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# Grobbel Environmental & Planning Associates L.L.C.

800 Cottageview Dr., Ste 211B Traverse City, MI 49684  
a Beckett & Raeder company

May 9, 2009

REVISED May 19, 2009

Mr. William Tong  
U.S. EPA Region 5, UIC Branch  
77 W. Jackson Blvd., (WU-16J)  
Chicago, IL 60604

**RE: Preliminary Review and Public Comment, Proposed Cherry Berry B1-25 SWD, Class II Injection Well Draft Permit #MI-055-2D-0042, NW ¼, SW ¼, NW ¼, Section 25, T28 R10W, Acme Township, Grand Traverse County, Michigan.**

Dear Mr. Tong,

Grobbel Environmental & Planning Associates were retained by Acme Township residents and landowners to provide preliminary review and public comment regarding the above-referenced proposed deep injection well. Based on our review, please consider the following comments.

## Deep Injection Well Proposal

O.I.L. Energy Corp. of Traverse City, Michigan has proposed a new deep injection well within Section 25, Acme Township, Grand Traverse County to dispose of an expected maximum daily volume of 3,000 barrels (or 126,000 gallons) of noncommercial, waste brine into a bedrock formation at between 1,920 and 2,130 feet below ground surface (b.g.s.). Waste gas well production brines are proposed to be injected into the Dundee limestone formation at a maximum 554 pounds per square inch gauge (psig).<sup>1</sup> O.I.L. Energy Corp. has reportedly also applied with the Michigan Department of Environmental Quality (MEDQ) pursuant to Michigan's Mineral Well Operations Regulations, Part 625 of the Natural Resources and Environmental Protection Act, P.A. 451 of 1994, as amended, R 299.2301 *et seq.*

U.S. EPA is authorized to regulate the underground injection of waste fluids through underground drinking water sources pursuant to the Safe Drinking Water Act, 40 C.F.R., Parts 144 and 146.

## Proposed Deep Injection Well Site

The proposed Cherry Berry deep injection well would be located along or near the eastern boundary of parcel No. 01-226-002-02, owned by Cherries R Da Berries, LLC, of Kewadin, Michigan, and near the eastern boundary of parcel No. 01-225-009-00, also owned by Cherries R Da Berries, LLC.

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<sup>1</sup> Statement of Basis for Issuance of Underground Injection Control (UIC) Permit, Class 2, Permit Number MI-055-2D-0042, Facility Name Cherry Berry B1-25 SWD, U.S. Environmental Protection Agency, Region 5, 77 West Jackson Boulevard, Chicago, IL.



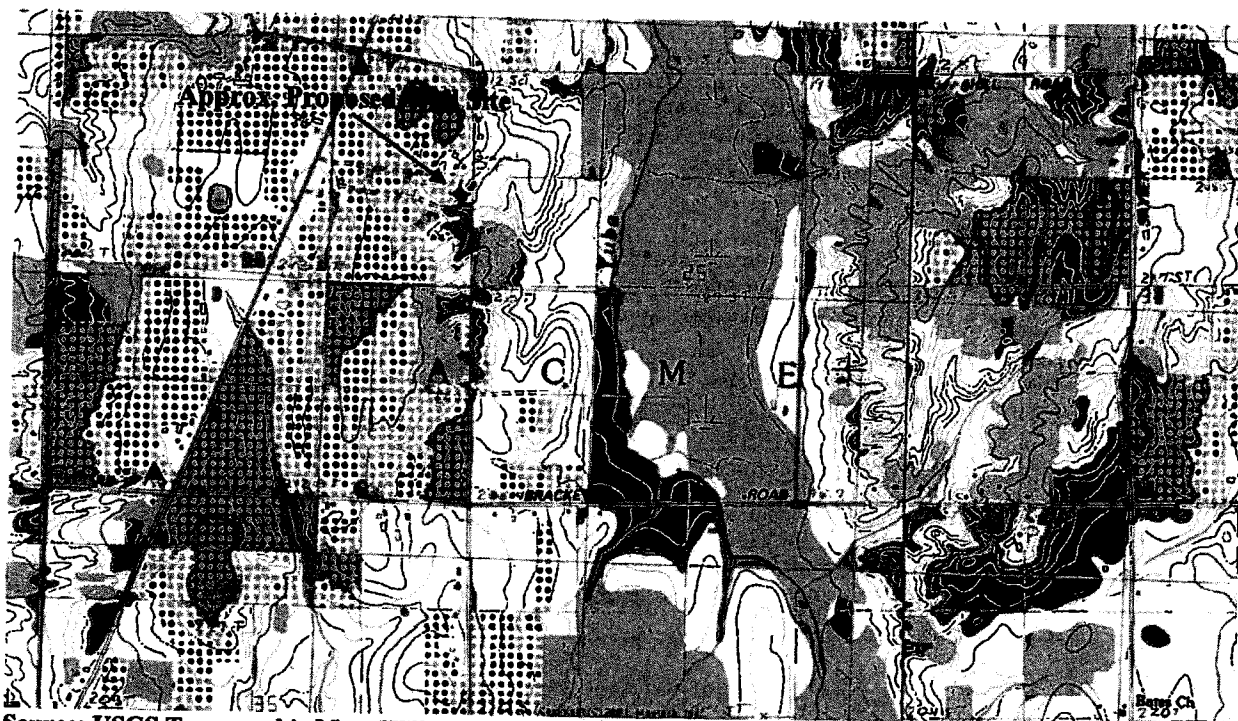
Source: 2005 Orthophotograph, Grand Traverse County website, <http://gis.co.grand-traverse.mi.us/gis>.

### **Site Topography**

The vicinity of the proposed deep well steeply slopes eastward toward Yuba Creek, dropping a total of more than one-hundred and fifty (150) feet in elevation from approximately 750 feet above mean sea level (m.s.l.) at the proposed well site to approximately 600 feet above m.s.l. to the east-southeast at Yuba Creek. Importantly, drainage ways which include Emmet sandy loam (18-25% slope) and the wetland soil Tonkin sandy loam, exist at and near the site, and slope steeply from west to east toward a broad wetland complex along to Yuba Creek.<sup>2</sup> Good site planning principles would preclude the potential for any spillage of waste brines or other hazardous materials from within these natural drainage features.

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<sup>2</sup> Natural Resources Conservation Service, Web Soil Survey 2.1, National Cooperative Soil Survey, April 13, 2009.



Source: USGS Topographic Map, Williamsburg Quad, Provisional Edition 1985.

### Site Soils

Natural Resources Conservation Service soils and U.S. Geological Survey topographic maps indicate that the proposed deep well injection site is located within or near a former gravel pit. Gravel pits by their nature possess highly permeable soils that allow surface infiltration of precipitation or other fluids released to the ground surface. On-site soil types, slopes, characteristics and limitations for development are summarized in Table 1 below from the Grand Traverse Soil Survey.<sup>3</sup>

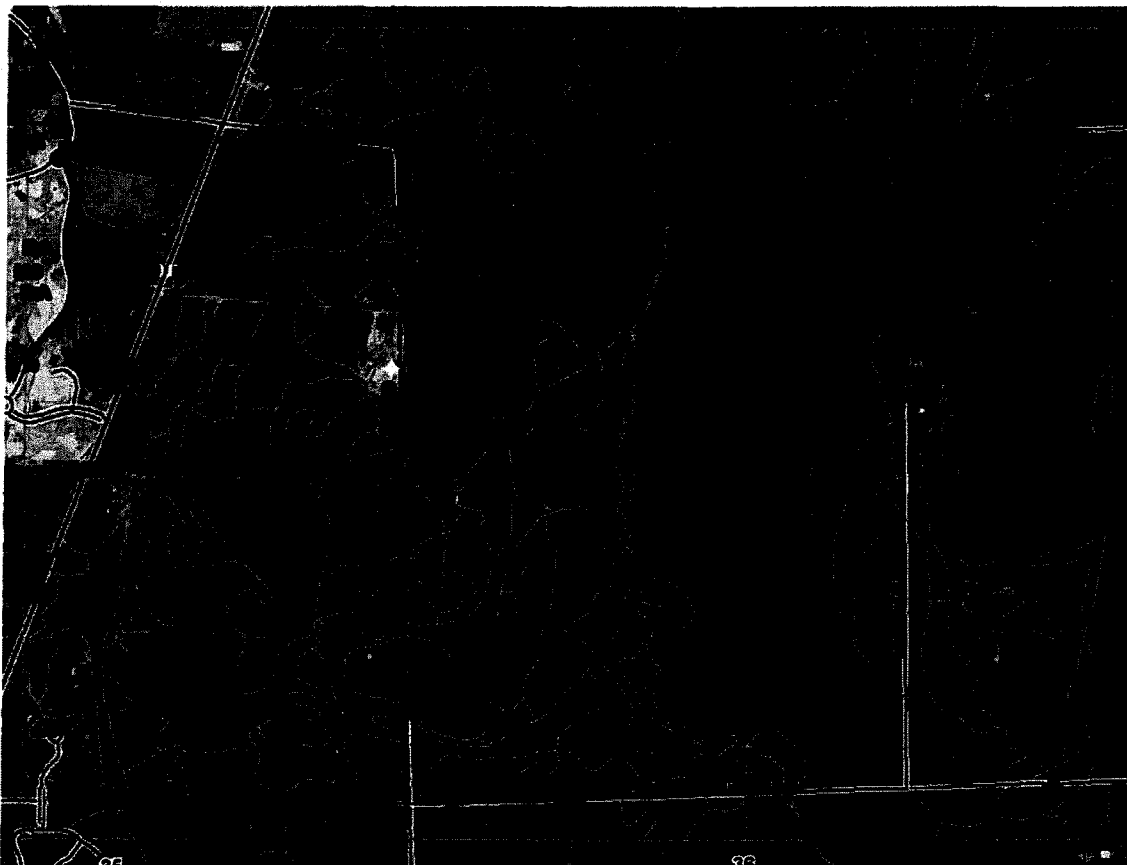
Table 1: Summary of Site Soils

Soil Association	Slope	Comments	Limitations
1. Gravel pits (Gt)	---		Typically highly permeable sand and/or gravel deposits therefore vulnerable to groundwater contamination.
2. Emmet sandy loam (EyB)	2-6 %	Well-drained calcareous soil developed in glacial outwash plains. Gently sloping soil mostly cleared for farming, orchard. Some reverted to woodlots.	Severe construction limitation due to caving cutbanks.
3. Emmet sandy loam (EyC)	6-12 %	Well-drained, moderately sloping calcareous soil developed in glacial outwash plains. Gently sloping soil mostly cultivated.	Severe construction limitation due to caving cutbanks.
4. Emmet sandy loam (EyE)	18-25 %	Within drainage way to Yuba Creek. Well-drained, steep calcareous soil developed in glacial outwash plains. Mostly cultivated. Subject to significant erosion. Some reverted to woodlots.	Severe construction limitation due to caving cutbanks and slope.
5. Leelanau-Kalkaska sandy	2-6%	Well-drained, gently sloping sandy loams soils formed in glacial outwash plains.	Severe construction limitation due to caving cutbanks.

<sup>3</sup> Soil Survey of Grand Traverse County, Michigan, USDA, issued 1966, updated and reprinted August 1990.

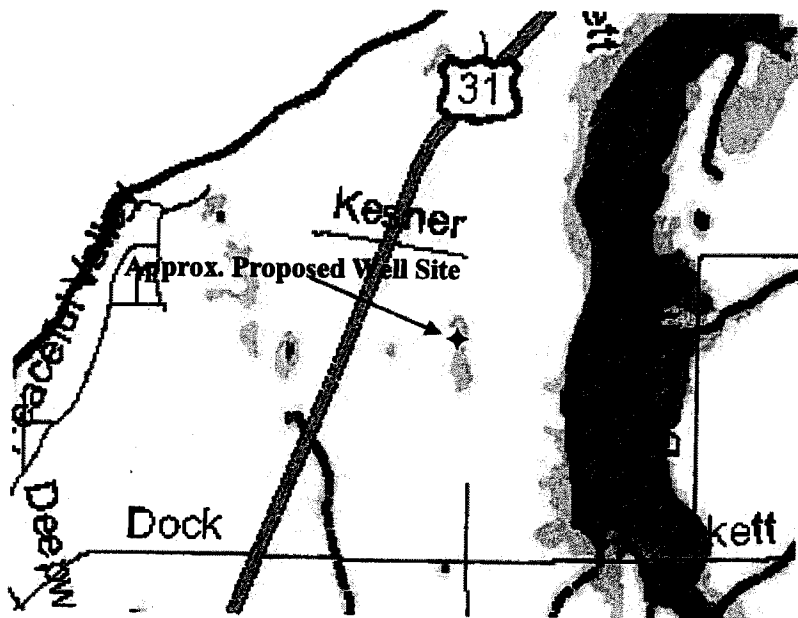
loams (LkB)			
6. Leelanau-Kalkaska sandy loams (LkE2)	18 – 25%	Well-drained, steeply sloping and moderated erode sandy loams soils formed in glacial outwash plains.	Severe construction limitation due to caving cutbanks and slope.
7. Kalkaska loamy sand (KaA)	0-2%	Well drained, nearly level and very sandy soils formed in glacial outwash plains. Primarily cultivated, many acres abandoned agricultural lands.	Severe construction limitation due to caving cutbanks.
8. Richter loams (RcA)	0-2%	Within drainage way to Yuba Creek. Imperfectly drained, nearly level sandy loam soil commonly adjacent to drainage ways. Used for orchard, farming, pasture and woodland.	Severe construction limitation due to caving cutbanks and wetness.
9. Tonkey sandy loam (To)	0-2%	Poorly drained wetland soil with sandy loam surface and gravelly loam subsurface ranging to mucky sand loam. Mostly wooded wetland.	Severe construction limitation due to caving cutbanks and ponding.

Importantly, the MDEQ Grand Traverse County Final Wetland Inventory reports the presence of soil areas which include wetland soils at and in the vicinity of the proposed deep well site.<sup>4</sup> The presence of wetland or “hydric” soils indicates the presence of a high water table at and near the proposed deep injection well site.



Source: Natural Resources Conservation Service, Web Soil Survey 2.1, National Cooperative Soil Survey, <http://websoilsurvey.nrcs.usda.gov>, April 13, 2009.

<sup>4</sup> Grand Traverse County Final Wetland Inventory, Michigan Department of Environmental Quality, compiled October 7, 2008.



Source: MDEQ, Grand Traverse County Final Wetland Inventory, October 7, 2008.

### Hydrology

Based on the review of thirteen (13) available residential well logs within Section 25, Acme Township, site geology is typified by a surficial sand layer (i.e. an unconfined sandy aquifer, 57.5 feet in average thickness). This surface sandy aquifer is underlain by a thick confining, clay layer (i.e. 77.6 feet average thickness). Based on the review of thirteen (13) available residential well logs within Section 26, Acme Township, site hydrogeology is also typified by a surficial sand layer (i.e. an unconfined sandy aquifer, 13.2 feet in average thickness). This surface sandy aquifer is also underlain by a thick confining, clay layer (i.e. 47.8 feet average thickness). These geologic conditions have resulted in a high, near surface water table immediately east of the site discharging to Yuba Creek and its riparian wetlands. Yuba Creek exists approximately 1,900 feet east of the proposed deep injection well site, and East Grand Traverse Bay exists approximately one (1.0) mile northwest of the site.

Importantly, all residential water wells in Section 25 and 26 are screened within glacial drift, about half of which are screened within an upper aquifer at 85 feet below ground surface on average, and slightly more than one-half within a deeper confined sandy aquifer and screened at an average 302 feet b.g.s. in Section 25. Importantly, wells screened within the upper aquifer possess an average static water level of 34 feet b.g.s. and 153 feet b.g.s. within the deeper aquifer. Based on site geology, hydrogeology, topography and soils, near surface groundwater resources are interpreted to flow generally easterly, northeasterly toward Yuba Creek, and deep groundwater aquifer is interpreted to flow generally westerly toward East Grand Traverse Bay. Refer to Appendix A for copies of residential well logs.

The proposed Cherry Berry deep injection well site exists approximately one-thousand (1,000') feet north-northwest of a potable water well at an adjacent residence located at 7490 Lautner Road, parcel No. 01-225-011-00. Finally, the proposed Cherry Berry well site exists near, slightly north of and up groundwater flow direction from within the wellhead protection area (WHPA) as defined for the Lochenheath residential and golf course development.<sup>5</sup> Refer to Appendix B for a copy of the MDEQ Lochenheath Well Head Protection Area map.

### Conclusions

Section 18 of DRAFT Cherry Berry UIC Permit states that "the permittee shall be restricted to the injection of

<sup>5</sup> Lochenheath Wellhead Protection Area, Michigan Department of Environmental Quality, Drinking Water and Radiological Protection Division, Ground Water Supply Section, Wellhead Protection Unit, January 2002.

fluids brought to the surface in connection with conventional oil or natural gas production or those fluids used in the enhancement of oil and gas production...Further, no fluids other than those from sources noted in the administrative record for this permit and approved by the (U.S. EPA) Director shall be injected.”<sup>6</sup> However, the DRAFT permit allows for changes in permitted injection fluids following the notice and approval of the U.S. EPA. We are concerned that owners/operators of the proposed deep injection well may seek reclassification as a Class I well to be utilized over time for the disposal of liquid industrial wastes (i.e. “nonhazardous”<sup>7</sup> chemical, food processing, petroleum refining, environmental remediation and/or other wastes) – without significant public input or involvement.

Based on the above findings, the site is unsuited for the proposed deep injection well for natural gas development brines. Importantly, and alternatives already exist to dispose of the applicant O.I.L. Energy Corp’s natural gas development wastes. Specifically, site soils, topography, and hydrogeological conditions -- including the presence of a natural drainage way, vulnerable surficial aquifer, and steeply sloping site from west to east toward Yuba Creek and its associated wetlands, and existing neighboring resident’s use of and reliance upon groundwater for drinking water sources -- render this site unsuitable for the proposed liquid waste disposal facility. Given this setting, environmental conditions and natural features, the site is best suited for agriculture or low density residential development as envisioned within the Acme Township Master Plan and embodied with Acme Township’s zoning ordinance.<sup>8</sup>

#### Recommendations

- **Surface Facilities.** A surface facility plan has not been provided to the U.S. EPA for the evaluation of this proposed permit. Specifically, a surface facility plan, including plans to contain and prevent surface spillage, pipeline loss or other potential releases to the environment from production brine waste conveyance, has apparently not yet been provided for public or U.S. EPA evaluation or review. Based on our experience, such plans are fundamental to assess potential environmental risk from proposed deep injection well facilities. Moreover, a surface facility plan for this facility will likely not be available until after final MDEQ decision-making pursuant to Part 625. *It is recommended and strongly urged that the U.S. EPA in fulfilling its Safe Drinking Water Act obligations to protect subsurface water resources deny this permit until such surface facility and containment plans are disclosed by the applicant. Such plans would enable the U.S. EPA to verify appropriate engineering design and operation and maintenance practices to protect drinking water at and downgradient of the proposed well site, and within all storage and conveyance apparatus or practices, i.e. above ground tanks, pipelines, truck on-loading and off-loading, truck routes, on-site truck circulation, etc.*<sup>9</sup> Finally, at a minimum facility maintenance plans including anti-scaling methods, secondary containment of off-loading and brine tanks/storage facilities and/or brine conveyance pipelines, remotely monitored leak detection, spill prevention and response plans, and pass-through truck circulation for off loading are recommended should this facility be permitted.
- **Groundwater Monitoring.** Similarly, merely one (1) groundwater monitoring well will be required by the MDEQ’s Part 625 permitting process. At least three (3) groundwater monitoring wells are required as part of a reliable hydrogeologic study to determine the depth to groundwater, groundwater flow direction and gradient, etc. Such findings must be made before the appropriate location of a “sentinel” groundwater monitoring well or wells. *It is recommended and strongly urged that the U.S. EPA in fulfilling its Safe*

<sup>6</sup>DRAFT: United State Environmental Protection Agency (USEPA), Underground Injection Control Permit: Class II, Permit Number: MI-055-2D-0042, Facility Name: Cherry Berry B1-25 SWD, Region 5, 77 West Jackson Boulevard, Chicago, IL, p. 10.

<sup>7</sup> “Nonhazardous waste” as defined within the federal Resource Conservation and Recovery Act, 40 C.F.R., Part 261 et seq.

<sup>8</sup> Acme Township Zoning Ordinance, adopted 11/18/08, effective 12/01/08. pp. 40 -43, and Acme Township Master Plan, created 1999 and updated in 2005.

<sup>9</sup> O.I.L. Energy Corporation, Morrison A3-18 & Whitewater 9, Grand Traverse County Antrim Gas Units & Projects map dated May 30, 2008 indicates that O.I.L. Energy owns/operates production and brine pipelines at production facility A2-20 within the NW ¼, NW ¼, NW ¼ of Section 20, Acme Township, approximately 4.75 miles away from the proposed Cherry Berry deep well as measured along Lautner, Brackett, and Bates Road right of ways.

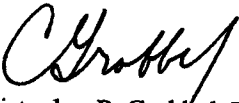
*Drinking Water Act obligations to protect subsurface water resources deny this permit until such groundwater data is generated to properly locate and determine the appropriately determine screen intervals of sentinel well or wells.*

- **Alternatives.** Plans previously provided by the applicant to the MDEQ indicate that it owns mineral rights and owns/operates and plans to expand an existing natural gas well and pipeline network (i.e. O.I.L. Energy Corps' Acme 18, Acme 25, Acme 31 and Whitewater 9 Antrim natural gas production units) that leads to its central production facility (CPF) within Section 9, Acme Township.<sup>10</sup> This CPF facility includes a brine disposal well (i.e. the Hubbell B1-9 SWD), the subject concurrently of a request to change its use from production brine disposal (i.e. Class II) to cherry processing waste/brine disposal (i.e. Class I). Clearly, these two applications are related and it is recommended and strongly urged that the U.S. EPA deny the subject permit application, in effect requiring O.I.L. to continue with its ongoing plan to use the existing Hubbell B1-9 SWD deep well for production waste and requiring the Williamsburg Receiving and Storage facility to appropriately treat and/or pre-treat its cherry processing waste at its facility and/or properly dispose of it at a municipal waste water treatment plant (WWTP), or similar facility.

If you have any questions regarding this assessment, please contact me at 231-933-8400 or [cgrobbel@grobbelenvironmental.com](mailto:cgrobbel@grobbelenvironmental.com).

Sincerely,

**Grobbel Environmental & Planning Associates, L.L.C.**



Christopher P. Grobbel, Ph.D.  
Senior Project Manager

file 1009-07

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<sup>10</sup>O.I.L. Energy Corporation, Acme & Whitewater 9 Projects, Grand Traverse County Antrim Gas Units & Projects map, undated.



**Appendix A**

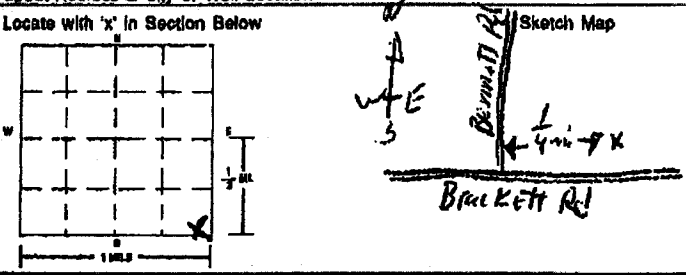
**Residential Well Logs  
Sections 25 & 26, Acme Township  
Grand Traverse County, Michigan**



MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY  
 DRINKING WATER & RADIOLOGICAL PROTECTION DIVISION  
**WATER WELL AND PUMP RECORD**

Completion is required under authority of Part 127 Act 366 PA 1978  
 Failure to comply is a misdemeanor

**1. LOCATION OF WELL**  
 County Grand Traverse Township Name Acme Fraction SE 1/4 SE 1/4 SE 1/4  
 Distance and Direction from Road Intersection  
5959 Brackett Rd on north side 1/4 mile east of Bennett Rd. Williamsburg  
 Street Address & City of Well Location  
 Locate with 'x' in Section Below



**3. OWNER OF WELL**  
 Name Jeff Luckman  
 Address 5959 Brackett Rd Williamsburg MI 49690  
 Address Same as Well Location  Yes  No

**4. WELL DEPTH:** 93 ft. Date Completed 9-4-97  New Well  Replacement Well

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

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

**7. CASING:**  Steel  Threaded  Plastic  Welded  Other  
 Height Above/Below Surface: 0 ft  
 Diameter: 5 in. to 85 ft. depth Weight: 50R21 lbs./ft.  
 BORE HOLE: Diameter: 7 1/8 in. to 93 ft. depth  
 Drive Shoe  Shale Packer

**8. SCREEN:**  Not Installed  Gravel-Packed  
 Type PVC Diameter 4"  
50 gauge 10 Length: 8  
 Set Between 85 ft. and 93 ft.  
 FITTINGS:  K-Packer  Bromer Check  
 Blank Above Screen 2 ft. Other \_\_\_\_\_

**9. STATIC WATER LEVEL:** 80 ft. Below Land Surface  Flowing

**10. PUMPING LEVEL:** Below Land Surface  
81 ft. After 1 1/2 hrs. Pumping at 10 G.P.M.  
 Plunger  Bailor  Air  Test Pump

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

**12. WELL GROUTED?**  No  Yes From 0 to 83 ft.  
 Neat Cement  Bentonite  Other Volcan  
 No. of Bags 0 Additives \_\_\_\_\_

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

**14. PUMP:**  Not Installed  Pump Installation Only  
 Manufacturer's Name Red Jacket  
 Model Number S-W HP 1/2 Volts 230  
 Length of Drop Pipe 80 ft. Capacity 10 G.P.M.  
 TYPE:  Submersible  Jet  Other \_\_\_\_\_  
 PRESSURE TANK:  
 Manufacturer's Name Well Extrol  
 Model Number WT 203 Capacity 36 Gallons 9.9

**2. FORMATION DESCRIPTION**

FORMATION DESCRIPTION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
<u>Sand-Gravel</u>	<u>25</u>	<u>25</u>
<u>Sand-clay</u>	<u>54</u>	<u>79</u>
<u>Sand</u>	<u>14</u>	<u>93</u>
<u>Clay on Bottom</u>		

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

**16. REMARKS:** (Elevation, Source of Data, etc.)  
USE A 2ND SHEET IF NEEDED

**16. WATER WELL CONTRACTOR'S CERTIFICATION:**  
 This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.  
Phil's Well Drilling Inc 0481  
 REGISTERED BUSINESS NAME REGISTRATION NO.  
 Address 3783 Rennie School Rd. TC. MI.  
 Signed Phil Sheverson Date 9-8-97  
 AUTHORIZED REPRESENTATIVE

**17. DRILLING MACHINE OPERATOR:**  
 Employee  Subcontractor  
 Name DOUG SCHEITEL

RECEIVED NOV 19 1997

GEOLOGICAL SURVEY NO.

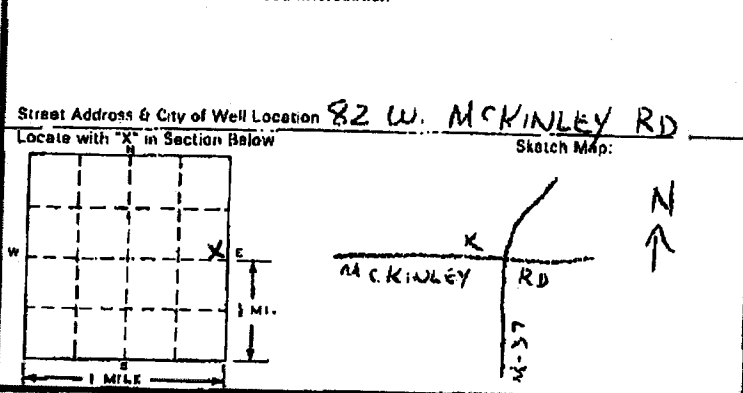
MICHIGAN DEPARTMENT OF PUBLIC HEALTH  
**WATER WELL AND PUMP RECORD**

48-011-323-093-00  
20870  
 PERMIT NUMBER

**1 LOCATION OF WELL**

County <b>GRAND TRAVERSE</b>	Township Name <b>PENINSULA</b>	Fraction <b>SE 1/4 SE 1/4 NE 1/4</b>	Section Number <b>25</b>	Town Number <b>28 NYS</b>	Range Number <b>10 EAW</b>
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Distance And Direction From Road Intersection



**3 OWNER OF WELL:**  
**MARK NADOLSKI**  
 Address  
**10 MCKINLEY RD, T.C.**  
 Address Same As Well Location?  Yes  No

**2 FORMATION DESCRIPTION**

FORMATION DESCRIPTION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
<i>sand gravel stone</i>	<i>110</i>	<i>110</i>
<i>Clay</i>	<i>60</i>	<i>170</i>
<i>sand</i>	<i>10</i>	<i>180</i>
<i>Clay</i>	<i>30</i>	<i>210</i>
<i>water sand</i>	<i>20</i>	<i>230</i>
<i>Clay</i>		

**4 WELL DEPTH:** *238* FT. Data Completed MO. DAY YEAR  New Well  Replacement Well

**5**  Cable tool  Rotary  Driven  Dug  
 Hollow rod  Auger  Jetted

**6 USE:**  Domestic  Type I Public  Type III Public  
 Irrigation  Type IIa Public  Hoist pump  
 Test Well  Type IIb Public

**7 CASING:** Diameter  Steel  Threaded  Height Above/Below Surface \_\_\_\_\_ ft.  
 Plastic  Welded Weight \_\_\_\_\_ lbs./ft.  
 \_\_\_\_\_ in. to \_\_\_\_\_ ft. depth  
 Grouped Drill Hole Diameter Drive Shoe  Yes  No  
 \_\_\_\_\_ in. to \_\_\_\_\_ ft. depth  
 \_\_\_\_\_ in. to \_\_\_\_\_ ft. depth

**8 SCREEN:**  Not Installed  
 Type *slotted* Diameter *4*  
 Slot/Screen *1/2* Length *4*  
 Set between *280* ft. and *238* ft.  
 FITTINGS:  K-Packer  Lead Packer  Bremer Check  
 Blank above screen *2* ft. Other \_\_\_\_\_

**9 STATIC WATER LEVEL:** *184* ft. below land surface  Row

**10 PUMPING LEVEL:** below land surface  
*210* ft. after *1* hrs. pumping at *46* G.P.M.  
 \_\_\_\_\_ ft. after \_\_\_\_\_ hrs. pumping at \_\_\_\_\_ G.P.M.

**11 WELL HEAD COMPLETION:**  Pitless adapter  12" above grade  
 Basement offset  Approved pit

**12 WELL GROUTED?**  No  Yes From *0* in. to *25* ft.  
 Neat cement.  Bentonite  Other *polymer*  
 No. of bags of cement *7* Additives \_\_\_\_\_

**13 Nearest source of possible contamination**  
 Type *septic* Distance *60* ft. Direction *N*  
 Well disinfectant upon completion?  Yes  No  
 Was old well plugged?  Yes  No

**14 PUMP:**  Not installed  Pump Installation Only  
 Manufacturer's name *Walt & Waltham*  
 Model number *4E10610* IIP *1* volts *230*  
 Length of Drop Pipe *210* ft. capacity *10-12* G.P.M.  
 TYPE:  Submersible  Jet  
 PRESSURE TANK:  
 Manufacturer's name *well 126*  
 Model number *100-03* Capacity *32* Gallons

**RECEIVED**  
 Mich. Dept. of Public Health  
 OCT 23 1992

**BUREAU OF ENVIRONMENTAL AND OCCUPATIONAL HEALTH-SWOS**

**15. Remarks, elevation, source of water**

**17. Rig Operator's Name:**  
*Ken Motul*

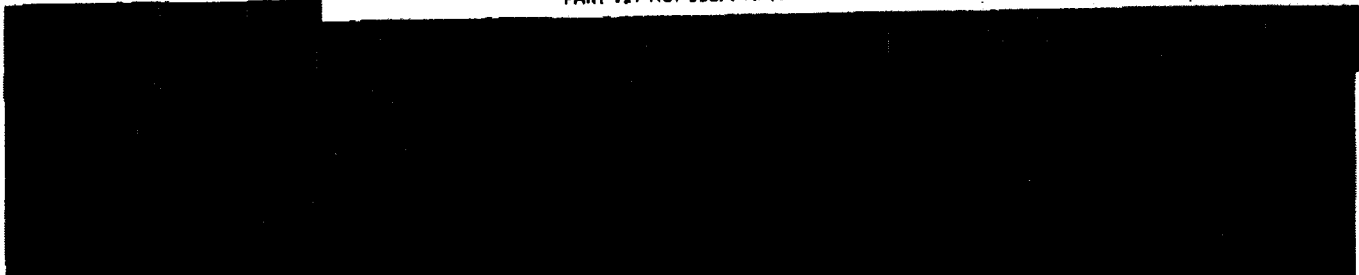
**16. WATER WELL CONTRACTOR'S CERTIFICATION:**  
 This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.  
*Chas. M. ...* 28-1244  
 REGISTERED BUSINESS NAME REGISTRATION NO.  
 Address *4410 cent. rd. Tuscon, Ariz*  
 Signed *Alfred J. ...* Date *10-21-92*  
 AUTHORIZED REPRESENTATIVE

Authority: Act 388 PA 1978  
 Completion: Required  
 Penalty: Conviction of a violation of any provision is a misdemeanor.

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

PERMIT NUMBER **8018**

PART 127 ACT 368, P.A. 1978



2 FORMATION DESCRIPTION		THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM	6 <input type="checkbox"/> Cable tool <input checked="" type="checkbox"/> Rotary <input type="checkbox"/> Driven <input type="checkbox"/> Dug <input type="checkbox"/> Hollow rod <input type="checkbox"/> Auger <input type="checkbox"/> Jetted <input type="checkbox"/>	
SAND - GRAVEL		20'	20'	8 USE: <input checked="" type="checkbox"/> Domestic <input type="checkbox"/> Type I Public <input type="checkbox"/> Type II Public <input type="checkbox"/> Irrigation <input type="checkbox"/> Type I <sub>a</sub> Public <input type="checkbox"/> Heat pump <input type="checkbox"/> Test Well <input type="checkbox"/> Type II <sub>b</sub> Public <input type="checkbox"/>	
CLAY		80'	100'	7 CASING Diameter: <input type="checkbox"/> Steel <input type="checkbox"/> Threaded <input type="checkbox"/> Height Above Surface <b>0</b> ft. <input checked="" type="checkbox"/> Plastic <input type="checkbox"/> Welded <input type="checkbox"/> Surface <b>1</b> ft. <b>5</b> in. to <b>104</b> ft. depth Weight <b>SDr 21</b> lbs./ft. <input type="checkbox"/> in. to _____ ft. depth Grouted Drill Hole Diameter _____ in. to _____ ft. depth Drive Shoe <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> in. to _____ ft. depth	
SAND		8'	108'	8 SCREEN: <input type="checkbox"/> Not installed Type <b>Stainless</b> Diameter <b>4"</b> Slot/Gauge <b>#10</b> Length <b>4"</b> Set between <b>104</b> ft. and <b>108</b> ft. FITTINGS: <input checked="" type="checkbox"/> K-Packer <input type="checkbox"/> Lead Packer <input type="checkbox"/> Bremer Check <input checked="" type="checkbox"/> Blank above screen <b>2</b> ft. Other <b>Plug</b>	
				9 STATIC WATER LEVEL: <b>50</b> ft. below land surface <input type="checkbox"/> Flow	
				10 PUMPING LEVEL below land surface _____ ft. after _____ hrs. pumping at _____ G.P.M. _____ ft. after _____ hrs. pumping at _____ G.P.M.	
				11 WELL HEAD COMPLETION: <input checked="" type="checkbox"/> Pitless adapter <input type="checkbox"/> 12" above grade <input type="checkbox"/> Basement offset <input type="checkbox"/> Approved pit	
				12 WELL GROUTED? <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes From <b>0</b> to <b>100</b> ft. <input type="checkbox"/> Neat cement <input checked="" type="checkbox"/> Bentonite <input type="checkbox"/> Other _____ No. of bags of cement _____ Additives _____	
				13 Nearest source of possible contamination Type <b>Septic</b> Distance _____ ft. Direction _____ Well disinfected upon completion? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
				14 PUMP <input type="checkbox"/> Not installed <input type="checkbox"/> Pump installation Only Manufacturer's name <b>Aermotor</b> Model number <b>SD8-50</b> HP <b>1/2</b> Volts <b>220</b> Length of Drop Pipe <b>90</b> ft. capacity <b>8</b> G.P.M. TYPE: <input checked="" type="checkbox"/> Submersible <input type="checkbox"/> Jet PRESSURE TANK: Manufacturer's name <b>Well-x-Trol</b> Model number <b>202</b> Capacity <b>20</b> Gallons	

**RECEIVED**  
 Mich. Dept. of Public Health  
 Allis (20) 100  
 Environmental and Occupational Health Services Administration

15. Remarks, elevation, source of data, etc.  
 \*ADDED INFO BY DRILLER, ITEM NO.  
 \*CORRECTED BY  
 \*\*ADDITION BY  
 ELEVATION  
 DEPTH TO ROCK

16. WATER WELL CONTRACTOR'S CERTIFICATION:  
 This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.  
**B & Z WELL DRILLING CO. 1647**  
 REGISTERED BUSINESS NAME REGISTRATION NO.  
 Address **233 E. Kasson Road, Maple City, MI**  
 Signed **Edward J. Zientek** Date **7/22/82**  
 AUTHORIZED REPRESENTATIVE

APR 5 1984

WATER WELL AND PUMP RECORD

PART 127 ACT 368, P.A. 1976

PERMIT NUMBER 9063

2

FORMATION DESCRIPTION

~~CLAY GRAVEL~~  
SAND  
CLAY  
SAND

12 WELL GROUTED?  No  Yes From 0 to 30 ft.

No.1 cement  Bentonite  Other

No. of bags of cement \_\_\_\_\_ Additives \_\_\_\_\_

13 Nearest source of possible contamination

Type SEPTIC Distance 70 ft. Direction N

Well disinfected upon completion?  Yes  No

14 PUMP:  Not installed  Pump Installation Only

Manufacturer's name F+W

Model number \_\_\_\_\_ HP 1/2 Volts 220

Length of Drop Pipe \_\_\_\_\_ ft. capacity 10 G.P.M.

TYPE:  Submersible  Jet

PRESSURE TANK:

Manufacturer's name WX 203

Model number \_\_\_\_\_ Capacity \_\_\_\_\_ Gallons

USE A 2ND SHEET IF NEEDED

15. Remarks, elevation, source of data, etc.

ADDED INFO BY DRILLER, ITEM NO.

\*CORRECTED BY

\*\*ADDITION BY

ELEVATION

DEPTH TO ROCK

16. WATER WELL CONTRACTOR'S CERTIFICATION:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

McPHERSON & SONS 0672  
REGISTERED BUSINESS NAME REGISTRATION NO.

Address Kewadin, MI

Signed Charles McPherson 2-29-84  
AUTHORIZED REPRESENTATIVE



NOV 28 1983

WATER WELL AND PUMP RECORD

7914 PERMIT NUMBER

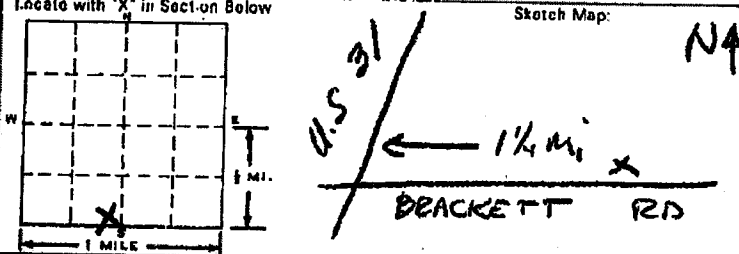
PART 127 ACT 388, P.A. 1878

1 LOCATION OF WELL

County GRAND TRAVERS Township Name ARME Fraction SE 1/4 SW 1/4 Section Number 25 Town Number 28 Range Number 10 EAW

Distance And Direction From Road Intersection 1/4 mi EAST of US 31 on BRACKET RD 200' No of RD.

Street Address & City of Well Location



3 OWNER OF WELL

Address FROMHOLZ 6105 BRACKET RD (BAYVIEW) WILLIAMS BORO

WELL DEPTH: (completed) 155 ft. Date of Completion 6-30-83

6 Cable tool Rotary Driven Auger Hollow rod Jetted

8 USE: Domestic Type I Public Type II Public Irrigation Type III Public Heat pump Fast Well Type IV Public

7 CASING: Diameter Steel Threaded Plastic Welded Height: Above/Below Surface 5 in. to 150 ft. depth Weight 508 lbs. 21 Grouped Drill Hole Diameter 6 3/4 in. to 155 ft. depth Drive Shoe Yes No

8 SCREEN: Not installed Type STAINLESS Diameter 4 INCH Slot/Gauge 1/2 Length 5 FEET Set between ft and ft FITTINGS: K Packer Lead Packer Remor Check Blank above screen 2 ft. Other

9 STATIC WATER LEVEL: 50 ft. below land surface Flow

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

11 WELL HEAD COMPLETION: Pileless adapter 12" above grade Resorment offset Approved pit

12 WELL GROUTED? No Yes From 0 to 50 ft Neat cement Bentonite Other No. of bags of cement Additives

13 Nearest source of possible contamination Type SEPTIC Distance 50 ft. Direction NE Well disinfected upon completion? Yes No

14 PUMP: Not installed Pump Installation Only Manufacturer's name AERMOTOR Model number SD8-75 HP 3/4 Volts 290 Length of Drop Pipe 120 ft. capacity 8 G.P.M. TYPE: Submersible Jet PRESSURE TANK Manufacturer's name X-TRUL Model number LX 203 Capacity 9.4 Gallons

2 FORMATION DESCRIPTION

Table with 3 columns: Formation Description, Thickness of Stratum, Depth to Bottom of Stratum. Rows include SAND, CLAY, SAND, CLAY, SAND, CLAY, SAND, SAND & clay, SAND & GROUT.

RECEIVED

USE A 2ND SHEET IF NEEDED

15. Remarks, elevation, source of data, etc. ADDITIONAL INFO BY DRILLER, ITEM NO. CORRECTED BY ADDITION BY ELEVATION DEPTH TO ROCK

OCT. 6 1983

Environmental and Occupational Health Services Administration

16. WATER WELL CONTRACTOR'S CERTIFICATION:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief. KRUPP WELL DRILLING 0795 REGISTERED BUSINESS NAME REGISTRATION NO. Address 6010 M-72 W TC Signed [Signature] AUTHORIZED REPRESENTATIVE Date 8/10/83



MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY  
DRINKING WATER & RADIOLOGICAL PROTECTION DIVISION

**WATER WELL AND PUMP RECORD**

Completion is required under authority of Part 127 Act 388 PA 1978  
Failure to comply is a misdemeanor

PERMIT NO:

25720

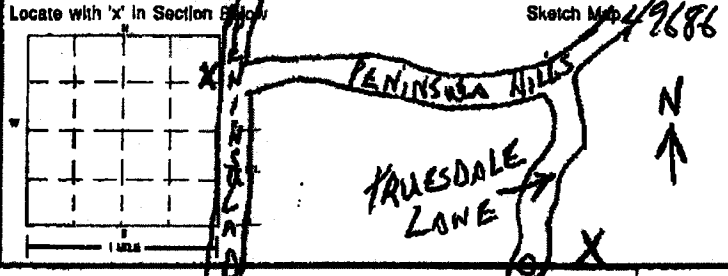
581-004-00

NAME OF WELL

ANN TRVERSE PENINSULA SE 1/4 NE 1/4 25 T. 38 N R. 17 W

Location and Direction from Road Intersection  
**LOT #4 TRUESDALE ESTATES**  
**7780 TRUESDALE LANE, TRAVERSE CITY, MI**

3. OWNER OF WELL: **HARBOR PARTNERS**  
Address: **2150 A SOUTH AIRPORT TRAVERSE CITY, MI 49684**



4. WELL DEPTH: **382** ft. Date Completed: **8-10-98**  New Well  Replacement Well

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

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

7. CASING:  Steel  Threaded  Plastic  Welded  Other  
Height Above/Below Surface: **1** ft  
Diameter: **5** in. to **374** ft. depth  
BOREHOLE: Diameter: **7 7/8** in. to **382** ft. depth  
Weight: **50221** lbs./ft. **SDR 17**  
 Drive Shoes  Shale Packer

2. FORMATION DESCRIPTION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
SAND-GRAVEL-ROCKS	41	41
CLAY-GRAVEL-SAND	8	49
SAND-GRAVEL	64	113
SAND-GRAVEL-ROCKS	86	199
SAND-GRAVEL-CLAY	119	318
CLAY	52	370
SAND	12	382

8. SCREEN:  Not Installed  Gravel-Packed  
Type: **Stainless Steel** Diameter: **3**  
Slot/Gauge: **10** Length: **81**  
Set Between: **374** ft. and **382** ft.  
FITTINGS:  K-Packer  Bremor Check  
 Blank Above Screen **3 1/2** ft. Other

9. STATIC WATER LEVEL: **180** ft. Below Land Surface  Flowing

10. PUMPING LEVEL: Below Land Surface  
**185** ft. After **1** hrs. Pumping at \_\_\_\_\_ G.P.M.  
 Plunger  Bailer  Air  Test Pump

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

12. WELL GROUTED?  No  Yes From **0** to **364** ft.  
 Neat Cement  Bentonite  Other: **CLAY**  
No. of Bags: **18** Additives

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

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

14. PUMP:  Not Installed  Pump Installation Only  
Manufacturer's Name: **RED JACKET**  
Model Number: **3W** HP: **2** Volts: **30**  
Length of Drop Pipe: **331** ft. Capacity: **18** G.P.M.  
TYPE:  Submersible  Jet  Other  
PRESSURE TANK:  
Manufacturer's Name: **WELL EXPLOR**  
Model Number: **302** Capacity: **56** Gallons

16. REMARKS: (Elevation, Source of Data, etc.)  
**Well to be a minimum of 350' deep**

18. WATER WELL CONTRACTOR'S CERTIFICATION:  
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.  
**PHILIP'S WELL DRILLING AND RESTORATION**  
REGISTERED BUSINESS NAME: **3783 Norman Street**  
Address: **Traverse City, MI 49684**  
Signed: **Philip Schmitt** Date: **8-15-98**  
AUTHORIZED REPRESENTATIVE

17. DRILLING MACHINE OPERATOR:  
 Employee  Subcontractor  
Name: **Doug Schmitt**

RECEIVED OCT 09 1998

GEOLOGICAL SURVEY COPY

EQP 2017 (12/96)

GEOLOGICAL SURVEY NO.  

MICHIGAN DEPARTMENT OF PUBLIC HEALTH

**WATER WELL AND PUMP RECORD**

      1 1300

**PERMIT NUMBER**

<b>1 LOCATION OF WELL</b>			<b>3 OWNER OF WELL:</b>		
County <b>CRAWFORD TRAVURSE</b>	Township Name <b>AKME</b>	Fraction <b>SW 1/4 SE 1/4 NE 1/4</b>	Section Number <b>25</b>	Town Number <b>28 (N)</b>	Range Number <b>10 (E)</b>
Distance And Direction From Road Intersection <b>BENNETT RD - 7676</b>			Address <b>RONALD RAMOIE</b> <b>4366 5 mile rd - T.C.</b>		
Street Address & City of Well Location Locate with "X" in Section Below			Address Same As Well Location? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
<div style="display: flex; align-items: center;"> <div style="flex: 1;"> </div> <div style="flex: 1; border-left: 1px solid black; padding-left: 5px;"> <p style="writing-mode: vertical-rl; transform: rotate(180deg);">Sketch Map</p> <p style="writing-mode: vertical-rl; transform: rotate(180deg);">BENNETT RD.</p> <p style="writing-mode: vertical-rl; transform: rotate(180deg);">Beckett Rd.</p> </div> </div>			<b>4 WELL DEPTH: (completed)</b> <b>57 ft.</b> Date of Completion <b>8/85</b>		
<b>2 FORMATION DESCRIPTION</b>			<b>5</b> <input type="checkbox"/> Cable tool <input type="checkbox"/> Rotary <input type="checkbox"/> Driven <input type="checkbox"/> Dug <input type="checkbox"/> Hollow rod <input type="checkbox"/> Auger <input type="checkbox"/> Jetted <input type="checkbox"/>		
<b>top soil</b>	<b>3</b>	<b>3</b>	<b>6 USE:</b> <input type="checkbox"/> Domestic <input type="checkbox"/> Type I Public <input type="checkbox"/> Type III Public <input type="checkbox"/> Irrigation <input type="checkbox"/> Type IIa Public <input type="checkbox"/> Heat pump <input type="checkbox"/> Test Well <input type="checkbox"/> Type IIb Public <input type="checkbox"/>		
<b>gravel</b>	<b>6</b>	<b>9</b>	<b>7 CASING:</b> <input checked="" type="checkbox"/> Steel <input type="checkbox"/> Threaded <input type="checkbox"/> Height: Above/Below <input type="checkbox"/> Plastic <input type="checkbox"/> Welded Surface <input type="checkbox"/> ft. _____ in. to _____ ft. depth Weight _____ lbs./ft. _____ in. to _____ ft. depth Grouted Drill Hole Diameter _____ in. to _____ ft. depth Drive Shoe <input type="checkbox"/> Yes <input type="checkbox"/> No _____ in. to _____ ft. depth		
<b>wet soil red mud</b>	<b>35</b>	<b>44</b>	<b>8 SCREEN:</b> <input type="checkbox"/> Not Installed Type <u>Spinner</u> Diameter _____ Slot/Gauze _____ Length _____ Set between _____ ft. and _____ ft. FITTINGS: <input type="checkbox"/> K-Packer <input checked="" type="checkbox"/> Load Packer <input type="checkbox"/> Bremer Check <input type="checkbox"/> Blank above screen _____ ft. Other _____		
<b>water sand</b>	<b>13</b>	<b>57</b>	<b>9 STATIC WATER LEVEL:</b> <b>7</b> ft. below land surface <input type="checkbox"/> Flow		
			<b>10 PUMPING LEVEL: below land surface</b> <b>2.6</b> ft. after _____ hrs. pumping at _____ G.P.M. _____ ft. after _____ hrs. pumping at _____ G.P.M.		
			<b>11 WELL HEAD COMPLETION:</b> <input type="checkbox"/> Pitless adapter <input type="checkbox"/> 12" above grade <input type="checkbox"/> Basement offset <input type="checkbox"/> Approved pit		
			<b>12 WELL GROUTED?</b> <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes From <b>0</b> to <b>7</b> ft. <input type="checkbox"/> Neat cement <input checked="" type="checkbox"/> Bentonite <input type="checkbox"/> Other _____ No. of bags of cement _____ Additives _____		
			<b>13 Nearest source of possible contamination</b> Type <u>Septic</u> Distance <b>75</b> ft. Direction <b>S.E.</b> Well disinfected upon completion? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		
<p style="text-align: center;"><b>RECEIVED</b></p> <p style="text-align: center;">Mich. Dept. of Public Health</p> <p style="text-align: center; font-weight: bold;">JUN 26 1986</p> <p style="text-align: center;">Bureau of Environmental and Occupational Health - GWOS</p> <p style="font-size: small;">USE A 2ND SHEET IF NEEDED</p>			<b>14 PUMP:</b> <input type="checkbox"/> Not Installed <input type="checkbox"/> Pump Installation Only Manufacturer's name <u>Flint &amp; Walling</u> Model number _____ HP <b>5</b> Volts <b>230</b> Length of Drop Pipe <b>26</b> ft. capacity _____ G.P.M. TYPE: <input checked="" type="checkbox"/> Submersible <input type="checkbox"/> Jet PRESSURE TANK: Manufacturer's name <u>own tank</u> Model number _____ Capacity _____ Gallons		
<b>15. Remarks, elevation, source of data, etc.</b>			<b>16. WATER WELL CONTRACTOR'S CERTIFICATION:</b> This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief. <u>Chas. Hill Drilling Co. 28-1244</u> REGISTERED BUSINESS NAME _____ REGISTRATION NO. _____ Address <u>6414 South 1st St. Traverse City MI 49781</u> Signed <u>Chas. Hill</u> Date <u>12-13-85</u> AUTHORIZED REPRESENTATIVE		

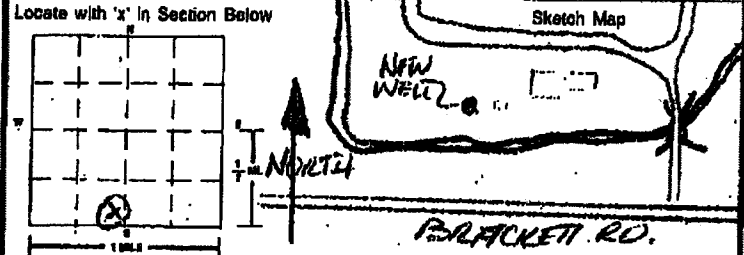
D676 2/84

Authority: Act 366 PA 1978  
Completion: Required  
Penalty: Conviction of a violation of any provision is a misdemeanor.

**DQC MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY**  
**DRINKING WATER & RADIOLOGICAL PROTECTION DIVISION**  
**WATER WELL AND PUMP RECORD**  
 Completion is required under authority of Part 127 Act 368 PA 1978  
 Failure to comply is a misdemeanor

WSSN# 20191-28  
 PERMIT NO:  
**26592**

Township Name **ACME** Section No. **25** Town No. **28N** Range No. **10W**  
 Distance and Direction from Road Intersection  
**~ 350' NORTH OF BRACKETT ROAD.**  
**1400' WEST OF BENNETT ROAD.**  
 Street Address & City of Well Location **5481 BRACKETT ROAD**



2. FORMATION DESCRIPTION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
Black Dirt	2	2
Muck	4	6
Grey Clay & Traces Gravel	10	16
Grey Clay & Rocks	25	41
Grey Clay & Traces Gravel & Few Stones	29	80
Grey Clay & Small Streaks		
Sand	8	78
Grey Clay & Gravel		78-?

15. ABANDONED WELL PLUGGED?  Yes  No  
 Casing Diameter **2** in. Depth **70** ft.  
 PLUGGING MATERIAL:  
 Cement/Bentonite Slurry  Neat Cement  Bentonite Slurry  
 Concrete Grout  Bentonite Chips  
 No. of Bags **3** Casing Removed?  Yes  No

16. REMARKS: (Elevation, Source of Data, etc.)  
**NOTE: PROPERLY ABANDON OLD WELL.**  
**-THIS MAY BE A FLOWING WELL.**

17. DRILLING MACHINE OPERATOR:  
 Employee  Subcontractor  
 Name **Robert J. Bufka**

3. OWNER OF WELL **DENNIS PENNEY**  
 Address **5481 BRACKETT RD.**  
**EVER FLOWING WATER C.O.**  
 Address Same as Well Location  Yes  No

4. WELL DEPTH: **78** ft. Gate Completed **3/21/99**  
 New Well  Replacement Well

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

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

7. CASING:  Steel  Threaded  Plastic  Welded  
 Only **70** ft. Height: Above/Below Surface: **SDR21** ft.  
 Diameter: **7/8** in. to **78** ft. depth Weight: **8** lbs./ft.  
 BORE HOLE **7/8** Diameter: **78** ft. depth  
 Drive Shoes  Shale Packer

8. SCREEN:  Not Installed  Gravel-Packed **4"**  
 Type **#12** Diameter **8"**  
 Slot/Gauze **70** Length: **78**  
 Set Between **2** ft. and **0** ft.  
 FITTINGS:  K-Packer  Bremer Check  
 Blank Above Screen  Other

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

10. PUMPING LEVEL: Below Land Surface  
 ft. After **0** hrs. Pumping at **0** G.P.M.  
 Plunger  Baller  Air  Test Pump

11. WELL HEAD COMPLETION:  
 Pitless Adapter  12" Above Grade  
 Basement Offset  Well House **0** **68**

12. WELL GROUTED?  No  Yes **11** ft. from **11** to **11** ft.  
 Neat Cement  Bentonite  Other  
 No. of Bags **11** Additives

13. NEAREST SOURCE OF POSSIBLE CONTAMINATION:  
 Type **Septic** Distance **50+** ft. Direction **N**  
 Type **Septic** Distance **50+** ft. Direction **N**

14. PUMP:  Not Installed  Submersible  Surface Station Only  
 Manufacturer's Name **Well-Rite** Model Number **120-04** HP **33.4** Volts **115**  
 Length of Drop Pipe **96** ft. Capacity **115** G.P.M.  
 TYPE:  Submersible  Jet  Other  
 PRESSURE TANK: **Well-Rite**  
 Manufacturer's Name **120-04** Capacity **33.4** Gallons  
 Model Number **120-04**

18. WATER WELL CONTRACTOR'S CERTIFICATION:  
 This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.  
**Well Drilling Co.**  
 REGISTERED BUSINESS ADDRESS **45-2034 Kasin Rd., Maple City, MI 49651**  
 Address **45-2034 Kasin Rd., Maple City, MI 49651**  
 Signed **Mark W. Zittel** Date **6-1-99**  
 AUTHORIZED REPRESENTATIVE

RECEIVED JUN 15 1999

# MICHIGAN DEPARTMENT OF PUBLIC HEALTH WATER WELL AND PUMP RECORD

PERMIT NUMBER [ ] [ ] [ ] [ ] **14210**

1 LOCATION OF WELL			3 OWNER OF WELL:			
County <b>GRAND TRAVERSE</b>	Township Name <b>ACME</b>	Fraction <b>SW 1/4 SE 1/4</b>	Section Number <b>25</b>	Town Number <b>28 OS</b>	Range Number <b>10 E</b>	
Distance And Direction From Road Intersection <b>(5831 BRACKETT RD.)</b>			Address <b>VAIDMANIS &amp; MEYERS CONST.</b> <b>115 N. HALL ST. - T.I.C.</b> Address Same As Well Location? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			
Street Address & City of Well Location Locate with "X" in Section Below		Sketch Map:		4 WELL DEPTH: Date Completed <input checked="" type="checkbox"/> New Well <input type="checkbox"/> Replacement Well <b>90 FT.</b> <b>7/23/87</b>		
[Map showing grid and well location 'X' at intersection of Brackett Rd and Hall St]		[Sketch Map showing well location 'X' at intersection of Brackett Rd and Hall St]		5 <input type="checkbox"/> Cable tool <input checked="" type="checkbox"/> Rotary <input type="checkbox"/> Driven <input type="checkbox"/> Dug <input type="checkbox"/> Hollow rod <input type="checkbox"/> Auger <input type="checkbox"/> Jetted <input type="checkbox"/>		
2 FORMATION DESCRIPTION		THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM	6 USE: <input checked="" type="checkbox"/> Domestic <input type="checkbox"/> Type I Public <input type="checkbox"/> Type III Public <input type="checkbox"/> Irrigation <input type="checkbox"/> Type IIa Public <input type="checkbox"/> Heat pump <input type="checkbox"/> Test Well <input type="checkbox"/> Type IIb Public <input type="checkbox"/>		
		<b>Clay Loam</b>	<b>3</b>	<b>3</b>	7 CASING: Diameter <input type="checkbox"/> Steel <input type="checkbox"/> Threaded <input checked="" type="checkbox"/> Plastic <input type="checkbox"/> Welded Height: Above/Below Surface _____ ft. Weight <b>SDP22</b> lbs./ft. Drive Shoe <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
		<b>Sand</b>	<b>12</b>	<b>15</b>	8 SCREEN: <b>WIPE WOUND</b> <input type="checkbox"/> Not installed Type <b>STAINLESS</b> Diameter <b>4" Te/te</b> Slot/Gauze <b>10</b> Length <b>4'</b> Set between <b>86</b> ft. and <b>90</b> ft. FITTINGS: <input checked="" type="checkbox"/> K-Packer <input type="checkbox"/> Lead Packer <input type="checkbox"/> Bremer Check <input checked="" type="checkbox"/> Blank above screen <b>2</b> ft. Other _____	
		<b>Clay-sand</b>	<b>55</b>	<b>70</b>	9 STATIC WATER LEVEL: _____ ft. below land surface <input type="checkbox"/> Flow	
<b>Sand-gravel</b>		<b>20</b>	<b>90</b>	10 PUMPING LEVEL: below land surface _____ ft. after _____ hrs. pumping at _____ G.P.M. _____ ft. after _____ hrs. pumping at _____ G.P.M.		
				11 WELL HEAD COMPLETION: <input checked="" type="checkbox"/> Pileless adapter <input type="checkbox"/> 12" above grade <input type="checkbox"/> Basement offset <input type="checkbox"/> Approved pit		
				12 WELL GROUTED? <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes From <b>0</b> to <b>80</b> ft. <input type="checkbox"/> Neat cement <input checked="" type="checkbox"/> Bentonite <input type="checkbox"/> Other _____ No. of bags of cement _____ Additives _____		
				13 Nearest source of possible contamination Type <b>SEPTIC</b> Distance <b>50+</b> ft. Direction <b>W</b> Well disinfected upon completion? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Was old well plugged? <input type="checkbox"/> Yes <input type="checkbox"/> No		
				14 PUMP: <input type="checkbox"/> Not installed <input type="checkbox"/> Pump Installation Only Manufacturer's name <b>Flint &amp; Walling</b> Model number <b>2081</b> HP <b>1/2</b> Volts <b>230</b> Length of Drop Pipe <b>60</b> ft. capacity <b>10</b> G.P.M. TYPE: <input checked="" type="checkbox"/> Submersible <input type="checkbox"/> Jet PRESSURE TANK: Manufacturer's name <b>Am-Trol</b> Model number <b>WX 202</b> Capacity <b>20</b> Gallons		
15. Remarks, elevation, source of data, etc.		16. WATER WELL CONTRACTOR'S CERTIFICATION: This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief. <b>BTZ Well Drilling Co</b> <b>1647</b> REGISTERED BUSINESS NAME REGISTRATION NO. _____ Address <b>233 E KASSON RD, Maple City, MI 49664</b> Signed <b>Edward J. [Signature]</b> Date <b>4-30-87</b> AUTHORIZED REPRESENTATIVE				
17. Rig Operator's Name: <b>Robert Stachnik</b>						

RECEIVED  
Mich. Dept. of Public Health  
**SEP 24 1987**  
Bureau of Environmental and  
Occupational Health - GWOS

Authority: Act 388 PA 1978  
Completion: Required  
Penalty: Conviction of a violation of any provision is a misdemeanor.

MICHIGAN DEPARTMENT OF PUBLIC HEALTH WATER WELL AND PUMP RECORD

1 LOCATION OF WELL: County GRAND TRAVERSE, Township Name ARMC, Fraction SE 1/4 SW 1/4 SE 1/4, Section Number 25, Town Number 28, Range Number 10. 2 FORMATION DESCRIPTION: SAND 20 20, CLAY & STONE 37 57, SAND 28 85. 3 OWNER OF WELL: WM Kerkhof, 4843 Hampshire Dr-Williamsburg. 4 WELL DEPTH: 85 ft. 5 CASING: 5 in. to 80 ft. depth. 6 SCREEN: P.V.C. Diameter 4 INCH, Length 5 FEET. 9 STATIC WATER LEVEL: 40 ft. below land surface. 11 WELL HEAD COMPLETION: Recess adapter. 12 WELL GROUTED? Bentonite. 13 Nearest source of possible contamination: SEPTIC. 14 PUMP: RED JACKET, Model number 2W, 1/2 HP, 230 Volts.

15. Remarks, elevation, source of data, etc. RECEIVED DEC 22 1986 Bureau of Environmental and Occupational Health - GWOS. PHIL'S WELL DRILLING 0481, 10785 GRANDVIEW RD. T.R. Signed Phil Sharnacki Date 8-15-86

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

TAX NO:  
 28-011-600-010-00

PERMIT NO:  
 24468

1. LOCATION OF WELL  
 County Grand Traverse

Township Name Peninsula

Fraction NE 1/4 SE 1/4 SE 1/4

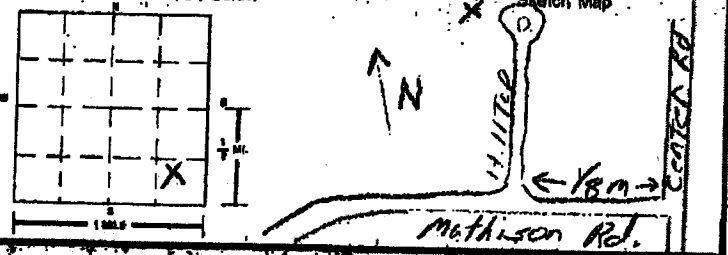
Section No. 25

Town No. 728N

Range No. R11W

Distance and Direction from Road Intersection  
Peninsula Mills Lot #10

Street Address & City of Well Location  
7185 Hilltop



3. OWNER OF WELL  
 Address R. J. Tucker Const. 1404 Boodle St. T.C. 49686  
 Address Same as Well Location  Yes  No

4. WELL DEPTH: 461 ft. Date Completed 12/11/96  
 New Well  Replacement Well

5.  Cable Tool  Rotary  Driven  Dig  
 Hollow Rod  Auger/Bored  Jatted

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

7. CASING:  Steel  Threaded  Plastic  Welded  Other  
 Height: Above/Below Surface: 1 ft.  
 Diameter: 5 in. to 196 ft. depth  
5 in. to 456 ft. depth  
 Weight: SDR21 lbs/ft.  
SDR17  
 BORE HOLE:  Drive Shoe  Shale Packer  
 Diameter 7-7/8 in. to 450 ft. depth  
 in. to in. ft. depth

8. SCREEN:  Not Installed  Gravel-Packed  
 Type Stainless Steel Diameter 3"  
 Slot/Gelize #12 Length: 5'  
 Set Between 456 ft. and 461 ft.  
 FITTINGS:  K-Packer  Bremer Check  Blank Above Screen  
4 ft. Other 3" plug

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

10. PUMPING LEVEL: Below Land Surface  
 ft. After \_\_\_\_\_ hrs. Pumping at \_\_\_\_\_ G.P.M.  
 Plunger  Bailor  Air  Test Pump

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

12. WELL GROUTED?  No  Yes From 0 to 450 ft.  
 Neat Cement  Bentonite  Other Volclay  
 No. of Bags 28 Additives \_\_\_\_\_

13. NEAREST SOURCE OF POSSIBLE CONTAMINATION:  
 Type Septic Distance 50' Direction NW  
 Type \_\_\_\_\_ Distance \_\_\_\_\_ ft. Direction \_\_\_\_\_

14. PUMP:  Not Installed  Pump Installation Only  
 Manufacturer's Name Aermotor  
 Model Number T12-150 HP 1/2 Volts 220  
 Length of Drop Pipe 300 ft. Capacity 12 G.P.M.  
 Submersible  Jet  Other  
 PRESSURE TANK:  
 Manufacturer's Name Well-Rite  
 Model Number 120-01 Capacity 33.4 Gallons

2. FORMATION DESCRIPTION

FORMATION DESCRIPTION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
Loamy Sand & Gravel	3	3
Sand, Gravel & Stones	76	79
Sand & Fine Gravel	75	154
Red Clay & Traces Gravel		
w/ Few Small Streaks Fine Sand	107	261
Gray Clay & Traces Gravel	46	307
Gray Clay & Gravel	136	443
Sand & Gravel	18	461
Sand & Gravel		

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

16. REMARKS: (Elevation, Source of Data, etc.)  
JAN 16 1997  
BUREAU OF ENVIRONMENTAL HEALTH  
DOCUMENT NO. 111-A-05

17. DRILLING MACHINE OPERATOR:  
 Employee  Subcontractor  
 Name Robert J. Hickey

15. WATER WELL CONTRACTOR'S CERTIFICATION:  
 This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.  
B & Z Well Drilling Co. 45-2030  
 REGISTERED BUSINESS NAME REGISTRATION NO.  
 Address 233 E. Kesson Rd., Maple City, MI 49664  
 Signed Mark W. Z... Date 12-12-96  
 AUTHORIZED REPRESENTATIVE

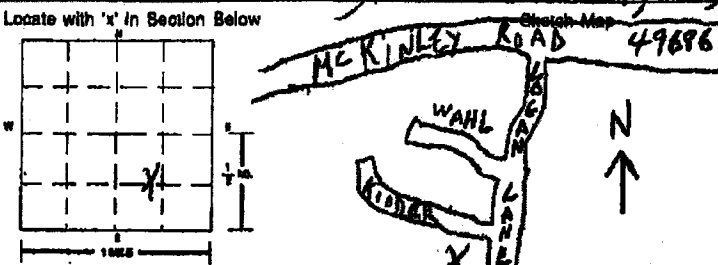
TAX NO: 28-011-537-024-00

MICHIGAN DEPARTMENT OF PUBLIC HEALTH  
WATER WELL AND PUMP RECORD

1. LOCATION OF WELL

County GRAND TRAVERSE Township Name PENINSULA Fraction SE 1/4 NW 1/4 SE 1/4

Distance and Direction from Road Intersection  
Lot # 24 LOGAN HILLS SUBDIVISION  
7153 LOGAN LANE, TRAVERSE CITY, MI.



3. OWNER OF WELL YODD NIEN HOUSE  
Address 2704 CHANDLER ROAD  
TRAVERSE CITY, MI. 49686  
Address Same as Well Location  Yes  No

4. WELL DEPTH: 325 ft. Date Completed 7-12-96  
 New Well  
 Replacement Well

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

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

7. CASING:  Steel  Threaded  Plastic  Welded  
 Other  
Height: Above/Below Surface: \_\_\_\_\_ ft.  
Diameter: 5 in. to 31.5 ft. depth  
Weight: \_\_\_\_\_ lbs./ft.  
BORE HOLE:  Drive Shoe  Shale Packer  
Diameter: 7 1/2 in. to 32.5 ft. depth

2. FORMATION DESCRIPTION

FORMATION DESCRIPTION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
<u>loamy sand</u>	<u>4</u>	<u>4</u>
<u>rock gravel sand</u>	<u>126</u>	<u>130</u>
<u>gravel sand</u>	<u>40</u>	<u>170</u>
<u>sand red clay</u>	<u>20</u>	<u>190</u>
<u>gray clay</u>	<u>125</u>	<u>315</u>
<u>shale</u>	<u>10</u>	<u>325</u>

8. SCREEN:  Not Installed  Gravel-Packed  
Type Wesco S-5 Diameter 4  
Slot/Gauge 1/2 Length: 10  
Set Between 315 ft. and 325 ft.  
FITTINGS:  K-Packer  Bremer Check  
 Blank Above Screen 2 ft. Other \_\_\_\_\_

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

10. PUMPING LEVEL: Below Land Surface \_\_\_\_\_ ft. After \_\_\_\_\_ hrs. Pumping at \_\_\_\_\_ G.P.M.  
 Plunger  Baler  Air  Test Pump

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

12. WELL GROUTED?  No  Yes From 0 to 325 ft.  
 Neat Cement  Bentonite  Other gravel  
No. of Bags 15 Additives \_\_\_\_\_

13. NEAREST SOURCE OF POSSIBLE CONTAMINATION:  
Type Septic Distance 75+ ft. Direction W  
Type \_\_\_\_\_ Distance \_\_\_\_\_ ft. Direction \_\_\_\_\_

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

14. PUMP:  Not Installed  Pump Installation Only  
Manufacturer's Name Milnes  
Model Number 273 HP 1/2 Volts 230  
Length of Drop Pipe 27.3 ft. Capacity 1.5 G.P.M.  
TYPE:  Submersible  Jet  Other \_\_\_\_\_  
PRESSURE TANK:  
Manufacturer's Name Well Bits  
Model Number 240 Capacity \_\_\_\_\_ Gallons 81

16. REMARKS: (Elevation, Source of Data, etc.)  
Well to be a minimum of 270' deep

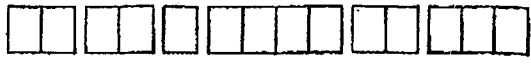
15. WATER WELL CONTRACTOR'S CERTIFICATION:  
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.  
Registered Business Name \_\_\_\_\_ Registration No. \_\_\_\_\_  
Address 2704 Chandler Rd, Traverse City, MI 49686  
Signed Greg T. Delinski Date 7-12-96

17. DRILLING MACHINE OPERATOR:  
 Employee  Subcontractor  
Name Greg T. Delinski

GW-3-228 6/93

GEOLOGICAL SURVEY COPY

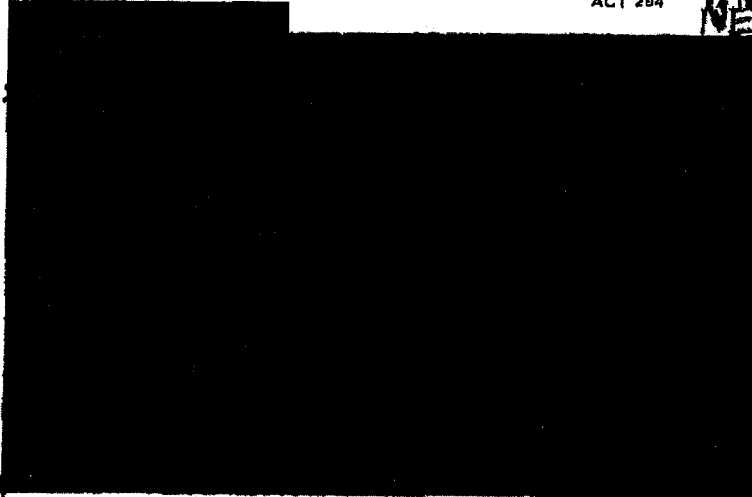
Author: Act 398 PA 1979  
Completion Required  
Penalty: Continuation of a violation of any provision is a misdemeanor.



**WATER WELL RECORD**  
ACT 294

MICHIGAN DEPARTMENT OF PUBLIC HEALTH

NESE SE



3 OWNER OF WELL Dan Hanna

Address Rt. 2 Williamsburg Mich 49690

4 WELL DEPTH: (completed) 110 ft. Date of Completion 5/16/78

5  Cable tool  Rotary  Driven  Dup  
 Hollow rod  Jolted  Bored

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

7 CASING: Threaded  Welded  Height: Above/Below  
Diam 2" Surface \_\_\_\_\_ ft.  
0 in. to 110 ft. Depth Weight 2.75 lbs./ft.  
\_\_\_\_\_ in. to \_\_\_\_\_ ft. Depth Drive Blue? Yes  No

2 FORMATION

medium sand  
fine soft clay  
course sand  
fine sand

30

8 SCREEN:  
Type 316 STAINLESS Dia.: 1 1/4"  
Gauze 20 Length 5"  
Set between 105 ft. and 110 ft.  
Fittings: Brammer Check

9 STATIC WATER LEVEL 90 ft. below land surface

10 PUMPING LEVEL below land surface  
\_\_\_\_\_ ft. after \_\_\_\_\_ hrs. pumping \_\_\_\_\_ G.P.M.  
\_\_\_\_\_ ft. after \_\_\_\_\_ hrs. pumping \_\_\_\_\_ G.P.M.

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

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

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

14 Nearest Source of possible contamination TIRE FIELD  
60 feet S Direction South Type  
Well disinfected upon completion  Yes  No

15 PUMP:  
 Not installed  
Manufacturer's Name SEARS  
Model Number \_\_\_\_\_ HP/Volts 220  
Length of Drop Pipe 100 ft. capacity 8 G.P.M.  
Type:  Submersible  
 Jet  Reciprocating

16 Remarks, elevation, etc.  
\*CORRECTED BY dlc  
\*\*ADDITION BY  
ELEVATION  
DEPTH TO ROCK

17 WATER WELL CONTRACTOR'S CERTIFICATION:  
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.  
JULIUS WELLS DRILLING 0017  
REGISTERED BUSINESS NAME REGISTRATION NO.  
Address Williamsburg Mich. 49690  
Signature Julius Soyinski Date 5/16/78  
AUTHORIZED REPRESENTATIVE



**WATER WELL RECORD**  
 ACT 294 PA 1965

MICHIGAN DEPARTMENT  
 OF  
 PUBLIC HEALTH

<b>1 LOCATION OF WELL</b>					
County <b>GRAND TRAVERSE</b>	Township Name <b>ACME</b>	Fraction <b>SE 1/4 SE 1/4 NW 1/4</b>	Section Number <b>26</b>	Town Number <b>28 N/2</b>	Range Number <b>10 E/W</b>
Distance And Direction from Road Intersections <b>.5 mile No. of Brackett Rd. on US 31 125' West of Rd. ACME, MI.</b>			3 OWNER OF WELL: <b>TOM LEMCOOL Rt. 2 US 31N WILLIAMSBURG, MI. 49690</b>		
Street address & City of Well Location Locate with "X" in section below			4 WELL DEPTH: (completed) Date of Completion <b>161 ft. 6/7/76</b>		
Sketch Map: 			5 <input checked="" type="checkbox"/> Cable tool <input type="checkbox"/> Rotary <input type="checkbox"/> Driven <input type="checkbox"/> Dug <input type="checkbox"/> Hollow rod <input type="checkbox"/> Jetted <input type="checkbox"/> Bored <input type="checkbox"/>		
2 FORMATION			6 USE: <input checked="" type="checkbox"/> Domestic <input type="checkbox"/> Public Supply <input type="checkbox"/> Industry <input type="checkbox"/> Irrigation <input type="checkbox"/> Air Conditioning <input type="checkbox"/> Commercial <input type="checkbox"/> Test Well		
			7 CASING: Threaded <input type="checkbox"/> Welded <input checked="" type="checkbox"/> Diam. <b>5</b> in. to <b>1</b> in. Depth <b>154</b> ft. Depth <b>280</b> lbs. TEST Height: Above <del>Surface</del> Surface <b>1</b> ft. Drive Shoe? Yes <input type="checkbox"/> No <input type="checkbox"/>		
SAND			8 SCREEN: <b>JOHNSON</b> Type: <b>STAINLESS STEEL</b> Dia.: <b>4</b> inch Slot/Screen <b>10</b> Length <b>3</b> feet Set between <b>154</b> ft. and <b>159</b> ft. Fittings: <b>threaded drive screen X-packer, set length</b>		
CLAY & GRAVEL			9 STATIC WATER LEVEL <b>118</b> ft. below land surface		
GRAVEL			10 PUMPING LEVEL below land surface <b>118</b> ft. after <b>1</b> hrs. pumping <b>15</b> o.p.m. _____ ft. after _____ hrs. pumping _____ o.p.m.		
SAND & GRAVEL			11 WATER QUALITY in Parts Per Million: Iron (Fe) _____ Chlorides (Cl) _____ Hardness _____ Other _____		
CLAY			12 WELL HEAD COMPLETION: <input type="checkbox"/> In Approved Pit <input checked="" type="checkbox"/> Pitless Adapter <input type="checkbox"/> 12" Above Grade		
SAND & GRAVEL			13 Well Grouted? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Neat Cement <input type="checkbox"/> Bentonite <input type="checkbox"/> Depth: From _____ ft. to _____ ft.		
5" PV @			14 Nearest Source of possible contamination <b>55</b> feet <b>NW</b> Direction <b>septic</b> Type Well disinfected upon completion <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
			15 PUMP: <input type="checkbox"/> Not installed Manufacturer's Name <b>DEBSTER</b> Model Number <b>CL-50</b> HP <b>3/4</b> Volts <b>230</b> Length of Drop Pipe <b>138</b> ft. capacity <b>8</b> G.P.M. Type: <input checked="" type="checkbox"/> Submersible <input type="checkbox"/> Jet <input type="checkbox"/> Reciprocating		
16 Remarks, elevation, source of data, etc. ADDED INFO BY DRILLER, ITEM NO. *CORRECTED BY <b>JZ</b> **ADDITION BY ELEVATION DEPTH TO ROCK			17 WATER WELL CONTRACTOR'S CERTIFICATION: This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief. <b>KROPP WELL DRILLING</b> <b>0795</b> REGISTERED BUSINESS NAME REGISTRATION NO. Address <b>CEDAR, MI. 49621</b> Signed <b>Walt Fry</b> Date <b>6/9/76</b> AUTHORIZED REPRESENTATIVE		

GEOLOGICAL SURVEY NO.

MICHIGAN DEPARTMENT OF PUBLIC HEALTH

**WATER WELL AND PUMP RECORD**

PART 127 ACT 368, P.A. 1978

PERMIT NUMBER

Section Number

26

3 OWNER OF WELL: ZIMMERMAN  
do Burkholder Const.  
Address Traverse city.

Address Same As Well Location?  Yes  No

4 WELL DEPTH: (Completed) 152 ft. Date of Completion 8-28-91

5  Cable tool  Rotary  Driven  Dug  
 Hollow rod  Auger  Jotted

6 USE:  Domestic  Type I Public  Type II Public  
 Irrigation  Type III Public  Heat pump  
 Test Well  Type IV Public

7 CASING Diameter  Steel  Threaded  Plastic  Welded  
5 in. to 142 ft depth Height: Above/Below Surface 1 ft.  
Weight SDR21 lbs./ft.  
Ground Drill Hole Diameter 7-7/8 in. to 25 ft. depth Drive Shoe  Yes  No

8 SCREEN:  Not installed  
Type Stainless Diameter Full 4"  
Slot/Gauze #12 Length 10'  
Set between 142 ft. and 152 ft.  
FITTINGS:  K-Packer  Lead Packer  Bromor Check  
 Blank above screen 1 ft. Other plug

9 STATIC WATER LEVEL: 47 ft. below land surface  Flow

10 PUMPING LEVEL: below land surface  
\_\_\_\_\_ ft. after \_\_\_\_\_ hrs. pumping at \_\_\_\_\_ G.P.M.  
\_\_\_\_\_ ft. after \_\_\_\_\_ hrs. pumping at \_\_\_\_\_ G.P.M.

11 WELL HEAD COMPLETION:  Pitless adapter  12" above grade  
 Basement offset  Approved pit

12 WELL GROUTED?  No  Yes From 0 to 25 ft.  
 Neat cement  Bentonite  Other Holeplug  
No. of bags of cement \_\_\_\_\_ Additives \_\_\_\_\_

13 Nearest source of possible contamination  
Type Septic Distance 60' Direction S  
Well disinfected upon completion?  Yes  No

14 PUMP:  Not installed  Pump installation Only  
Manufacturer's name Aermotor  
Model number A20B-100 HP 1 Volts 230  
Length of Drop Pipe 120 ft. capacity 20 G.P.M.  
TYPE:  Submersible  Jet  
PRESSURE TANK: Well-Rite  
Manufacturer's name \_\_\_\_\_  
Model number 260-03(2) capacity 85 (ea.) gallons

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

B&Z Well Drilling Co. 1647  
REGISTERED BUSINESS NAME REGISTRATION NO.  
Address 233 E. Kannon Rd., Maple City, MI  
Signed Mark W. Zientek Date 4-21-92  
AUTHORIZED REPRESENTATIVE

2 FORMATION DESCRIPTION

Sand

Red Clay

Sand

Clay & Sand

Fine Sand

Sand

Clay

RECEIVED  
Mich. Dept. of

JAN 27 1993

USE A 2ND SHEET IF NEEDED

15. Remarks, elevation, source of data, etc.

Well Driller-  
Mark W. Zientek

BUREAU OF ENVIRONMENTAL AND OCCUPATIONAL HEALTH SERVICES

**WATER WELL AND PUMP RECORD**  
28-001-226-004-00

 
 
 
 
21760

PERMIT NUMBER

**2 FORMATION DESCRIPTION**

Sand & Clay  
Clay  
Sand  
Sand & Clay & Rocks  
Sand & Gravel & Rocks  
Sand

**RECORDED**  
Mich. Dept. of Public Health  
Serial No. 553

**3 OWNER OF WELL:** JOHN GARDNER  
Address 765 US 31 N  
Address Same As Well Location?  Yes  No

**4 WELL DEPTH:** 170 FT. Date Completed 8/30/93  New Well  Replacement Well

**5 TYPE:**  Cable tool  Rotary  Driven  Dug  
 Hollow rod  Auger  Jetted  Other

**6 USE:**  Domestic  Type I Public  Type II Public  
 Irrigation  Type III Public  Heat pump  
 Test Well  Type IV Public  Other

**7 CASING:** Diameter 5 1/2 in. to 170 ft. depth Height: Above/Below Surface 300-21  
 Steel  Plastic  Threaded  Welded Weight 300 lbs./ft.  
Drill Hole Diameter 7 1/2 in. to 170 ft. depth Drive Shoe  Yes  No

**8 SCREEN:**  Not installed  
Type 17K Diameter 4"  
Length 5 FT.  
Sol between 105 ft. and 170 ft.  
FITTINGS:  K-Packer  Load Packer  Bremer Check  
 Blank above screen 2 ft. Other \_\_\_\_\_

**9 STATIC WATER LEVEL:** 120 FT. ft. below land surface  Flow

**10 PUMPING LEVEL:** below land surface  
\_\_\_\_\_ ft. after \_\_\_\_\_ hrs. pumping at \_\_\_\_\_ G.P.M.  
\_\_\_\_\_ ft. after \_\_\_\_\_ hrs. pumping at \_\_\_\_\_ G.P.M.

**11 WELL HEAD COMPLETION:**  Flange adaptor  2" above grade  
 Basement offset  Approved pit

**12 WELL GROUTED?**  No  Yes From 0 to 25 ft.  
 Neat cement  Bentonite  Other Volclay  
No. of bags of cement \_\_\_\_\_ Additives \_\_\_\_\_

**13 Nearest source of possible contamination:** Type septic Distance 50 ft. Direction \_\_\_\_\_  
Well disinfected upon completion?  Yes  No  
Was old well plugged?  Yes  No

**14 PUMP:**  Not installed  Pump installation Only  
Manufacturer's name Home Owners  
Model number \_\_\_\_\_ HP \_\_\_\_\_ Volts \_\_\_\_\_  
Length of Drop Pipe \_\_\_\_\_ ft capacity \_\_\_\_\_ G.P.M.  
TYPE:  Submersible  Jet  
PRESSURE TANK: Manufacturer's name Home Owners  
Model number \_\_\_\_\_ Capacity \_\_\_\_\_ Gallons \_\_\_\_\_

15. Remarks, elevation, source of data, etc. **BUREAU OF ENVIRONMENTAL AND OCCUPATIONAL HEALTH**

17. Rig Operator's Name: Doug Scheller

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

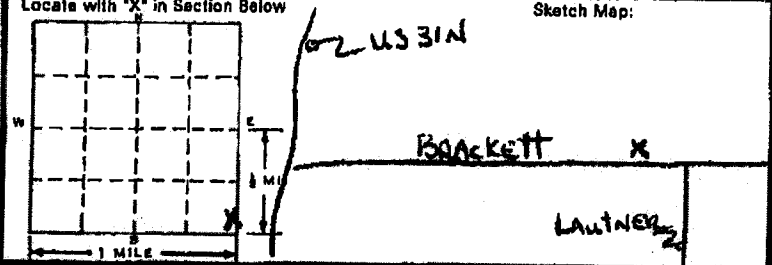
Phil Well Drilling 0481  
REGISTERED BUSINESS NAME REGISTRATION NO.  
Address 3703 Pennick School Rd. TC  
Signed Ph.L. Szarowski Date 8/31/93  
AUTHORIZED REPRESENTATIVE

**WATER WELL AND PUMP RECORD**

<b>1 LOCATION OF WELL</b>					
County <b>Grand Traverse</b>	Township Name <b>Acme</b>	Fraction <b>SE 1/4 SE 1/4 SE 1/4</b>	Section Number <b>26</b>	Town Number <b>28</b>	Range Number <b>10E</b>

Distance and Direction From Road Intersection  
**1/10 mile west of LAUTNER Rd ON North side of BRACKETT Rd.**  
 Street Address & City of Well Location  
**(4821 BRACKETT Rd)**

**3 OWNER OF WELL:**  
**CINDY LARENZ**  
 Address  
**4821 BRACKETT Rd - T.C.**  
 Address Same As Well Location?  Yes  No



**4 WELL DEPTH: (completed)** **145 ft.** Date of Completion  
**4, 24, 86**

**5**  Cable tool  Rotary  Driven  Dug  
 Hollow rod  Auger  Jetted

**6 USE:**  Domestic  Type I Public  Type II Public  
 Irrigation  Type IIa Public  Heat pump  
 Test Well  Type IIb Public

**7 CASING:**  Steel  Threaded  Welded  Plastic  
 Diameter **5** in. to **5** ft. depth  
 Height: Above/Below Surface **1** ft.  
 Weight \_\_\_\_\_ lbs./ft.  
 Grouded Drill Hole Diameter **7 7/8** in. to **145** ft. depth  
 Drive Shoe  Yes  No

2 FORMATION DESCRIPTION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
-------------------------	----------------------	----------------------------

TOP SOIL	0	1
SAND CLAY	9	10
CLAY	91	101
SAND	4	105
CLAY	6	111
CLAY SAND BATTERS	6	117
CLAY SAND LAYER	18	135
SAND	10	145
FINE SAND		

**8 SCREEN:**  Not installed  
 Type **5 TIA 520** Diameter **3**  
 Slot/Gauze **10** Length \_\_\_\_\_  
 Set between **141** ft. end **145** ft.  
 FITTINGS:  K-Packer  Lead Packer  Bremer Check  
 Blank above screen \_\_\_\_\_ ft. Other \_\_\_\_\_

**9 STATIC WATER LEVEL:** **78** ft. below land surface  Flow

**10 PUMPING LEVEL:** below land surface  
**160** ft. after \_\_\_\_\_ hrs. pumping at \_\_\_\_\_ G.P.M.  
 \_\_\_\_\_ ft. after \_\_\_\_\_ hrs. pumping at \_\_\_\_\_ G.P.M.

**11 WELL HEAD COMPLETION:**  Pileless adaptor  12" above grade  
 Basement offset  Approved pit

**12 WELL GROUTED?**  No  Yes From \_\_\_\_\_ to \_\_\_\_\_ ft.  
 Neat cement  Bentonite  Other \_\_\_\_\_  
 No. of bags of cement \_\_\_\_\_ Additives **POLYCLAY**

**13 Nearest source of possible contamination**  
 Type **SEPTIC** Distance **60** ft. Direction **E**  
 Well disinfected upon completion?  Yes  No

**14 PUMP:**  Not installed  Pump Installation Only  
 Manufacturer's name **F1 WALLING**  
 Model number **F10** HP **1/4** Volts **230**  
 Length of Drop Pipe **120** ft. capacity **10** G.P.M.  
 TYPE:  Submersible  Jet  
 PRESSURE TANK:  
 Manufacturer's name **EXTRA**  
 Model number **203** Capacity **9.3** Gallons

RECEIVED  
 Mich. Dept. of Public Health  
**JUN 26 1986**  
 Bureau of Environmental and  
 Occupational Health - GWQS

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

**18. WATER WELL CONTRACTOR'S CERTIFICATION:**  
 This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief  
**KRAPP WELL DRILLING 0795**  
 REGISTERED BUSINESS NAME REGISTRATION NO.  
 Address **6010 M 73 WEST TRAVELER P.M.**  
 Signed **J. Krapp** Date **5/20/86**  
 AUTHORIZED REPRESENTATIVE

PART OF

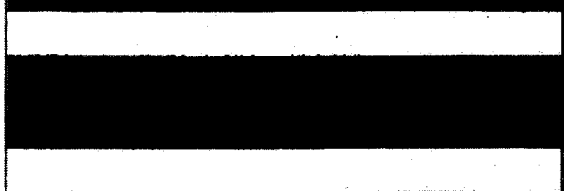
# MICHIGAN DEPARTMENT OF PUBLIC HEALTH WATER WELL AND PUMP RECORD

7. CASING:  Steel  Threaded  
 Plastic  Welded  
 Other

Diameter: \_\_\_\_\_ in. to \_\_\_\_\_ ft. depth  
 \_\_\_\_\_ in. to \_\_\_\_\_ ft. depth

BORE HOLE: \_\_\_\_\_  
 Diameter: \_\_\_\_\_ in. to \_\_\_\_\_ ft. depth  
 \_\_\_\_\_ in. to \_\_\_\_\_ ft. depth

*160*  
*24 to 16 ft*



17. DRILLING MACHINE OPERATOR:  
 Employee  Subcontractor  
 Name Doug Schettek

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

**PHIL'S WELL DRILLING** 0481  
 REGISTERED BUSINESS NAME 3783 RENNIE SCHOOL RD. REGISTRATION NO.  
 Address TRAVERSE CITY, MI 49684-8245  
 Signed Phil Sharnowski Date 8-2-95  
 AUTHORIZED REPRESENTATIVE

GEOLOGICAL SURVEY COPY

Authority: Act 368 PA 1976  
Completion: Required  
Penalty: Conviction of a violation of any provision is a misdemeanor.

GEOLOGICAL SURVEY SAMPLE NO.

--	--	--	--	--	--	--	--	--	--

NOV 19 1971

**WATER WELL RECORD**  
ACT 204 PA 1966

MICHIGAN DEPARTMENT  
OF  
PUBLIC HEALTH

Fraction  
 $SE \frac{1}{4} SW \frac{1}{4} SE \frac{1}{4}$

2	FORMATION
	BLACK DIRT
	CLAY - LOAM
	CLAY - GRAVEL
	SAND
	CLAY
	SAND
	CLAY
	CLAY - GRAVEL
	MUDDY SAND
	SAND

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

**10 PUMPING LEVEL below land surface**  
150 ft. after 2 hrs. pumping 25 g.p.m.

\_\_\_\_\_ ft. after \_\_\_\_\_ hrs. pumping

USE A 2ND SHEET IF NEEDED

16 Remarks, elevation, source of data, etc.  
ADDED INFO. BY DRILLER, ITEM NO. \_\_\_\_\_  
CORRECTED BY: \_\_\_\_\_  
REVISION BY: \_\_\_\_\_

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

**KROPP WELL DRILLING** 0795  
REGISTERED BUSINESS NAME REGISTRATION NO.

Address **COAR, MI 49621**

Signed *W. J. ...* Date **11/5/70**  
AUTHORIZED REPRESENTATIVE



**WATER WELL RECORD**  
 ACT 204 PA 1966

MICHIGAN DEPARTMENT  
 OF  
 PUBLIC HEALTH

2	FORMATION
	SAND
	SAND & GRAVEL & ROCKS

3 OWNER OF WELL: **BURKHOLDER CONSTRUCTION**  
 Address **1614 U.S. 31N. TRAVERSE CITY, MI. 49684**

4 WELL DEPTH: (completed) Date of Completion  
**56** ft. **8/19/75**

6  Cable tool  Rotary  Driven  Dug  
 Hollow rod  Jatted  Bored

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

7 CASING: Threaded  Welded   
 Diam. \_\_\_\_\_ Height: Above Surface \_\_\_\_\_ ft.  
**4** In. to **52** ft. Depth Weight **11** lbs./ft.  
 \_\_\_\_\_ In. to \_\_\_\_\_ ft. Depth Drive Shoe? Yes  No

8 SCREEN: **COOK**  
 Type: **RED BRASS** Dia.: **4** inch  
 Slot/Gauge **10** Length **4** feet  
 Set between **52** ft. and **56** ft.

Fittings: **standard bottom, lead packer, set length**

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

10 PUMPING LEVEL below land surface  
**22** ft. after **1** hrs. pumping **15** g.p.m.  
 \_\_\_\_\_ ft. after \_\_\_\_\_ hrs. pumping \_\_\_\_\_ g.p.m.

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

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

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

14 Nearest Source of possible contamination  
**50** foot **NW** Direction **septic** Type  
 Well disinfected upon completion  Yes  No

15 PUMP:  Not installed  
 Manufacturer's Name **ARMOTOR**  
 Model Number **8D8-33** HP **1/3** volts **230**  
 Length of Drop Pipe **40** ft. capacity **8** G.P.M.  
 Type:  Submersible  
 Jet  Reciprocating

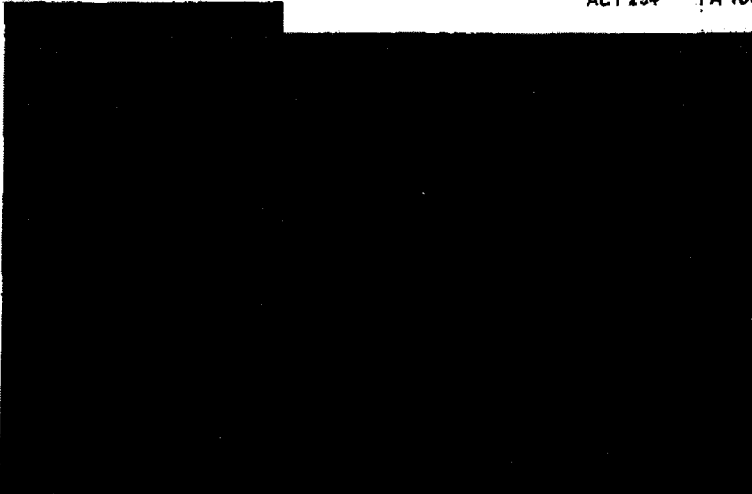
16 Remarks, elevation, source of data, etc.  
 ADDED INFO BY DRILLER, ITEM NO.  
 \* CORRECTED BY **JZ**  
 \*\* ADDITION BY  
 ELEVATION  
 DEPTH TO ROCK

17 WATER WELL CONTRACTOR'S CERTIFICATION:  
 This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.  
**KROPP WELL DRILLING 0795**  
 REGISTERED BUSINESS NAME REGISTRATION NO.  
 Address **GEDAR, MI. 49621**  
 Signed **[Signature]** Date **8/29/75**  
 AUTHORIZED REPRESENTATIVE

2 SEP 15 1975

**WATER WELL RECORD**  
ACT 294 PA 1986

MICHIGAN DEPARTMENT  
OF  
PUBLIC HEALTH



2 FORMATION	
BLACK DIRT	
SAND	
CLAY	
SAND	
SAND & GRAVEL	
GRAVEL	
SAND	
FINE SAND	27
SAND	15

**3 OWNER OF WELL:**  
**JAMES MAITLAND**

Address **RT. #2  
WILLYONSBURG, MI. 49690**

**4 WELL DEPTH:** (completed) **222** ft. Date of Completion **9/4/75**

**5**  Cable tool  Rotary  Driven  Dip  
 Hollow rod  Jetted  Borad

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

**7 CASING:** Threaded  Welded  Height: Above ~~Surface~~  
Diam. Surface **1** ft.  
**6** in. to **207** ft. Depth Weight **19** lbs./ft.  
in. to \_\_\_\_\_ ft. Depth Drive Shoes? Yes  No

**8 SCREEN:** **COOK**  
Type: **RED BRASS** Dia.: **6 inch**  
Slot ~~Size~~ **10** Length **15 feet**  
Set between **207** ft. and **222** ft.  
Fittings: **standard bottom, lead packer, set length**

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

**10 PUMPING LEVEL** below land surface  
**152** ft. after **1** hrs. pumping **50** g.p.m.  
\_\_\_\_\_ ft. after \_\_\_\_\_ hrs. pumping \_\_\_\_\_ g.p.m.

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

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

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

**14** Nearest Source of possible contamination  
**300** feet **all** Direction: **field** Type \_\_\_\_\_  
Well disinfected upon completion  Yes  No

**16 PUMP:**  Not installed  
Manufacturer's Name **GOULDS**  
Model Number **IDM** H5 **5** Volts **230**  
Length of Drop Pipe **188** ft. capacity **50** G.P.M.  
Type:  Submersible  Jet  Reciprocating

16 Remarks, elevation, source of data, etc.  
ADD INFO BY DRILLER, ITEM NO.  
\*\* DIRECTED BY *JL*  
\*\* ADDITION BY \_\_\_\_\_  
ELEVATION \_\_\_\_\_  
DEPTH TO ROCK \_\_\_\_\_

**17 WATER WELL CONTRACTOR'S CERTIFICATION:**  
This well was drilled under my jurisdiction and this report is true  
to the best of my knowledge and belief.  
**KROFF WELL DRILLING** **0795**  
REGISTERED BUSINESS NAME REGISTRATION NO.  
Address **CEDAR, MI. 49621**  
Signed *Walt Frey* Date **9/8/75**  
AUTHORIZED REPRESENTATIVE



GEOLOGICAL SURVEY NO.



MICHIGAN DEPARTMENT OF PUBLIC HEALTH  
WATER WELL AND PUMP RECORD

PART 127 ACT 308, P.A. 1978

10608  
PERMIT NUMBER

**1 LOCATION OF WELL**

County GRAND TRAVERSE Township Name ACME

Distance And Direction From Road Intersection  
1/2 mile north of DOCK RD ON DEEPWATER Pt - bay side

Street Address & City of Well Location 7143 DEEPWATER Pt

Locate with "X" in Section Below

Sketch Map: Shows a grid with 'X' marks indicating the well location. Labels include 'E. Bay', 'Deepwater Pt.', and 'DOCK'. A scale bar indicates 1 mile.

**2 FORMATION DESCRIPTION**

FORMATION DESCRIPTION	DEPTH TO BOTTOM OF STRATUM
<u>sand</u>	<u>15</u>
<u>wet sand</u>	<u>9 24</u>
<u>sand grain</u>	<u>3 27</u>
<u>water sand</u>	<u>7 34</u>
<u>clay</u>	

**7 CASING:**

Diameter  4 in. to 30 ft. depth  
 Plastic  Threaded  Welded  
 Grouted Drill Hole Diameter \_\_\_\_\_ in. to \_\_\_\_\_ ft. depth  
 Blank above screen \_\_\_\_\_ ft. Other \_\_\_\_\_

Height: Above/Below Surface \_\_\_\_\_ ft.  
 Weight \_\_\_\_\_ lbs./ft.  
 Drive Shoe  Yes  No

**8 SCREEN:**  Not installed

Type Johnson Diameter 4  
 Size/Gauge 10 Length 3  
 Set between 30 ft. and 33 ft.  
 FITTINGS:  K-Packer  Lead Packer  Griener Chuck  
 Blank above screen \_\_\_\_\_ ft. Other \_\_\_\_\_

**9 STATIC WATER LEVEL:** 15 ft. below land surface  Flow

**10 PUMPING LEVEL:** below land surface  
24 ft. after 1 hrs. pumping at 24 G.P.M.  
 \_\_\_\_\_ ft. after \_\_\_\_\_ hrs. pumping at \_\_\_\_\_ G.P.M.

**11 WELL HEAD COMPLETION:**  Pitless adapter  12" above grade  
 Basement offset  Approved pit

**12 WELL GROUTED?**  No  Yes From 0 to 12 ft.  
 Neat cement  Bentonite  Other \_\_\_\_\_  
 No. of bags of cement \_\_\_\_\_ Additives \_\_\_\_\_

**13 Nearest source of possible contamination**

Type Septic Distance 60 ft. Direction E  
 Well disinfected upon completion?  Yes  No

**14 PUMP:**  Not installed  Pump Installation Only

Manufacturer's name Fleet & Wallace  
 Model number 4EM205 HP 1/2 Volts 230  
 Length of Drop Pipe 19 ft. capacity 12 G.P.M.  
 TYPE:  Submersible  Jet  
**PRESSURE TANK:**  
 Manufacturer's name Well & Tank  
 Model number 203 Capacity 32 Gallons

15. Remarks, elevation, source of data, etc.

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

Cliff Well Drilling Co. 28-1244  
 REGISTERED BUSINESS NAME REGISTRATION NO.  
 Address 6410 Center Rd. Traverse City, Mich.  
 Signed Cliff Well Drilling Co. Date 4-5-84  
 AUTHORIZED REPRESENTATIVE

D67d

(Rev 10-80)

GEOLOGICAL SURVEY NO.

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

**12499**  
 PERMIT NUMBER

2	FORMATION DESCRIPTION
	SAND
	CLAY
	CLAY SAND GRAVEL
	SAND GRAVEL.
	SAND
	SAND GRAVEL.
	86 FT FINE SAND.


13 Nearest source of possible contamination.  
 Type SEPTIC Distance 70 ft. Direction N.W.  
 Well disinfected upon completion?  Yes  No

14 PUMP:  Not Installed  Pump Installation Only  
 Manufacturer's name GOUCOS  
 Model number GE-13 HP 3/4 Volts 230  
 Length of Drop Pipe 60 ft. capacity 15 G.P.M.  
 TYPE:  Submersible  Jet  
 PRESSURE TANK: EXTRU-251  
 Manufacturer's name EXTRU-251  
 Model number 251 Capacity 1.5 Gallons

NITRATE .7

**RECEIVED**  
 Mich. Dept. of Public Health

USE A 2ND SHEET IF NEEDED

15. Remarks, elevation, source of data, etc.  
7/21/86 1000  
 Bureau of Environmental and Occupational Health - GWC/S

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

TRAPP Well Drilling, Inc. 0795  
 REGISTERED BUSINESS NAME REGISTRATION NO.  
 Address 6010 N 72 WEST T.C.  
 Signed L. Trapp Date 11.16.85  
 AUTHORIZED REPRESENTATIVE

Township Name

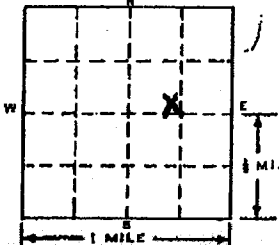
ACME

Distance And Direction From Road Intersection

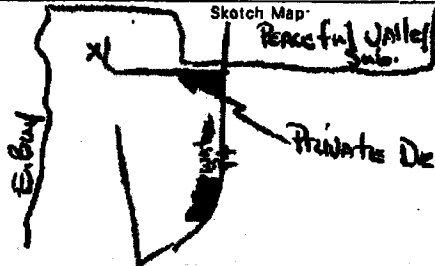
DEEPWATER Pt Rd to ENTRANCE to Peaceful Valley Sub. - TURN LEFT ON PRIVATE DR. - first house on Bay.

Street Address & City of Well Location

Locate with "X" in Section Below



Sketch Map



3 OWNER OF WELL:

Blandin, Victor

Address

DEEPWATER Pt. Rd.

Address Same As Well Location?

Yes No

4 WELL DEPTH: (completed)

68 ft.

Date of Completion

6/26/81

5 Cable tool: Rotary Driven Aug Dug Hollow rod Auger Jailed

6 USE: Domestic Type I Public Type II Public Irrigation Type III Public Heat pump Test Well Type IV Public

7 CASING: Stool Threaded Plastic Welded Height: Above/Below Surface 1 ft. Weight 11.0 lbs./ft. Drive Shoe Yes No

8 SCREEN: Not installed Type Stainless Diameter 3" Slot/Gauze #10 Length 5' Set between 63 ft. and 68 ft. FITTINGS: K-Packer Lead Packer Bremer Check Blank above screen 3 ft. Other

9 STATIC WATER LEVEL 35 ft. below land surface Flow

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

11 WELL HEAD COMPLETION: Pitless adapter 12" above grade Basement offset Approved pit

12 WELL GROUTED? No Yes From 0 to 59 ft. Neat cement Bentonite Other No. of bags of cement Additives

13 Nearest source of possible contamination Type Septic Distance 55 ft. Direction N Well disinfected upon completion? Yes No

14 PUMP: Not installed Pump Installation Only Manufacturer's name Aermotor - Franklin Model number SD12-50 HP 1/2 Volts 220 Length of Drop Pipe 46 ft. capacity 12 G.P.M. TYPE: Submersible Jet PRESSURE TANK: Well-x-Trol Manufacturer's name Model number 250 Capacity 144 Gallons

USE A 2ND SHEET IF NEEDED

15. Remarks, elevation, source of data, etc.

dlc

18. WATER WELL CONTRACTOR'S CERTIFICATION:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

B & Z WELL DRILLING CO. 1645 REGISTERED BUSINESS NAME REGISTRATION NO.

Address 233 E. Kasson Road, Maple City, MI

Signed [Signature] Date 6/26/81 AUTHORIZED REPRESENTATIVE



**WATER WELL RECORD**  
ACT 294 PA 1985

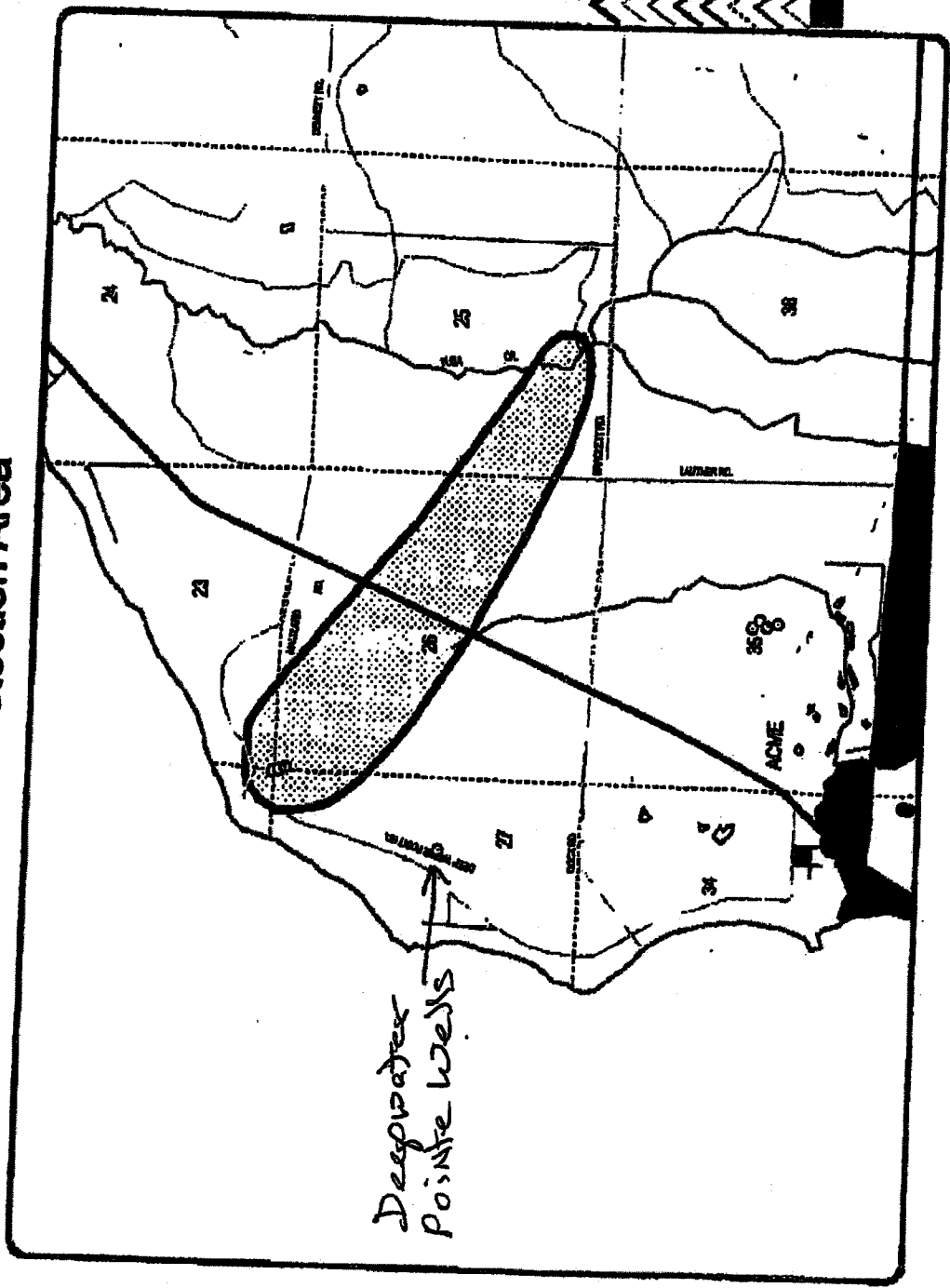
MICHIGAN DEPARTMENT  
OF  
PUBLIC HEALTH

<b>1 LOCATION OF WELL</b>					
Country <b>GRAND TRAVERSE</b>	Township Name <b>ACME</b>	Election <b>SE 1/4 SW SE 1/4 NE 1/4 NE 1/4</b>	Section Number <b>27</b>	Town Number <b>28 N/S.</b>	Range Number <b>10-8 W.</b>
Distance And Direction from Road Intersections <b>3/4 mi. N. FROM DOCK RD. ON DEEPWATER POINT ROAD - THENCE 50' E.</b>			3 OWNER OF WELL: Address <b>MR. DALE BEERY 412 WADSWORTH TRAVERSE CITY MICHIGAN</b>		
Street address & City of Well Location Locate with "x" in section below			4 WELL DEPTH: (completed) Date of Completion: <b>71 ft. 10/8/73</b>		
			5 <input checked="" type="checkbox"/> Cable tool <input type="checkbox"/> Rotary <input type="checkbox"/> Driven <input type="checkbox"/> Dig <input type="checkbox"/> Hollow rod <input type="checkbox"/> Jetted <input type="checkbox"/> Bored <input type="checkbox"/>		
			6 USE: <input checked="" type="checkbox"/> Domestic <input type="checkbox"/> Public Supply <input type="checkbox"/> Industry <input type="checkbox"/> Irrigation <input type="checkbox"/> Air Conditioning <input type="checkbox"/> Commercial <input type="checkbox"/> Test Well <input type="checkbox"/>		
<b>2 FORMATION</b>			7 CASING: Threaded <input checked="" type="checkbox"/> Welded <input type="checkbox"/> Height: Above/Below Diam. _____ Surface <u>1</u> ft. <b>4</b> in. to <b>71</b> ft. Depth Weight _____ lbs./ft. _____ in. to _____ ft. Depth Drive Shoes? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		
			8 SCHEEN: Type: <b>MUSTANG STAINLESS</b> Dia.: <b>4"</b> Slot/Gauze <b>12</b> Length <b>10'</b> Set between <b>61</b> ft. and <b>71</b> ft. Fittings: <b>LEAD COLLAR</b>		
			9 STATIC WATER LEVEL <b>10</b> ft. below land surface		
			10 PUMPING LEVEL below land surface _____ ft. after _____ hrs. pumping _____ G.P.M. _____ ft. after _____ hrs. pumping _____ G.P.M.		
			11 WATER QUALITY in Parts Per Million: Iron (Fe) _____ Chlorides (Cl) _____ Hardness _____ Other _____		
			12 WELL HEAD COMPLETION: <input type="checkbox"/> In Approved Pit <input type="checkbox"/> Pitless Adapter <input checked="" type="checkbox"/> 12" Above Grade		
			13 Well Grouted? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Neat Cement <input checked="" type="checkbox"/> Bentonite <input type="checkbox"/> Depth: From _____ ft. to _____ ft.		
			14 Nearest Source of possible contamination <b>50</b> feet <b>NW</b> Direction <b>SEPTIC</b> Type Well disinfected upon completion <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		
			15 PUMP: <input checked="" type="checkbox"/> Not installed Manufacturer's Name _____ Model Number _____ HP _____ Volts _____ Length of Drop Pipe _____ ft. capacity _____ G.P.M. Type: <input type="checkbox"/> Submersible <input type="checkbox"/> Jet <input type="checkbox"/> Reciprocating		
			16 Remarks, elevation, source of data, etc. Drilled INTO BY DRILLER. ITEM NO. _____ CORRECTED BY: _____ ADDITION BY: _____		
17 WATER WELL CONTRACTOR'S CERTIFICATION: This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief. <b>CLIFF WELL DRILLING CO. #1244</b> REGISTERED BUSINESS NAME REGISTRATION NO. Address <b>6410 CENTER ROAD TRAVERSE CITY, MICHIGAN 49604</b> Signed <i>Frank W. [Signature]</i> Date <b>10-10-73</b> AUTHORIZED REPRESENTATIVE					

## **Appendix B**

**MDEQ Well Head Protection Area  
Lochenheath, Acme Township  
Grand Traverse County, Michigan**

# Lochenheath Wellhead Protection Area



*Deepwater  
Pointe Wells*



Map provided by  
 Michigan Department of Environmental Quality  
 Drinking Water and Radiological Protection Division  
 Ground Water Supply Section  
 Wellhead Protection Unit  
 January 2002

B6

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

PUBLIC MEETING AND HEARING  
TUESDAY, MAY 19, 2009

Mill Creek Elementary School  
9039 Old M-72  
Williamsburg, Michigan

Proposed Class II Permit  
For the Cherry Berry B1-25 SWD Injection Well  
Grand Traverse County, Michigan

Reported by: Kathleen Tulick, CSR 4806



1 Williamsburg, Michigan

2 Tuesday, May 19, 2009 - 8:35 p.m.

3  
4 MS. PATTERSON: We do realize that the Cherry  
5 Berry hearing was scheduled to be from 8:00 until 9:00.  
6 We did let the Hubbell hearing go over, because we  
7 wanted to make sure we got everyone's comments. We can  
8 run past 9:00. We want to make sure that everyone who  
9 wants to submit an oral comment will be able to do so.  
10 We are required to read our hearing officer's statement  
11 and our permit writer's statement into the record  
12 first, then we will go ahead and get started taking  
13 group comments.

14 Will the hearing come to order, please? Good  
15 evening. Welcome to the public hearing on the Class II  
16 injection well permit that the US Environmental  
17 Protection Agency has proposed to issue to OIL Energy  
18 for the Cherry Berry B1-25 SWD well. My name is Leslie  
19 Patterson. I'm an environmental scientist with EPA,  
20 and for this hearing I am representing EPA as the  
21 hearing officer. With me are: William Tong, a  
22 geologist with EPA and author of the draft underground  
23 injection control permit; and Marietta Newell, an  
24 environmental protection specialist with EPA and  
25 tonight's hearing assistant.

1           The Class II permit which is the subject of  
2           tonight's hearing is being issued pursuant to the  
3           Federal Underground Protection Control Program for the  
4           State of Michigan, which may be found in the Code of  
5           Federal Regulations at Title 40, Section 147.1151.  
6           This section was promulgated pursuant to Part C of the  
7           Safe Drinking Water Act. It incorporates the  
8           Underground Injection Control Program requirements of  
9           Part 124, 144 and 146 of the Code of Federal  
10          Regulations. The effective date of this program in  
11          Michigan was June 25, 1984.

12          The Underground Injection Control or UIC Program  
13          is designed to protect underground sources of drinking  
14          water by permitting only those injection wells which  
15          meet stringent technical requirements. The program is  
16          also designed to ensure public participation in the  
17          permitting process. The public is invited to comment  
18          on every proposed permit decision. EPA then holds  
19          public hearings for those draft permit decisions that  
20          generate significant public interest or comments. An  
21          announcement of this public hearing was made in the  
22          Traverse City Record Eagle on April 13, 2009 and was  
23          mailed to interested parties.

24          Public hearings such as this provide members of  
25          the public with an opportunity to publicly make the EPA

1 aware of their views on an intended regulatory action.  
2 Although oral presentations are recorded word for word  
3 by a court reporter, there is no sworn testimony or  
4 cross examination. This is your opportunity to tell us  
5 officially whether you feel the terms of the permit are  
6 consistent with EPA's Underground Injection Control  
7 Program requirements and whether the facts, as EPA has  
8 determined them, are accurate. As the comments are  
9 being given during tonight's hearing, EPA will listen  
10 to them, but we will not respond to them during this  
11 hearing. EPA will respond to all the comments received  
12 throughout the entire public comment period in a  
13 comprehensive response to comments.

14 All comments received on this permit will become  
15 part of the Administrative Record, which is maintained  
16 at EPA's regional office in Chicago. This includes the  
17 transcript of this hearing, all written comments  
18 submitted tonight, all written comments made prior to  
19 this hearing, and all written comments that EPA  
20 receives through June 3, 2009. If you have a written  
21 statement after tonight, you must forward it to EPA at  
22 the address on the comment form and in the public  
23 notice by that date. A copy of the comments, the  
24 transcript of this hearing, and a copy of the response  
25 to comments, will be available for your review at the

1 Traverse Area District Library at 615 Woodmere in  
2 Traverse City.

3 EPA will consider all comments in making its  
4 decision to issue or deny this UIC permit for OIL  
5 Energy. All commenters have the right to appeal EPA's  
6 final decision to the Environmental Appeals Board;  
7 however, in order to preserve this right, you must  
8 submit your comment during the public comment period,  
9 whether in writing or orally at this hearing. If you  
10 wish to make a statement at this hearing, please be  
11 sure that you have filled in a registration form so  
12 that we may correctly enter your name into the hearing  
13 record. If you have a written comment to submit today,  
14 please give it to me before you leave tonight. If you  
15 don't choose to make a statement, but you want to  
16 receive a copy of EPA's response to comments and the  
17 final permit decision, make sure that you have  
18 indicated so on the sign-in sheet at the sign-in  
19 table.

20 First, Mr. Tong will read his statement into the  
21 record. I will then begin calling on those who have  
22 checked on their registration form that they would like  
23 to make a statement and have it transcribed by the  
24 court reporter. Now, I will turn the floor over to Mr.  
25 Tong.

1           MR. TONG: Good evening. My name is Bill Tong,  
2 and I'm a geologist with EPA. I am here today to  
3 listen to your comments on a permit which we propose to  
4 issue to OIL Energy to inject brine underground by a  
5 Class II saltwater disposal well. The permit which is  
6 the subject of today's hearing is being issued under  
7 the Federal Underground Injection Control Program for  
8 the State of Michigan. The well is known as Cherry  
9 Berry B1-25 SWD.

10           The scope of the Federal Underground Injection  
11 Control (UIC) regulations is to determine the soundness  
12 of construction and operation of injection wells as  
13 they relate to the protection of all underground  
14 sources of drinking water, also known as USDWs. This  
15 is done by imposing certain technical requirements on  
16 each and every injection well which injects fluids into  
17 the ground. An underground source of drinking water is  
18 an aquifer or its portion which contains less than  
19 10,000 milligrams per liter of total dissolved solids.  
20 This includes current sources of drinking water, as  
21 well as potential sources of drinking water.

22           The permit which is the subject of today's hearing  
23 is a Class II saltwater disposal well. Class II  
24 saltwater disposal wells are wells which inject fluids  
25 which are brought to the surface in connection with oil

1 or natural gas production, or for enhanced recovery of  
2 oil or natural gas. In the oil or gas reservoir,  
3 natural formation waters, also known as brines, are  
4 mixed in with the oil and gas. During the production  
5 of oil or gas, these brines are also brought to the  
6 surface, the oil or gas is separated from the brine and  
7 the brine is then injected back into the same  
8 formation, or into another formation suitable for  
9 disposal. In this case, the oil is being produced from  
10 the Antrim Formation and the brine will be injected  
11 back into the Dundee Limestone, which is located below  
12 the Antrim Formation. This well does not accept cherry  
13 processing brine or other associated waste.

14 The proposed injection well will be drilled to a  
15 total depth of 2,130 feet below ground surface. The  
16 base of the lowermost underground source of drinking  
17 water in the vicinity of the proposed injection well  
18 has been identified as the glacial drift at about 415  
19 feet below ground surface. The injection zone will be  
20 limited to the Dundee Limestone at depths between 1,920  
21 feet and 2,130 feet below ground surface. The  
22 injection zone is separated from the lowermost  
23 underground source of drinking water by a confining  
24 zone of approximately 1,505 feet of shales, limestones  
25 and various other rock formations. Because fluids

1 cannot move easily through these formations, the  
2 confining zone will serve to prevent the injection  
3 fluid from migrating upward out to the injection zone.

4 The construction of the proposed injection well  
5 will include an 8 5/8 inch surface casing which will be  
6 set at 515 feet and will be cemented all the way to the  
7 surface. A 5 1/2 inch diameter longstring casing will  
8 be set at 1,935 feet and will also be cemented all the  
9 way to the surface. In addition, injection will take  
10 place through tubing which is set within the steel  
11 casing. A packer will be set at the bottom of the  
12 tubing to seal off the space between the casing and  
13 tubing, which will be filled with a liquid mixture  
14 containing a corrosion inhibitor, and will allow the  
15 pressure in the space, known as the annulus, to be  
16 monitored. The pressure in the space between the  
17 tubing and casing is tested initially after the  
18 completion of the well to ensure that the well has  
19 mechanical integrity, and then it's tested periodically  
20 thereafter to ensure that the well maintains mechanical  
21 integrity. These tests are witnessed by an EPA  
22 representative. The injection pressure will be limited  
23 to 554 pounds per square inch gauge to ensure that the  
24 injection pressure will not cause the movement of  
25 injection or formation fluids into underground sources

1 of drinking water.

2 If EPA issues this permit, OIL Energy will be  
3 responsible for observing and recording injection  
4 pressure, flow rate, annulus pressure, and cumulative  
5 volume on a weekly basis, and will be responsible for  
6 reporting this to the EPA on a monthly basis. OIL  
7 Energy will also be responsible for observing,  
8 recording and reporting annulus liquid loss on a  
9 quarterly basis. An analysis of the injected fluid  
10 must be submitted on an annual basis. In addition, OIL  
11 Energy is required to conduct and pass a mechanical  
12 integrity test before receiving authorization to  
13 commence injection, and periodically thereafter.

14 These requirements for proper construction,  
15 operation, and monitoring of the well provide multiple  
16 safeguards to protect the underground source of  
17 drinking water in this area. Now it is your  
18 opportunity to tell us your comments regarding the  
19 proposed permit. EPA will consider all comments in  
20 making its decision to issue or deny this underground  
21 injection control permit to OIL Energy.

22 MR. WAGNER: Okay. At this time we are ready to  
23 receive your public comments concerning the Cherry  
24 Berry well. Remember that if you have written  
25 comments, please provide them to the hearing officers



1 before you leave tonight.

2 We're going to deviate a little bit in terms of  
3 our approach due to the number of people we have here.  
4 We're going to open up the floor. So I'm going to ask  
5 if you wish to make a comment, please indicate so by  
6 raising your hand. I will call upon you at that time.  
7 Please remember to come to the microphone and give your  
8 complete name and the spelling of your last name. So,  
9 yes, sir?

10 BOB GARVEY: Good evening. My name is Bob Garvey,  
11 G-a-r-v-e-y. Our farm is located immediately south of  
12 the proposed site, and I'd like to first start by  
13 saying I don't pretend to understand the technical  
14 things that everybody has been talking about tonight.  
15 And I also notice that the DEQ has left the table. So  
16 I presume that no permit has been asked for from the  
17 DEQ at this point?

18 Okay. Anyway, I'd like to know how this site was  
19 chosen. Our future land use map classifies the  
20 proposed site as rural residential. Quoting our master  
21 plan, "this category encompasses areas in Acme Township  
22 with special natural features that shall be  
23 preserved." I don't think the wise men and women who  
24 drafted our master plan believed that a deep injection  
25 well falls under the category of special natural

1 features that shall be preserved.

2 My major concern is for potential for failure of  
3 the horizontal delivery system, those pipelines that  
4 run along the surface. I am concerned the caustic  
5 material over time will encourage failure, and just  
6 from I found that a two-hour informational meeting  
7 could be informative, because I didn't realize that not  
8 so many years ago they used to make those pipes out of  
9 steel and they stopped, and I presume they stopped  
10 because they failed. And then they went to fiberglass,  
11 and they stopped using fiberglass I presume because  
12 they were failing. And now they are saying  
13 polypropylene is the state-of-the-art. When are we  
14 going to find out that they are failing; 10 years from  
15 now, 15 years from now? You know, my children may want  
16 to occupy that farm some day.

17 My concerns are for, first of all, for our  
18 drinking water. The Yuba Creek, which is a designated  
19 coldwater trout stream, officially designated by the  
20 State of Michigan, runs in close proximity to the  
21 site. The Grand Traverse Bay is near by. I believe  
22 that there are more suitable alternatives including  
23 existing wells.

24 We don't know what the facility will look like  
25 yet. I'm assuming that, because the DEQ is not sitting

1 at the table. When we do, I would like to request an  
2 environmental impact study. I would also request a  
3 public hearing from the DEQ after we have more details,  
4 and I would also ask the applicant provide adequate  
5 security for environmental cleanup. Thank you very  
6 much.

7 MR. WAGNER: Thank you, Bill. Yes, sir?

8 GREG REISIG: I'm Greg Reisig, chairman of the  
9 Northern Michigan Environmental Action Council. We're  
10 asking that this permit be denied. We don't believe  
11 that the OIL Company is being honest with the DEQ or  
12 the EPA. We believe that the intention of this well is  
13 to be a Class I well and be used to receive fruit  
14 wastewater.

15 We also believe that there should be a complete  
16 environmental impact assessment done on this well, and  
17 the well is located in very close proximity to the  
18 Hubbell well, and that's kind of an unusual thing to  
19 have those two deep wells right there between Elk Lake  
20 and Grand Traverse Bay. We were told by the DEQ  
21 earlier that there are only 15 of those deep injection  
22 wells that receive material other than oil and gas  
23 product in the State of Michigan, and now there are  
24 likely to be two, because I'm certain that they are  
25 going to come back and ask for a Class I permit on

1 this.

2 So they are getting the well under the guise of a  
3 natural gas brine well, but it's actually going to be a  
4 fruit wastewater disposal well. Please deny the  
5 permit. The company should be honest and tell us what  
6 they are going to do with this well. I don't believe  
7 they are being honest.

8 MR. WAGNER: Thank you, Greg. Anyone else? Yes,  
9 ma'am.

10 RACHELLE BABCOCK: I do have another hand-in.  
11 Again, my name is Rachelle Babcock. I am also a member  
12 of Concerned Citizens for Acme Township. That's my  
13 hometown. So the well that you are talking about right  
14 now is very close to where I live.

15 Though I call attention to all the contents of the  
16 permit, in particular, for the Cherry Berry injection  
17 well, I am opposed to allowing it in our area. To  
18 further strengthen my comments I'm handing in a copy of  
19 a report I have, and I handed it in the first time with  
20 the other one too. Both of them are the case against  
21 new Great Lakes oil and gas drilling, "Michigan Fails  
22 to Clean up Oil and Gas Pollution." And I guess I kind  
23 of made a strong statement there.

24 The United States EPA and the State of Michigan  
25 DEQ have highly educated and trained specialists in all

1 matters related to any specific topic within the  
2 framework of each permit at issue. Both federal and  
3 state agencies have worked to create permits that are  
4 meant to protect the environment, yet when I look at  
5 page 1 of the US EPA underground injection control  
6 permit for a Class II facility named Cherry Berry and  
7 move down to the last paragraph, I see where the  
8 wording of the two statements within that same  
9 paragraph have created a weakness that resonates  
10 throughout the permit and limits the government's  
11 ability to enforce strong environmental protection.

12 An indication of just how weakened the permit  
13 gets, once all technical parameters have been put into  
14 place by all responsible parties is the statement that  
15 says, "this permit shall become effective on and shall  
16 remain in full force and effect during the operating  
17 life of the well, unless the permit is otherwise  
18 revoked, terminated, modified or re-issued," and then  
19 it goes on with a bunch of numbers that don't mean much  
20 to me. I can give them to you.

21 The words modified or re-issued serves as a  
22 loophole for a change to take place. A modification  
23 could mean the permittee wants to change the Class II  
24 well to a Class I well that accepts industrial waste at  
25 some later date. Could modified or re-issued in that

1 sentence allow for a change in the classification?

2 Knowing that this area could be geologically  
3 receptive to Class I deep injection wells, the very  
4 location of the Cherry Berry well is an indication that  
5 this action is highly possible. If your answer turns  
6 out to be yes, I request that the words modified or  
7 re-issued be removed from the sentence and elsewhere in  
8 the permit to close this loophole.

9 Another statement I am concerned with, "this  
10 permit shall also remain in effect upon delegation of  
11 primary enforcement responsibility to the State of  
12 Michigan, unless the state chooses to adopt the permit  
13 as a state permit." I interpret this statement to mean  
14 once this permit is approved the federal government  
15 turns the permit over to the State of Michigan to  
16 police.

17 If this is the case, where are the protection  
18 measures in this permit such as recordkeeping on  
19 maintenance and testing in and around the site, and for  
20 how long and at whose expense?

21 In the short time I have researched deep injection  
22 wells in close proximity to Acme, I find it is the  
23 permittee who is allowed to be in charge of  
24 recordkeeping. Although, the state acts as an  
25 enforcer. This could prove highly problematic for our

1 environmentally sensitive areas here in northern  
2 Michigan or anywhere else in Michigan. Permits that  
3 allow structures of an industrial nature into these  
4 highly sensitive areas and are allowed to be  
5 self-policed could pollute our environment, and end up  
6 costing us taxpayers a lot of money.

7 Bay Harbor CKD waste and cleanup methods still  
8 endanger many watersheds. It has caused residents in  
9 the area thousands of dollars and thousands more for  
10 the Michigan taxpayer. The State of Michigan, who has  
11 been handling the Bay Harbor CKD waste problem for many  
12 years, tells us taxpayers that the problem was created  
13 years ago when proper laws governing waste of this kind  
14 were not then in place. Do we have laws in place today  
15 within each permit that guarantees the taxpayers and  
16 the environment more protection?

17 Only minimal monetary protection is in place for  
18 the Cherry Berry Class II well should a shut-down  
19 occur. The permit shows a total cost of plugging and  
20 abandonment of the well is \$6,000. Who pays and who is  
21 responsible for the what-ifs that can occur? Should we  
22 trust that all companies keeping records for state  
23 compliance are ethical? What if a company goes  
24 bankrupt? What if the well itself or any pipes leading  
25 in or out of the well leak causing environmental

1 long-term problems to occur? I do not think that  
2 \$6,000 is enough monetary protection for any well in  
3 our area. It should be minimally 15 times that  
4 amount. I would like to see this issue addressed  
5 before a permit is granted to OIL Energy Corp.

6 I strongly encourage the State of Michigan DEQ to  
7 require an addendum be added to the permit itself to  
8 maintain control over recordkeeping and testing  
9 practices on the Cherry Berry injection well, to spell  
10 out time tables for inspections and, furthermore,  
11 charge the company or individual for these costs if  
12 this permit is granted. Thanks.

13 MR. WAGNER: Thank you.

14 (Note from court reporter: Mr. Norris was very  
15 difficult to hear, and his statement is transcribed to  
16 the best of my ability)

17 JACK NORRIS: Jack Norris, N-o-r-r-i-s. I suppose  
18 these questions aren't going to be distinct from the  
19 ones already asked in the earlier hearing. So I will  
20 repeat.

21 The (inaudible) given, the quarter mile radius  
22 from the well, that seems like it -- that doesn't seem  
23 far enough to me. I wonder how that, how that decision  
24 is made. There must be alternate ways of protecting  
25 the drinking water wells, and I should think that a



1 larger area would be needed.

2 Then under, on page 2, under construction  
3 requirements, it occurs to me to ask since the midtown  
4 ridge runs approximately through the proposed site, is  
5 it sufficient for the applicant to say simply that he  
6 or she doesn't know of any open faults or fractures?  
7 That seems to me something to be really concerned  
8 about.

9 And then I wonder about the gallonage. Is the  
10 gallon, is the mineral mentioned here, the standard 42  
11 gallon barrel or is it some other volume? The  
12 gallonage anticipated to be put underground, it looks  
13 to me to be about 126,000 gallons per day, and I wonder  
14 if that is correct.

15 I'll repeat an earlier question having to do with  
16 the Dundee Formation. I think it's becoming  
17 increasingly apparent that the Dundee Limestone  
18 formation is an open-flowing vascular formation, and it  
19 strikes me that this proposal, to have a deep injection  
20 well to put waste into that formation, is just a more  
21 modern way of throwing it into the lake as our  
22 grandfathers got rid of stuff they didn't want. They  
23 threw it over the hill or into the river, and I think  
24 we're coming to today perhaps our grandchildren will  
25 arrive at the information and knowledge that there

1 really isn't any "away," and what you must do with  
2 caustic substances is somehow render them benign or at  
3 least harmless, and I hope some of the authorities in  
4 charge here will adopt that view.

5 Again, I ask about the property rights involved  
6 plainly displaces neighbors through its minerals  
7 without compensation. Does he really have the right to  
8 do that? Can the state offer him that right? It  
9 doesn't sound right to me.

10 And on the laboratory analysis of what's to be  
11 injected has to be available for public review, and if  
12 so, where they may be seen; and if not, why not? I'd  
13 like to know what the level of protection is in the  
14 reports that are given.

15 I also wonder why there were no automatic  
16 monitoring (inaudible) rights required in this permit.  
17 Are other well operations have to do with them? And it  
18 seems to me that it would be if there is (inaudible)  
19 well, it would be necessary to have those. And I ask,  
20 is it correct that only the substances -- the only  
21 substances to be permitted down this well are fluids  
22 brought to the surface in connection with the  
23 conventional oil or natural gas process or are other  
24 fluids likely to be used in addition?

25 Those are my major questions, and I thank you for

1 the opportunity to present them.

2 MR. WAGNER: Thanks, Jack.

3 PAUL BRINK: Hello again. My name is Paul Brink,  
4 B-r-i-n-k. I'm a resident of Acme Township. I want to  
5 thank you for hanging in here. It's getting late. I'm  
6 sorry it's taken so long, and I'll be brief.

7 I speak for myself, but I speak for a lot of  
8 people of Acme Township when I can say that many of us  
9 support the agricultural community. We love having the  
10 farmers around, and, in fact, four years ago we voted  
11 to pay extra taxes to support the farming community and  
12 to a farmland preservation initiative whereby some of  
13 our tax money is used to help the farming community  
14 keep their farms in their family. In fact, we're the  
15 only township on this side of the bay that has voted to  
16 do that.

17 Also, we certainly aren't, at least I'm not,  
18 opposed to oil and gas exploration and drilling. Acme  
19 Township, in fact, has been a recipient of substantial  
20 amounts of money from the trust fund that is funded  
21 from the royalties from these operations, and we have a  
22 number of wonderful areas that have been preserved  
23 partly because of this funding.

24 So what's the problem? Have you had a chance to  
25 go out to look at where this well will be located?

1 Maybe you have. I hope so. You need to understand  
2 that it's very close to Yuba Creek. Yuba Creek flows  
3 into the bay. Our grandkids swim there, and so we are  
4 very concerned about should there be any surface spills  
5 the implications to Yuba Creek.

6 And I wonder if you are aware that just slightly  
7 downstream from this property Yuba Creek flows through  
8 what's called the Yuba valley natural area. A  
9 wonderfully preserved part of our township. In fact,  
10 the State of Michigan through this trust fund has spent  
11 a lot of money to preserve this area. A number of us  
12 have also donated private money for this purpose. And  
13 a spill, a surface spill, would be terrible anywhere,  
14 but it would be especially terrible on that property.  
15 Because of the proximity it would be a real disaster,  
16 and that is why I think so many people came out tonight  
17 to raise concern. Thank you.

18 MR. WAGNER: Thank you, Paul. Chris?

19 CHRISTOPHER GROBBEL: Good evening. Christopher  
20 Grobbel, Grobbel Environmental and Planning Solutions  
21 in Traverse City. The last name is spelled  
22 G-r-o-b-b-e-l. And I am here on behalf of the  
23 Concerned Citizens of Acme Township as well as a many  
24 number of residents.

25 This site is an excellent link to the last in

1 terms of the well network that OIL Corporation has on  
2 file with the DEQ. I have in my packet and I'll draw  
3 your attention to plans of the natural gas wells,  
4 pipelines, brine wells and disposal wells. The OIL  
5 Corporation, essentially, has three production units as  
6 they name them, two in Acme, one in Whitewater  
7 Township, that are connected by a network of over ten  
8 miles of pipelines.

9 There is this Angell Road Section 18 system that  
10 in 2008 was supposed to be serviced by a deep injection  
11 well at its location, and then some time later we see  
12 another map show up where all of a sudden we have the  
13 Cherry Berry well proposed as well as exploration and  
14 production wells in that unit.

15 My point is that because of an economic incentive  
16 of wanting to become a liquid waste disposal facility  
17 at the Hubbell facility, where an essential processing  
18 facility was planned, now we've got this Cherry Berry  
19 well, the subject well proposed, and it's not needed.  
20 There are other alternatives, and the two issues are  
21 not only linked in this permitting process but they are  
22 linked by pipes.

23 At this site it's proposed to pump up to 3,000  
24 barrels a day of natural gas brine waste into the  
25 Dundee. The Dundee Formation has been the subject of

1 some study. You will have sent to you in the next 15  
2 days a study by Dr. Jim McClurg, University of Wyoming,  
3 who questions based on empirical data the integrity of  
4 the Bell Shale in this part of Michigan, where he is  
5 also a part-time resident, having studied the Bell  
6 Shale formation. He questions it, and that study will  
7 be provided for the record, and I ask you to respond to  
8 it respectfully.

9 Moreover, the site itself is even more problematic  
10 than the last that I spoke to. We have a location  
11 that's a gravel pit. The well is proposed in a formal  
12 gravel pit that's full of broken concrete, stumps and  
13 other waste, and the aerial photos will be provided or  
14 forwarded. Highly permeable, not the kind of place you  
15 want to put hazardous materials or a disposal facility  
16 for them.

17 Moreover, with all of these pipes running to this  
18 site I am concerned about the junctures of those pipes,  
19 wells, old pipes, glued elbows or other types of  
20 junctions in the poly pipe, if that's what's going to  
21 be used. This is where the problems occur.

22 Further, this site slopes 150 feet down to Yuba  
23 Creek. It's a straight shot down. You'll see the  
24 ravines on the US topo maps. You'll see them in site  
25 visits. Yuba Creek is less than 2,000 feet due east,

1 and wetlands and wetland soils exist between these  
2 ravines and Yuba Creek.

3 This site is also right on the northern edge of  
4 the wellhead protection area as identified and accepted  
5 by the DEQ for the Lockenheath residential development  
6 to the west and northwest. This site is unsuited.

7 If you look at the soils, again, we've got the  
8 Emmet sandy loam. The aquifers, we have a shallow and  
9 a deep aquifer in the area. In that section about half  
10 of the drift wells, they are all drift wells, but about  
11 half of the residential wells are near surface, about  
12 85 feet deep, with a standing water level of 34 feet.  
13 There's a deeper system underneath, a thick clay layer,  
14 that on average is about 300 feet deep wells, and a  
15 standing water level of something like 150 feet.

16 There's upwelling, upward hydrostatic pressure.  
17 That's why the wetland is there. That's why the creek  
18 is there in the first place. A direct conduit for  
19 contaminants to Yuba should a release occur.

20 One of the real frustrations of this process is  
21 that many of these issues aren't answered. The public  
22 comes, they read a draft permit that doesn't really  
23 speak to many of their concerns. We're in the little  
24 bureaucratic box. However, if there is a permit  
25 application to the DEQ, and we do get to see the

1 facility plan, that plan has to be tight to prevent any  
2 kind of spills and releases to the environment should  
3 this be permitted.

4 I think that there are numerous alternatives.  
5 This is a red herring. This is a strawman. This well  
6 is not needed if the Hubbell well is continued in its  
7 current use, and wanting to, you know, take some  
8 industrial waste from a violator of environmental law  
9 who can't seem to manage his own waste currently and  
10 has it released to the environment and documented  
11 numerous times, that's what that's about, as opposed to  
12 truly, you know, being a natural gas developing  
13 company, and I think that's the real motivation.

14 I urge you to deny this permit. I urge you to  
15 deny the other one. Look at the big picture and see  
16 how the two are connected. There are alternatives for  
17 all the waste streams, and if you look at their  
18 network, this thing is about nine miles away from where  
19 the brine is coming from, and they want to send it all  
20 the way down to Acme in the corner and where they don't  
21 currently have anything producing. And it's just  
22 another reason why people like me become suspicious  
23 that, in actuality, there's something else at work  
24 here, and there will be a re-classification of this  
25 well also in a couple of years.



1           Thank you for the opportunity. I hope you take  
2           our comments seriously and respond to each one  
3           directly. The wellhead protection area map is in your  
4           packet as well as the OIL Corporation pipeline network  
5           and plan for future wells. Thank you.

6           MR. WAGNER: Thank you, Chris. Yes, ma'am?

7           GAIL VANDERNOOT: My name is Gail Vandernoot,  
8           V-a-n-d-e-r-n-o-o-t. I'm the neighbor to the north of  
9           the Cherry Berry well. I have the 40 acres off of it  
10          that backs right up to this site. I want to reiterate  
11          what Chris said. I mean, that is such a strong  
12          statement, what he said, and just I've come late into  
13          this process and just came here tonight to try to find  
14          out some information.

15          It was really interesting when I came in there was  
16          a group of experts, people with the DEQ over here, and  
17          I saw all these maps and, okay, and I say, well, I live  
18          next door to that, would you live next door to that,  
19          and the gentleman there didn't know what to say, didn't  
20          know how to quite answer me, and I thought that was  
21          real interesting. And I know it's really late and I'm  
22          missing the end of "Dancing With the Stars" to be here,  
23          and you guys have listened to all these comments and  
24          everything, but it's important to us, and it's  
25          important to me. That property that I am on is the

1 Kesner farm. It's with the Kesner Road, and that means  
2 something to me.

3 And as we're here talking about these wells and  
4 about this type of thing and disposal and nasty  
5 chemicals and everything, right now downtown Traverse  
6 City they are talking about our grand vision, what we  
7 want for this area, how we want to protect it, and I  
8 don't think disposal wells are part of it.

9 And the other thing that I find so interesting is  
10 that the name of this well. I mean, come on. Let's  
11 call it what it is. Cherry Berry? Get real. I mean,  
12 this is unbelievable. There's no reason for it to be  
13 put there. It just flies in the face of common sense.

14 And the other thing that is what I probably  
15 shouldn't say and go on record, but I wonder what the  
16 price of the rooms are going to be at the bed and  
17 breakfast that's located on the property. Thank you.

18 MR. WAGNER: Thank you.

19 ANDY KNOTT: Again, I'm Andy Knott, K-n-o-t-t.  
20 I'm with the Watershed Center at Grand Traverse Bay.  
21 I'll hand in my written comments which were similar to  
22 the ones I've provided earlier. So I will just  
23 paraphrase.

24 As we said with the earlier permit, we have  
25 similar very strong concerns about the proposed new

1 Cherry Berry Class II well. As he says, it's a quarter  
2 to a half mile from Yuba Creek, which flows through the  
3 Yuba Creek natural area, and then into the bay, Grand  
4 Traverse Bay, about one and a half miles downstream.

5 Similarly, there are near surface groundwater  
6 aquifers under the site. They are drinking water  
7 sources, including the Lockenheath development. Again,  
8 based on information we've seen, there's been no  
9 examination of potential impacts to surface and  
10 groundwater from a spill or leak from the well  
11 operation. No facility plans have been provided for  
12 spill containment, which we think is essential in these  
13 kinds of facilities.

14 And, again, as has been said by others, I think  
15 this is very important, there's been no examination of  
16 alternatives. And one obvious alternative is the  
17 continued use of the Hubbell well, which is operating  
18 by the same applicant, and that alternative should be  
19 asked.

20 Lastly, again, it appears as a trend here where  
21 the applicant applies for a Class II well and then, as  
22 we saw with the Hubbell well, they have it  
23 re-classified to accept other wastes that are more  
24 dangerous. And, again, this just seems a concern,  
25 because it doesn't really get the information out to

1 the public at the beginning that it should.

2 Again, we think the EPA has a duty under the Safe  
3 Drinking Water Act to protect groundwater aquifers, and  
4 because of the potential threats to both subsurface and  
5 surface water resources, including Yuba Creek and Grand  
6 Traverse Bay, we urge the EPA to deny the Cherry Berry  
7 injection well permit. Thank you.

8 MR. WAGNER: Thank you, Andy. Is there anyone  
9 else at this time that would like to put a comment on  
10 the record? Barb?

11 BARBARA BRADFORD: Thank you. My name is Barb  
12 Bradford, B-r-a-d-f-o-r-d. I live in Bellaire. I  
13 would like to make the same comments that were in the  
14 Hubbell. Is there a way that those comments can be  
15 transferred into this one as part of this hearing as  
16 well or do I have to repeat them all?

17 MS. PATTERSON: If you are looking to have them  
18 formally entered as part of a public comment period you  
19 should restate them. If you are looking for a  
20 response, a response to your comments, as opposed to  
21 have them formally entered, you can certainly respond  
22 to them, but then they would not be, unless you enter  
23 them for this well, they would not be formally entered  
24 into the record.

25 BARBARA BRADFORD: Okay. Thank you. First of

1 all, I would like to thank you all for your  
2 attentiveness. Bob, thank you. And, ma'am, I would  
3 like to say I never saw anybody sit at a table, and I'm  
4 on the Antrim County Planning Commission, and I'll tell  
5 you, your eyes never leave the people, and that's a  
6 good attribute. That says you are paying attention.  
7 You are listening. And, Mr. Tong, I thank you as well  
8 for your attendance. And I think you people are very  
9 interested in what you are trying to achieve, and  
10 you're caught within goals that need to be met as  
11 well.

12 I would like to make these comments then that  
13 would say I feel the same way about this well as I did  
14 the other well a few minutes ago, the Hubbell. However,  
15 my emphasis now would be that Lisa Jackson is setting a  
16 pace that seems to be, as director of EPA, she wants to  
17 see better cleanup. She wants to see Super Funds that  
18 could never be addressed find a way to be addressed.  
19 And with the economy like it is, and it seems to go  
20 deeper every day, I can't see how all those things are  
21 going to be met unless you people are given better  
22 tools. So that you can have more discrimination on  
23 what is brine, when brine can be called an inert  
24 product and it can be CKD, it can be anything, because  
25 the definitives were taken away. I would urge somehow

1 that if it can come from you to her as a guidance tool,  
2 I wish we could find some of those tools and put them  
3 back in place.

4 I would wish that you people would hear the  
5 judgment made by Judge Power on our first well here in  
6 Alba when he said you cannot trespass. Your mineral  
7 rights are yours. The brine has a value. Dow Chemical  
8 proved it. So you have no right to trespass on your  
9 neighbors' mineral rights, and there is no box out  
10 there that you can put all your brine in and keep it  
11 safely in your pocket. It will be in your neighbors'  
12 and it's a trespass.

13 If you can understand, first, that the judge has  
14 made that decision, though it's being appealed, his  
15 decision is made. That is standing at this moment.  
16 The appeal hasn't happened. So to me his word is now  
17 the word it would seem.

18 Number two, I'm concerned that, again, we're  
19 looking at areas close to our Grand Traverse Bays, East  
20 Bay, West Bay, but the native Americans have rights,  
21 sovereign rights, fishing rights. They shared them  
22 with us. They have a right to see their fishing rights  
23 preserved, their water preserved. And when these wells  
24 are leaking and they are coming up in the different  
25 waters, and they know that they are coming from

1 somewhere, and you just keep pushing it down this hole  
2 with never-ending thousands of gallons or millions of  
3 gallons, common sense says that it's going somewhere,  
4 are we really being fair to them? They go through a  
5 different court system, that's true. They go through  
6 the Indian Bureau, but the answer is, are we being  
7 caretakers? Are we being good to our neighbors? They  
8 were here. They are sharing. Is this our way of  
9 sharing back? I hope it's not.

10 Another thing I would like to ask you, I'm  
11 concerned that there constantly seems to be a case of  
12 changing what is "is." You know, you hear the  
13 bureaucracy on television, what is "is." You've heard  
14 it. Everybody has heard it; what is "is," what is  
15 meant by the word "is." Is "is" inert brine? No, it's  
16 not. Is brine something pure and pristine? That's  
17 what the intended view of brine was, pure and valuable  
18 and had a reasonable value, dollar value, but once you  
19 pump all this stuff down it you are diluting its value.  
20 You are really taking away its value.

21 And so why are we doing this? When we know that  
22 treatment plants can work. Treatment plants can take a  
23 lot of the contaminants away. Not all of them. Some  
24 are going to go right back in the bays, because waste  
25 treatment plants will eventually push it out, and if

1       there are metals and things that will go in there  
2       because you can't dilute a metal, but yet we know that  
3       that is the safest bet. Why are we saving it here when  
4       we could fix it and be done with it there?

5             And if a treatment plant were put on each site as  
6       a prerequisite, instead of saying, well, why don't you  
7       just put \$6,000 down and that's a deposit in case you  
8       go oops? If we had that safety factor put in place to  
9       begin with, each of these small ones like you do a  
10      small subdivision now can be made to have its own  
11      septage treatment. So why can't these treatment plants  
12      be a part of the prerequisite to allowing them to  
13      operate rather than a well? Can we not say, no, not a  
14      well, but a treatment plant we can work with? Thank  
15      you, and thank you for tonight.

16            MR. WAGNER: Thank you, Barb. Yes, sir?

17            DEAN VELIQUETTE: My name is Dean Veliquette, and  
18      we own the land on the Cherry Berry well site, and our  
19      kids are quite proud of coming up with the name Cherry  
20      Berry to name the company, and we had no idea that it  
21      would cause such a stir; namely, cherries are berries.

22            We're not asking, or anybody that I know of,  
23      we're not asking for a permit to put cherry brine or  
24      anything else done this site. It should be considered  
25      just for the gas company, and I trust the gas company.



1 I came here and I asked five people at this hearing  
2 questions that I had. I had two hours to do that  
3 before the hearing, and I got a lot of questions  
4 answered from people that are not drilling the wells  
5 and they are not gaining financially from the wells,  
6 and I was able to have my questions answered to my  
7 satisfaction.

8 I didn't know we had so many gas and oil experts  
9 in the crowd here that can have so much passion and  
10 emotion and everything else without one shred of  
11 evidence. We're worried about everything. I got my  
12 tooth pulled last week, and I worried about my dentist.  
13 I tried to assure myself that I'm doing the right  
14 thing, getting my tooth pulled. But worrying about  
15 putting the brine back into the ground minus the  
16 natural gas almost twice the depth that it comes out of  
17 the ground at, that's all this is about.

18 This is just so they can extract the gas, so that  
19 we can warm our homes, and at some point in time we  
20 will be looking for jobs in this state. A lot of  
21 people work for the gas companies. A lot of people  
22 work for the cherry growers, the processing plants. A  
23 lot of people consume our products, but don't tie the  
24 two together. They are not together. They have never  
25 been together on this site.

1           And, you know, all of the questions about whether  
2           or not the facility, from down the road, the people who  
3           have spent money reporting it to the DEQ, we have a  
4           plant for wastewater treatment and disposal on over 240  
5           acres of property that we own. We have never had any  
6           intentions of using that site for that purpose. We're  
7           not asking for it. We don't have any intention of ever  
8           doing it in the future. We spent a lot of money  
9           cleaning up the water, putting it back on our own land  
10          and growing another crop of cherries. That's what we  
11          do.

12           MR. WAGNER: Thank you.

13           MS. PATTERSON: Is there anyone else who would  
14          like to enter comments into the formal record? Let the  
15          record show that no one indicates they wish to enter  
16          comments. Again, if you have written comments but do  
17          not wish to speak, please give them to me before you  
18          leave here tonight or forward them in writing to Mr.  
19          Tong prior to the deadline of June 3, 2009. This  
20          concludes the hearing. Thank you and good night.

21

22                   (At 9:30 p.m. hearing concluded)

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STATE OF MICHIGAN )  
COUNTY OF GRAND TRAVERSE)

I certify that this transcript, consisting of 36 pages, is a complete, true, and correct transcript of the proceedings and testimony taken in this case on May 19, 2009.

Date: \_\_\_\_\_

Kathleen Tulick, CSR 4806  
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