Mission Road, Mount Pleasant, Michigan 48858

 (989) 772-4900
 (Fax) (989) 773-4094

October 19th, 2016

Bill Tong Underground Injection Control Branch UIC Section U.S. EPA-Region 5 77 West Jackson Blvd. Chicago, IL 60604-3590

OCT 2'5 2016

Attention: WU-16J

Dear Mr. Tong:

As requested, I have sent an amended Attachment Q for the permit application to convert the Holcomb 1-22 well to a water injection well. This includes a third party cost estimate for plugging the well.

Thank you.

Sincerely,

Bennett E. Myler, Geologist Muskegon Development Company

Encl.

ATTACHMENT Q





EASE MANAGEMENT, INC.

503 INDUSTRIAL AVE. / P.O. BOX 290 / MT. PLEASANT, MI 48804-0290 / 989-773-5948 / FAX 989-773-5798

October 18, 2016

Bennett Myler Muskegon Development Company 1425 South Mission Road Mt. Pleasant, Michigan 48858

Topic: Cost Estimate to Plug the Holcomb 1-22 Well

Lease Management is pleased to offer our services for plugging the Holcomb 1-22 well in Clare County Michigan. This proposal is based on plugging instructions titled "attachment Q". The scope of work is to provide complete plugging and abandonment services that include: our service rig, labor, tools, and cement to properly plug the well in accordance with the plugging instructions. This proposal is based on the plugging instructions as currently written and assume work goes as planned.

WORK HAN and COST SUMMARY:

- 1. Day 1 :
 - a Mobilize Equipment and rig up
 - b. Install BOP
 - c. Pull tubing & packer, bit n scrapper run
- 2. Day 2 :
 - a. Set CIBP
 - b. Dump bail 5 sx
 - c. Free Point 4 1/2" , cut n puli (3164')
- 3. Day 3:
 - a. Run in tubing 50' into 4 1/2" stub, spot 35sx
 - b. Free point & cut 7"
 - c. Pull 7" casing (2650)
- 4. Day 4
 - a. Run in tubing 50' into 7" stub, spot 65sx
 - b. Pull tubing to 842', cement to surface 335 sx
- 5. Day 5
 - a. Contingency day for pulling casing
- 6. Day 6
 - a. Rig down move out
- 7. Cut and Cap casing
- 8. Clean, Level, and Seed location

Other Cost:

- 1. Mud Pit Rental
- 2. Misc. Tool Rentals (7" casing tongs)
- 3. Waste Hauling

TOTAL:

\$29,600

Terms:

- o Lease Management will provide our services on a time and material basis
- o Tubing and casing will be credited to LMI

I hope you find this proposal acceptable and look forward to performing the job in a safe efficient manner.

Sincerely,

Doug Struble Lease Management (989) 773-5948 office (989) 506-2333 cell

OCT 2,5 2015

UIC ERAMON EPA, RECENS



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY REGION 5 77 WEST JACKSON BOULEVARD CHICAGO, IL 60604-3590

STATEMENT OF BASIS FOR ISSUANCE OF UNDERGROUND INJECTION CONTROL (UIC) DRAFT PERMIT

Permit Number: MI-035-2R-0034

Facility Name: Holcomb 1-22

Muskegon Development Company of Mount Pleasant, Michigan, has applied for a U. S. Environmental Protection Agency (EPA) permit to convert the Holcomb 1-22 well so it can be used for enhanced oil recovery in Clare County, Michigan.

Review of the permit application indicates that no significant environmental impact should result from the proposed injection. EPA, therefore, intends to issue a permit for this well. Under the authority of Title 40 of the Code of Federal Regulations (40 C.F.R.) Parts 144 and 146, EPA permits must specify conditions for construction, operation, monitoring, reporting, and plugging and abandonment of injection wells so as to prevent the movement of fluids into any Underground Source of Drinking Water (USDW). General provisions for EPA UIC permit requirements are found at 40 C.F.R. Parts 144 and 146, while regulations specific to Michigan injection operations are found at 40 C.F.R. Part 147 Subpart X. In accordance with 40 C.F.R. § 124.7, general information and highlighted permit conditions specific to this well are as follows:

Area of Review (AOR) and Corrective Action: In accordance with 40 C.F.R. §§ 144.55, 146.6 and 146.7, this is the area surrounding the well within which the applicant must research wells which penetrate the injection zone. If any of these wells are improperly sealed, completed or abandoned, and might provide a conduit for fluid migration, the applicant must develop a corrective action plan as shown in Attachment C of the permit to address the deficiency. The applicant has provided documentation on the well population within 1/4 mile of the injection well (i.e., the AOR). There are 2 producing, 0 injection, 0 temporarily abandoned, and 1 plugged and abandoned wells within the 1/4 mile radius AOR which penetrate the injection zone. Based on current information, there are no inadequately constructed wells within the AOR so there is no need for a corrective action.

<u>Underground Sources of Drinking Water (USDWs)</u>: USDWs are defined by the UIC regulations as aquifers or portions thereof which contain less than 10,000 milligrams per liter of total dissolved solids and which are being or could be used as a source of drinking water. The base of the lowermost possible USDW in the vicinity of the injection well has been identified at approximately 464 feet below ground surface. This water-bearing formation is the Glacial Drift.

Injection and Confining Zone: Injection for enhanced oil recovery is limited by the permit to the Richfield Formation of the Detroit River Group in the interval between 4948 and 5010 feet below ground surface. This injection zone is separated from the lowermost USDW by approximately 4484 feet of rock strata. The confining zone is composed of the rocks of the Detroit River Anhydrite, Detroit River Salts, and Massive Anhydrite between 4013 and 4948 feet below ground surface, that serve to confine or impede potential upward flow between the top of the confining zone and the bottom of the lowermost USDW.

Construction Requirements: The proposed conversion of the well meets the regulatory criteria of 40 C.F.R. § 146.22. This requires that all converted wells which inject fluids which are brought to the surface in connection with oil or natural gas production, or for enhanced recovery of oil or natural gas, be sited so that they inject into a formation which is separated from any USDW by a confining zone free of known open faults or fractures within the AOR. All such wells must also be cased and cemented to prevent the movement of fluids into or between USDWs. The permittee shall not commence conversion of any well until a final permit has been issued. In addition, the permittee shall not commence injection until the requirements of Part I. (E) 10 of the final permit have been met.

Injection Fluid: The injected fluid is limited by the permit to fresh water for enhanced oil recovery. The expected maximum daily volume of fluid to be injected is 350 barrels.

Maximum Injection Pressure: The maximum injection pressure shall be limited to 3238 pounds per square inch gauge (psig). EPA calculated this limit using the formula on page A-1 of the draft permit. This limitation will ensure that the pressure during injection does not initiate fractures in the injection zone.

Monitoring and Reporting Requirements: In accordance with 40 C.F.R. §§ 144.54 and 146.23, the applicant will be responsible for observing and recording injection pressure, flow rate, annulus pressure, and cumulative volume on a weekly basis and reporting this to EPA on a monthly basis. The applicant will also be responsible for observing, recording and reporting annulus liquid loss on a quarterly basis. An analysis of the injected fluid must be submitted on an annual basis. In addition, the applicant is required to conduct and pass a two-part Mechanical Integrity Test (MIT), in accordance with 40 C.F.R. § 146.8, before authorization to inject is granted, and after the well is completed. The applicant is also required to repeat the annulus pressure test, which is the first part of the MIT, at least once every five (5) years thereafter. If a temperature or noise log or another method as approved by the Director is used to determine the second part of the MIT (i.e., the absence of fluid movement), then the applicant will be required to repeat this test at least once every five (5) years thereafter. These tests will provide EPA with an evaluation of the integrity of the tubular goods (casing, tubing and packer) as well as documentation as to the absence or presence of fluid movement behind the casing.

Plugging and Abandonment: In accordance with 40 C.F.R. §§ 146.10 and 146.24(d), the permit includes a plugging and abandonment plan for an environmentally protective well closure at the time of cessation of operations. Muskegon Development Company has demonstrated adequate financial responsibilities to close, plug, and abandon this underground injection

operation. Muskegon Development Company has provided Financial Statement Coverage as financial assurance for the company's injection wells in Michigan. This coverage must be updated on an annual basis.

Issuance and Effective Date of Permit: In accordance with 40 C.F.R. § 124.15, the permit will become effective immediately upon issuance if no public comments are received that request a change in the draft permit. However, in the event that public comments are received that request changes to the draft permit, and EPA issues a final permit, then the final permit will become effective 45 days after the date of issuance unless the permit is appealed. In accordance with 40 C.F.R. § 144.36(a), the permit will be in effect for the life of the facility, unless it is otherwise modified, revoked and reissued, or terminated as provided at 40 C.F.R. §§ 144.39, 144.40, and 144.41. The permit will expire in one (1) year if the permittee fails to commence construction, unless a written request for an extension of this one (1) year period has been approved by the Director. The permit will be reviewed by EPA at least once every five (5) years from its effective date for consistency with new or revised Federal regulations.

Questions and requests for additional information may be submitted to William Tong at (312) 886-9380 or tong.william@epa.gov via the internet. The date for closure of the comment period includes the required 30 days for public comment and an additional three days for the delay caused by mailing. The public comment period will close as described in the Public Notice. Requests for a hearing must be submitted in writing. If EPA determines that there is significant public interest in the draft permit, a public notice of a scheduled hearing will be published locally and mailed to interested parties.

To preserve your right to appeal any final permit decision that may be made in this matter under 40 C.F.R. Part 124, you must either send in written comments or participate in a public hearing on the draft permit decision. (A hearing is not planned at this time.) The first appeal must be made to the Environmental Appeals Board; only after all agency review procedures have been exhausted may you file an action in the appropriate Circuit Court of Appeals for review.

U.S. Environmental Protection Agency Region 5 (WU-16J) 77 West Jackson Boulevard Chicago, Illinois 60604-3590

Christopher Korleski

Director, Water Division

UNITED STATES JONEDR

UNITE STATES ENVIRONMENTAL PRODUCTION AGENCY REGION 5 77 WEST JACKSON BOULEVARD CHICAGO, IL 60604-3590

Page 1 of 15

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY UNDERGROUND INJECTION CONTROL PERMIT: CLASS II

Permit Number: MI-035-2R-0034

Facility Name: Holcomb 1-22

Pursuant to the provisions of the Safe Drinking Water Act, as amended 42 U.S.C. §§ 300f <u>et seq.</u>, (commonly known as the SDWA) and implementing regulations promulgated by the U.S. Environmental Protection Agency at Parts 124, 144, 146, and 147 of Title 40 of the Code of Federal Regulations (40 C.F.R.),

Muskegon Development Company of Mount Pleasant, Michigan

is hereby authorized to convert and operate an injection well located in Michigan, Clare County, T19N, R3W, Section 22, NW 1/4 Section, for injection into the Richfield Formation of the Detroit River Group at depths between 4948 and 5010 feet, upon the express condition that the permittee meet the restrictions set forth herein. Injection shall not commence until the operator has received authorization in accordance with Part I(E)(10) of this permit.

The injection shall be limited to fresh water for enhanced oil recovery from production wells owned or operated by Muskegon Development Company.

All references to Title 40 of the Code of Federal Regulations are to all regulations that are in effect on the date that this permit is effective. All terms used in this permit shall have the meaning set forth in the SDWA and implementing regulations at 40 C.F.R. Parts 124, 144, 146, and 147.

This permit shall become effective on _______ and shall remain in full force and effect during the operating life of the well, unless this permit is otherwise revoked and reissued, terminated or modified pursuant to 40 C.F.R. §§ 144.39, 144.40, and 144.41. This permit shall also remain in effect upon delegation of primary enforcement responsibility to the State of Michigan, unless that State chooses to adopt this permit as a State permit. The permit will expire in one (1) year if the permittee fails to commence construction, unless a written request for an extension of this one (1) year period has been approved by the Director. The permittee may request an expiration date sooner than the one (1) year period, provided no construction on the well has commenced. This permit will be reviewed at least every five (5) years from the effective date specified above.

Signed and dated:

DRAFT

Christopher Korleski Director, Water Division

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PART I

GENERAL PERMIT COMPLIANCE

A. EFFECT OF PERMIT

The permittee is allowed to engage in underground injection in accordance with the conditions of this permit. The underground injection activity, otherwise authorized by this permit or rule, shall not allow the movement of fluid containing any contaminant into underground sources of drinking water, if the presence of that contaminant may cause a violation of any Primary Drinking Water Regulation pursuant to 40 C.F.R. Part 142 or may otherwise adversely affect the health of persons. Any underground injection activity not specifically authorized in this permit or otherwise authorized by permit or rule is prohibited. Issuance of this permit does not convey property rights of any sort or any exclusive privilege; nor does it authorize any injury to persons or property, any invasion of other private rights, or any infringement of State or local law or regulations. Compliance with the terms of this permit does not constitute a defense to any action brought under Section 1431 of the Safe Drinking Water Act (SDWA), or any other law governing protection of public health or the environment.

B. PERMIT ACTIONS

This permit may be modified, revoked and reissued, or terminated for cause as specified in 40 C.F.R. §§ 144.39, 144.40, and 144.41. The filing of a request for a permit modification, revocation and reissuance, termination, or the notification of planned changes or anticipated noncompliance on the part of the permittee does not stay the applicability or enforceability of any permit condition.

C. SEVERABILITY

The provisions of this permit are severable, and if any provision of this permit or the application of any provision of this permit to any circumstance is held invalid, the application of such provision to other circumstances and the remainder of this permit shall not be affected thereby.

D. CONFIDENTIALITY

In accordance with 40 C.F.R. Part 2 and § 144.5, any information submitted to EPA pursuant to this permit may be claimed as confidential by the submitter. Any such claim must be asserted at the time of submission by stamping the words "confidential business information" on each page containing such information. If no claim is made at the time of submission, EPA may make the information available to the public without further notice. If a claim is asserted, the validity of the claim will be assessed in accordance with the procedures in 40 CFR Part 2 (Public Information). Claims of confidentiality for the following information will be denied:

- (1) The name and address of the permittee; and,
- (2) Information which deals with the existence, absence or level of contaminants in drinking water.

E. DUTIES AND REQUIREMENTS

1. Duty to Comply

The permittee shall comply with all conditions of this permit, except to the extent and for the duration such non-compliance is authorized by an emergency permit pursuant to 40 C.F.R. § 144.34. Any permit noncompliance constitutes a violation of the SDWA and is grounds for enforcement action, permit termination, revocation and reissuance or modification.

2. Penalties for Violations of Permit Conditions

Any person who operates this well in violation of permit conditions is subject to civil penalties, fines, and other enforcement action under the SDWA and may be subject to such actions under the Resource Conservation and Recovery Act. Any person who willfully violates a permit condition is subject to criminal prosecution.

3. Need to Halt or Reduce Activity not a Defense

It shall not be a defense for a permittee in an enforcement action to state that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

4. Duty to Mitigate

The permittee shall take all reasonable steps to minimize or correct any adverse impact on the environment resulting from noncompliance with this permit.

5. Proper Operation and Maintenance

The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance includes effective performance, adequate funding, adequate operator staffing and training, and adequate laboratory and process controls, including appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems only when necessary to achieve compliance with the conditions of the permit.

6. Duty to Provide Information

The permittee shall furnish to the Director, by the date specified by the Director, any information which the Director may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with this permit. The permittee shall also furnish to the Director, upon request, copies of records required by this permit to be retained.

7. Inspection and Entry

The permittee shall allow the Director, or an authorized representative, upon the presentation of credentials and other documents as may be required by law to:

- a. Enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where records are kept under the conditions of this permit;
- b. Have access to and copy, at reasonable times, any records that must be retained under the conditions of this permit;
- c. Inspect, at reasonable times, any facilities, equipment (including monitoring equipment), practices, or operations, regulated or required under this permit; and
- d. Sample or monitor the injected fluids, at reasonable times, for the purposes of assuring permit compliance, or as otherwise authorized by the SDWA, at any location.

8. <u>Records</u>

- a. The permittee shall retain records of all monitoring information, including all calibration and maintenance records and copies of all records required by this permit, for a period of at least three (3) years from the date of the sample, measurement or report. The permittee shall also maintain records of all data required to complete this permit application and any supplemental information submitted under 40 C.F.R. §§ 144.31 and 144.51. These periods may be extended by request of the Director at any time by written notice to the permittee.
- b. The permittee shall retain records concerning the nature and composition of all injected fluids until three (3) years after the completion of plugging and abandonment in accordance with the plugging and abandonment plan, contained in Part III(B) of this permit. The owner or operator shall continue to retain the records after the three (3) year retention period unless he delivers the records to the Regional Administrator or obtains

written approval from the Regional Administrator to discard the records.

- c. Records of monitoring information shall include:
 - (i) The date, exact place, and the time of sampling or measurements;
 - (ii) The individual(s) who performed the sampling or measurements;
 - (iii) A precise description of both sampling methodology and the handling of samples;
 - (iv) The date(s) analyses were performed;
 - (v) The individual(s) who performed the analyses;
 - (vi) The analytical techniques or methods used; and,
 - (vii) The results of such analyses.

9. Notification Requirements

- a. <u>Planned Changes</u> The permittee shall notify and obtain the Director's approval at least thirty (30) days prior to any planned physical alterations or additions to the permitted facility, or changes in the injection fluids. Within ten (10) days prior to injection, an analysis of new injection fluids shall be submitted to the Director for approval in accordance with Parts II(B)(2) and II(B)(3) of this permit.
- b. <u>Anticipated Noncompliance</u> The permittee shall give at least thirty (30) days advance notice to the Director of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.
- c. <u>**Transfer of Permits</u>** This permit is not transferable to any person except after notice is sent to the Director at least thirty (30) days prior to transfer and the requirements of 40 C.F.R. § 144.38 have been met. The Director may require modification or revocation and reissuance of the permit to change the name of the permittee and incorporate such other requirements as may be necessary under the SDWA.</u>
- d. <u>Compliance Schedules</u> Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit shall be submitted to the Director no later than thirty (30) days following each schedule date.

Twenty-Four Hour Reporting

e.

f.

- (i) The permittee shall report to the Director any noncompliance which may endanger health or the environment. This information shall be provided orally within twenty-four (24) hours from the time the permittee becomes aware of the circumstances, and shall include the following information:
 - (a) Any monitoring or other information which indicates that any contaminant may cause an endangerment to an underground source of drinking water; or,
 - (b) Any noncompliance with a permit condition or malfunction of the injection system which may cause fluid migration into or between underground sources of drinking water.
- (ii) A written submission shall also be provided as soon as possible but no later than five (5) days from the time the permittee becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent recurrence of the noncompliance.
- Other Noncompliance All other instances of noncompliance shall be reported at the time when monthly reports are submitted under Part II(B)(3)(a) of this permit. The written submission shall contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent recurrence of the noncompliance.
- g. <u>Other Information</u> If or when the permittee becomes aware that the permittee failed to submit any relevant facts in the permit application, or submitted incorrect information in a permit application or in any report to the Director, the permittee shall promptly submit such facts or corrected information in accordance with 40 C.F.R. § 144.51(1)(8).
- h. <u>**Report on Permit Review</u>** Within thirty (30) days of receipt of the final issued permit, the permittee shall report to the Director that the permittee has read and is personally familiar with all terms and conditions of this permit.</u>

10. Commencing Injection

The permittee shall not commence injection into any newly drilled or converted well until:

- a. Formation data and injection fluid analysis have been submitted in accordance with Parts II(A)(6) and II(B)(2), respectively;
- b. A report on any logs and tests required under Parts II(A)(5) and III(D) of this permit has been submitted;
- c. Mechanical integrity of the well has been demonstrated in accordance with Part I(E)(17);
- d. Any required corrective action has been performed in accordance with Parts I(E)(16) and III(C); and,

e. Construction is complete and the permittee has submitted to the Permit Writer, by certified mail with return receipt requested, a notice of completion of construction using EPA Form 7520-10 and either:

- The Director has inspected or otherwise reviewed the new injection well and finds it is in compliance with the conditions of the permit; or,
- (ii) The permittee has not received, within thirteen (13) days of the date of the Director's receipt of the report required above, notice from the Director of his or her intent to inspect or otherwise review the new injection well, in which case prior inspection or review is waived and the permittee may commence injection.

11. Signatory Requirements

All reports required by this permit and other information requested by the Director shall be signed and certified according to 40 CFR § 144.32.

12. Notice of Plugging and Abandonment

The permittee shall notify the Director at least forty-five (45) days before conversion or abandonment of the well.

13. Plugging and Abandonment

The permittee shall plug and abandon the well as provided in the plugging and abandonment plan contained in Part III(B) of this permit. Plugging shall occur as soon as practicable after operation ceases but not later than two (2) years

thereafter. During the period of non-operation, the well must be tested to ensure that it maintains mechanical integrity, unless the permittee fulfills the other requirements under 40 C.F.R. § 144.52(a)(6), prior to expiration of the two (2) year period. The permittee shall notify the Director of plugging and abandonment in accordance with the reporting procedures in Part I(E)(12) of this permit.

14. Financial Responsibility

The permittee shall maintain financial responsibility and resources to plug and abandon the underground injection well in accordance with 40 C.F.R. § 144.52(a)(7) as provided in Attachment R of the permit application corresponding to this permit action which is hereby incorporated by reference as if it appeared fully set forth herein. The permittee shall not substitute an alternative demonstration of financial responsibility from that which the Director has approved, unless the permittee has previously submitted evidence of that alternative demonstration to the Director and the Director has notified the permittee in writing that the alternative demonstration of financial responsibility mechanism shall be updated periodically, upon request of the Director, except when Financial Statement Coverage is used as the financial mechanism, this coverage must be updated on an annual basis.

15. Insolvency

- a. In the event of the bankruptcy of the trustee or issuing institution of the financial mechanism, or a suspension or revocation of the authority of the trustee institution to act as trustee or the institution issuing the financial mechanism to issue such an instrument, the permittee must submit an alternative demonstration of financial responsibility acceptable to the Director within sixty (60) days after such event. Failure to do so will result in the termination of this permit pursuant to 40 C.F.R. § 144.40(a)(1).
- An owner or operator must also notify the Director by certified mail of the commencement of voluntary or involuntary proceedings under Title 11 (Bankruptcy), U.S. Code, naming the owner or operator as debtor, within ten (10) business days after the commencement of the proceeding. A guarantor of a corporate guarantee must make such a notification if he/she is named as debtor, as required under the terms of the guarantee.

16. Corrective Action

The permittee shall shut in the injection well whenever he/she or EPA determines that operation thereof may be causing upward fluid migration through the well bore of any improperly plugged or unplugged well in the area of review and shall take such steps as he/she can to properly plug the offending well(s). Any operation of the well which may cause upward fluid migration from an improperly plugged or unplugged well will be considered a violation of this permit. If the permittee or the EPA determines that the permitted well is not in compliance with 40 C.F.R. § 146.8, the permittee will immediately shut in the well until such time as appropriate repairs can be effected and written approval to resume injection is given by the Director. In addition, the permittee shall not commence injection until any and all corrective action has been taken in accordance with any plan contained in Part III(C) of this permit and the requirements in Part I(E)(10) of this permit have been met.

17. Mechanical Integrity

- a. The permittee must establish (prior to receiving authorization to inject), and shall maintain mechanical integrity of this well, in accordance with 40 CFR § 146.8.
- A demonstration of mechanical integrity, in accordance with 40 C.F.R. § 146.8, shall be performed at least every five (5) years from the date of the last approved demonstration. The permittee shall notify the Director of his/her intent to demonstrate mechanical integrity at least thirty (30) days prior to such demonstration.
- c. The permittee shall demonstrate the mechanical integrity of the well by pressure testing whenever:
 - (i) the tubing is removed from the well or replaced;
 - (ii) the packer is reset; or,
 - (iii) a loss of mechanical integrity occurs. Operation shall cease whenever one of the aforementioned conditions occurs and not resume until the Director gives approval to recommence injection.
- d. The Director may, by written notice, require the permittee to demonstrate mechanical integrity at any time.
- e. The permittee shall cause all gauges used in mechanical integrity demonstrations to be calibrated prior to the demonstration.
- f. The permittee shall cease injection if a loss of mechanical integrity occurs or is discovered during a test, or a loss of mechanical integrity as defined by 40 C.F.R. § 146.8 becomes evident during operation. Operations shall not be resumed until the Director gives approval to recommence injection.
- g. The permittee shall notify the Director of the loss of mechanical integrity, in accordance with the reporting procedures in Parts $\Pi(B)(3)(d)$ and

I(E)(9)(e) of this permit.

h. The permittee shall report the result of a satisfactory mechanical integrity demonstration as provided in Part II(B)(3)(d) of this permit, except the first such result after Permit issuance, which shall be sent to the Permit Writer.

18. <u>Restriction on Injected Substances</u>

The permittee shall be restricted to the injection of fluids brought to the surface in connection with oil or natural gas production or those fluids used in the enhancement of oil and gas production as specified in 40 C.F.R. § 146.5(b). Further, no fluids other than those from sources noted in the administrative record for this permit and approved by the Director shall be injected.

PART II

WELL SPECIFIC CONDITIONS FOR UNDERGROUND INJECTION CONTROL PERMITS

A. CONSTRUCTION REQUIREMENTS

1. Siting

Notwithstanding any other provision of this permit, the injection well shall inject only into a formation which is separated from any USDW by a confining zone that is free of known open faults or fractures within the area of the review.

2. Casing and Cementing

Injection wells shall be cased and cemented to prevent the movement of fluids into or between underground sources of drinking water. The casing and cement to be used in the construction of the well shall be as contained in Attachments L and M of the permit application corresponding to this permit action which is hereby incorporated by reference as if they appeared fully set forth herein.

3. Tubing and Packer Specifications

Injection shall only take place through tubing with a packer set in the long string casing within or below the nearest cemented and impermeable confining system immediately above the injection zone. Tubing and packer specifications shall be as represented in engineering drawings contained in Attachments L and M of the permit application corresponding to this permit action which are hereby incorporated by reference as if they appeared fully set forth herein. Any proposed changes shall be submitted by the permittee in accordance with Part I(E)(9)(a) and (b) of this permit.

4. Wellhead Specifications

For every injection well, the operator shall provide a female fitting, with a cutoff valve, to the tubing at the wellhead, so that the amount of injection pressure being used may be measured by a representative of EPA by attaching a gauge having a male fitting.

5. Logs and Tests

Upon approval of the surface casing and cementation records by the Director, any logs and tests noted in Part III of this permit shall be performed, unless already provided. Prior to commencement of injection, the permittee shall submit a descriptive report prepared by a knowledgeable log analyst interpreting the results of those logs and tests to the Director for approval along with the notice of

completion required in Part I(E)(10) of this permit.

6. Formation Data

If not already provided, the permittee shall determine or calculate the following information concerning the injection formation and submit it to the Director for review and approval, prior to operation:

- a. Formation fluid pressure;
- b. Fracture pressure; and,

c. Physical and chemical characteristics of the formation.

7. Prohibition of Unauthorized Injection

Any underground injection, except as authorized by permit or rule issued under the UIC program, is prohibited. The construction, including drilling, of any well required to have a permit is prohibited until the permit has been issued.

B. OPERATING, MONITORING AND REPORTING REQUIREMENTS

1. **Operating Requirements**

- a. Beginning on the effective date of this permit, the permittee is authorized to operate the injection well, subject to the limitations and monitoring requirements set forth herein. The injection pressure and injected fluid shall be limited and monitored as specified in Parts I(E)(18) and III(A) of this permit.
- b. Injection at a pressure which initiates fractures in the confining zone or causes the movement of injection or formation fluids into or between underground sources of drinking water is prohibited.
- c. Injection between the outermost casing protecting underground sources of drinking water and the well bore is prohibited.
- d. The annulus between the tubing and the long string casing shall be filled with a liquid designed to inhibit corrosion. The annulus liquid will be monitored in accordance with Parts II(B)(2)(d) and II(B)(3)(b) of this permit. Any specific annulus requirements are contained in Part III(A) of this permit.

2. Monitoring Requirements

- a. Samples and measurements, taken for the purpose of monitoring as required in Part II(B)(3), shall be representative of the monitored activity. Grab samples shall be used to obtain a representative sample of the fluid to be analyzed. Part III(A) of this permit describes the sampling location and required parameters for injection fluid analysis. The permittee shall identify the types of tests and methods used to generate the monitoring data. The monitoring program shall conform to the one described in Part III(A) of this permit.
- b. <u>Analytical Methods</u> Monitoring of the nature of injected fluids shall comply with applicable analytical methods cited and described in Table I of 40 C.F.R. § 136.3 or in Appendix III of 40 CFR Part 261 or by other methods that have been approved by the Director.
- c. <u>Injection Fluid Analysis</u> The nature of the injection fluids shall be monitored as specified in Part III(A) of this permit. An initial analysis of the injection fluid is contained in Attachment H of the permit application corresponding to this permit action which is hereby incorporated by reference as if it appeared fully set forth herein. The Director may, by written notice require the permittee to sample and analyze the injected fluid at any time.
- d. <u>Injection Pressure, Annulus Pressure, Annulus Liquid Loss, Flow</u> <u>Rate and Cumulative Volume</u> - Injection pressure, annulus pressure, flow rate and cumulative volume shall be recorded at least weekly and shall be reported monthly as specified in Part III(A) of this permit. Annulus liquid loss shall be recorded at least quarterly and shall be reported in accordance with the provisions of Part II(B)(3)(b), as the volume of liquid added to the annulus to keep it filled in accordance with Part II(B)(1)(d). All gauges used in monitoring shall be calibrated in accordance with Part I(E)(17)(e) of this permit.

3. Reporting Requirements

Copies of the monitoring results and all other reports shall be submitted to the Director at the following address:

U.S. Environmental Protection Agency Region 5 77 West Jackson Boulevard Chicago, Illinois 60604-3590 Attn: UIC Branch, (WU-16J) a.

<u>Monthly Reports</u> - Monitoring results obtained during each week shall be recorded on a form which has been signed and certified according to 40 C.F.R. § 144.32. The first report shall be postmarked no later than the 10th day of the month after authorization to inject has been granted. Thereafter, forms shall be submitted at the end of each month and shall be postmarked no later than the 10th day of the month following the reporting period. This report shall include the weekly measurements of injection pressure, annulus pressure, flow rate and cumulative volume as required in Parts II(B)(2)(d) and III(A) of this permit.

- <u>Quarterly Reports</u> Monitoring results obtained each quarter shall include the measurement of annulus liquid loss as required in Parts II(B)(2)(d) and III(A) of this permit. Reports shall be submitted at the end of each quarter and shall be postmarked no later than the 10th day of the first month of the following quarter.
- c. <u>Annual Reports</u> Monitoring results obtained each year shall include the measurements of injected fluid characteristics as required in Part III(A) of this permit. Reports shall be submitted at the end of each anniversary year and shall be postmarked no later than the 10th day of the first month of the following year.

d. <u>Reports on Well Tests, Workovers, and Plugging and</u>

<u>Abandonment</u> - The applicant shall provide the Director with the following reports and test results within sixty (60) days of completion of the activity:

- Mechanical integrity tests, except tests which the well fails in which case twenty-four (24) hour reporting under Part I(9)(e) is applicable;
- (ii) Logging or other test data;
- (iii) Well workovers (using EPA Form 7520-12); and
- (iv) Plugging and abandonment.

PART III

SPECIAL CONDITIONS

These special conditions include, but are not limited to plans for maintaining correct operating procedures, monitoring conditions and reporting, as required by 40 C.F.R. Parts 144 and 146. These plans are described in detail in the permittee's application for a permit, and the permittee is required to adhere to these plans as approved by the Director, as follows:

A. OPERATING, MONITORING AND REPORTING REQUIREMENTS (ATTACHED)

B. PLUGGING AND ABANDONMENT PLAN (ATTACHED)

C. CORRECTIVE ACTION PLAN (ATTACHED)

i.		Minimum M Require	Minimum Reporting Requirements	
Characteristic	Limitation	Frequency	Туре	Frequency
*Injection Pressure	3238 psig (maximum)	weekly		monthly
Annulus Pressure		weekly		monthly
Flow Rate		weekly		monthly
Cumulative Volume		weekly		monthly
Annulus Liquid Loss		quarterly		quarterly
**Chemical Composition of Injection Fluid		annually	grab	annually

OPERATING, MONITORING AND REPORTING REQUIREMENTS

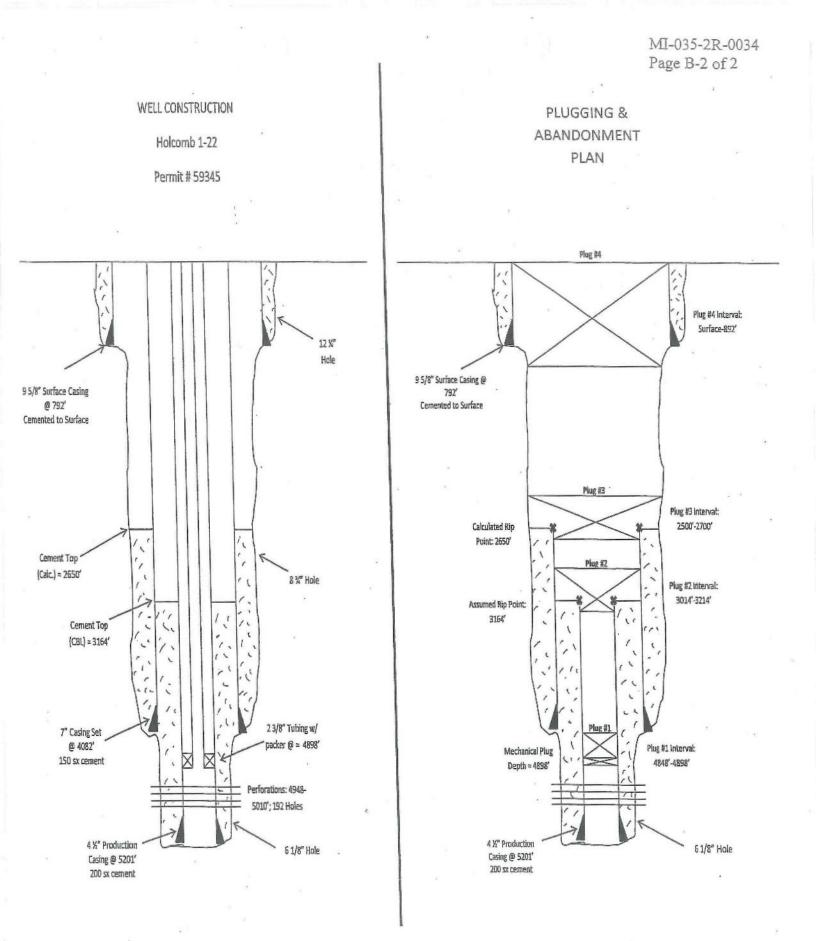
SAMPLING LOCATION: The sample location is at the well head

*The limitation on wellhead pressure serves to prevent confining-formation fracturing. This limitation was calculated using the following formula: $[\{1.112 psi/ft - (0.433 psi/ft)(specific gravity)\}$ x depth] - 14.7 *psi*. The maximum injection pressure is dependent upon depth and specific gravity of the injected fluid. The Richfield Formation of the Detroit River Group at 4948 feet was used as the depth and a specific gravity of 1.05 was used for the injected fluid. The fracture gradient of 1.112 psi/ft was determined from an acid-fracture job from a nearby well.

**Chemical composition analysis shall include, but not be limited to, the following: Sodium, Calcium, Magnesium, Barium, Total Iron, Chloride, Sulfate, Carbonate, Bicarbonate, Sulfide, Total Dissolved Solids, pH, Resistivity (ohm-meters @ 75°F), and Specific Gravity.

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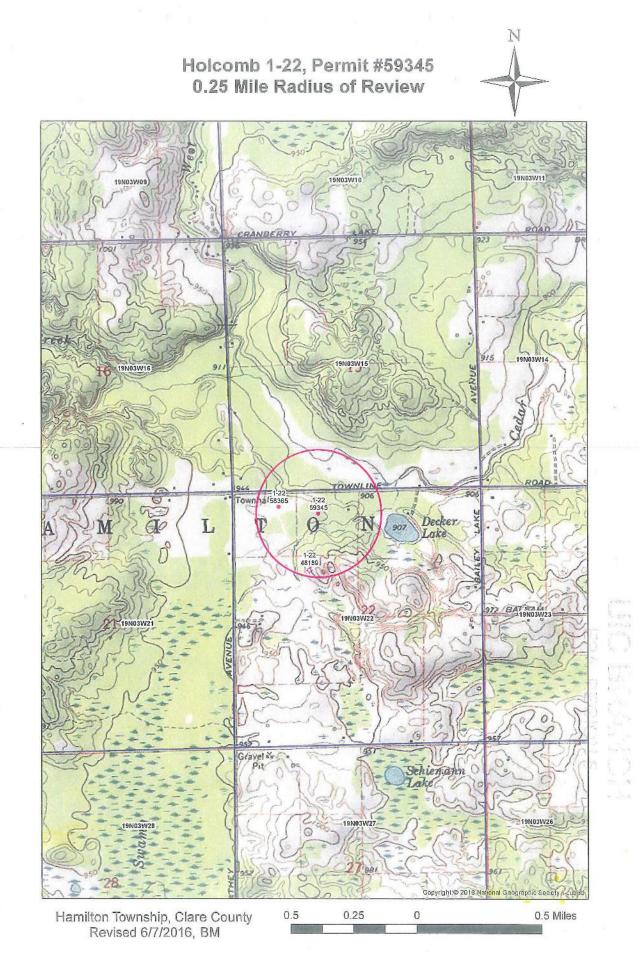
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CORRECTIVE ACTION PLAN

No corrective action is required at this time.

List of Landowners Within 1320' of Holcomb 1-22 Hamilton Township, Clare County, T19N-R03W

Section	Short Legal Description	Owner Name	Owner's Street Address	City, State Zip
15	W/2 SE SW	Oblinsky, Frank & Nancy	9321 East Townlake Road	Harrison, Michigan 48625
15	W/2 E/2 SE SW	Burtka Trust, Richard A. & Eveline E.	3360 12th Street	Wyandotte, Michigan 48192
15	E/2 E/2 SE SW	Molinari, James & Lydia Magda	9463 East Townline Lake Road	Harrison, Michigan 48625
15	SW SW except 300-05 & 300-06	Roe, Herman L. II & Marilyn K.	5600 Cribbins Road	North Street, Michigan 48049
15	W/2 SW SE & W/2 W/2 E/2 SW SE	Scott, Paul & Shawn	10447 Lewis Road	Clio, Michigan 48420
22	N/2 NW NW	Fanslau Trust, Robert A. & Pearl	9062 East Townline Lake Road	Harrison, Michigan 48625
22	S/2 NW NW	Fanslau, Frederick & Katherine	200 North Occidental Road, Apt 23	Tecumseh, Michigan 49286
22	W/2 NE NW	Weaver, Vernon & Miranda	9326 East Townline Lake Road	Harrison, Michigan 48625
22	E/2 NE NW	Driver, Ronald E.	9478 East Townline Lake Road	Harrison, Michigan 48625
22	W/2 NW NE	Primemark Properties LLC	437 North Larch	Lansing, Michigan 48912
22	N 330' of SW NW	Miller, Alvin B.	10860 Strasburg	Erie, Michigan 48133
22	S 990' of SW NW	Cover, Willis & Pamela E.	9161 Balsam Road	Harrison, Michigan 48625
22	E/2 S/2 NW	Troyer, Levi & Naomi	2593 North Bailey Lake Avenue	Harrison, Michigan 48625
22	S/2 NE	Troyer, Levi & Naomi	2593 North Bailey Lake Avenue	Harrison, Michigan 48625



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ATTACHMENT E: NAME AND DEPTH OF U.S.D.W.'S

The underground source of drinking water in the area is the Glacial Drift. The drift in this area extends from the surface to a depth of approximately 464'. It is an unconsolidated formation of clay, gravel and sand.

The Hydrogeologic Atlas of Michigan, Western Michigan University, 1981, is the reference used to determine the depth to the lowest U.S.D.W.

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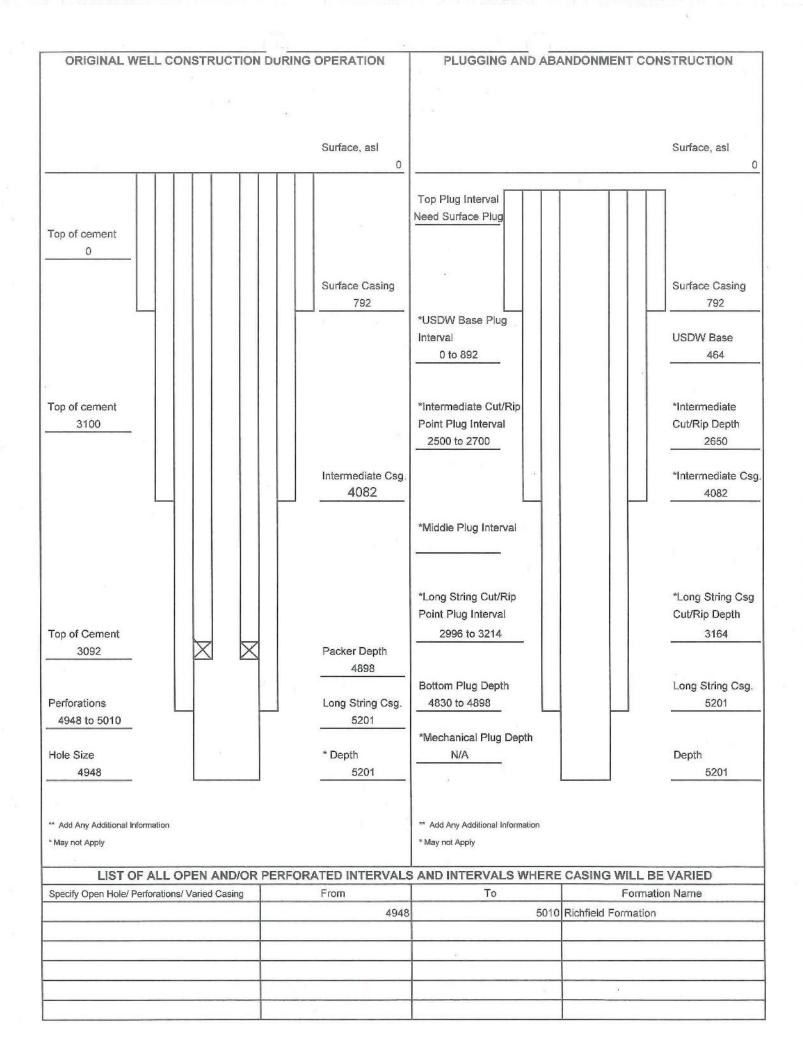
ATTACHMENT G: GEOLOGICAL DATA ON INJECTION AND CONFINING ZONES

The Richfield Formation is part of the Detroit River Group and consists of alternating zones of dolomitic limestone and anhydrite, with zones ranging from 5' to 15' thick. The top of the Richfield occurs near 4948' and has an average thickness of approximately 180'.

The injection interval will be the Richfield Formation from 4948' to 5010'. The Richfield is immediately confined uphole by approximately 85' of the Massive Anhydrite and then approximately 850' of Detroit River anhydrite and salt. The Richfield Formation is underlain by the Amherstburg Limestone.

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			Plug #	1	2	3	4		,	
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	op of Plug (ft.)	ug Will Be Placed (inc	nes)	4.5	2996	2352	0			
	eh et t te B (tet)									
easured To	op of Plug (ft.)					0700	000			
Contractor and the second	op of Plug (ft.) tom of Plug (ft.)			4898	3214	2700	892			
epth to Bot	and the second second second second			4898 5	3214 35	65	892 335			
epth to Bot tacks of Cer	tom of Plug (ft.)	t.)		5 5.9	35 41.3	65 76.7	335 395.3			
epth to Bot acks of Cer urry Volum urry Weigh	tom of Plug (ft.) ment to be Used ne to be Used (cu. F nt (lb./gal.)			5 5.9 15.6	35 41.3 15.6	65 76.7 15.6	335 395.3 15.6			
epth to Bot acks of Cer urry Volum urry Weigh spe of Cem	tom of Plug (ft.) ment to be Used te to be Used (cu. F nt (lb./gal.) nent, Spacer or Othe		2 2	5 5.9	35 41.3	65 76.7	335 395.3			
epth to Bot acks of Cer urry Volum urry Weigh vpe of Cem	tom of Plug (ft.) ment to be Used te to be Used (cu. F nt (lb./gal.) nent, Spacer or Othe			5 5.9 15.6 Class A ION OF PLUG	35 41.3 15.6 Class A GING PROCED	65 76.7 15.6 Class A URE	335 395.3 15.6 Class A			
epth to Bot acks of Cer urry Volum urry Weigh rpe of Cem rpe of Prefl	tom of Plug (ft.) ment to be Used te to be Used (cu. F nt (lb./gal.) nent, Spacer or Othe	er Material Used	ES	5 5.9 15.6 Class A ION OF PLUG	35 41.3 15.6 Class A GING PROCED	65 76.7 15.6 Class A URE	335 395.3 15.6 Class A			
epth to Bot acks of Cer urry Volum urry Weigh pe of Cem pe of Prefl	tom of Plug (ft.) ment to be Used te to be Used (cu. F nt (lb./gal.) nent, Spacer or Othe) E	5 5.9 15.6 Class A ION OF PLUG	35 41.3 15.6 Class A GING PROCED	65 76.7 15.6 Class A URE	335 395.3 15.6 Class A			
epth to Bot acks of Cer urry Volum urry Weigh rpe of Cem rpe of Prefi ement ervice Rig fireline Service	tom of Plug (ft.) ment to be Used le to be Used (cu. F it (lb./gal.) nent, Spacer or Othe lush Used	er Material Used \$7,000 \$10,000 \$6,000	ES	5 5.9 15.6 Class A ION OF PLUG	35 41.3 15.6 Class A GING PROCED ST OF PLUGGII Water Trucking	65 76.7 15.6 Class A URE NG AND ABANDOI \$1,500 \$1,500	335 395.3 15.6 Class A			
epth to Bot acks of Cer urry Volum urry Weigh ype of Cem ype of Prefi ement ervice Rig fireline Sen te Supervis	tom of Plug (ft.) ment to be Used (cu. F tt (lb./gal.) nent, Spacer or Othe lush Used	er Material Used \$7,000 \$10,000	ES	5 5.9 15.6 Class A ION OF PLUG	35 41.3 15.6 Class A GING PROCED ST OF PLUGGII	65 76.7 15.6 Class A URE URE NG AND ABANDOI \$1,500 \$1,500 \$1,500 \$27,800	335 395.3 15.6 Class A			
epth to Bot acks of Cer lurry Volum lurry Weigh ype of Cem ype of Prefi ement ervice Rig <i>Tireline Sen</i> ite Supervis	tom of Plug (ft.) ment to be Used le to be Used (cu. F it (lb./gal.) nent, Spacer or Othe lush Used vice sion TIFICATION I certify under the all attachments an I believe that the	r Material Used \$7,000 \$10,000 \$6,000 \$1,800 penalty of law that I h nd that, based on my	ES)) have examine inquiry of tho curate, and c	5 5.9 15.6 Class A ION OF PLUG STIMATED CO	35 41.3 15.6 Class A GING PROCED ST OF PLUGGII Water Trucking Total Total ar with the information mediately respons ware that there are	65 76.7 15.6 Class A URE URE NG AND ABANDOI \$1,500\$1,500\$1,500\$1,500\$1,500\$1,500\$1,500\$1,500\$1,500\$1	335 395.3 15.6 Class A VMENT			





ATTACHMENT H: OPERATING DATA

INJECTION RATES AND VOLUMES

The proposed average injection rate is 150 barrels of water per day. The maximum anticipated rate should be no greater than 350 barrels of water per day.

INJECTION PRESSURES

The proposed average injection pressure is 3,250 psig. The maximum injection pressure will be 3,345 psig based on a fracture gradient of 1.112 psi/ft. This fracture pressure gradient was determined from an ISIP observed during an acid treatment performed on the nearby Fanslau 1-22 well in May of 2016. A graph and job ticket is included in the appendix.

NATURE OF THE ANNULUS FLUID

The annulus fluid will be fresh water mixed with TECHNI-HIB[™] 606W, or equivalent. This chemical works as a corrosion inhibitor and oxygen scavenger, and will be used at the recommended volume. The casing tubing annulus pressure will be monitored weekly for the purpose of insuring mechanical integrity.

SOURCE AND ANALYSIS OF INJECTION FLUID

The injection fluid will be fresh water. The source of the injection fluid will be the glacial drift. Analysis of a representative sample taken from a water well within ¹/₄ mile of where the supply well will be located is included in the appendix.

Version: Well Const	ruction 2010-07-30		C
CALCUL	ATION OF WELL-SP	ECIFIC PRESSURE	EFFECTS
Facility Name	mb 1-22	Operator	lopment Company
Well Name Holco	mb 1-22	USEPA Permit Number MI-035-2R-0034	State Permit Number 59345
County Clare	State MI	Well Class 2R	Analyst Bill Tong
Township 19N	Range 3W	Section 22	Date 42629
Sector Sector J	USTIFICATION FOR I	FRACTURE GRADIE	ENTERIO
Administrative Basis for Fracture G Default	iradient	Defa	l Field Name
Site Source of Fracture Gradient Fracture Treatment	Well Name Fanslau 1-22	adient Test Date 5/25/2016	Fracture Gradient 1.11
	MAXIMUM INJEC	TION PRESSURE	
Fracture gradient, psi/ft 1.11	Type of Fluid, liquid or gas LIQUID	Safety factor 0.05	Average well-bore temperature, F
Top of Inj. Zone, ft 4948	Specific Gravity 1.000	Maximum Injection Pr 3	ressure, psi 238
	PRESSURE LOS	SS TO FRICTION	
Outer Diameter of the Tubing, in. 2.500	Weight of Tubing, lbs/ft 0.000	Inner Diameter of Tubing, in 0.000	Tubing length, ft 4898
Measured	Reynolds Number Method	Hazen-Williams Method	Estimated from Chart
Surface injection pressure, psi	Average velocity of injection, ft/sec 0.00	Kinematic viscosity, cSt	Maximum Flow Rate, bbl/min 8.33
Depth of gauge, ft	Viscosity of injectate, cp 0.0	Maximum Injection Rate, gpm 350	Tubing material
Downhole injection pressure, psi	Reynolds Number	Roughness Constant 100	Total Friction Loss, psi
Total Friction Loss, psi	Total Friction Loss, psi #VALUE!	Total Friction Loss, psi NOT APPLICABLE	Friction Loss to Use, psi
INFORM	ATION FOR CALCU		CHANGE
Total Volume of Well (tubing and C		Total Volume of Annulus, gals	143
Predicted Well Bore Storage, gals/ 0		Additional Volume to Increase Pres	

MI-035-2R-0034 Page A-1 of 1

		Minimum Mo Requiren	Minimum Reporting Requirements	
Characteristic	Limitation	Frequency	Туре	Frequency
*Injection Pressure	3238 psig (maximum)	weekly		monthly
Annulus Pressure		weekly		monthly
Flow Rate		weekly		monthly
Cumulative Volume		weekly		monthly
Annulus Liquid Loss		quarterly		quarterly
**Chemical Composition of Injection Fluid		annually	grab	annually

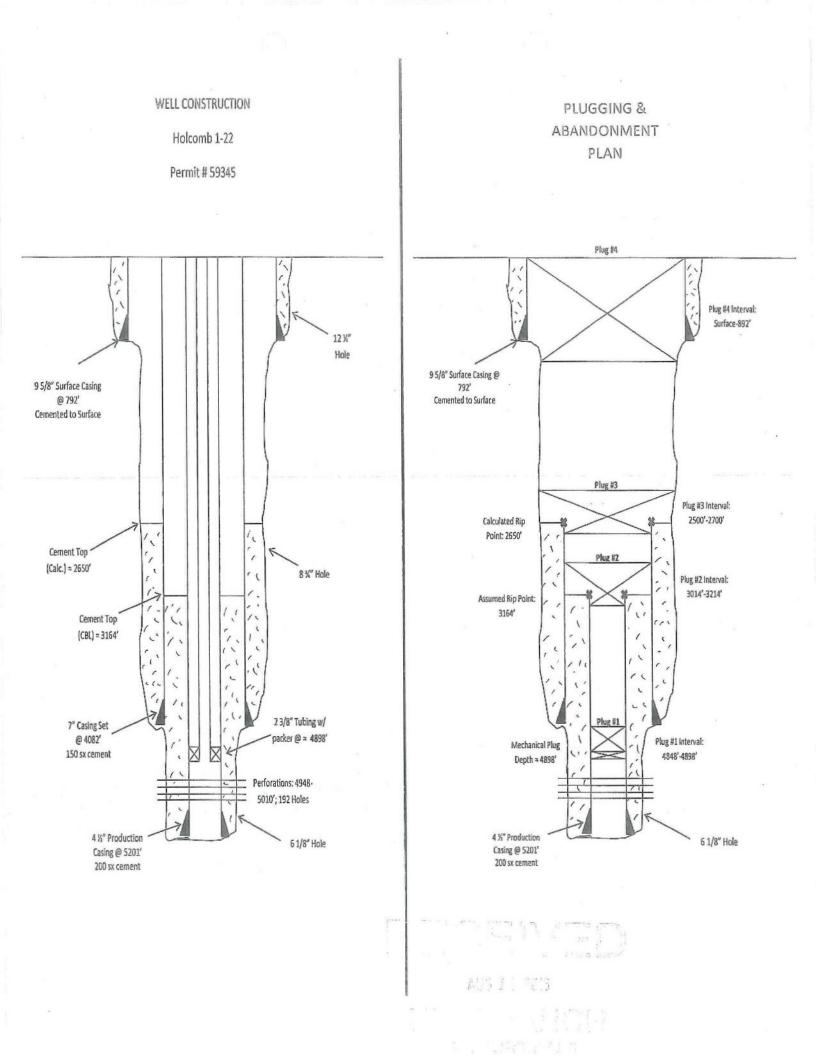
OPERATING, MONITORING AND REPORTING REQUIREMENTS

SAMPLING LOCATION: The sample location is at the well head

*The limitation on wellhead pressure serves to prevent confining-formation fracturing. This limitation was calculated using the following formula: $[\{1.112 \text{ psi/ft} - (0.433 \text{ psi/ft})(\text{specific gravity})\} \times \text{depth}] - 14.7 \text{ psi}$. The maximum injection pressure is dependent upon depth and specific gravity of the injected fluid. The Richfield Formation of the Detroit River Group at 4948 feet was used as the depth and a specific gravity of 1.05 was used for the injected fluid. The fracture gradient of 1.112 psi/ft was determined from an acid-fracture job from a nearby well.

**Chemical composition analysis shall include, but not be limited to, the following: Sodium, Calcium, Magnesium, Barium, Total Iron, Chloride, Sulfate, Carbonate, Bicarbonate, Sulfide, Total Dissolved Solids, pH, Resistivity (ohm-meters @ 75°F), and Specific Gravity.

											[15]	
							OMB No. 2040-	-0042 Aş	proval Expire	s 12/31/2018		
€E	DA			United States V		ental Protectio 1, DC 20460	n Agency					
VE	F74		PLU	GGING AN			MENT PL	AN				
Vame and Address of Facility Holcomb 1-22 Smith Creek Field					Name and Address of Owner/Operator Muskegon Development Comapany 1425 South Mission Road, Mt. Pleasant, MI, 48858							
1.00	ate Well and O	utilizz Uziti za		State		1	County		Permit	Number	1. Nov. 4 14. (4. 4 14.)	
	tion Plat - 640 A			Michig		-the mention	Clare		59345		and the second second	
		N		and the second second		Description				202121		
					and the second s		of <u>NW</u> 1/4 of				and the second second second	
W				Surface Location	n 490 ft, fi 26ft, from (i	m (N/S) <u>N</u>	om nearest lin Line of quarte e of quarter se ION	r section		drilling unit		
<i></i>					lividual Pe ea Permit Ile er of Wells				ISS ISS Brine Dispos: Enhanced Re Hydrocarbon ISS	covery		
		S		Lease N	Holc	omb		Well Nur	umber 1-22			
	CA	SING AND TU	BING RECORD	AFTER PLUGGI	in the second second		METH		LACEMENT O	F CEMENT P	UGS	
SIZE	WT (LB/FT)		N WELL (FT)	TO BE LEFT IN		HOLE SIZ		e Balance N				
9 5/8" 7" 4.5"	36 23 11.6"			792' 1432' 2037'		12 1/4" 8 3/4" 6 1/8"	Th	ie Dump Bai ie Two-Plug her	ler Method			
	CEMENTING	TO PLUG AN	DABANDON DA	TA:	PLUG #	1 PLUG #	2 PLUG #3	PLUG #4	PLUG #5	PLUG #6	PLUG #7	
ize of H	lole or Pipe in t				4.5"	4.5", 7"	7", 8 3/4"	9 5/8"	1	1 100 10		
	Bottom of Tub				4898'	3214	2700'	892'	1 E	and the second s		
	Cement To Be				5	35	65	335	-			
	olume To Be Pu				5.90	41.30	76.70	395.30	[Contraction of the	laure course	
_	ed Top of Plug d Top of Plug (i				4848' C.I.B.P	3014'	2500'	Surface	-		1	
	t. (Lb./Gal.)				15.6	15.6	15.6	15.6	A Contract of the State		Contractor and	
	nent or Other N	laterial (Class	111)	and the second second	Class A	and an and a second sec	Class A	Class A		1	1	
	LIS	T ALL OPEN	HOLE AND/OR	PERFORATED IN		-	and the second	-	E VARIED (if	any)		
	From			То			From			То		
4948'			4954'	e voetkonde die nie No ween onernoording		3164'	a for a strong strong a strong st		Assumed Fr	ee Point for	4.5"	
4966'		ente del Sector del	4976'		}	2650'			Calculated I	Free Point fo	or 7"	
4990'			5000'					in the second				
5004' stimate \$27,80	d Cost to Plug 0	Wells	5010'			herioan an a						
					Certific	cation						
at In	achments and	that, based o e, accurate, a	n my inquiry o and complete.	ersonally examin f these individua I am aware that 0 CFR 144.32)	is immedia	ately respons	ble for obtaini	ing the info	mation, beli	eve that the		
	d Official Title	(Please type	or print)	SI	gnature					Date Signer	1	
Name and Official Title (Please type or print) Signate William C. Myler, Jr., President /					3 0	4	1	17		1-1	10	
	n C. Myler, Jr.	, President		14 6	1	rll	- Mri	10 7		8/8/	16	



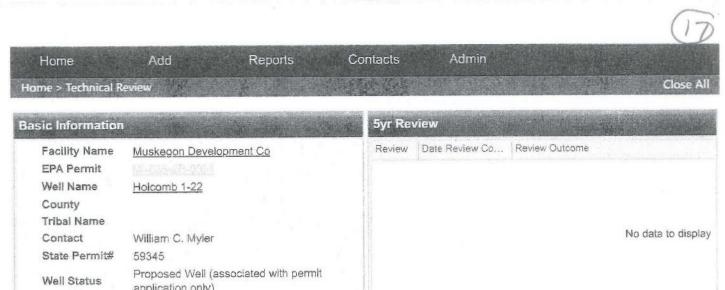


Muskegon Development Company

Financial Report December 31, 2015

AUG 1 1 2013





Class Permit Type	2R Individual Permit	Add Rev	view			ner mer nær hen se beser beser Te	
	ate 8/11/2016 12:00:00 AM				e presidente de la constant de la constant		
Monitoring		Tests			10-01-13-		
Monitoring		Tests	Category	Туре	Date	Result	

Inspections				Violations	
	Туре	Date	.a.		
			'W'		
Add Inspection				Add Violation	Add Enforcemen

Report History

Add Report

mines, wells, and known faults)

Add Test

A. Area of Review Methods
What is the AOR based on?
Save Cancel
B. Maps of Wells : Area of Review
Does the topographic map show all of the required features? (The map should
include all surface features man-made or natural, and subsurface features such as
Yes v

that depict the facility and each of its waste treatment, storage, or disposa facility are injected; and those wells, drinking water wells listed in the pub	al facilities; each well wher , springs, and other surface	ictures, hazardous e fluids from the e water bodies and	<u>No</u>
Is there a list of all of the land owner	rs within the AOR?		Yes 🔻
Surface elevation of the wellsite			933
The elevation is based on			Ground level V
Save Cancel			

C. Corrective Action Plan and Well Data	
Number of wells that are temporarily abandoned	0
Is the construction adequate?	NA 🔻
Number of wells that are plugged and abandoned	1
Is the construction adequate?	Yes 🔻
Number of wells that are producers	2
Is the construction adequate?	Yes 🔻
Number of wells that are injectors	0
Is the construction adequate?	NA 🔻
Number of Other Wells	0
Is the construction adequate?	NA 🔻
Is there a corrective action plan?	No 🔻
Number of wells that penetrate into or through the confining zone Save Cancel	

E. Name and Depths of USDWs

Formation name of lowest USDW:	Glacial Drift	
Depth to base of lowest most USDW(ft)	464	
Method for USDW determination	Hydrogeological Atlas	28 Characters Left
Save Cancel		

an para serengan da kara	Injection Interval	Confining Zone	Bleed Off Zone
Formation Name	Detroit River Group	Detroit River Group 🗳	8
Lithology	Dolomite	Anhydrite	<u> </u>
Depth to Top (ft)	4948	4013	
Depth to Bottom (ft)	5010	4948	

What is the separation between the top of the injection zone and the base of the USDW?

Were the presence and extent of natural or induced fractures in the injection and confining zones adequately investigated?

4484 No **v**

Save Cancel

H. Operating Data	
The injectate is	liquid 🔻
Injection Rate Unit	Select
Method used to determine maximum injection pressure	Fracture Gradient equation V
	100 Characters Le
Source of fracture gradient	Fracture Treatment data 🔻
Fracture gradient	1.112
Maximum expected injection rate(gpm)	14700
Maximum enforceable injection rate(gpm)	
Raw Maximum specific gravity of injectate (without safety factor)	1
Should database calculate MIP using Safety Factor For Specific Gravity?	Calculated MIP 1.05 yes V
Friction Allowance	
Technical basis for friction allowance	
Maximum injection pressure(r5_mip_calc_formula) txtr5MipCalcFormula / lblr5MipCalcFormula	3238 3238
Does the corrosion monitoring comply with 40 CFR part 146.68(c)?	Yes 🔻
	Fresh Water with Corrosion Inhibitors 🔻
What is the composition of the annulus fluid	an a
	Save Cancel
I. Formation Testing (for new wells only)	Rosental & Robert & De
Does the formation testing proposed meet CFR 146.12 (d) and (e) [for non-haz] or 146.32(b) [Class III]?	146.66 [for haz] or Yes V
Are there adequate procedures for acquiring formation pressures above the injection	on interval? Yes 🔻
Are there adequate sampling and analysis procedures for the injection zone?	Yes 🔻
	Summing and the second se
Proposed method for determining fracture gradient Save Cancel	Nearby well acid frac
Coave Coalicel	-
J. Stimulation Program	
Is a stimulation proposed	Yes 🔻
	The second se
What is the type of stimulation?	acid
Is this type of stimulation approved?	Yes 🔻
Save Cancel	
K. Injection Procedures	
Is there a plant plan that shows the stream flow lines?	No 🔻

te stere e Frence Frence en	
Are there descriptions of any filters, storage tanks, and/or pretreatment?	Yes 🔻
What is the storage tank capacity?	
What is the rate capacity of the pumps?	443
What is the pump capacity type?	Variable 🔻
Is an alarm system proposed?	No 🔻
What are the alarm thresholds?	control of the second
The shut-off system will be	Automatic 🔻
What are the shut-off thresholds?	low or high pressure
Save Cancel	

Save Cancel

M. Construction Details

	Pipe/	Hole set				C	emented
	From top (ft)	To base(ft)	Pipe Size(in)	Hole Size(in)	Number of sacks of cement	From top	o(ft) To base(ft)
Conductor	• (hour company company)			and devident on the second sec	- Counter-ord management		
Surface Casing	0	792	9.625	. 12.25	500	0	792
Intermediate Casing	0	4082	7	8.75	150	3101	4082
Long String Casing	0	5201	4.5	6.125	200	3091	5201
Liner		 Parlameter contraction to more an Contraction contraction and 				 A second s	
Perforated Section	4948	5010					
Open Hole	5201			The second secon			
Packer depth		4898					
Tail Pipe depth		and all and a second second					
What is the plug back total dep	oth?	5201					
What is the total depth of the v	vell?	5201	Sugar				
Is the packer set 100 ft or less injection zone?	above the	No					
Tubing material			Y				
Tubing size		the construction of the first of the second se					

O. Plans for well failure

Is the contingency plan adequate? What actions are proposed if MI is lost? Yes V Shut in well, inspect

Save Cancel

P. Monitoring Program		
Where is the sample located?	At the well hea	ıd
Is there an adequate description of source(s) of waste? Is there a representative of waste analysis?		V
What are the sampling parameters? What's the frequency of physical and chemical monitoring? What's the frequency of monitoring reports?	Select	
Save Cancel		
Q. Plugging and Abandonment Plan		
How many plugs will be used to plug the well? Signed estimate of plugging and abandonment costs (and post-closure costs, if applicabl an independent firm	e) by	7 No 🔻
Estimated Plugging Cost	27800	

Date the plan was signed

Date of 3rd Party Plugging Cost Estimate

	Plug #	Method	Base	Sacks	Yield	
Edit	Plug 1	Surface Plug	892	335	1.18	Delete
Edit	Plug 2	Intermed Rip Point	2500	65	1.18	Delete
Edit	Plug 3					Delete
Edit	Plug 4					Delete
Edit	Plug 5					Delete
Edit						Delete
Edit						Delete
Add Plua		na na mangang kang pang pang kanang mang pang pang pang pang pang pang pang p	alations constant manufacture		na shinonarar, Kubura afundishin	

8/8/2016

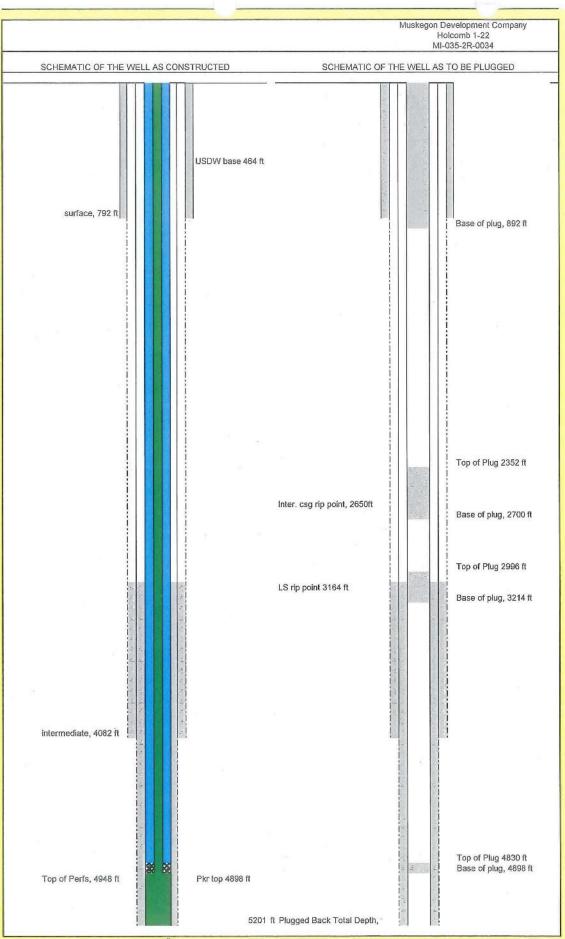
R. Necessary Resources		And the second	
Available Mechanisms	Selected Mechanisms	un version a	
Trust agreement Add ->	Test1 Class2		ALC: UNK
Test1 Class2 Add -> Test2 Class2 <- Remove			
Surety performance bond			
Edit Mechanisms			
S. Aquifer Exemptions		The second second	
Is the company asking for an aquifer exemption?		N	7
Aguifer Name		None	1
Save Cancel			and the second
T. Existing Permits			
List Existing permits and permit numbers		Over 350 existing UIC pern	nit
List outstanding permit applications		MI-129-2R-0042	
Save Cancel			
U. Description of Business	Contraction States		
Business description	Muskegon Development		
	a Michigan Corporatio]
	dedicated to the exp.	86 Characters l	_eft
Save Cancel			
V. Compliance with other Federal Acts			n Desi
Any designated wild and scenic rivers within the AOR	?	No 🔻	
If so, what are they?		a summing a second s	
Has the permit writer evaluated whether there are end	langered or threatened species in the	AOR? Yes 🔻	
Are there any listed species in the AOR?		Yes 🔻	
List any threatened species within the area		Northern long-eared bat, K	Girtl
Will the permit need an ESA Clause?		No 🔻	
Was the Historic Preservation Office contacted?		Yes 🔻	
Are there historic resources present?		No 🔻	
		and produced and constrained.	

Is the well located in a coastal zone? If yes, then has the permit writer contac Does the permit application call for the water body in excess of 10 acres? EJ number Save Cancel			No ▼ NA ▼ No ▼ 1ej screen
X. Confidentiality Has any part of this permit application	been declared confidential by the	e operator?	No v
Save Cancel			(
Other			
	Comments		
	500 0	Characters Left	
Update Cancel			
Review Completion			
Reviewer	TONG WILLIAM		
Signature Date Update Cancel	8/26/2016		

Version: Well Construction 2010-07-30

CALCULATION	OF CEMEN	IT FILL AND		LUMES	
Facility Name	USEPA Permit Nur		State Permit Number		Well Class
Holcomb 1-22		2R-0034 593			2R
Well Name Holcomb 1-22	State MI	County	are	Analyst Bill	Tong
Operator	Township	Range		Analysis Date	
Muskegon Development Company	19N	3W	22	the second se	er 16, 2016
Geological Information			Completion		
Name of Lowermost USDW	and the second se	Plugged Back Tota	and the second se	Actual or Proposed	
Glacial Drift	464	5201 Packer Depth, ft	4948	act	tual
Richfield	4948	4898	Packer Depth OK? YES		
EVALUA	TION OF W	ELL CONS	TRUCTION		
		C.	ASING STRIN	IG	
	surface	intermediate	long string		
Top of Casing	-0,	0	0		
Bottom of Casing	792	4082	5201		
Well Bore Diameter	12.25	8.75	6.125	2.5	
Outside Diameter of Casing	9.625	7	4.5		
Weight per Foot of Casing	36	23	11.6	50	
1st Stage Cement					
Cu Ft to Fill Annulus in Open Hole	297.7	593.5	126.5		
Cu Ft to Fill Annulus in Cased Hole		132.1	451.3		1
Cement/Epoxy Used	500	150	200		
Average Yield	1.18	1.18	1.18		
Top of Cement in Annulus	0	3101	3091	3	
2nd Stage Cement					
Depth of DV Tool					
Cu Ft to Fill Annulus in Open Hole	and a classified				
Cu Ft to Fill Annulus in Cased Hole					1
Sacks of Cement Used					
Average Yield					1
Top of Cement in Annulus		1			
3rd Stage Cement		Participation and and			
Depth of DV Tool				CONTRACTOR STATE	
Cu Ft to Fill Annulus in Open Hole		· · · · · · · · · · · · · · · · · · ·			
Cu Ft to Fill Annulus in Cased Hole					
Sacks of Cement Used			1		
Average Yield		1			
Top of Cement in Annulus					
Meets Standards for Surface Casing	YES	NO-cement	NO-cement		
Meets Standards for Any Casing	YES	YES	YES	l	
Meets Standards for Protection Casil		NO-casing	YES		1
Comments					1
Comments in this cell					

le



Version: Well Construction 2010-07-30

0/0/0040	Facility Name	Operator			
8/8/2016 Well Name	Holcomb 1-22	Muskegon Development Company USEPA Permit Number			
Holcom	ıb 1-22	MI-035-2R-0034	59345		
County Clare	State MI	2R	Bill Tong		
Township 19N	Range 3W	Section Da	ate 16-Sep-16		
Plug 1 Bala	nced on BP	Plug 2 LS F	Rip Point		
Plug Type	Balanced on BP	Plug Type	LS Rip Point		
Depth to BP, ft	4898	Depth of Long String Cut Of	3164		
Sacks of Cement	5	Base of Plug, ft	3214		
Yield of Cement	1.18	Sacks of Cement	35		
Top of Cement Plug, ft	4830	Yield of Cement, cu ft/sk	1.18		
Ft above top of inj. Zone	118	Top of Cement	2996		
Plug Meets	Standards	Plug meets s	standards		
Plug 3 Interm	ed Rip Point	Plug 4 Surfa	ace Plug		
Plug Type	Intermed Rip Point	Plug Type	Surface Plug		
Depth of Inter. String Cut Of	2650				
Base of Plug, ft	2700	Base of Plug, ft	892		
Sacks of Cement	65	Sacks of Cement	335		
Yield of Cement, cu ft/sk	1.18	Yield of Cement, cu ft/sk	1.18		
Top of Cement	2352	Top of Cement	0		
Plug meets	standards	Plug meets s	standards		
Plu	g 5	Plug	6		
Plug Type		Plug Type			
Deep of Dive #		Dana of Diver #			
Base of Plug, ft Sacks of Cement		Base of Plug, ft Sacks of Cement			
Yield of Cement		Yield of Cement			
Top of Cement		Top of Cement			
rop of Gement	5				
Plu	g 7	Plug	8		
Plug Type		Plug Type	입기 부분을 바랍니다		
			和你们的 机合金油		
Base of Plug		Base of Plug, ft			
Sacks of Cement		Sacks of Cement			
Yield of Cement, cu ft/sk		Yield of Cement			
Top of Plug, depth in ft.		Top of Cement	1		
Plu	α 9	Plug	10		
Plug Type		Plug Type			
Base of Plug, ft		Base of Plug, ft			
Sacks of Cement		Sacks of Cement			
Yield of Cement		Yield of Cement			
Top of Cement		Top of Cement			

MUSKEGON DEVELOPMENT COMPANY

1425 South Mission Road, Mount Pleasant, Michigan 48858 (989) 772-4900 (Fax) (989) 773-4094

June 13th, 2016

Anna Miller Underground Injection Control Branch U.S. Environmental Protection Agency – Region 5 Mail Code WU-16J 77 W. Jackson Blvd. Chicago, IL, 60604-3590

Dear Ms. Miller,

I have reviewed the potential impact to endangered species caused by conversion of the existing Holcomb 1-22 producing well to a water injection well. The Holcomb 1-22 well is located in Clare County, MI, which contains habitat for two threatened or endangered species (1): The Northern Long-Eared Bat and the Kirtland's Warbler.

Clare County is a potential habitat for the threatened Northern Long-Eared Bat during spring and summer time. It typically roosts and forages in upland forests (2). The Long-Eared Bat hibernates in caves and mines during late-Autumn and winter. The Kirtland's Warbler is an endangered species that is found in Clare County (3). They typically nest in the low-hanging branches of Jack Pine trees, and migrate to the Bahamas in late-Autumn.

The project area is contained within a 75 ft. radius circle centered at the well. The project area contains little to no vegetation.

It is my determination that conversion of the Holcomb 1-22 well to water injection is not likely to adversely affect the Northern Long-Eared Bat or the Kirtland's Warbler. The project area does not contain any trees that would provide shelter for either threatened or endangered animals.

Please contact me at (989) 772-4900 or <u>bennettmyler@muskegondevelopment.com</u> if you have any questions. Thank you.

Sincerley,

Burnt Magen

Bennett Myler, Geologist



Hamilton Township, Clare County Revised 6/7/2016, BM

N



GOVERNOR

STATE OF MICHIGAN MICHIGAN STATE HOUSING DEVELOPMENT AUTHORITY STATE HISTORIC PRESERVATION OFFICE

KEVIN ELSENHEIMER EXECUTIVE DIRECTOR

July 25, 2016

LISA PERENCHIO EPA REGION 5 77 WEST JACKSON BLVD WU 16J CHICAGO IL 60604

RE: ER04-92

Muskegon Development Company Well Projects - Holcomb 1-22, Sec. 22, T19N, R3W, Hamilton Township, Clare County (EPA)

Dear Ms. Perenchio:

Under the authority of Section 106 of the National Historic Preservation Act of 1966, as amended, we have reviewed the above-cited undertaking at the location noted above. Based on the information provided for our review, it is the opinion of the State Historic Preservation Officer (SHPO) that <u>no historic properties are affected</u> within the area of potential effects of this undertaking.

This letter evidences the EPA's compliance with 36 CFR § 800.4 "Identification of historic properties," and the fulfillment of the EPA's responsibility to notify the SHPO, as a consulting party in the Section 106 process, under 36 CFR § 800.4(d)(1) "No historic properties affected." If the scope of work changes in any way, or if artifacts or bones are discovered, please notify this office immediately.

We remind you that federal agency officials or their delegated authorities are required to involve the public in a manner that reflects the nature and complexity of the undertaking and its effects on historic properties per 36 CFR § 800.2(d). The National Historic Preservation Act also requires that federal agencies consult with any Indian tribe and/or Tribal Historic Preservation Officer (THPO) that attach religious and cultural significance to historic properties that may be affected by the agency's undertakings per 36 CFR § 800.2(c)(2)(ii).

The State Historic Preservation Office is not the office of record for this undertaking. You are therefore asked to maintain a copy of this letter with your environmental review record for this undertaking.

If you have any questions, please contact Brian Grennell, Cultural Resource Management Specialist, at 517-335-2721 or by email at GrennellB@michigan.gov. Please reference our project number in all communication with this office regarding this undertaking. Thank you for this opportunity to review and comment, and for your cooperation.

www.michigan.gov/shpo * 517.373.1630 * FAX 517.335.0348 * TTY 800.382.4568

Sincerely,

Brian J. Brian G. Grennell

Cultural Resource Management Specialist

for Brian D. Conway State Historic Preservation Officer

SAT:BGG

Copy: Bennett Myler, Muskegon Development Company

RECENE

AUG 0 1 2016

UIC SAMOH

Equal Housing Lender

ENDANGERED SPECIES ACT COMPLIANCE DETERMINATION

To: Well file, Permit # MI-035-2R-0034, Holcomb 1-22 (Muskegon Development)

From: William K. Tong, Permit Writer UIC Branch

William L. Tong

Re: Endangered Species Determination

Eastern massasauga

(Sistrurus catenatus)

rattlesnake

Date: January 24, 2017

According to the species list published by U.S. Fish & Wildlife Service (USFWS) at their web site, the following endangered and threatened species present in Clare County as of October 2016:

Habitat County Species Status Threatened Hibernates in caves and mines Clare Northern long-eared bat Myotis septentrionalis - swarming in surrounding wooded areas in autumn. Roosts and forages in upland forests during spring and summer. Kirtland's warbler Endangered Nests in young stands of jack (Setophaga kirtlandii) pine

Threatened

Lives in shallow wetlands and adjacent uplands; USFWS has

determined that designating

critical habitat for the eastern massasauga is not prudent.

https://www.fws.gov/midwest/endangered/lists/michigan-cty.html

The following information is excerpted from the report dated June 13, 2016, prepared by Bennett Myler, Geologist (Muskegon Development Company), included with the permit application:

"...The project area is contained within a 75 foot radius circle centered at the well. The conversion of the Holcomb 1-22 well to water injection is not likely to affect the Northern Long-Eared Bat, or the Kirtland's Warbler. The project area contains little or no vegetation, and does not contain any trees that would provide shelter for either threatened or endangered animals." (The Eastern massasauga was not yet listed for Clare County at the time the report was prepared; it was added by USFWS in October 2016.)

This proposed well conversion will not create any new land disturbance nor construction activity other than in the immediate vicinity of the well pad. Analysis of aerial photography of the site location on MDEQ's GeoWebFace confirms the lack of vegetation in the 75 foot radius circle centered at the well, cited by the permit applicant above. Due to there being no suitable habitat in the action area, I have determined that this well will have <u>NO EFFECT</u> on endangered or threatened species.

Endangered Species in Michigan - county distribution

Midwest Endangered Species Home

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Species Information

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Bat Fact of the Day

Daily Bat Fact - Jan. 24 Bats with white-nose syndrome often behave uncharacteristically during cold winter months, like flying outside in daylight and clustering near cave entrances. This video has more information on how WNS affects bats and what is being done.

Connect With Us





Great Lakes

County Distribution of Federally-Listed Endangered and Threatened Species

PDF Version of this page

Michigan

For more information about threatened and endangered species in Michigan, contact the <u>U.S. Fish</u> <u>& Wildlife Service office at 2651 Coolidge Road, East Lansing, Michigan 48823 (517/351-6274)</u>

Bald Eagle

Bald eagles are no longer protected under the federal Endangered Species Act and Section 7 consultation with the U.S. Fish and Wildlife Service is no longer necessary. However, the bald eagle remains protected under the Bald and Golden Eagle Protection Act.

ACC

Information about Bald Eagles

Information about Eagle Permits and the Bald and Golden Eagle Protection Act

Gray Wolf

Due to a Federal court decision, <u>gray wolves</u> in the western Great Lakes area (including Michigan, Minnesota, and Wisconsin) were relisted under the Endangered Species Act, effective December 19, 2014.

Revised October 2016



Endangered Species in Michigan - county distribution

Clare	Northern long-eared bat Myotis septentrionalis	Threatened	Hibernates in caves and mines - swarming in surrounding wooded areas in autumn. Roosts and forages in upland forests during spring and summer.
	<u>Kirtland's warbler</u> (Setophaga kirtlandii)	Endangered	Nests in young stands of jack pine
	Eastern massasauga (Sistrurus catenatus)	Threatened	

https://www.fws.gov/midwest/endangered/lists/michigan-cty.html



USFWS: Eastern Massasauga

Midwest Endangered Species Horne

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Bat Fact of the Day

Daily Bat Fact - Jan. 25 What should you do if you find dead or dying bats, or if you observe bats with signs of white-nose syndrome? Contact your state wildlife agency (many provide an online electronic reporting system), email the U.S. Fish and Wildlife Service at WhiteNoseBats@fivs.gov, or contact your nearest Service field office to report your observations. See additional information on what to do.

Connect With Us







Eastern massasauga rattlesnake observed in Ontario, Canada. Photo courtesy of Joe Crowley; Ontario Nature

Eastern Massasauga (Sistrurus catenatus)

Status: Threatened

The U.S. Fish and Wildlife Service listed the eastern massasauga rattlesnake (*Sistrurus catenatus*) as a threatened species under the Endangered Species Act. We also determined that designating critical habitat for the eastern massasauga is not prudent. The final rule published in the <u>Federal</u> <u>Register on Sept. 30, 2016</u>.

The eastern massasauga is a small, thick-bodied rattlesnake that lives in shallow wetlands and adjacent uplands in portions of Illinois, Indiana, Iowa, Michigan, Minnesota, New York, Ohio, Pennsylvania, Wisconsin, and Ontario. The species, a candidate for listing since 1999, has been declining over the past few decades due to loss and fragmentation of its wetland habitat. Nearly 40 percent of the historical populations are now extirpated and an additional 15 percent are of uncertain status. Of those known remaining populations, most are experiencing ongoing threats, meaning additional population losses are anticipated in the future.

News Release

Final Rule (Federal Register)

FAQs

Fact Sheet

Species Status Assessment (117-page PDF D; 2.4MB)

This report summarizes the results of an assessment of the eastern massasauga's overall viability. The assessment begins with a description of the snake's ecological requirements for survival and reproduction as they relate to its overall viability. We generally defined viability as the ability of the species to maintain selfsustaining populations over the long-term. Using the principles of resiliency, representation, and redundancy, we considered the species' needs at the individual, population, and species scales. We also identified the beneficial and risk factors influencing the species' viability. We considered the degree to which the species' ecological needs are met both currently and as can be forecasted into the future, and assessed the consequences of any unmet needs as they relate to species viability.

Range wide Extinction Risk Modeling for the Eastern Massasauga Rattlesnake (Sistrurus catenatus catenatus) (66-page PDF 2; 2.3MB)

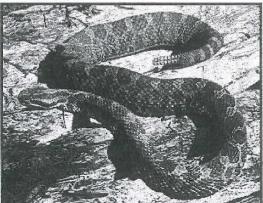


Photo courtesy of Joe Crowley

Eastern Massasauga

Status: Threatened; 2015

Habitat: Open to forested wetlands and adjacent upland areas

Lead Region: 3

Region 3 Lead Office: Chicago, Illinois Field Office

Range: Illinois, Indiana, Iowa, Michigan, Minnesota, New York, Ohio, Pennsylvania, Wisconsin, and Ontario

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USFWS: Eastern Massasauga



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Midwest Region

2.1

	Video
Life History and Ecology	from the Michigan DNR
Live and Let Live - Oakland County, Michigan Blog	60-Second Snakes: The Easte
Species Spotlight: Eastern Massasauga - USFWS Chicago Field Office	
Eastern Massasauga - Michigan Society of Herpetologists	
Species Survival Plan	1
AZA Species Survival Plan - A Species Survival Plan® is a collaborative science-based management program of the Association of Zoos and Aquariums (AZA).	
<u>Michigan is Main Focus of Eastern</u> Massasauga Rattlesnake Survival Plan	From the Michigan DNR Natural Features Inventory
Lincoln Park Zoo Recovery Efforts	About Massasaugas
Conservation and Research Managing for Massasaugas - Edward Lowe	Identification and Look-Alikes
Foundation Land Stewardship. 4-page PDF. 2012	Life History and Ecology
Long-term Research on Rattlesnake Life	Safety Tips and Snakebite Treatment
History Will Help Managers Plan Habitat Restoration August 7, 2012	Report an Observation in Michigan
Species Action Plan - Pennsylvania Fish and Boa	t Commission (PDF). June 2011
Learning to Live with the Eastern Massasaug Education in Southern Michigan Dec. 31, 2009. 17	
Spotlight Species Action Plan October 2009. 9-	Page PDF

Restoring Southeast Michigan's High Diversity Landscapes Through Collaborative <u>Stewardship</u> – Hillsdale, Jackson, Lenawee, Oakland, and Washtenaw Counties, Michigan. Private Stewardship Grant (May 2007):

Reforestation and Wetland Restoration for Permanent Native Habitat in the St. Joseph River Watershed – Hillsdale County, Michigan; Defiance and Williams Counties, Ohio; Allen, Dekalb, and Noble Counties, Indiana Private Stewardship Grant. May 2007

Response to Habitat Management by the Eastern Massasauga (Sistrurus catenatus) at Carlyle Lake, Illinois S6 Grant Project. 2006

Molecular Diversity among Massasauga Rattlesnakes: Nuclear Intron Analyses S6 Grant Project 2006

Rome State Nature Preserve Candidate Conservation Agreement with Assurances Ashtabula County, Ohio. August 2006

Final Environmental Assessment for Eastern Massasauga Candidate Conservation Agreements in the Midwest. July 26, 2005

Survey and Management Guidances <u>A Handbook for Land Managers</u> (PDF 1.2 MB)

Recommended Standard Survey Protocol

Archives

Reptiles Midwest Endangered Species Home

Last updated: January 5, 2017

USFWS Ecological Services Field Offices in the Upper Midwest Illinois | Chicago | Indiana | Iowa | Michigan | Minnesota | Missouri | Ohio | Wisconsin

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Coastal Conservation | Endangered Species | Environmental Contaminants | Fisheries and Habitat Conservation

MUSKEGON DEVELOPMENT COMPANY

 1425 South Mission Road, Mount Pleasant, Michigan 48858

 (989) 772-4900
 (Fax) (989) 773-4094

June 13th, 2016

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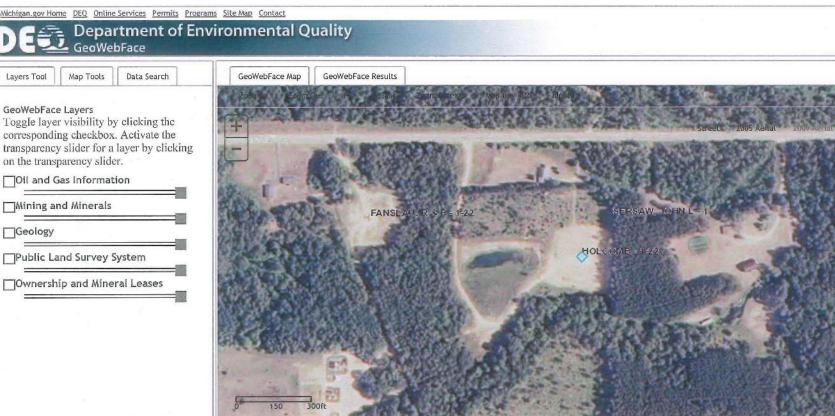
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Bennett Myler, Geologist

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