K&A

Site Investigation
Wisconsin Air National Guard
Truax Field
Madison, Wisconsin

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Madison, Wisconsin

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EXECUTIVE SUMMARY

Kapur and Associates, Inc. and Warzyn Engineering Inc. performed a site investigation between December 1989 and May 1990 at the Truax Field Wisconsin Air National Guard Base in Madison, Wisconsin. The purpose of the site investigation was to test selected underground storage tanks at the site and to assess soil and groundwater conditions in the vicinity of the tanks.

Precision tank tightness testing was performed on ten underground storage tanks containing petroleum fuel products, used oil or used oil and solvents. Results of the precision tank tightness testing indicated that 9 of the 10 tested tanks met a tightness criterion of less than 0.1 gal/hr loss. A 3,000 gallon used oil/solvent storage tank (tank 1201-1) failed to meet the tightness criterion, exhibiting a measured loss rate of 0.33 gal/hr. Two 50,000 gallon jet fuel (JP-4) storage tanks (405-3 and 405-4) exhibited anomalously large increases in product volume during the tightness test.

Fourteen soil borings were performed and fourteen groundwater monitoring wells were installed near individual storage tank locations to assess soil conditions, groundwater quality and groundwater flow. Soil samples were field screened for organic vapors with a photoionization detector (PID). Soil affected by petroleum product was encountered in the vicinity of JP-4 storage tank 405-4.

Water levels were measured and groundwater samples were collected from each of the fourteen monitoring wells on March 26, 1990. Each of the samples were analyzed for volatile organic compounds by Warzyn. Analytical results from March 26, 1990, indicated groundwater concentrations of volatile organic compounds at several well locations exceeded State groundwater standards. Local groundwater flow was determined to be to the southeast.

Analytical results and field observations indicated four areas of concern at the site:

- Groundwater and soil is affected by what appears to be JP-4 jet fuel in the area between buildings 405, 411 and 414;
- Elevated concentrations of chlorinated hydrocarbon compounds were detected in groundwater beneath the area between buildings 401, 409 and 410;
- Elevated levels of chlorinated hydrocarbon compounds were detected in groundwater south of building 1201; and
- Elevated concentrations of chlorinated hydrocarbon compounds were detected in groundwater southeast of building 1000.

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SITE BACKGROUND

SITE DESCRIPTION

The Wisconsin Air National Guard Base is located at Dane County Regional Airport - Truax Field. The site is in the northeast and northwest quarters of Section 28, T.8N., R.10E., approximately five miles northeast of downtown Madison, Wisconsin. The Air National Guard Base (ANGB) occupies approximately 155 acres of the Truax Field complex. The site location and ANGB facility boundaries are shown on Drawings 15073-A1 and 15073-A3.

The base has been in operation since October 1942. Underground storage tanks (USTs) are used to store fuel for operation of aircraft, support vehicles and equipment. Four 50,000 gallon USTs are located next to building 405, the petroleum, oil and lubricant (POL) pump house. The tanks are constructed of steel and have been in active use since 1952. The tanks currently contain JP-4 (jet fuel) used to refuel aircraft on base. Two steel USTs, one 12,000 gallon unleaded gasoline tank and one 6,000 gallon diesel tank, are located southeast of building 1000. These tanks have been in use since their installation in 1975. One 300 gallon coated steel UST containing leaded gasoline is located on the south side of building 1209. This tank was installed in 1985 and is also in use. The locations of the underground tanks are shown on Drawing 15073-2.

Several other USTs ranging from 250 to 3,000 gallons in capacity, are currently used to temporarily store used oil and solvents generated by the operation and maintenance of aircraft and air base equipment.

An abandoned underground fuel pipeline system and fueling/defueling hydrant system are located on the base. The pipeline extends from an abandoned off-base tank farm to the four 50,000 gallon JP-4 tanks. The system was sealed off and abandoned in 1973. As reported in the Installation Restoration Program, Preliminary Assessment (PEER Consultants, P.C., August 1988), the pipeline and hydrant system have never been cleaned or purged. It is not known if there is fuel remaining in the system.

PETROLEUM PRODUCT SPILLS

As reported in the Installation Restoration Program, Preliminary Assessment (PEER Consultants, P.C, August 1988), two spills of JP-4 have occurred at the base since 1980.

On March 6, 1981, approximately 2,000 gallons of JP-4 jet fuel spilled onto the ground west of the POL pump house (building 418) due to a filling overflow. The fuel was reportedly flushed to an existing dammed drainage ditch running east-west next to the spill (between the POL pump island and well W11, refer to Drawing 15073-2). The fuel was allowed to soak into the ground and the affected soil was excavated to a depth of approximately six feet and removed by April 9, 1981.

On August 3, 1985, approximately 100 gallons of used JP-4 jet fuel spilled onto the ground during transfer to storage tank 1201-1 (refer to Drawing 15073-2). The fuel was contained by diking and removed with absorbent blotters. Three 55 gallon drums of contaminated soil were removed within two days of the incident.

SITE INVESTIGATION
WISCONSIN AIR NATIONAL GUARD
TRUAX FIELD
MADISON, WISCONSIN

INTRODUCTION

This report presents the results of the underground storage tank, soil and groundwater investigation at the Truax Field Wisconsin Air National Guard Base in Madison, Wisconsin. The investigation was performed for the Wisconsin Air National Guard (WANG) by Kapur and Associates, Inc. (Kapur) and Warzyn Engineering Inc. (Warzyn) in accordance with the February 6, 1990 Work Plan prepared by Kapur and Warzyn.

The scope of services performed included:

- Precision tightness testing of ten underground storage tanks;
- Drilling of fourteen soil borings and installation of fourteen monitoring wells;
- Surveying of monitoring well locations and elevations;
- Laboratory analysis of soil samples for total petroleum hydrocarbons;
- Groundwater level monitoring and sampling for volatile organic compounds; and
- Preparation of a water table map for the site.

The site background, results of the field investigation and laboratory analyses, conclusions and recommendations are included in the following sections.

GEOLOGIC SETTING

The Truax Field ANGB is situated near the center of the Central Lowlands Physiographic Province of the United States. The province is characterized by generally horizontal to gently dipping strata and widespread topographic effects of glaciation.

In Dane County, Cambrian formations overlie the Precambrian bedrock. The Cambrian strata are mainly sandstone with minor units of shale, siltstone and dolomite. Where they have not been removed by erosion, Ordovician rocks, principally dolomite, overly the Cambrian sandstone. Unconsolidated Quarternary glacial deposits overlie the units of Cambrian and Ordovician age.

As illustrated on Drawing 15073-A4, the ANGB is located on a wedge of glacial drift approximately 300 ft thick, which overlies the Mt. Simon Sandstone. The glacial drift is predominantly sand and silt with some clay and gravel, and is believed to occupy the pre-glacial Yahara River Valley. Glacial deposits cover all but the southwestern quarter of Dane County. The ANGB is about 15 miles east and 15 miles northeast of the terminal moraines marking the southwestern limit of late Wisconsin Stage glaciation and associated surficial deposits.

The uppermost glacial deposits near Truax Field are mostly lacustrine plain silt and clay deposited in former glacial Lake Yahara. Outwash sand and gravel may exist near former glacial lake shorelines and within a few feet of the surface beneath the finer grained lake sediments.

SURFACE WATER DRAINAGE

Surface drainage from Truax Field ANGB ultimately drains west into Starkweather Creek. Starkweather Creek surrounds the ANGB on the north, west and south sides, eventually emptying into Lake Monona to the south. Drainage on the base is provided by man-made ditches and culverts which connect to Starkweather Creek. Lakes Mendota, Monona and Waubesa lie to the west and south. Cherokee Marsh lies to the northwest. Drawing 15073-A2 depicts the surface water drainage of the area.

HYDROGEOLOGY

The aquifer system in Dane County is generally subdivided into the lower sandstone aquifer, composed of the Cambrian age sandstones, and the upper aquifer, composed mostly of Ordovician dolomites and overlying unconsolidated Quarternary deposits. Precambrian crystalline rocks underlie the Madison area at a depth of about 700 to 1,000 feet, forming the lower boundary of the aquifer system.

Madison's municipal water supply is obtained from large capacity wells finished in the sandstone aquifer. Truax Field ANGB receives all of its water from the City of Madison. The nearest groundwater withdrawal is from the sandstone aquifer by municipal wells located approximately one mile to the southeast (Madison City Well No. 15, 3900 E. Washington Avenue) and 1 1/2 miles to the southwest (Madison City Well No. 7, 1709 N. Sherman Avenue). Large capacity Oscar Mayer Plant wells are also located approximately 1 1/2 miles southwest of the base. The Madison Area Technical College - Truax Campus, located south of the ANGB, is supplied by the Madison City Water Utility.

Holt et. al. (1970) and McLeod (1975) report that drawdown from Madison area municipal pumpage has resulted in the interception of upper aquifer groundwater that formerly flowed toward area lakes. Based on projected municipal pumping rates through 1990, a United States Geological Survey computer model predicts upper aquifer drawdowns of 10 feet or more in areas approximately one mile east and one mile west of the base (McLeod, 1975).

Although the model did not predict drawdowns as great as 10 feet in the immediate vicinity of the ANGB, municipal and industrial pumping may have altered shallow groundwater flow from historical patterns in the area.

PRIVATE WATER SUPPLY WELLS

Twenty-two well constructor's reports for private wells in Sections 28 and 29 were obtained from the Wisconsin Geological and Natural History Survey. The logs are included in Appendix E. The reported locations of the wells by quarter section or quarter-quarter section on the constructor's reports have not been confirmed. The dates of well construction range from 1920 to 1984.

Eight of the well reports listed locations in the northeast or southeast quarter section of Section 28. The closest boundaries of these quarter sections are approximately 0.7 to 1.0 miles cross gradient or down and cross gradient from groundwater flow under the ANGB.

Well constructor's reports indicate four wells in the southwest quarter of Section 28, potentially 0.5-1 mile cross gradient or downgradient from the site. Three of the wells were constructed in the 1940's and the other well in 1971. It is not known whether any of these four wells are in use.

Five private well constructor's reports indicate locations in the northwest quarter of Section 28, 0.3 to 0.8 miles east (cross gradient) of the ANGB site. These wells were constructed between 1939 and 1977. The current status and location of these wells has not been confirmed.

Four wells are reported in Section 29, the section occupied by the ANGB facility. All of these wells were constructed between 1920 and 1943. Two of the well constructor's reports are not complete but indicate farm wells located in the southwest quarter of the northwest quarter of Section 29 (under the current Truax Field runway), and in the northeast quarter of the southeast quarter section. The other two remaining well constructor's reports give locations in the northeast and southeast quarters of Section 29. The dates of these well constructor's reports suggest the wells were used on farms before the Department of the Army acquired 2050 acres in the area in 1943. Whether all of the reported wells in Section 29 were destroyed or abandoned during the expansion of the military facility is not known. In light of current development and past activities in the immediate vicinity of the current ANGB, these four wells are believed to be abandoned or not in use, though this has not been confirmed.

SITE INVESTIGATION

TANK TESTING PROGRAM

Ten of the Site USTs, including the four 50,000 gallon JP-4 tanks, were precision tightness tested by Midwest Petroleum Services, Inc. (MPS) under the supervision of Kapur personnel. MPS used the Ainlay Tank Tegrity Tester temperature compensated method, authorized for use in Wisconsin (Corrective Action Plan for the Leaking Underground Storage Tank Management Program, Wisconsin Department of Natural Resources, May 1989).

The lengths of the manometer level tests were five hours for each of the 50,000 gallon tanks and one hour for the remainder of the tanks. The MPS tank test results are summarized in Table 1 and are included in Appendix D. The locations of the underground storage tanks are shown on Drawing 15073-2. With the exception of the 3,000 gallon used oil tank 1201-1, all of the tested tanks met the federal tightness criterion of less than 0.1 gallon/hour measured loss. Tank 1201-1 exhibited a measured loss of 0.33 gallons/hour.

Petroleum, oil and lubricant (POL) house tanks 3 and 4 (405-3 and 405-4), tested in December 1989, exhibited anomalously large increases in volume relative to other tested tanks (+0.38 and +0.45 gal/hr, respectively). According to an MPS representative, the tanks were reportedly topped off with 7,000 gallons from a tanker truck the day before the testing (MPS, personal correspondence, March 20, 1990). Internal thermal stabilization may not have been achieved in the large liquid volume (50,000 gal) overnight, possibly causing the measured volume increase.

GROUNDWATER MONITORING WELLS

Fourteen groundwater monitoring wells (MW1 through MW14) were installed near the USTs of concern at the site between February 7 and February 13, 1990. The locations of the wells are shown on Drawing 15073-2. Pre-site investigation information suggested that that dominant groundwater flow direction in the area was to the southwest. Where possible, the wells were located southwest of the underground storage tank under consideration. The presence of underground utilities, fuel lines, buildings and overhead lines prohibited the placement of some wells to the southwest of individual tanks. In these instances, wells were placed as near as possible to the underground tank as potential drilling hazards would permit.

Drilling and monitoring well installation were performed by Environmental and Foundation Drilling, Inc. Prior to drilling each well, the drilling rig and drilling tools were decontaminated using steam pressure washing to minimize the possibility of cross-contamination. Each monitoring well boring was drilled using a truck-mounted auger rig with 4-1/4 in. inside diameter hollow stem augers. Two-inch diameter split spoon soil samples were collected at 2.5 ft intervals to a depth of 10 ft and at 5 ft intervals below 10 feet.

The borings were terminated at depths ranging from 17 to 27 ft below land surface. The samples were lithologically logged and screened for organic vapors with a photoionization detector (PID) using the field headspace analytical technique. Boring logs with PID readings were prepared for each well and are included in Appendix A. PID screening results are summarized in Table 2.

Monitoring Well Construction

The fourteen monitoring wells (W1-W14) were constructed of threaded, flush joint, 2 in. inside diameter, Schedule 40 PVC. Each well screen had 0.010 in. factory cut slots. A uniform washed coarse sand was installed around and extended 1.5 to 2 ft above the top of the well screen slots to serve as a filter pack. A seal consisting of six inches of bentonite pellets was placedon top of the filter pack sand. The pellets were hydrated with a small amount of water and granular bentonite was then extended to one ft below ground surface as an annular space seal. Except for wells W6 and W8, the wells were completed with two feet of solid PVC stick-up and locking steel protective casings. Storage tank location and ANGB activities necessitated the completion of wells W6 and W8 as flush mount wells with water tight protective steel cover pipes. A variance for construction of the flush mount wells was received from the Wisconsin Department of Natural Resources and is included in Appendix F.

Ten foot long screens were installed where the water table was estimated during drilling to be less than 10 ft below ground surface (wells W6, W7, W9, W10, W11 and W12). The 10 ft screens were set with the top of the slotted portion 3 to 4 ft above the estimated water table. Where the water table was encountered at a depth greater than 10 ft, 15 ft screens were installed (wells W1, W2, W3, W4, W5, W8, W13, W14). The 15 ft screens were set with the top of the slotted portion 5 to 6 ft above the estimated water table. Well construction details are included in Appendix B.

Monitoring Well Development

The fourteen monitoring wells were initially developed between February 7 and February 13, 1990, by Environmental and Foundation Drilling, Inc. (EFD), by surging and purging with a PVC bailer. Free floating petroleum product was present on the groundwater removed from well W8. Approximately 1 to 2 in. of brown, translucent petroleum product floated on the 13 gallons of bailed water retained in three 5 gallon discharge containers. There was a second separate yellowish-green non-aqueous phase present in well W8. Field observations by Warzyn indicated that the two non-aqueous phases appeared immiscible. The yellow/green liquid readily stains PVC bailers and plastic bailing discharge containers. A similar green/yellow liquid and fuel odor was noted in the first bailer volume of water removed from well W10. Observations recorded by EFD personnel indicated petroleum product odor and/or an organic film was also present on water removed from wells W4, W5, and W9 during development. Initial well development information is summarized in Table 4 and included in Appendix B. Purged water was discharged through a Wisconsin Air National Guard oil and water separator into the sanitary sewer.

The monitoring wells were redeveloped in accordance with Chapter NR 141, Wisconsin Administrative Code on March 26, 1990, by surging with a bailer and removing ten well volumes with a centrifugal and/or B-K pump. Development equipment was cleaned with trisodium phosphate detergent followed by a deionized water rinse between wells to minimize cross-contamination. Well W2 was bailed dry and allowed to recharge 5 times. Wells W8 and W10 had approximately one foot and one-half inch, respectively, of free petroleum product on the standing water. These two wells were not re-developed on March 26, 1990. A summary of the well development performed by Warzyn is presented in Table 5. Well development documentation is included in Appendix B.

ORGANIC VAPOR SCREENING

Strong fuel odor while drilling and headspace PID readings of 100-200 ppm as benzene equivalents were observed in split spoon samples from 3.5 to 10 ft at wells W8 and W10. Saturation with a yellow-green organic liquid was noted at a depth of approximately 9.5 ft in the W8 split spoon sample taken from 8.5 to 10 ft. Elevated PID readings were also detected in samples beneath the water table to the boring bottoms in wells W8 and W10. The split spoon sample from 8.5 to 10 ft in well W9 (west of W8 and W10) had a detectable fuel odor and a PID headspace reading of about 1 ppm above background. Split spoon samples from borings for wells W2, W4, W5, W7 and W14 yielded low level PID readings (1 to 4 ppm above background).

Variation in air temperature and weather conditions precluded rigorous standardization of the PID field screening for the duration of the drilling. As noted in Table 2, the commercial sample bags used for headspace screening gave readings of 0.2 to 0.3 ppm above background when the probe was inserted into an empty bag. Headspace PID values below approximately 1 ppm above background should be considered tenuous.

SOIL ANALYTICAL RESULTS

At least one split spoon sample from each well boring was collected and transported to the Warzyn analytical laboratory using standard preservation techniques and chain of custody documentation. Based on field PID screening results, twelve soil samples were selected for total petroleum hydrocarbon analysis. The analytical results are summarized in Table 3 and included in Appendix C. Soil samples from borings for wells W8 and W10 had elevated concentrations of petroleum hydrocarbons as kerosene and #6 fuel oil (Table 3). Soil samples collected from 5 to 6.5 ft at well W8 had measured concentrations of 494 and 57.0 mg/kg as kerosene and #6 fuel oil, respectively. Soil samples collected from 6 to 7.5 ft at well W10 had measured concentrations of 393 and 102 mg/kg, respectively, as kerosene and #6 fuel oil.

Based on the soil analytical results and field PID screening results, the petroleum product affected soil extends from a depth of 3 ft to the water table (approximately 10 ft) near well W8. Affected soil near well W10 is limited to a depth between approximately 5 and 8 ft. The depth interval of affected soils at well W10 suggests the petroleum product in the soil may have been derived from petroleum product floating on a fluctuating water table. Floating petroleum product was collected from both wells W8 and W10 (see Monitoring Well Development section, above). The present water table may be up to several feet lower than normal, due to drought conditions in 1988 and 1989.

The lateral extent of affected soil north and east of well W8 and to the west of well W10 has not been determined. Petroleum product affected soil apparently does not extend as far south as wells W11 and W12.

SITE STRATIGRAPHY

A surficial layer of silty clay or clayey sand, typically five feet or less in thickness, was encountered in eight of the fourteen borings (W1, W2, W3, W7, W8, W10, W12, W14). Fine grained lacustrine surface deposits were anticipated over the entire site. Construction activities at the base may have removed much of the expected surficial silt and clay at the remainder of the boring locations.

Below a depth of approximately five feet, the stratified deposits are generally fine to medium sand with occasional coarse sand and gravel. The coarser sediments occur in apparently discontinuous lenses. Predominantly silty fine sand was present in borings W2, W3 and W4. A layer of clay and clayey sand was present at approximately 22 to 27 ft at boring W2.

GROUNDWATER FLOW

Monitoring well locations and elevations were surveyed by Kapur and Associates, Inc. in April 1990. The water table elevation was determined from measurements made by Warzyn on March 26, 1990. With the exception of wells W2 and W14, the water table was between 8 and 11 ft below ground surface (between 9 and 13 ft below the top of the PVC well casing) on March 26, 1990. The depth to water in both wells W2 and W14 was approximately 13.5 ft below ground surface. A summary of measured groundwater elevations is provided in Table 6.

A water table map prepared from the measured groundwater elevations is shown on Drawing 15073-2. The water table configuration on March 26, 1990 indicates flow to the south-southeast, with a gradient of approximately 0.001 ft/ft across the site. Hydraulic conductivity testing necessary to estimate groundwater flow velocity has not been performed.

GROUNDWATER SAMPLING AND ANALYSIS

Groundwater samples were collected from all wells except W8 and W10, which contained free oil product, on March 26, 1990. Samples were collected with a stainless steel bailer and cable after removing three well volumes with the bailer. The stainless steel bailer and cable were cleaned with trisodium phosphate detergent followed by a deionized water rinse between samples to minimize cross-contamination. Field duplicates, a bailer blank and trip blank were collected for quality assurance/quality control. Samples were analyzed for volatile organic compounds (VOCs) at the Warzyn analytical laboratory using SW846 methods 8010 and 8020 with modifications. Samples of floating petroleum product were collected from wells W8 and W10 for product characterization.

GROUNDWATER ANALYTICAL RESULTS

Groundwater analytical results are summarized in Table 7 and included in Appendix C. Various volatile organic compounds (petroleum compounds and chlorinated hydrocarbons) were detected in several of the monitoring wells. The concentrations of VOCs detected in some of the wells exceeded Preventive Action Limits (PAL) or Enforcement Standards (ES) as defined in Chapter NR 140.10, Wisconsin Administrative Code. ESs and PALs are concentrations established as groundwater protection standards by the State of Wisconsin. PALs are intended to serve as a warning that a particular substance has been detected in groundwater and that some regulatory response may be necessary. ESs establish the concentration of a substance at which a violation has occurred. PALs and ESs for the substances detected in Truax Field ANGB groundwater samples are included in Table 7.

Benzene, ethylbenzene, toluene and xylenes (BETX) were detected in well W9. BETX compounds are common constituents of petroleum fuels. The detected level of benzene in well W9 groundwater was approximately 15 times the ES, while the detected level of xylenes was about twice the PAL.

The petroleum product samples collected from wells W8 and W10 were characterized relative to gasoline, kerosene, #2 fuel oil and #6 fuel oil reference standards. The chromatographic fingerprints of the product samples closely matched the gasoline reference standard. However, the sample chromatograms exhibited more enhanced, heavier, later eluting hydrocarbon fractions than the gasoline reference standard. Due to the proximity of wells W8 and W10 to the four 50,000 gallon JP-4 USTs and associated piping in the transport filling area, the free product is presently assumed to be JP-4 fuel. A reference standard of JP-4 jet fuel for analytical confirmation is not available to Warzyn.

The most likely potential sources of the floating petroleum product in wells W8 and W10 and petroleum product compounds in well W9 include the JP-4 jet fuel tanks (405-1,2,3,4), the piping associated with the JP-4 tanks and fuel unloading system, the reported 2,000 gallon spill (March 6, 1981) of JP-4 at the fuel unloading areas (419-1, Drawing 15073-2) and the abandoned underground fuel pipeline and fueling/defueling hydrant system (Drawing 15073-2).

The 50,000 gallon JP-4 storage tanks met the tightness testing criterion of less than 0.1 gallon/hr loss. Results for tanks 405-3 and 405-4, however, are potentially suspect due to apparent thermal non-equilibrium during the tightness testing process. The integrity of the piping between the JP-4 tanks and the fuel unloading area has not been tested. The amount of residual fuel (if any) remaining in the underground fuel pipeline and fueling/defueling hydrant system is not known. The hydrant and fuel pipeline were reportedly not purged when abandoned in 1973 (Installation Restoration Program, Preliminary Assessment, PEER Consultants, P.C., August 1988).

No BETX compounds were detected in groundwater sampled from wells W11 and W12. The respective locations of wells W11 and W12 are approximately 180 ft and 120 ft downgradient from well W8, and approximately 60 ft and 90 ft, respectively, downgradient from the location reported for the drainage ditch used to contain the product spilled in March 1981. If the product in wells W8 and W10 is associated with the March 1981 spill, then either the groundwater flow velocity is too small to have transported dissolved BETX compounds from the vicinity of the spill to the vicinity of wells W11 and W12 in this time interval, or a preferential conduit for groundwater flow and product migration may exist in the vicinity of the JP-4 tanks and fuel unloading system. As hydraulic conductivity testing has not been performed at the site, the rates of groundwater flow and potential contaminant migration from the area of the free product has not been determined. If groundwater flow rate is sufficient to have transported dissolved compounds 100 to 200 ft downgradient from the area of wells W8 and W10 since the floating petroleum product was released, then dispersion may have decreased VOC concentrations to below detection limits in the area of wells W11 and W12.

A preferential path for groundwater flow and petroleum product migration may exist along the currently used underground fuel unloading system piping and pipeline of the abandoned fueling/defueling hydrant system in the vicinity of wells W8 and W10 (Drawing 15073-2). Information necessary to initially assess the possibility of preferential groundwater and petroleum product movement has not been obtained.

The Wisconsin Air National Guard contacted the WDNR to report the release of petroleum hydrocarbons and other organic compounds to soil and groundwater in the vicinity of several UST systems at the site.

Chlorinated hydrocarbons, common constituents of chemical solvents, were detected in samples from seven wells (W1, W4, W5, W6, W7, W13 and W14). The concentration of cis-1,2-dichloroethene (cis-1,2-DCE) detected in well W1 groundwater (35.9 ug/L) exceeds the PAL by approximately 3.5 times. The source of the cis-1,2-DCE in W1 is ambiguous. The nearest reported USTs to well W1 contained unleaded gasoline and diesel fuel used for the ANGB motor pool. A 250 gallon used oil tank and a 275 gallon used oil/solvent tank are located approximately 250 and 300 ft, respectively, northwest (upgradient) of well W1 (Drawing 15073-2). No VOCs were detected in groundwater samples from monitoring wells W2 and W3 installed within 20 ft of these storage tanks. However, the present water table configuration suggests that wells W2 and W3 are located cross or upgradient from the nearest USTs. If releases from the used oil and solvent storage tanks located near wells W2 or W3 are the sources of the cis-1,2-DCE detected in well W1, groundwater flow may result in migration of solute away from W2 and/or W3.

Trichloroethene (TCE) concentrations detected in wells W4 and W5 exceeded ES values. TCE detected in well W6 groundwater exceeded the PAL. The vinyl chloride concentration detected in well W6 exceeded the ES. Although monitoring wells W4, W5 and W6 are located generally cross gradient from the respective used oil/solvent tank each is intended to monitor, their proximity to the tanks makes the individual USTs the likely sources of the chlorinated hydrocarbons detected in wells W4, W5 and W6. An appropriate downgradient monitoring network to confirm the sources does not exist. The VOCs may have been introduced to the groundwater by spills during disposal and transfer of used oil and/or solvents to and from the tanks. The ground surface around the used oil/solvent UST fill pipes was stained with black residue.

The tetrachloroethene concentration detected in well W13 (2.0 ug/L) exceeds the ES by a factor of two. Well W13 is located approximately 70 ft down gradient from a 3000 gallon used oil and solvent UST (tank 1201-1). Tank 1201-1 failed the tank tightness test criterion (Table 1). The trace levels of cis-1,2-DCE and vinyl chloride detected in groundwater samples from well W14, are possible breakdown products of tetrachloroethene. Well W14 is located approximately 400 ft south-southwest (downgradient and cross gradient) of well W13 and tank 1201-1. Other than the possibility of surficial spills, the only known potential source of tetrachloroethene, DCE and vinyl chloride in the vicinity of wells W13 and W14 is UST 1201-1. No BETX compounds were detected in well W14, which is located approximately 12 ft crossgradient from a 300 gallon gasoline UST (1209-1).

The vinyl chloride detected in well W14 samples was present at levels below the method quantitation limit (BMQL, Table 7). The quantitation limit is above the PAL and ES for vinyl chloride. In this case, as defined in Chapter NR 140.12, Wisconsin Administrative Code, the PAL or ES is not considered to have been attained or exceeded unless the presence of the substance has been confirmed by a statistically sufficient number of analyses of multiple samples. The nature and extent of a possible contaminant plume of tetrachloroethene and associated compounds potentially emanating from UST 1201-1 cannot be determined with the existing monitoring well network.

CONCLUSIONS

Based on the results of the Site Investigation at the Truax Field Wisconsin Air National Guard Base, there are four areas of concern with regard to groundwater and soil:

- Groundwater and soil affected by what appears to be JP-4 jet fuel in the area between buildings 405, 411 and 414;
- Elevated concentrations of chlorinated hydrocarbon compounds in groundwater beneath the area between buildings 401, 409 and 410;
- Elevated concentrations of chlorinated hydrocarbon compounds in groundwater south of building 1201;
- Elevated concentrations of chlorinated hydrocarbon compounds in groundwater southeast of building 1000.

Groundwater and soil conditions in the JP-4 storage tank and fuel unloading area (buildings 405 and 411) are summarized below:

- Soil sample analytical results indicated that the extent of affected soils near individual underground storage tanks was not significant, with the exception of soil borings W8 and W10 southwest of the JP-4 tanks (405-1, 2, 3, 4).
- Field PID screening and laboratory analyses indicated that soil near the 50,000 gallon JP-4 tanks and associated fuel filling piping were affected by petroleum product.
- Soil near well W8 has been affected by petroleum product from a depth of three feet to the water table (approximately ten feet). Near well W10, soil is affected by petroleum product between depths of approximately five and eight feet. The lateral extent of affected soil to the north and to the east of well W8 and to the west of well W10 has not been determined.
- Free floating petroleum product is present on the water table near the southern end of the JP-4 tanks. The northern, eastern and southern extent of the free product has not been determined.
- Potential source(s) of the petroleum product in the vicinity of wells W8 and W10 include loss from the piping associated with the JP-4 tanks (405-1,2,3,4) and fuel unloading system, small rates of loss from the JP-4 tanks themselves (though the tanks met tightness criterion), the reported 2,000 gallon spill in 1981, or fuel product derived from the abandoned fueling/defueling hydrant system pipeline.

- Compounds common to petroleum fuels have affected groundwater quality in the vicinity of the JP-4 storage tanks. Groundwater analyses indicated that the affected water did not extend as far south as wells W11 and W12. The area of affected groundwater extended at least 75 ft west to well W9. Concentrations of benzene and xylenes exceeded state groundwater standards in well W9. The eastern, northern and southwestern extent of affected groundwater are not known.

Elevated levels of chlorinated hydrocarbon compounds were detected in groundwater beneath the area between buildings 401, 409 and 410 (wells W4, W5 and W6).

- Concentrations of chlorinated hydrocarbons, common constituents of petrochemical solvents, exceed state groundwater standards in the following individual wells:

  W4 - Trichloroethene (TCE) exceeds Enforcement Standard;
  W5 Trichloroethene (TCE) exceeds Enforcement Standard;
  W6 - Trichloroethene (TCE) exceeds PAL; and
  W6 - Vinyl chloride exceeds Enforcement Standard.

- Chlorinated hydrocarbon compounds in groundwater at well W6 suggest that the source is tank 409-2, designated as a used oil and solvents storage tank.

- Storage tanks 401-1 and 401-2 near wells W4 and W5 are designated as used oil tanks. TCE in wells W4 and W5 may have originated from storage tanks 401-1 and 401-2 respectively, if solvents have been disposed of in the tanks along with the used oil or if chlorinated hydrocarbons become mixed with the used oil during handling and cleaning processes. However, wells W4 and W5 are cross gradient from the storage tanks. Downgradient groundwater samples near tanks 401-1 and 401-2 are necessary to confirm the tanks as sources and assess the extent of affected groundwater.

The concentration of tetrachloroethene detected in groundwater south of building 1201 and tank 1201-1 (well W13) exceeded the Enforcement Standard.

- The 3,000 gallon used oil and solvents storage tank 1201-1, located approximately 70 ft upgradient from well W13, is the probable source of tetrachloroethene detected in well W13 groundwater. UST 1201-1 failed tank tightness testing performed by Midwest Petroleum Services.

- Cis-1,2-DCE and vinyl chloride detected at trace levels in well W14 are possible breakdown products of tetrachloroethene detected in well W13, located approximately 400 ft upgradient and cross gradient from well W14. The possibility of a continuous plume of chlorinated hydrocarbon compound affected groundwater migrating downgradient from well W13 and toward well W14 has not been confirmed.

The concentration of cis-1,2-dichloroethene detected in groundwater southeast of building 1000 (well W1) exceeded the PAL.

- The potential source of cis-1,2-DCE in W1 is ambiguous. Used oil and solvents storage tanks 100-3 and 1000-5 are located 250-300 ft upgradient of well W1. Groundwater samples from wells W2 and W3, located cross gradient from tanks 1000-3 and 1000-5, contained no detectable chlorinated hydrocarbons. No monitoring well exists between well W1 and storage tanks 1000-3 and 1000-5 to confirm the tanks as the source of well W1 chlorinated hydrocarbons. It is not known if past disposal activities occurred in the immediate vicinity of well W1. The extent of affected water downgradient from well W1 has not been determined.

Nine of the ten underground storage tanks tested for tightness met the tightness criterion of less than 0.1 gallon/hour loss, though five of the tanks exhibited loss rates of less than 0.1 gallon/hour. Test results for JP-4 storage tanks 405-3 and 405-4 are suspect due to apparent thermal non-equilibrium during the testing process. Groundwater analytical results suggest the possibility of petroleum fuel product or solvent loss from several of the tanks or from spillage associated with disposal of fluids in the tanks. All of the existing regulated underground storage tanks will require replacement or upgrade to meet Federal corrosion protection and/or spill and overfill protection by December 1998. Approved leak detection measures for tanks and piping must be in place between the present and 1993 dependant upon installation date.

Shallow groundwater flow at the site is toward the south-southeast, rather than to the southwest as suggested by regional hydrogeologic information.

RECOMMENDATIONS

RECOMMENDATIONS TO ADDRESS SOIL AND GROUNDWATER CONTAMINATION

The following activities are recommended to address the affected soil and groundwater observed at the site:

- Evaluate the source of free product in the vicinity of buildings 405 and 411. Retest JP-4 storage tanks 405-3 and 405-4, under conditions of thermal equilibrium. Verify the integrity of piping from the current JP-4 fuel unloading system to the JP-4 storage tanks. Examine the abandoned underground fuel transfer line for residual fuel and purge the pipeline if residual fuel is present. Tank testing methods should be given careful consideration due to the large size of the JP-4 tanks.

- Determine the extent of petroleum product-affected soil and groundwater in the vicinity of the JP-4 storage tanks and assess the possibility of preferential groundwater flow and petroleum product along the abandoned underground fuel transfer pipeline. Perform three additional soil borings and install three monitoring wells located: 1) on the east side of the JP-4 tank 405-1, 2) 80-100 feet north of well W8, and 3) approximately 100 ft southwest of well W8, along the abandoned fuel transfer pipeline. Remedial actions should be considered based on information obtained from the additional borings and sampling of the additional wells.

- Evaluate the lateral and vertical extent of chlorinated hydrocarbon-affected groundwater in the vicinity of buildings 401, 409 and 410. Install two water table wells downgradient of tanks 409-2, 401-1 and 401-2, with one of the wells located approximately 200 feet south of well W6 and the other located approximately 150 feet south of well W5. Install a piezometer nested with one of these wells. One monitoring well should be 100-200 feet upgradient from wells W6 and W5 to determine whether tanks 409-2, 401-1 and 401-2 are potential sources of chlorinated hydrocarbon compounds observed in the area. Removal of the used oil and used oil/solvents tanks should be considered based on information obtained from sampling and monitoring of the additional wells.

- Evaluate the extent of chlorinated hydrocarbon compound-affected groundwater downgradient from used oil and solvents storage tank 1201-1. Install and sample an additional monitoring well approximately 100-150 ft east of well W13.

- Perform additional sampling of groundwater at well W1 to monitor the level of chlorinated hydrocarbon compounds in groundwater southeast of building 1000.

An additional round of groundwater sampling and analysis should be performed after installation and development of the additional wells. To assist in identifying the potential sources of volatile organic compounds detected in groundwater at the site, consideration should be given to in-situ hydraulic conductivity testing to determine rates of groundwater flow and contaminant migration. Remedial action and potential contaminant source removal should be considered after the additional information has been obtained.

RECOMMENDATIONS FOR UNDERGROUND STORAGE TANK COMPLIANCE

This section provides a summary of regulatory compliance issues and recommendations for each of the facility's underground storage tanks (USTs) addressed during this investigation. The two issues of concern are environmental liability for volatile organic compounds detected in site groundwater at concentrations exceeding State groundwater standards and compliance with Environmental Protection Agency rules promulgated in the Code of Federal Regulations (40 CFR Part 280) for UST systems. A summary of the status and recommended actions outlined below for each tank is included in Table 8 of this report.

As described in the May 1989 Wisconsin Department of Natural Resources' "Corrective Action Plan for the Leaking Underground Storage Tank Management Program" (WDNR-CAP), the overriding concern for environmental impacts from leaking UST systems is degradation of groundwater quality. Chapter NR 140, Wisconsin Administrative Code (NR 140) requires that groundwater contamination be defined and remediated by owners and operators responsible for the contamination. As summarized in this report, groundwater has been affected by volatile organic compounds at the Truax Field facility. Recommendations made below for individual tanks in terms of compliance with 40 CFR Part 280 are in addition to, and do not supersede, previous recommendations to address the observed groundwater contamination. Compliance with 40 CFR Part 280 for the UST systems does not eliminate potential environmental liability.

As required by 40 CFR Part 280, several USTs were tightness tested between December 1989 and February 1990. Only one of the tanks (1201-1) failed the tightness criterion, exhibiting greater than 0.1 gal/hr loss. However, as stated in the WDNR-CAP, tightness testing does not provide sufficient evidence to rule out a UST as a potential source of release. The distribution of affected groundwater suggests that several of the USTs of the site are potential release sources, although the existing monitoring well network does not unambiguously define which individual tanks are potential release points.

In addition to the general recommendations for individual tanks outlined below, Warzyn recommends development of a detailed Tank Management Plan for the facility. 40 CFR Part 280 requires replacement or upgrading of the tanks with fiberglass tanks or approved lined and/or cathodically protected steel systems with leak detection and spill/overfill protection by December 22, 1998.

Dependent upon the nature of the stored compounds, the used oil/solvents underground storage tanks may be classified as hazardous waste UST systems as defined in Chapter NR 181, Wisconsin Administration Code (Hazardous Waste Management). If the used oil/solvent UST systems are classified as hazardous waste UST systems, it is likely that a hazardous waste storage license would be required for the facility. The Truax Field facility would benefit from consolidation of the current 10 used oil and used oil/solvent storage tank sites into fewer tank systems, segregation the solvent storage systems or complete removal of the underground solvent storage systems. A Tank Management Plan detailing appropriate removal, replacement or upgrade design and construction of tanks would serve to identify the most cost effective means of meeting compliance with NR 181 and 40 CFR Part 280. An appropriate Tank Management Plan would consider current operations, A compatibility of construction materials with stored substances and required storage capacity to provide a storage tank system which meets the operational needs of the facility, reduces potential future environmental liability and ensures compliance with State and Federal regulations.

The following provides a summary of 40 CFR Part 280 upgrade corrosion protection and leak detection requirements for existing tanks and piping. Temporary or permanent closure of tanks must meet the requirements of 40 CFR Parts 280.70, 280.71 and 280.72, which include assessment for released product where contamination is most likely to occur.

Tank Corrosion Protection - 40 CFR 280.21(b) Steel tanks may be upgraded to new UST performance standards or comply with one of the following by December 22, 1998:

1. An approved interior lining may be added;

2. An approved cathodic protection system may be added, provided tank integrity is ensured by one of the following:

   a. Internal inspection for structural soundness and lack of corrosion holes.

   b. Monthly monitoring may be performed on tanks installed for less than 10 years.

   c. Two approved tightness tests are performed, one test before and one between three and six months after operation of the cathodic protection system (for tanks installed less than 10 years only); or

3. Cathodic corrosion protection combined with internal lining may be added.

Piping Corrosion Protection - 40 CFR 280.21(c) Steel piping must have approved cathodic corrosion protection.

Spill and Overfill Protection - 40 CFR 280.20(c) Spill and overfill protection consisting of catchment basins and automatic shut-off devices or overfill alarms is required. (*Note:* spill and overfill protection is not required if the UST system is filled by transfers of no more than 25 gallons.)

Release Detection Schedule - 40 CFR 280.40 Release detection is required for all existing tanks on the following phased-in time schedule:

Tank Installation Date	Release Detection Required by December 22nd of year:
Unknown or before 1965	1989
1965-69	1990
1970-74	1991
1975-79	1992
1980-88	1993
New tanks	Upon installation

Tank Release Detection - 40 CFR 280.43 Release detection for existing tanks must consist of one of the following:

1. Monthly or more frequent monitoring of:

   a. Soil gas in excavation zone; or
   b. Groundwater in the excavation zone.

2. Monthly inventory control and annual tank tightness testing.

3. Monthly inventory control and tank tightness testing every five years for cathodically protected tanks with spill and overfill protection.

4. Automatic tank gauging equipment.

5. Manual tank gauging may be used for tanks of 550 gallons or less under the following conditions:

   a. At least 36 hours lapse between beginning and ending measurements;

   b. Two consecutive stick measurements are made; and

   c. The level of product can be measured to the nearest 1/8 inch over the full range of the tank's height.

Piping Release Detection - 40 CFR 280.41 & 40 CFR 280.44 Release detection methods are required for all product piping and may consist of:

1. Automatic line leak detectors;
2. Line tightness testing; or
3. Applicable tank methods.

For suction piping, release detection must be in place on the same phased-in time schedule as for existing tanks. Release detection for pressurized piping must be in place by December 22, 1990.

INDIVIDUAL TANK SUMMARIES

A summary of individual storage tank characteristics, potential relation to observed groundwater quality and general recommendations for compliance with 40 CFR Part 280 is given below. Information regarding tank construction, installation dates, capacity and contents was obtained from the Installation Restoration Program, Preliminary Assessment (PEER Consultants, P.C., August 1988) and from information provided by the Wisconsin Air National Guard to Kapur and Associates.

Tank Nos. 405-1, 405-2, 405-3, 405-4 and Associated Piping.
Reported Construction: Steel
Reported Capacity: 50,000 Gallons
Reported Installation Date: 1952
Reported Contents: JP-4 Jet Fuel

Comments. Tanks and/or associated piping are suspected sources of free petroleum product and petroleum product derived compounds detected in groundwater in the vicinity of the tanks (wells W8, W9 and W10) at concentrations above State standards (NR 140). Although the tanks met the tightness criteria of less than 0.1 gal/hour loss, tanks 405-3 and 405-4 exhibited anomolous tightness testing results.

Recommendations. Retest tightness of tanks 405-3 and 405-4, with careful consideration of testing methods due to the large capacity of the tanks. Perform product line tightness testing of the fuel unloading and delivery piping per 40 CFR Section 280.44(b), as soon as possible. Release detection must be in place on pressurized piping systems by December 22, 1990. Tanks and piping require replacement or upgrade with approved lining and/or corrosion protection, leak detection and spill/overfill prevention devices by December 22, 1998. Because the tanks are greater than 10 yrs old, upgrade with approved cathodic protection methods would require internal inspection to verify structural integrity. As of December 22, 1989, leak detection was required. Due to the age of these tank systems and the presence petroleum hydrocarbons on groundwater in the vicinity of the tanks, we recommend that these tanks be replaced as soon as possible.

Tank No. 1201-1.
Reported Construction: Steel
Reported Capacity: 3,000 Gallons
Reported Installation Date: Unknown
Reported Contents: Used Oil/Solvents

Comments. Tank 1201-1 failed the tightness criterion of 0.1 gallon/hour or less loss. Tank 1201-1 is the suspected source of tetrachloroethene detected in groundwater at well W13 at a concentration which exceeded the NR 140 standard.

Recommendation. Tank closure and assessment.

Tank Nos. 401-1, 401-2, 409-2

	401-1	401-2	409-2
Reported Construction:	Coated Steel	Steel	Coated Steel
Reported Capacity:	550 Gal.	250 Gal.	275 Gal.
Reported Installation Date:	1983	Unknown	1981
Reported Contents:	Used Oil	Used Oil	Used Oil/Solvents

Comments. All three tanks met tightness criterion of less than 0.1 gal/hour loss. However, concentrations of chlorinated hydrocarbon compounds in exceedance of NR 140 standards were detected in groundwater at wells W4, W5 and W6, suggesting the possibility of release in the vicinity of these tanks. The soil around the fill pipe at tank 401-2 was heavily stained with apparent oily residue.

Recommendations. Closure of the tanks or internal inspection to confirm that tanks are structurally sound and free of corrosion holes. If structural integrity of the tanks can be confirmed, the tanks need to be upgraded with approved corrosion protection, leak detection and spill/overfill prevention devices, or replaced by December 22, 1998. As of December 22, 1989 for tank 401-2 and December 22, 1993 for tanks 401-1 and 409-2, leak detection monitoring is required until the tanks are upgraded or replaced. The tank filling system of Tank 401-2 should be upgraded to prevent spillage. The soil around the fill pipe may require remediation.

Tank No. 1000-3.
Reported Construction: Steel
Reported Capacity: 275 Gal.
Reported Installation Date: 1975
Reported Contents: Used Oil/Solvents

Comments. Tank No. 1000-3 was not tightness tested. This tank is located approximately 250 ft upgradient of groundwater (sampled from well W1) which had a detected concentration of cis-1,2-dichloroethene in exceedance of the NR 140 standard. The soil around the fill pipe was heavily stained with apparent oily residue.

Recommendations. Leak detection monitoring is required by December 22, 1992. Closure or upgrading with approved corrosion protection, spill/overfill prevention and leak detection methods is required by December 22, 1998. The tank filling system should be upgraded to prevent spillage. The soil around the fill pipe may require remediation.

Tank No. 1000-5.
Reported Construction: Steel
Reported Capacity: 250 Gal.
Reported Installation Date: Unknown
Reported Contents: Used Oil

Comments. Tank 1000-5 is located approximately 300 ft upgradient from groundwater (sampled from well W1) which had a detected concentration of cis-1,2-dichloroethene in exceedance of the NR 140 standard. Tank 1000-5 met the tightness criterion of less than 0.1 gal/hr loss. Visible staining of the ground surface around the tank fill pipe indicates probable spillage during used oil transfer to the tank.

Recommendations. Closure or upgrading with approved corrosion protection, spill/overfill prevention and leak detection methods is required by December 22, 1998. As of December 22, 1989, leak detection monitoring was required until the tank is upgraded or replaced. The tank filling system should be upgraded to prevent spillage. The soil around the fill pipe may require remediation.

Tank Nos. 1000-1, 1000-2.

	1000-1	1000-2
Reported Construction:	Steel	Steel
Reported Capacity:	12,000 Gal.	6,000 Gal.
Reported Installation Date:	1975	1975
Reported Contents:	Unleaded Gasoline	Diesel

Comments. Tanks 1000-1 and 1000-2 have not been tightness tested. A trace level of benzene (0.5 to 1.0 ug/L) detected in well W1 may indicate potential petroleum product release from one or both of these tanks or spillage during filling activities.

Recommendations. Leak detection monitoring is required by December 22, 1992. If the product piping associated with in these tanks is pressurized, piping release detection is required by December 22, 1990. Closure or upgrading with approved corrosion protection, leak detection and spill/overfill prevention devices is required by December 22, 1998.

Tank No. 1209-1.
Reported Construction: Coated Steel
Reported Capacity: 300 Gal.
Reported Installation Date: 1985
Reported Contents: Leaded Gasoline

Comments. Tank 1209-1 was not tightness tested. Compounds consistent with gasoline (benzene, ethyl benzene, toluene and xylenes) were not detected in groundwater at well W14, located within 20 feet, but sidegradient of tank 1209-1.

Recommendations. Leak detection monitoring is required by December 22, 1993. If the product delivery piping associated with the tank is pressurized, piping release detection is required by December 22, 1990. Closure or upgrading with approved corrosion protection, leak detection and spill/overfill prevention devices is required by December 22, 1998.

Tank No. 415-1.
Reported Construction: Steel
Reported Capacity: 300 Gal.
Reported Installation Date: 1982
Reported Contents: Used Oil

Comments. Tank 415-1 met tightness criterion of less than 0.1 gal/hr loss. Volatile organic compounds were not detected in groundwater sampled within 20 feet sidegradient (well W12) of the tank.

Recommendations. Closure or upgrading with approved corrosion protection, leak protection and spill/overfill prevention devices is required by December 22, 1998. Leak detection monitoring is required by December 22, 1993 until tank is upgraded or closed.

Tank Nos. 414-1, 414-2, 414-3.

	414-1	414-2	414-3
Reported Construction:	Fiberglass	Fiberglass	Fiberglass
Reported Capacity:	550 Gal.	550 Gal.	550 Gal.
Reported Installation Date:	1982	1982	1982
Reported Contents:	Detergent	Used Solvent	Used Oil

Comments. Tanks have not been tightness tested. Concentrations of benzene and xylenes detected in exceedance of NR 140 standards in well W9 (approximately 40 ft downgradient) are probably associated with petroleum product apparently released from the JP-4 tanks or associated piping.

Recommendations. Examination of codes, as defined in 40 CFR Section 280.32, to assess compatibility of material with substances contained in the tanks. Tanks require appropriate leak detection monitoring by December 22, 1993. Spill and overfill prevention and secondary containment may be required by December 22, 1998 at tank 414-2.

Tank No. 403-2.
Reported Construction: Unknown
Reported Capacity: 250 gal
Reported Installation Date: Unknown
Reported Contents: Used Oil

Comments. Tank was not tightness tested. Tetrachloroethene was detected in groundwater at monitoring well W7 at a concentration exceeding the NR 140 standard.

Recommendations. This tank is reportedly out of service and should be closed as soon as possible. The tank closure process should include a closure assessment.

Abandoned POL Transfer Line

We recommend that the abandoned POL Transfer Line be examined to assess the presence of residual fuel. If residual fuel is present, the line should be purged of residual fuel and vapors and properly abandoned or removed. Due to the potential for past releases from the POL Transfer Line and the potential that the POL Transfer Line acts as a conduit for contaminated groundwater and/or free product from the POL tank area, we recommend that soil and groundwater conditions in the vicinity of the POL Transfer Line be investigated by soil borings, monitoring wells, soil vapor survey or other appropriate means.

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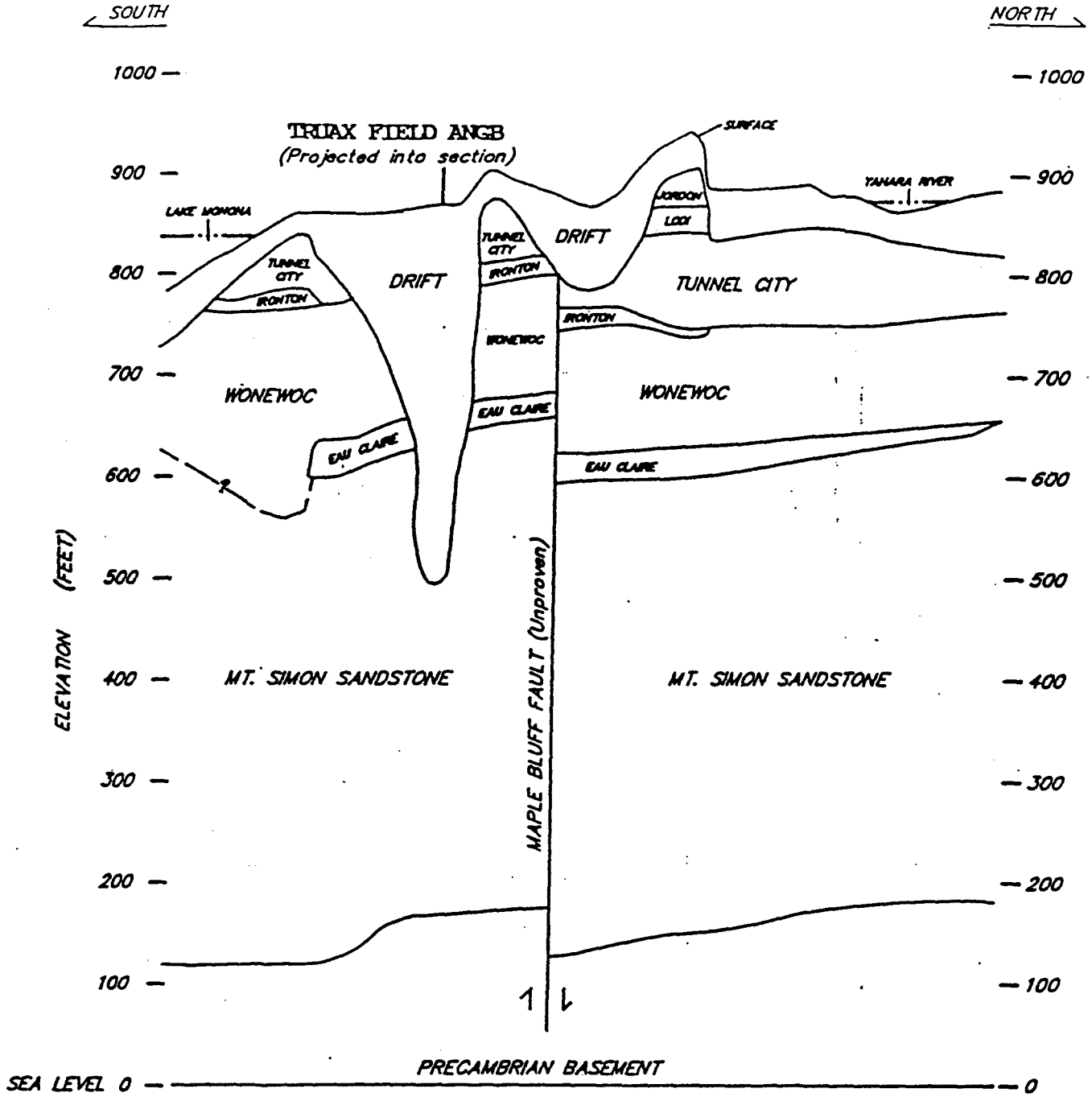
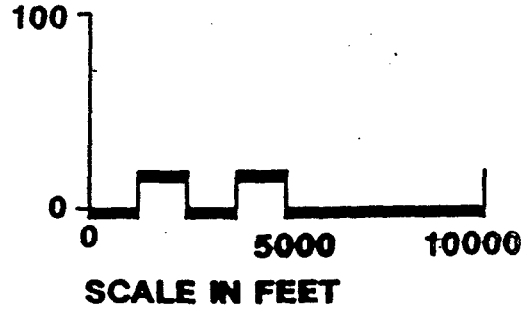
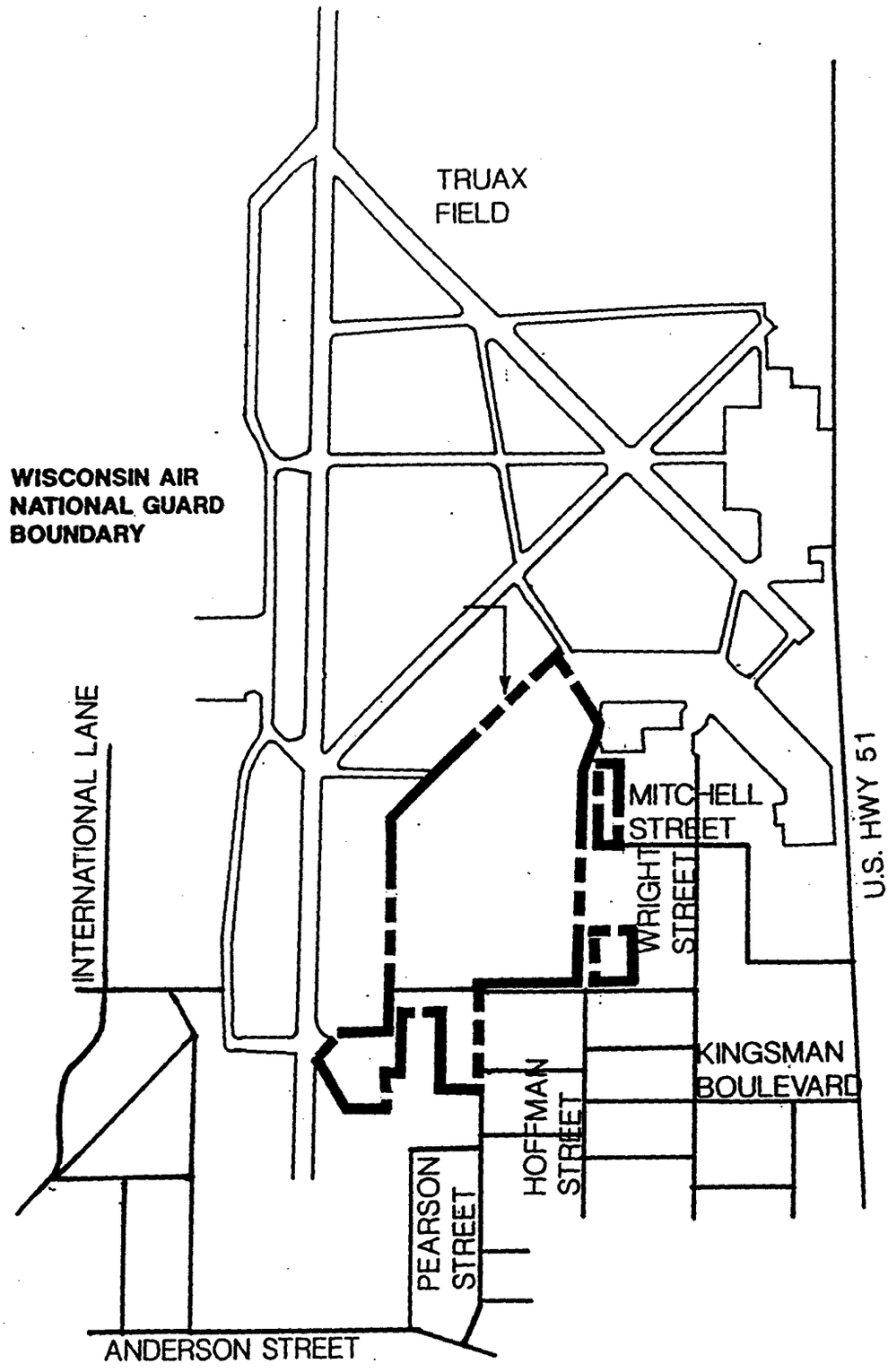
DRAWINGS



NOTE

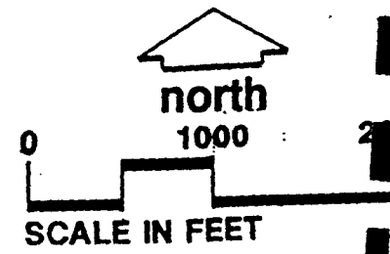
1. DRAWING DEVELOPED FROM CROSS-SECTION IN INSTALLATION RESTORATION PROGRAM PRELIMINARY ASSESSMENT, 128TH TACTICAL FIGHTER WING, WISCONSIN AIR NATIONAL GUARD-TRUAX FIELD, MADISON. HAZWRAP SUPPORT CONTRACTOR OFFICE, MARTIN MARIETTA ENERGY SYSTEMS, INC., OAK RIDGE, TENNESSEE.





NOTE

1. BASE MAP DEVELOPED FROM LOCATION MAP FROM INSTALLATION RESTORATION PROGRAM PRELIMINARY ASSESSMENT SUPPLIED BY HAZWRAP SUPPORT CONTRACTOR OFFICE, MARTIN MARIETTA ENERGY SYSTEMS, INC. OAK RIDGE, TENNESSEE.



TABLES

Table 1
Summary of Midwest Petroleum Services
Ainlay TTT Tank Tightness Results

Tank No.	Product	Capacity (Gallons)	Date Tested	Length of Test	Volume Change (gal/hr)	Meets Tightness Criterion?
401-1	Water	550	1/10/90	1 hr.	+0.006	Yes
401-2	Waste Oil/ Water	250	1/11/90	1 hr.	-0.013	Yes
415-1	Water	300	1/11/90	1 hr.	+0.011	Yes
409-2	Waste Oil/ Water	275	1/18/90	1 hr.	-0.011	Yes
1000-5	Water	250	1/18/90	1 hr.	-0.004	Yes
405-1	JP4	50,000	1/4/90	5 hrs.	-0.044	Yes
405-2	JP4	50,000	1/4/90	5 hrs.	-0.043	Yes
405-3	JP4	50,000	12/20/89	5 hrs.	+0.38*	Yes
405-4	JP4	50,000	12/20/89	5 hrs.	+0.446*	Yes
1201-1	Waste Oil	3,000	2/1/90	1 hr.	-0.33	No

Ainlay TTT = Ainlay Tank Tegrity Tester.
Refer to Drawing 15073-2 for locations of tanks.
POL-1 = Petroleum, Oil & Lubricant Pump House (Building 405) Tank 1.
A negative volume change indicates a decrease (loss) in fluid volume in tank.
A positive volume change indicates an increase (gain) in fluid volume in tank.
Tightness criterion used is loss equal to or greater than 0.1 gal/hr.
*Thermal stabilization may not have been achieved before tank test (see test).

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Table 2
Field Headspace Photoionization Detector Readings
Benzene Equivalents, Parts Per Million Above Background

Split Spoon Sample No.	Depth ft	Well No. W1	W2	W3	W4	W5	W6	W7	W8	W9	W10	W11	W12	W13	W14
1	1-2.5	0.2	0.3	0.2	1.0	2.1	0.7*	0.2	10	0.0	0.7	0.1	0.0	0.0	0.0
2	3.5-5	0.5	0.1	0.3	4.0*	0.3	0.5	0.1	170	0.3	6.7	0.1	0.5	0.0	0.0
3	5-6.5 or 6-7.5	0.5	0.5	0.2	3.6	0.9	0.1	1.0*	200*	0.6	190*	0.3	0.0	0.0	0.0
4	8.5-10	0.2	1.1	0.3*	2.1	0.9*	0.0	0.2	100	0.9*	2.7	0.4	0.1*	0.0*	3.1
5	13.5-15	0.3*	2.7*	0.1	1.4	0.5	0.3	0.5	18	0.3	17.7	0.1	0.0	0.0	0.0
6	18.5-20	0.0	1.7	0.3	0.6	0.2	NS	NS	10	NS	NS	NS	NS	0.0	0.0
7	23.5-25	NS	2.1	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS

Notes: Interference of 0.2 to 0.3 ppm above background was detected in analytical plastic bags used for field screening. PID screening values less than approximately 1 ppm above background should be viewed as tenuous.

NS = Not sampled. Sample depth is greater than borehole depth.
* = Samples analyzed for Total Petroleum Hydrocarbons at Warzyn Analytical Laboratory.

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Table 3
Summary of Soil Analytical Results
Total Petroleum Hydrocarbon Analyses
Samples Collected February 7 - February 12, 1990

	Total Petroleum Hydrocarbons (mg/kg) As:			
Sample I.D.	Gasoline	Kerosene	#2 Fuel Oil	#6 Fuel Oil
W1 (13.5-15 ft)	X	X	X	X
W2 (13.5-15 ft)	X	X	X	X
W3 (8.5-10 ft)	X	X	X	X
W4 (3.5-5 ft)	X	X	X	X
W5 (8.5-10ft)	X	X	X	X
W6 (1-2.5 ft)	X	X	X	X
W7 (5-6.5 ft)	X	X	X	X
W8 (5-6.5 ft)	X	494	X	57.0
W9 (8.5-10 ft)	X	X	X	X
W10 (6-7.5 ft)	X	393	X	102
W12 (8.5-10 ft)	X	X	X	X
W13 (8.5-10 ft)	X	X	X	X
Reportable Detection Limit	5.0	5.0	5.0	20.0

All concentrations in mg/kg.

X - Analyzed, but not detected.

Sample I.D. is well number of boring and depth interval of split spoon sample from which analyzed sediments were taken.

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Table 4
Well Development Information
Wisconsin Air National Guard, Truax Field

Well No.	Depth to Groundwater from top of PVC Before Devel. (ft.)	After Devel. (ft.)	Total Depth (ft.)	Well Vol. (gal)	Time Spent on Devel.	Volume of Water Removed (Gal.)	Clarity of Water Before Devel.	After Devel.	Color of Water	Comments
W1	13.7	13.5	22.4	1.4	1 hr.	17	Turb.	Turb.	lt. Br./ Gray	No Odor /Film
W2	16.3	25.1	25.7	1.5	30 min.	4.5	Turb.	Turb.	lt. Br.	No Odor /Film
W3	13.4	13.5	23.8	1.7	30 min.	17	Turb.	Turb.	lt. Br.	No Odor /Film
W4	13.3	13.1	21.3	1.3	30 min.	17	Turb.	Turb.	lt. Br. /Orange	Slight Film
W5	13.3	12.9	23.5	1.7	45 min.	17	Turb.	Sl. Turb.	Br./ Orange	Odor/ Slight Film
W6	9.8	10.0	15.3	0.9	30 min.	14	Turb.	Turb.	lt. Br.	No Odor /Film
W7	11.7	11.3	17.5	1.0	45 min.	13	Turb.	Turb.	lt. Br.	No Odor /Film
W8	9.7	9.5	18.4	1.5	1 hr.	13	Turb.	Turb.	Br./ Green	Strong Odor/ Green Film
W9	10.8	10.8	17.0	1.0	1 hr.	15	Turb.	Turb.	lt. Br.	Slight Film
W10	11.3	11.3	17.7	1.0	30 min.	16	Turb.	Turb.	lt. Green	Odor/ Green Film
W11	11.3	11.2	17.8	1.1	45 min.	15	Turb.	Turb.	lt. Br.	No Odor /Film
W12	11.5	11.5	17.3	0.9	30 min.	15	Turb.	Turb.	Br.	No Odor /Film
W13	13.3	13.3	22.0	1.4	1 hr.	16	Turb.	Turb.	lt. Br.	No Odor /Film
W14	16.3	16.0	25.6	1.6	30 min.	16	Sl. Turb.	Sl. Turb.	lt. Red-Br.	No Odor /Film

Well development performed by Environmental and Foundation Drilling, Inc. between February 7 and February 13, 1990.

Well development method: 1 1/4 in. diameter PVC bailer.

Well volume reported is standing water in PVC pipe.

KS/vlr/TD
[vlr-400·53b]
15073

Table 5

Well Redevelopment Information
Wisconsin Air National Guard, Truax Field

Well No.	Depth to Groundwater from top of PVC Before Devel.	After Devel.	Total Depth	Well Volume	Time Spent on Devel.	Removed (Gals.)	Turbidity Before/After Devel.	Color of Water	Comments
W1	12.72	12.80	22.0	9.2	35	100	Very/ Slight	Clear	
W2	15.67	25.23	26.0	9.5	55	15	Very/ Slight	Clear	bailed dry 5x
W3	12.81	12.90	23.5	10.4	45	90	Very/ None	lt. brown	
W4	12.69	12.71	21.0	8.2	40	75	Very/ None	lt. brown	
W5	12.47	12.83	23.4	10.5	70	100	Very/ None	lt. brown	
W6	9.16	9.49	15.0	5.8	50	55	Very/ None	Clear	
W7	10.98	11.02	17.0	6.2	40	55	Very/ None	lt. brown	
W8	9.99	--	18.4	8.0	--	--	--	--	0.95 ft of product
W9	9.81	9.89	17.0	6.8	55	100	Very/ None	Clear	
W10	10.52	--	17.7	6.8	--	--	--	--	0.04 ft of product
W11	10.17	10.23	18.0	7.2	45	100	Very/ None	Clear	
W12	10.60	10.64	17.0	6.3	--	100	Very/ None	Clear	
W13	12.52	12.54	21.5	9.0	50	80	Very/ Slight	Clear	
W14	15.54	15.58	25.5	9.6	40	100	Very/ None	Clear	

Redevelopment performed by Warzyn on March 26, 1990.
Wells were surged then purged with centrifugal and B-K pump.
Well volume is volume of water plus filter pack as defined in Wisconsin Administrative Code s.NR 141.

KS/vlr/TD
[jlv-402-62]
15073-MD

Table 6
Summary of Water Table Elevations
March 26, 1990

Well No.	Top of PVC Elevation (msl)	Depth to Water	Water Table Elevation
W1	860.27	12.72	847.55
W2	863.34	15.67	847.67
W3	860.44	12.81	847.63
W4	861.28	12.69	848.59
W5	861.09	12.47	848.62
W6	857.89	9.16	848.73
W7	860.02	10.98	849.04
W8	858.00	9.99*	848.73*
W9	858.73	9.81	848.92
W10	859.34	10.52*	848.85*
W11	858.86	10.17	848.69
W12	859.20	10.60	848.60
W13	861.07	12.52	848.55
W14	863.66	15.54	848.12

msl - feet above mean sea level.

All measurements are reported in feet.

Top of PVC elevations surveyed by Kapur and Associates, Inc. (April, 1990)

Depth to water measured from top of PVC casing.

* - Water table elevation corrected for amount of free floating petroleum product using an approximate product specific gravity of 0.76. Well W8 contained 0.95 ft of free product depressing the water table by 0.72 ft. Well W10 contained 0.04 ft of free product, depressing the water table by 0.03 ft.

KS/vlr/TD
[vlr-400-53d]
15073.00

Table 7
Summary of Groundwater Analytical Results
Volatile Organic Compounds
March 26, 1990

Compound	Detection Limit (ug/L)	W1	W4	W5	W5Dup	W6	W7	W9	W13	W14	W14Dup	PAL	ES
Benzene	1.00	BMQL (4)	x	x	x	x	x	9.79 (3)	x	x	x	.067	5.0
Carbon Tetrachloride	1.00	BMQL (4)	x	x	x	x	x	x	x	x	x	1	1
Dichloroethene	1.00	BMQL (4)	x	x	x	x	x	x	x	x	x	.024	.24
Cis-1,2-Dichlorothene	1.00	35.9 (2)	x	x	x	1.80	x	x	x	BMQL	BMQL	10	100
Ethylbenzene	1.00	x	x	x	x	x	x	27.3	x	x	x	272	1360
Tetrachloroethene	1.00	x	x	x	x	x	BMQL (4)	x	2.00 (3)	x	x	0.1	1
Toluene	1.00	x	x	x	x	1.77	x	3.07	x	x	x	68.6	343
Trichloroethene	1.00	x	2.36 (3)	11.8 (3)	9.18 (3)	1.34 (2)	x	x	x	x	x	.18	1.8
Vinyl Chloride	1.00	x	x	x	x	1.90 (3)	x	x	x	x	BMQL (4)	.0015	.015
Xylenes	1.00	x	x	BMQL	x	6.82	x	235 (2)	x	x	X	124	620

No VOCs were detected in samples from wells W2, W3, W11 and W12. Wells W8
and W10 were not sampled due to the presence of free product.
All concentrations reported in micrograms per liter.
x = analyzed but not detected
BMQL - detected, but below method quantitation limit
PAL - Preventive Action Limit, Wisconsin Administrative Code Chapters. NR 140
ES - Enforcement Standard, Wisconsin Administrative Code Chapters. NR 140
This table includes only those compounds detected in at least one groundwater sample. Full listing of the 36 VOCs included in the analyses is given in Appendix C.

(1) Sample chromatogram contains unidentified VOC compounds other than those listed here or in Appendix C.
(2) Concentration is above PAL but below ES.
(3) Measured concentration is above ES.
(4) Compound detected but BMQL with reported detection limit above PAL or ES for the substance. A statistically sufficient number of analyses have not been performed to confirm the presence of the substance as stated in NR140. With a reported detection limit of 1.00 ug/L, a BMQL designation generally signifies that the compound is detected at a concentration between approximately 0.5 and 1.0 ug/L.

KDS/vlr/TD
[vlr-400-53e]
15073

TABLE 8
(continued)
Summary of Status and Recommended Actions
for Selected UST Systems

Tank I.D.	Contents	Installation Date	Capacity (Gallons)	Construction Material	FEDERAL REQUIREMENTS Leak(1) Detection By	Corrosion Protection By	Spill/(2) Overfill Protection By	Comments	Recommendations
1000-3(4)	Used Oil Solvents	1975	275	Steel(3)	12/92	12/98	12/98	Stained soil was present around fill pipe. Dichloroethene was detected in groundwater 250 ft downgradient (Well W1). See Note, 4 below.	Comply with Federal tank requirements. Assess extent of affected groundwater. Assess potentially affected soil near fill pipe Upgrade filling system to prevent spillage.
1000-5	Used Oil	Unknown	250	Steel(3)	12/89	12/98	12/98	Stained soil was present around fill pipe. Dichloroethene was detected in groundwater 300 ft downgradient (Well W1).	Comply with Federal tank requirements. Assess extent of affected groundwater. Assess potentially affected soil near fill pipe. Upgrade filling system to prevent spillage.
1000-1	Unleaded Gasoline	1975	12,000	Steel(3)	12/92(1)	12/98	12/98	A trace level of benzene was detected in groundwater in the vicinity of the tank (Well W1).	Comply with Federal tank requirements. Assess extent of affected groundwater and source of benzene.
1000-2	Diesel	1975	6,000	Steel(3)	12/92(1)	12/98	12/98	A trace level of benzene was detected in groundwater in the vicinity of the tank (Well W1).	Comply with Federal tank requirements. Assess extent of affected groundwater and source of benzene.
1209-1	Leaded Gasoline	1985	300	Coated Steel(3)	12/93(1)	12/98	12/98	Tank has not been tightness tested. No compounds consistent with gasoline release were detected in groundwater in the tank vicinity (Well W14).	Comply with Federal tank requirements.
415-1	Used Oil	1982	300	Steel	12/93	12/98	12/98	No volatile organic compounds were detected in groundwater in the tank vicinity (Well W12).	Comply with Federal tank requirements.
414-1	Detergent	1982	550	Fiberglass	12/93	12/98(5)	12/98		No current regulatory constraints for tanks.
414-2(4)	Used Solvent	1982	550	Fiberglass	12/93	12/98(5)	12/98	No volatile organic compounds consistent with solvent release were detected in groundwater in the tank vicinity (Well W9).	Comply with Federal tank requirements.

TABLE 8

Summary of Status and Recommended Actions
for Selected UST Systems

Tank I.D.	Contents	Installation Date	Capacity (Gallons)	Construction Material	FEDERAL REQUIREMENTS Leak(1) Detection By	Corrosion Protection By	Spill/(2) Overfill Protection By	Comments	Recommendations
405-1	JP-4	1952	50,000	Steel(3)	12/89	12/98	12/98	Suspected source of released petroleum product in the vicinity of the tank.	Replace ASAP. Assess extent of affected soil and groundwater.
405-2	JP-4	1952	50,000	Steel(3)	12/89	12/98	12/98	Suspected source of released petroleum product in the vicinity of the tank.	Replace ASAP. Assess extent of affected soill and groundwater.
405-3	JP-4	1952	50,000	Steel(3)	12/89	12/98	12/98	Suspected source of released petroleum product in the vicinity of the tank. Anomalous tightness testing results.	Retest tightness. Replace ASAP. Assess extent of affected soil and groundwater.
405-4	JP-4	1952	50,000	Steel(3)	12/89	12/98	12/98	Suspected source of released petroleum product in the vicinity of the tank. Anomalous tightness testing results.	Retest tightness. Replace ASAP. Assess extent of affected soil and groundwater.
419-1 (Fuel unloading piping)	JP-4	Unknown	NA	Steel(3)	12/90(1)	12/98	12/98	Suspected source of released petroleum product in the vicinity of piping.	Implement leak detection per Federal requirements ASAP. Replace or upgrade ASAP. Assess affected soil and groundwater.
1201-1(4)	Used Oil & Solvents	Unknown	3,000	Steel(3)	12/89	12/98	12/98	Failed tightness test. Suspected source of tetrachloroethene in Well W13. See Note 4, below.	Perform tank closure and assessment ASAP. Assess extent of affected groundwater.
401-1	Used Oil	1983	550	Coated Steel(3)	12/93	12/98	12/98	Suspected source of chlorinated hydrocarbons in groundwater in vicinity of the tank (Well W4).	Comply with Federal tank requirements. Assess extent of affected groundwater.
401-2	Used Oil	Unknown	250	Steel(3)	12/89	12/98	12/98	Suspected source of chlorinated hydrocarbons in groundwater in vicinity of the tank (Well W5). Stained soil was present around tank fill pipe.	Comply with Federal tank requirements. Assess extent of affected groundwater. Assess potentially affected soil near fill pipe. Upgrade filling system to prevent spillage.
409-2(4)	Used Oil & Solvents	1981	275	Coated Steel(3)	12/93	12/98	12/98	Suspected source of chlorinated hydrocarbons in groundwater in vicinity of the tank (Well W6). See Note, 4 below.	Comply with Federal tank requirements. Assess extent of affected groundwater.

TABLE 8
(continued)

Summary of Status and Recommended Actions
for Selected UST Systems

Tank I.D.	Contents	Installation Date	Capacity (Gallons)	Construction Material	FEDERAL REQUIREMENTS Leak(1) Detection By	Corrosion Protection By	Spill/(2) Overfill Protection By	Comments	Recommendations
403-2	Used Oil	Unknown	250	Unknown(3)	12/89	12/98	12/98	Tetrachloroethene was detected in groundwater in the vicinity of the tank (Well W7). This tank is reportedly out of service.	Perform tank closure and assessment ASAP.
Abandoned POL Transfer Line	Unknown	Unknown	Unknown	Unknown	NA	NA	NA	Closure status of pipeline is not known. Pipeline may contain residual fuel.	Examine the pipeline to assess the presence of residual fuel. Purge system and properly abandon if residual fuel is present. Assess the potential of the pipeline to serve as a conduit for released product and contaminated groundwater migration from POL tank area

TABLE 8
(continued)

Notes

1. Leak detection for pressurized product piping must begin by 12/22/90. Leak detection for suction product piping must begin on same schedule as leak detection for tanks.

2. Spill and overfill protection is not required by Federal regulations if the UST system is filled by transfers of no more than 25 gallons at one time (40 CFR Part 280(c)(2)(ii)).

3. For steel tanks installed ten or more years (from date of upgrade), internal inspection is required before cathodic protection can be selected and installed as corrosion protection.

4. Dependent upon the nature of the stored compounds, the used solvents tanks may be classified as hazardous waste systems and be subject to construction requirements and facility licensing requirements in Wisconsin Administrative Code Chapter s.NR 181.

5. Fiberglass construction meets Federal corrosion protection requirements.

KDS/vlr/MGC
[jkk-400-53]
15073-MD

APPENDIX A

Well Boring Logs

WARZYN

LOG OF TEST BORING

Project: Wisconsin Air National Guard

Location: Madison, Wisconsin

Boring No. W11
Surface Elevation 857.0
Job No. 15073.00
Sheet 1 of 1

ONE SCIENCE COURT · P.O. BOX 5385, MADISON, WIS. 53705 · TEL.(608) 273-0440

SAMPLE No.	TYPE	Rec (in.)	Moist	N	Depth	VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES qu (qa) (tsf)	HNu	Explosive Gas	Field VOC Water	Monoto
						Gray Clay FILL					
1		12	D	7				0.4			
						Black Sandy Silty Soil					
2		10	D	6				0.4			
3		16	D	6	5	Tan Brown Fine to Medium SAND (SW)		0.6			
4		14	W	5		Gray Medium to Coarse SAND, Some Gravel (SP)		0.7			
					10						
5		20	W	6		Gray Fine to Medium SAND (SW)		0.4			
					15						
						End Boring at 18'					
						PID background = 0.3 ppm					
					20						
					25						
					30						
					35						
					40						

WATER LEVEL OBSERVATIONS

While Drilling ▽ _____ Upon Completion of Drilling _____
Time After Drilling _____
Depth to Water _____ ▼
Depth to Cave in _____

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

GENERAL NOTES

Start 2/7/90 End 2/7/90
Driller E&F Chief GM Rig CME 75
Logger KDS Editor MCB
Drill Method 4 1/4" HSA

WARZYN

LOG OF TEST BORING

Project: Wisconsin Air National Guard

Location: Madison, Wisconsin

Boring No. W14
Surface Elevation 861.7
Job No. 15073.00
Sheet 1 of 1

ONE SCIENCE COURT · P.O. BOX 5385, MADISON, WIS. 53705 · TEL.(608) 273-0440

SAMPLE No.	TYPE	Rec (in.)	Moist	N	Depth	VISUAL CLASSIFICATION and Remarks	qu (qa) (tsf)	HNu	Explosive Gas	Field VOC Water	Monoto
						TOPSOIL					
1		16	D	10		Brown Silty CLAY (CL)		0.4			
2		16	D	6				0.4			
3			D	4	5	Reddish Brown Fine to Medium Silty SAND with Minor Clay from 5.2-6' (SM)		0.4			
4		18	D	5	10	Tan Fine SAND (SP)		3.5			
5		16	W	5		Tan Fine SAND (Minor Silt)		0.4			
					15	Tan Fine to Medium SAND with Minor Coarse Sand (SP)					
6		18	W	4	20	Tan Fine to Medium SAND (SP)		0.4			
					25	End Boring at 24'					
						PID background = 0.4 ppm					
					30						
					35						
					40						

WATER LEVEL OBSERVATIONS

While Drilling ▽ _____ Upon Completion of Drilling _____
Time After Drilling _____
Depth to Water _____ ▼
Depth to Cave in _____

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

GENERAL NOTES

Start 2/13/90 End 2/13/90
Driller E&F Chief GM Rig CME 75
Logger KDS Editor MCB
Drill Method 4 1/4" HSA

WARZYN

LOG OF TEST BORING

Project: Wisconsin Air National Guard

Location: Madison, Wisconsin

Boring No. W13
Surface Elevation 859.1
Job No. 15073.00
Sheet 1 of 1

ONE SCIENCE COURT · P.O. BOX 5385, MADISON, WIS. 53705 · TEL.(608) 273-0440

SAMPLE No.	TYPE	Rec (in.)	Moist	N	Depth	VISUAL CLASSIFICATION and Remarks	qu (qa) (tsf)	SOIL PROPERTIES HNu	Explosive Gas	Field VOC Water	Monoto
						Black TOPSOIL					
1		18	D	22		Brown to Tan Medium SAND with Clay, Some Gravel (SC)		0.5			
2		18	D	7	5			0.5			
3		18	D	10		Tan SAND & GRAVEL, Medium to Coarse Sand (GP)		0.5			
4		17	D	7	10	Tan Medium to Coarse SAND (SP)		0.5			
5		18	W	6	15	Tan Medium to Coarse SAND & GRAVEL (GP)		0.5			
6		18	W	4	20	Gray-Tan Fine to Coarse SAND (SW)		0.5			
						End Boring at 20'					
					25	PID background = 0.5 ppm					
					30						
					35						
					40						

WATER LEVEL OBSERVATIONS

While Drilling ▽ _____ Upon Completion of Drilling _____
Time After Drilling _____
Depth to Water _____ ▼
Depth to Cave in _____

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

GENERAL NOTES

Start 2/7/90 End 2/7/90
Driller E&F Chief GM Rig CME 75
Logger KDS Editor MCB
Drill Method 4 1/4" HSA

WARZYN

LOG OF TEST BORING

Project: Wisconsin Air National Guard

Location: Madison, Wisconsin

Boring No. W12
Surface Elevation 857.3
Job No. 15073.00
Sheet 1 of 1

ONE SCIENCE COURT · P.O. BOX 5385, MADISON, WIS. 53705 · TEL.(608) 273-0440

SAMPLE No.	TYPE	Rec (in.)	Moist	N	Depth	VISUAL CLASSIFICATION and Remarks	qu (qa) (tsf)	SOIL PROPERTIES HNu	Explosive Gas	Field VOC Water	Monoto
						Black TOPSOIL					
1		8	D	7		Black-Brown Clayey Silty SAND (SC)		0.5			
2			D	12	5	Tan Gray Fine SAND (SP)		1.0			
3			D	11		Tan Coarse to Fine SAND (SW)		0.5			
4		16	W	6	10			0.6			
5			W	4	15	Tan Medium to Coarse SAND with Gravel (SP)		0.5			
					20	End Boring at 16.8'					
						PID background = 0.5 ppm					
					25						
					30						
					35						
					40						

WATER LEVEL OBSERVATIONS

While Drilling ▽ _____ Upon Completion of Drilling _____
Time After Drilling _____
Depth to Water _____ ▼
Depth to Cave in _____

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

GENERAL NOTES

Start 2/7/90 End 2/7/90
Driller E&F Chief GM Rig CME 75
Logger KDS Editor MCB
Drill Method 4 1/4" HSA

WARZYN

LOG OF TEST BORING

Project: Wisconsin Air National Guard

Location: Madison, Wisconsin

Boring No. W1
Surface Elevation 858.3
Job No. 15073.00
Sheet 1 of 1

ONE SCIENCE COURT · P.O. BOX 5385, MADISON, WIS. 53705 · TEL.(608) 273-0440

SAMPLE No.	TYPE	Rec (in.)	Moist	N	Depth	VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES qu (qa) (tsf)	HNu	Explosive Gas	Field VOC Water	Monoto
						TOPSOIL					
1		18	D	10		Black Sandy Clay FILL/Gravel FILL		0.5			
2		18	D	10		Black Silty Clay & Sand FILL, Rubble, Gravel Fill		0.8			
3		18	D	9	5	Black Silty Clay		0.8			
						Tan Coarse SAND & GRAVEL (SP)					
4		10	D	5		Tan Loose, Medium to Coarse SAND & GRAVEL		0.5			
					10						
						Tan Silty Fine to Medium SAND (SM)					
5		18	W	6				0.6			
					15	SAND & GRAVEL (GW-SW)					
6			W					0.3			
					20						
						End Boring at 23'					
						PID background = 0.3 ppm					
					25						
					30						
					35						
					40						

WATER LEVEL OBSERVATIONS

While Drilling ▽ _____ Upon Completion of Drilling _____
Time After Drilling _____ _____ _____ _____
Depth to Water _____ _____ _____ _____ ▼
Depth to Cave in _____ _____ _____ _____

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

GENERAL NOTES

Start 2/9/90 End 2/9/90
Driller E&F Chief GM Rig CME 75
Logger KDS Editor MCB
Drill Method 4 1/4" HSA

WARZYN

LOG OF TEST BORING

Project: Wisconsin Air National Guard

Location: Madison, Wisconsin

Boring No. W2
Surface Elevation 861.6
Job No. 15073.00
Sheet 1 of 1

ONE SCIENCE COURT · P.O. BOX 5385, MADISON, WIS. 53705 · TEL.(608) 273-0440

SAMPLE No.	TYPE	Rec (in.)	Moist	N	Depth	VISUAL CLASSIFICATION and Remarks	qu (qa) (tsf)	HNu	Explosive Gas	Field VOC Water	Monoto
						Black TOPSOIL					
1		16	D	10		Sand & Gravel FILL		0.6			
2		18	D	9	5	Brown Sandy Silty Clay (CL)		0.4			
3		18	D	10		Gray Mottled with Brown Sandy Clay (CL)		0.8			
4		18	D	8	10	Tan/Light Brown Fine SAND (SP)		1.4			
5		17	D	9	15	Tan to Light Brown Fine SAND with Some Silt		3.0			
6			W	8	20	Light Brown Very Fine Silty SAND (SM)		2.0			
7			W	5	25	Light Brown CLAY (CL)		2.4			
						Silty Clayey SAND with Mixed Gravel					
					30	End Boring at 27'					
						PID background = 0.3 ppm					
					35						
					40						

WATER LEVEL OBSERVATIONS

While Drilling ▽ 14.0 Upon Completion of Drilling _____
Time After Drilling _____
Depth to Water _____ ▼
Depth to Cave in _____

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

GENERAL NOTES

Start 2/12/90 End 2/12/90
Driller E&F Chief GM Rig CME 75
Logger KDS Editor MCB
Drill Method 4 1/4" HSA

WARZYN

LOG OF TEST BORING

Project: Wisconsin Air National Guard

Location: Madison, Wisconsin

Boring No. W3
Surface Elevation 858.5
Job No. 15073.00
Sheet 1 of 1

ONE SCIENCE COURT · P.O. BOX 5385, MADISON, WIS. 53705 · TEL.(608) 273-0440

SAMPLE No.	TYPE	Rec (in.)	Moist	N	Depth	VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES qu (qa) (tsf)	HNu	Explosive Gas	Field VOC Water	Monoto
						TOPSOIL					
1	■	18	D	9		Dark Brown Silty Clay (CL)		0.5			
						Gray Clay (CL)					
2	■	18	D	8				0.6			
3	■	18	D	11	5	Brown/Orange Fine Silty SAND (SM)		0.5			
						Tan Fine Silty SAND (SM)					
4	■	18	D	10		Tan Fine Silty SAND		0.6			
					10						
5	■	18	W	2				0.4			
					15						
6	■	18	W	4		Siltier and Finer from 19.5-20'		0.6			
					20						
						End Boring at 23.5'					
						PID background = 0.3 ppm					
					25						
					30						
					35						
					40						

WATER LEVEL OBSERVATIONS

While Drilling ▽ _____ Upon Completion of Drilling _____
Time After Drilling _____
Depth to Water _____ ▼
Depth to Cave in _____

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

GENERAL NOTES

Start 2/9/90 End 2/9/90
Driller E&F Chief GM Rig CME 75
Logger KDS Editor MCB
Drill Method 4 1/4" HSA

WARZYN

LOG OF TEST BORING

Project: Wisconsin Air National Guard

Location: Madison, Wisconsin

Boring No. W4
Surface Elevation 859.0
Job No. 15073.00
Sheet 1 of 1

ONE SCIENCE COURT · P.O. BOX 5385, MADISON, WIS. 53705 · TEL.(608) 273-0440

SAMPLE No.	TYPE	Rec (in.)	Moist	N	Depth	VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES qu (qa) (tsf)	HNu	Explosive Gas	Field VOC Water	Monoto
						TOPSOIL					
1		18	D	7		FILL: Brown Silty Clay & Sand		1.4			
2		18	D	6				4.4			
3		18	D	5	5			4.0			
						Tan Fine to Medium SAND (SP)					
4		18	D/W	8		Tan Fine Silty SAND (SM)		2.5			
					10						
						Tan Fine to Medium SAND with Coarse Sand & Gravel (SP)					
5		18	W	5				1.8			
					15	Tan Silty Fine SAND with Orange-Brown Stain (SM)					
6		18	W	9		Tan/Brown Fine to Medium SAND with Minor Silt with Occasional Orange/Brown Stain (SW)		1.0			
					20						
						End Boring at 21'					
						PID background = 0.4 ppm					
					25						
					30						
					35						
					40						

WATER LEVEL OBSERVATIONS

While Drilling ▽ 9.8 Upon Completion of Drilling _____
Time After Drilling _____
Depth to Water _____ ▼
Depth to Cave in _____

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

GENERAL NOTES

Start 2/9/90 End 2/9/90
Driller E&F Chief GM Rig CME 75
Logger KDS Editor MCB
Drill Method 4 1/4" HSA

WARZYN

LOG OF TEST BORING

Project: Wisconsin Air National Guard

Location: Madison, Wisconsin

Boring No. W5
Surface Elevation 859.2
Job No. 15073.00
Sheet 1 of 1

ONE SCIENCE COURT · P.O. BOX 5385, MADISON, WIS. 53705 · TEL.(608) 273-0440

SAMPLE No.	TYPE	Rec (in.)	Moist	N	Depth	VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES qu (qa) (tsf)	HNu	Explosive Gas	Field VOC Water	Monoto
						Black Silty TOPSOIL					
1		18	D	8		Brown Silty Fine SAND with Gravel (FILL)		2.4			
2		15	D	9	5			0.6			
3		14	D	12		Tan Fine SAND (SP)		1.2			
4		18	D	10	10	Tan Fine SAND Grading to Fine to Medium Sand with Depth (SW)		1.2			
5			W	6	15	Light Brown Fine & Medium SAND (SP)		0.8			
6			W		20	Medium SAND & GRAVEL (GW)		0.5			
						Tan Fine SAND (Fining with Depth from 19-20')					
					25	End Boring at 23'					
						PID background = 0.3 ppm					
					30						
					35						
					40						

WATER LEVEL OBSERVATIONS

While Drilling ▽ _____ Upon Completion of Drilling _____
Time After Drilling _____ _____ _____ _____
Depth to Water _____ _____ _____ _____ ▼
Depth to Cave in _____ _____ _____ _____

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

GENERAL NOTES

Start 2/12/90 End 2/12/90
Driller E&F Chief GM Rig CME
Logger KDS Editor MCB 75
Drill Method 4 1/4" HSA

WARZYN

LOG OF TEST BORING

Project: Wisconsin Air National Guard

Location: Madison, Wisconsin

Boring No. W6
Surface Elevation 858.2
Job No. 15073.00
Sheet 1 of 1

ONE SCIENCE COURT · P.O. BOX 5385, MADISON, WIS. 53705 · TEL.(608) 273-0440

SAMPLE No.	TYPE	Rec (in.)	Moist	N	Depth	VISUAL CLASSIFICATION and Remarks	qu (qa) (tsf)	HNu	Explosive Gas	Field VOC Water	Monoto
						FILL: Road Gravel					
1		18	D	10		Brown Silty Fine SAND & GRAVEL to 1.5'		1.0			
2		2	D	7	5			0.8			
3		18	D	5		Tan to Light Brown Sand (SP)		0.4			
4		18	W	6	10	Light Brown Fine Silty SAND (SM)		0.3			
5		18	W	8	15	Gray Gravelly Fine & Medium SAND (SW)		0.6			
						End Boring at 17'					
					20	PID background = 0.3 ppm					
					25						
					30						
					35						
					40						

WATER LEVEL OBSERVATIONS

While Drilling ▽ _____ Upon Completion of Drilling _____
Time After Drilling _____ _____ _____ _____
Depth to Water _____ _____ _____ _____ ▼
Depth to Cave in _____ _____ _____ _____

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

GENERAL NOTES

Start 2/12/90 End 2/12/90
Driller E&F Chief GM Rig CME 75
Logger KDS Editor MCB
Drill Method 4 1/4" HSA

WARZYN

LOG OF TEST BORING

Project: Wisconsin Air National Guard

Location: Madison, Wisconsin

Boring No. W7
Surface Elevation 858.0
Job No. 15073.00
Sheet 1 of 1

ONE SCIENCE COURT · P.O. BOX 5385, MADISON, WIS. 53705 · TEL.(608) 273-0440

SAMPLE No.	TYPE	Rec (in.)	Moist	N	Depth	VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES qu (qa) (tsf)	HNu	Explosive Gas	Field VOC Water	Monoto
						Black TOPSOIL					
1		9	D	8		TOPSOIL Mixed with Fine Sand FILL and Sandy Black Clay		0.6			
2		12	D	7	5	Gray Silty CLAY Mottled with Brown (CL)		0.5			
3		12	D	12				1.4			
4		12	W	7	10	Tan Fine to Medium SAND with Minor Gravel (SP) Tan Fine to Medium SAND with Minor Coarse Sand (SP)		0.6			
5			W	14	15	Tan Fine SAND with Very Minor Coarse Sand, Trace Silt with Depth (SP)		0.9			
					20	End Boring at 18'					
						PID background = 0.4 ppm					
					25						
					30						
					35						
					40						

WATER LEVEL OBSERVATIONS

While Drilling ▽ _____ Upon Completion of Drilling _____
Time After Drilling _____ _____ _____ _____
Depth to Water _____ _____ _____ _____ ▼
Depth to Cave in _____ _____ _____ _____

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

GENERAL NOTES

Start 2/12/90 End 2/12/90
Driller E&F Chief GM Rig CME
Logger KDS Editor MCB 75
Drill Method 4 1/4" HSA

WARZYN

LOG OF TEST BORING

Project: Wisconsin Air National Guard

Location: Madison, Wisconsin

Boring No. W8
Surface Elevation 858.4
Job No. 15073.00
Sheet 1 of 1

ONE SCIENCE COURT · P.O. BOX 5385, MADISON, WIS. 53705 · TEL.(608) 273-0440

SAMPLE No.	TYPE	Rec (in.)	Moist	N	Depth	VISUAL CLASSIFICATION and Remarks	qu (qa) (tsf)	SOIL PROPERTIES HNu	Explosive Gas	Field VOC Water	Monoto
						Brown TOPSOIL					
1		16	D	18		Brown Clayey Sandy Soil					
						Gray Green Clay (CL)		10.0			
2		18	D	9				170.0			
3		12	D	10	5	Black Silty Clay (CL)		200.0			
						Green/Tan Silty Fine SAND (Strong Fuel Smell) (SM)					
4		18	D	5				100.0			
					10	Tan/Green Fine SAND (Strong Fuel Smell) (SP)					
						Tan Fine & Medium to Coarse SAND (SP) with Green Liquid Saturation at 9.5'					
5		18	W	5				18.0			
					15	Tan Fine SAND (SP)					
					20	Tan to Tan Gray Fine SAND, Some Silt					
6		18	W	5				10.0			
						End Boring at 22'					
					25	PID background = 0.4 ppm					
					30						
					35						
					40						

WATER LEVEL OBSERVATIONS

While Drilling ▽ 9.5 Upon Completion of Drilling _____
Time After Drilling _____
Depth to Water _____ ▼
Depth to Cave in _____

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

GENERAL NOTES

Start 2/8/90 End 2/8/90
Driller E&F Chief GM Rig CME 75
Logger KDS Editor MCB
Drill Method 4 1/4" HSA

WARZYN

LOG OF TEST BORING

Project: Wisconsin Air National Guard

Location: Madison, Wisconsin

Boring No. W9
Surface Elevation 856.7
Job No. 15073.00
Sheet 1 of 1

ONE SCIENCE COURT · P.O. BOX 5385, MADISON, WIS. 53705 · TEL.(608) 273-0440

SAMPLE No.	TYPE	Rec (in.)	Moist	N	Depth	VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES qu (qa) (tsf)	HNu	Explosive Gas	Field VOC Water	Monoto
						Black/Brown TOPSOIL					
1		12	D	15		Black Clayey Silt FILL		0.3			
						Tan Fine SAND (Uniform) (SW)					
2		18	D	8	5			0.6			
3		18	D	9		Yellow/Brown Fine to Medium SAND (SP)		0.9			
4		18	W	2	10	Gray Fine to Medium and Coarse SAND with Gravel (Fuel Smell) (SP)		1.2			
5		18	W	6	15			0.6			
					20	End Boring at 18.5'					
						PID background = 0.3 ppm					
					25						
					30						
					35						
					40						

WATER LEVEL OBSERVATIONS

While Drilling ▽ _____ Upon Completion of Drilling _____
Time After Drilling _____ _____ _____ _____
Depth to Water _____ _____ _____ _____ ▼
Depth to Cave in _____ _____ _____ _____

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

GENERAL NOTES

Start 2/8/90 End 2/8/90
Driller E&F Chief GM Rig CME 75
Logger KDS Editor MCB
Drill Method 4 1/4" HSA

WARZYN

LOG OF TEST BORING

Project: Wisconsin Air National Guard

Location: Madison, Wisconsin

Boring No. W10
Surface Elevation 857.5
Job No. 15073.00
Sheet 1 of 1

ONE SCIENCE COURT · P.O. BOX 5385, MADISON, WIS. 53705 · TEL.(608) 273-0440

SAMPLE No.	TYPE	Rec (in.)	Moist	N	Depth	VISUAL CLASSIFICATION and Remarks	qu (qa) (tsf)	SOIL PROPERTIES HNu	Explosive Gas	Field VOC Water	Monoto
						TOPSOIL Mixed with Gravel Fill					
1		18	D	5		Dark Brown Silty CLAY (CL) Black Silty CLAY		1.0			
2		18	D	4	5	Gray Silty Fine SAND (Fuel Smell) (SM)		7.0			
3		18	D	6		Gray Silty CLAY (CL)		190.0			
						Gray Medium SAND (Strong Fuel Smell) (SP)					
4			W	4	10	Gray Fine to Medium SAND (Occasional Gravel) (SP)		3.0			
						Gray Medium SAND, Minor Gravel (Fuel Smell) (SP)					
5			W	5	15			18.0			
					20	End Boring at 17.5'					
						PID background = 0.3 ppm					
					25						
					30						
					35						
					40						

WATER LEVEL OBSERVATIONS

While Drilling ▽ _____ Upon Completion of Drilling _____
Time After Drilling _____
Depth to Water _____ ▼
Depth to Cave in _____

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

GENERAL NOTES

Start 2/8/90 End 2/8/90
Driller E&F Chief GM Rig CME 75
Logger KDS Editor MCB
Drill Method 4 1/4" HSA

APPENDIX B

Well Construction Details and Well Development Documentation

Note

Wells W8 and W10 were not redeveloped by Warzyn, due to the presence of floating product.

ite of Wisconsin
partment of Natural Resources

MONITORING WELL CONSTRUCTION
Form 4400-113A 8-89

Facility/Project Name: Wisconsin Air National Guard
Facility License, Permit or Monitoring Number:
Grid Location: ft. ☐ N. ☐ S. / ft. ☐ E. ☐ W.
Well Name: W1
Wis. Unique Well Number: DNR Well Number:
Type of Well: Water Table Observation Well ☒ 11; Piezometer ☐ 12
Section Location: SW 1/4 of NE 1/4 of Section 29, T 8 N, R 10 ☒ E ☐ W
Date Well Installed: 02 / 09 / 90 (m m / d d / y y)
Distance Well Is From Waste/Source Boundary: ft. (from UST potential source)
Well Installed By: (Person's Name and Firm): Kevin Swanson; Warzyn Engineering Inc.
Well A Point of Enforcement Std. Application? ☒ Yes ☐ No
Location of Well Relative to Waste/Source: ☐ Upgradient ☒ Sidegradient ☒ Downgradient ☐ Not Known

A. Protective pipe, top elevation 860.46 ft. MSL
B. Well casing, top elevation 860.27 ft. MSL
C. Land surface elevation 858.3 ft. MSL
D. Surface seal, bottom 857.3 ft. MSL or 1.0 ft.

12. USCS classification of soil near screen:
☐ GP ☐ GM ☐ GC ☐ GW ☒ SW ☒ SP
☒ SM ☐ SC ☐ ML ☐ MH ☐ CL ☐ CH
☐ Bedrock

13. Sieve analysis attached? ☐ Yes ☒ No

Drilling method used: Rotary ☐ 50; Hollow Stem Auger ☒ 41; Other ☐

Drilling fluid used: Water ☐ 02; Air ☐ 01; Drilling Mud ☐ 03; None ☒ 99

Drilling additives used? ☐ Yes ☒ No

Describe

17. Source of water (attach analysis):

E. Bentonite seal, top 855.3 ft. MSL or 3.0 ft.
F. Fine sand, top NA ft. MSL or ft.
G. Filter pack, top 854.8 ft. MSL or 3.5 ft.
H. Well screen, top 852.8 ft. MSL or 5.5 ft.
I. Well screen, bottom 838.0 ft. MSL or 20.3 ft.
J. Filter pack, bottom 838.0 ft. MSL or 20.3 ft.
K. Borehole, bottom 835.3 ft. MSL or 23.0 ft.
L. Borehole, diameter 8.2 in.
M. O.D. well casing 2.38 in.
N. I.D. well casing 2.0 in.

1. Cap and lock? ☒ Yes ☐ No
2. Protective cover pipe:
a. Inside diameter: 3.9 in.
b. Length: 5.1 ft.
c. Material: Steel ☒ 04; Other ☐
d. Additional protection? ☐ Yes ☒ No
If yes, describe:
3. Surface seal: Bentonite ☐ 30; Concrete ☐ 01; Soil; Other ☒
4. Material between well casing and protective pipe: Bentonite ☐ 30; Annular space seal ☒; Other ☐
5. Annular space seal: Granular Bentonite ☒ 33; Bentonite-sand slurry ☐ 35; Bentonite slurry ☐ 31; Bentonite-cement grout ☐ 50
1.4 Ft³ volume added for any of the above
How installed: Tremie ☐ 01; Tremie pumped ☐ 02; Gravity ☒ 08
6. Bentonite seal: Bentonite granules ☐ 33; ☐1/4 in. ☐3/8 in. ☐1/2 in. Bentonite pellets ☒ 32; Other ☐
7. Fine sand material: Manufacturer, product name and mesh size: NA
Volume added ft³
8. Filter pack material: Manufacturer, product name and mesh size: Eau Claire #20 Flint Sanc
Volume added 5.3 ft³
9. Well casing: Flush threaded PVC schedule 40 ☒ 23; Flush threaded PVC schedule 80 ☐ 24; Other ☐
10. Screen material: Sch 40 PVC
Screen type: Factory cut ☒ 11; Continuous slot ☐ 01; Other ☐
Manufacturer: Northern Air
Slot size: 0.010 in.
Slotted length: 14.8 ft.
11. Backfill material (below filter pack): None ☐; Natural Collapse; Other ☒

I hereby certify that the information on this form is true and correct to the best of my knowledge.
Signature
Firm: Warzyn Engineering Inc.

Please complete and return both sides of this form as required by chs. 144, 147 and 160, Wis. Stats., and ch. NR 141, Wis. Adm. Code. In accordance with s. 144, Wis Stats., failure to file this form may result in a forfeiture of not less than $10, nor more than $5,000 for each day of violation. In accordance with ch. 147, Wis. Stats., failure to file this form may result in a forfeiture of not more than $10,000 for each day of violation.

State of Wisconsin
Department of Natural Resources

MONITORING WELL DEVELOPMENT

Form 4400-113B 8-89

Facility/Project Name: Wisconsin Air National Guard 15073

Well Name: W1

License, Permit or Monitoring Number:

Wis. Unique Well Number:

DNR Well Number:

		Before Development	After Development
1. Can this well be purged dry?	☐ Yes ☒ No		
Well development method			
surged with bailer and bailed	☐ 41		
surged with bailer and pumped	☒ 61		
surged with block and bailed	☐ 42		
surged with block and pumped	☐ 62		
surged with block, bailed and pumped	☐ 70		
compressed air	☐ 20		
bailed only	☐ 10		
pumped only	☐ 51		
pumped slowly	☐ 50		
Other _____	☐ ___		
3. Time spent developing well	35 min.		
4. Depth of well (from top of well casisng)	22.0 ft.		
5. Inside diameter of well	2.00 in.		
6. Volume of water in filter pack and well casing	9.0 gal.		
7. Volume of water removed from well	100.0 gal.		
8. Volume of water added (if any)	0.0 gal.		
9. Source of water added	None		
10. Analysis performed on water added? (If yes, attach results)	☐ Yes ☐ No		
11. Depth to Water (from top of well casing)		12.72 ft.	12.80 ft.
Date		03/26/90 (m m d d y y)	03/26/90 (m m d d y y)
Time		11:05 ☒ a.m. ☐ p.m.	11:40 ☒ a.m. ☐ p.m.
12. Sediment in well bottom		0.0 inches	0.0 inches
13. Water clarity		Clear ☐ 10 Turbid ☒ 15 (Describe) very	Clear ☒ 20 Turbid ☐ 25 (Describe)
Fill in if drilling fluids were used and well is at solid waste facility:			
14. Total suspended solids		____.__ mg/l	____.__ mg/l
15. COD		____.__ mg/l	____.__ mg/l

Additional comments on development:

Well developed by: Person's Name and Firm

Name: William Bachus

Firm: Warzyn Engineering Inc.

I hereby certify that the above information is true and correct to the best of my knowledge.

Signature: _____

Firm: _____

NOTE: Shaded areas are for DNR use only. See instructions for more information.

e of Wisconsin
artment of Natural Resources

MONITORING WELL CONSTRUCTION
Form 4400-113A 8-89

acility/Project Name: Wisconsin Air National Guard
lity License, Permit or Monitoring Number:

Grid Location: ft. N. S. / ft. E. W.

Well Name: W2
Wis. Unique Well Number: DNR Well Number:

ype of Well: Water Table Observation Well 11 / Piezometer 12

Section Location: SW 1/4 of NE 1/4 of Section 29, T 8 N, R 10 E W

Date Well Installed: 02 / 09 / 90 (m m / d d / y y)

ance Well Is From Waste/Source Boundary: ft (from UST potential source)

Well Installed By: (Person's Name and Firm)
Kevin Swanson
Warzyn Engineering Inc.

Well A Point of Enforcement Std. Application? Yes No

Location of Well Relative to Waste/Source: Upgradient / Sidegradient / Downgradient / Not Known

. Protective pipe, top elevation 863.49 ft. MSL
Well casing, top elevation 863.34 ft. MSL
. Land surface elevation 861.6 ft. MSL
urface seal, bottom 860.6 ft. MSL or 1.0 ft.

. USCS classification of soil near screen:
GP GM GC GW SW SP
SM SC ML MH CL CH
Bedrock

3. Sieve analysis attached? Yes No

. Drilling method used: Rotary 50 / Hollow Stem Auger 41 / Other

. Drilling fluid used: Water 02 / Air 01 / Drilling Mud 03 / None 99

Drilling additives used? Yes No

Describe

7 Source of water (attach analysis):

. entonite seal, top 855.1 ft. MSL or 6.5 ft.
Fine sand, top NA ft. MSL or ft.
. ilter pack, top 854.6 ft. MSL or 7.0 ft.
. Well screen, top 852.5 ft. MSL or 9.1 ft.
Well screen, bottom 837.8 ft. MSL or 23.8 ft.
ilter pack, bottom 837.8 ft. MSL or 23.8 ft.
. Borehole, bottom 834.6 ft. MSL or 27.0 ft.
. orehole, diameter 8.2 in.
O.D. well casing 2.38 in.
. I.D. well casing 2.0 in.

1. Cap and lock? Yes No
2. Protective cover pipe:
a. Inside diameter: 3.9 in.
b. Length: 5.1 ft.
c. Material: Steel 04 / Other
d. Additional protection? Yes No
If yes, describe:
3. Surface seal: Bentonite 30 / Concrete 01 / Soil / Other
4. Material between well casing and protective pipe: Bentonite 30 / Annular space seal / Other
5. Annular space seal: Granular Bentonite 33 / Lbs/gal mud weight . . . Bentonite-sand slurry 35 / Lbs/gal mud weight . . . . . Bentonite slurry 31 / % Bentonite . . . . . Bentonite-cement grout 50
1.4 Ft^3 volume added for any of the above
How installed: Tremie 01 / Tremie pumped 02 / Gravity 08
6. Bentonite seal: Bentonite granules 33 / 1/4 in. 3/8 in. 1/2 in. Bentonite pellets 32 / Other
7. Fine sand material: Manufacturer, product name and mesh size
NA
Volume added ft^3
8. Filter pack material: Manufacturer, product name and mesh size
Eau Claire #20 Flint Sand
Volume added 3.7 ft^3
9. Well casing: Flush threaded PVC schedule 40 23 / Flush threaded PVC schedule 80 24 / Other
10. Screen material: Sch 40 PVC
Screen type: Factory cut 11 / Continuous slot 01 / Other
Manufacturer Northern Air
Slot size: 0.010 in.
Slotted length: 14.7 ft.
11. Backfill material (below filter pack): None / Other
Natural Collapse

reby certify that the information on this form is true and correct to the best of my knowledge.

ignature

Firm: Warzyn Engineering Inc.

se complete and return both sides of this form as required by chs. 144, 147 and 160, Wis. Stats., and ch. NR 141, Wis. Adm. Code. In accordance with 144, Wis Stats., failure to file this form may result in a forfeiture of not less than $10, nor more than $5,000 for each day of violation. In accordance

State of Wisconsin
Department of Natural Resources

MONITORING WELL DEVELOPMENT
Form 4400-113B 8-89

Facility/Project Name: Wisconsin Air National Guard 15073

License, Permit or Monitoring Number: _____

Well Name: W2

Wis. Unique Well Number: _____ DNR Well Number: _____

1. Can this well be purged dry? ☒ Yes ☐ No

2. Well development method

surged with bailer and bailed	☐	4 1
surged with bailer and pumped	☐	6 1
surged with block and bailed	☐	4 2
surged with block and pumped	☐	6 2
surged with block, bailed and pumped	☐	7 0
compressed air	☐	2 0
bailed only	☒	1 0
pumped only	☐	5 1
pumped slowly	☐	5 0
Other _____	☐	

3. Time spent developing well: 55 min.

4. Depth of well (from top of well casisng): 26.0 ft.

5. Inside diameter of well: 2.00 in.

6. Volume of water in filter pack and well casing: 9.3 gal.

7. Volume of water removed from well: 15.0 gal.

8. Volume of water added (if any): 0.0 gal.

9. Source of water added: None

10. Analysis performed on water added? ☐ Yes ☐ No
(If yes, attach results)

	Before Development	After Development
11. Depth to Water (from top of well casing)	15.67 ft.	25.23 ft.
Date	03/26/90 (m m d d y y)	03/26/90 (m m d d y y)
Time	11:05 ☒ a.m. ☐ p.m.	12:00 ☐ a.m. ☒ p.m.
12. Sediment in well bottom	0.0 inches	0.0 inches
13. Water clarity	Clear ☐ 10 Turbid ☒ 15 (Describe) very	Clear ☐ 20 Turbid ☒ 25 (Describe) slight

Fill in if drilling fluids were used and well is at solid waste facility:

14. Total suspended solids	_____ mg/l	_____ mg/l
15. COD	_____ mg/l	_____ mg/l

Additional comments on development:
The well dried up after removing 3 gal with a bailer. The well was bailed dry and allowed to recharge 5 times.

Well developed by: Person's Name and Firm

Name: William Bachus

Firm: Warzyn Engineering Inc.

I hereby certify that the above information is true and correct to the best of my knowledge.

Signature: _____

Firm: _____

NOTE: Shaded areas are for DNR use only. See instructions for more information.

e of Wisconsin
artment of Natural Resources

MONITORING WELL CONSTRUCTION
Form 4400-113A 8-89

acility/Project Name: Wisconsin Air National Guard
ility License, Permit or Monitoring Number:

Grid Location: ft. N. S. / ft. E. W.

Well Name: W3
Wis. Unique Well Number: DNR Well Number:

ype of Well: Water Table Observation Well 11 / Piezometer 12

Section Location: SW 1/4 of NE 1/4 of Section 29, T 8 N, R 10 E W

Date Well Installed: 02/09/90

ance Well Is From Waste/Source Boundary: 2 ft(from UST potential source)

Well Installed By: (Person's Name and Firm): Kevin Swanson / Warzyn Engineering Inc.

Vell A Point of Enforcement Std. Application? Yes / No

Location of Well Relative to Waste/Source: Upgradient / Sidegradient / Downgradient / Not Known

. Protective pipe, top elevation 860.65 ft. MSL
Well casing, top elevation 860.44 ft. MSL
. Land surface elevation 858.5 ft. MSL
urface seal, bottom 857.5 ft. MSL or 1.0 ft.

12. USCS classification of soil near screen:
GP GM GC GW SW SP
SM SC ML MH CL CH
Bedrock

13. Sieve analysis attached? Yes / No

Drilling method used: Rotary 50 / Hollow Stem Auger 41 / Other

Drilling fluid used: Water 02 / Air 01 / Drilling Mud 03 / None 99

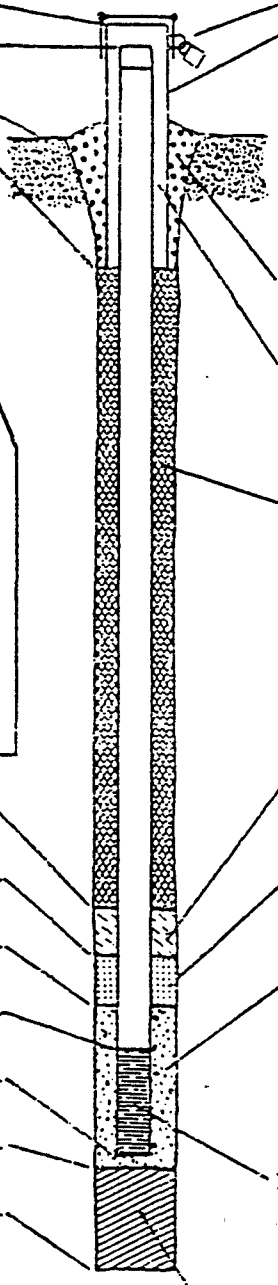
Drilling additives used? Yes / No

Describe

Source of water (attach analysis):

entonite seal, top 854.0 ft. MSL or 4.5 ft.
. Fine sand, top NA ft. MSL or ft.
ilter pack, top 853.2 ft. MSL or 5.3 ft.
Well screen, top 850.9 ft. MSL or 7.6 ft.
Well screen, bottom 836.1 ft. MSL or 22.4 ft.
ilter pack, bottom 836.1 ft. MSL or 22.4 ft.
. Borehole, bottom 835.0 ft. MSL or 23.5 ft.

. Borehole, diameter 8.2 in.
O.D. well casing 2.38 in.
I.D. well casing 2.0 in.



1. Cap and lock? Yes / No
2. Protective cover pipe:
a. Inside diameter: 3.9 in.
b. Length: 5.1 ft.
c. Material: Steel 04 / Other
d. Additional protection? Yes / No
If yes, describe:
3. Surface seal: Bentonite 30 / Concrete 01 / Soil / Other
4. Material between well casing and protective pipe: Bentonite 30 / Annular space seal / Other
5. Annular space seal: Granular Bentonite 33 / Lbs/gal mud weight ... Bentonite-sand slurry 35 / Lbs/gal mud weight ..... Bentonite slurry 31 / % Bentonite .... Bentonite-cement grout 50
1.1 Ft³ volume added for any of the above
How installed: Tremie 01 / Tremie pumped 02 / Gravity 08
6. Bentonite seal: Bentonite granules 33 / 1/4 in. 3/8 in. 1/2 in. Bentonite pellets 32 / Other
7. Fine sand material: Manufacturer, product name and mesh size
NA
Volume added ft³
8. Filter pack material: Manufacturer, product name and mesh size
Eau Claire #20 Flint Sand
Volume added 4.2 ft³
9. Well casing: Flush threaded PVC schedule 40 23 / Flush threaded PVC schedule 80 24 / Other
10. Screen material: Sch 40 PVC
Screen type: Factory cut 11 / Continuous slot 01 / Other
Manufacturer Northern Air
Slot size: 0.010 in.
Slotted length: 14.8 ft.
11. Backfill material (below filter pack): None / Natural Collapse / Other

ereby certify that the information on this form is true and correct to the best of my knowledge.

ignature | Firm: Warzyn Engineering Inc.

se complete and return both sides of this form as required by chs. 144, 147 and 160, Wis. Stats., and ch. NR 141, Wis. Adm. Code. In accordance with
. 144, Wis Stats., failure to file this form may result in a forfeiture of not less than $10, nor more than $5,000 for each day of violation. In accordance

State of Wisconsin
Department of Natural Resources

MONITORING WELL DEVELOPMENT
Form 4400-113B 8-89

Facility/Project Name: Wisconsin Air National Guard 15073
License, Permit or Monitoring Number: _____
Well Name: W3
Wis. Unique Well Number: _____ DNR Well Number: _____

1. Can this well be purged dry? ☐ Yes ☒ No

2. Well development method

surged with bailer and bailed	☐	41
surged with bailer and pumped	☒	61
surged with block and bailed	☐	42
surged with block and pumped	☐	62
surged with block, bailed and pumped	☐	70
compressed air	☐	20
bailed only	☐	10
pumped only	☐	51
pumped slowly	☐	50
Other _____	☐	

3. Time spent developing well: 45 min.
4. Depth of well (from top of well casisng): 23.5 ft.
5. Inside diameter of well: 2.00 in.
6. Volume of water in filter pack and well casing: 9.0 gal.
7. Volume of water removed from well: 90.0 gal.
8. Volume of water added (if any): 0.0 gal.
9. Source of water added: None
10. Analysis performed on water added? ☐ Yes ☐ No (If yes, attach results)

	Before Development	After Development
11. Depth to Water (from top of well casing)	12.81 ft.	12.90 ft.
Date	03/26/90 (m m d d y y)	03/26/90 (m m d d y y)
Time	11:10 ☒ a.m. ☐ p.m.	11:55 ☒ a.m. ☐ p.m.
12. Sediment in well bottom	0.0 inches	0.0 inches
13. Water clarity	Clear ☐ 10 Turbid ☒ 15 (Describe) very	Clear ☒ 20 Turbid ☐ 25 (Describe)
Fill in if drilling fluids were used and well is at solid waste facility:		
14. Total suspended solids	____.__ mg/l	____.__ mg/l
15. COD	____.__ mg/l	____.__ mg/l

Additional comments on development:

Well developed by: Person's Name and Firm

Name: William Bachus
Firm: Warzyn Engineering Inc.

I hereby certify that the above information is true and correct to the best of my knowledge.

Signature: _____
Firm: _____

NOTE: Shaded areas are for DNR use only. See instructions for more information.

e of Wisconsin
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MONITORING WELL CONSTRUCTION
Form 4400-113A 8-89

Facility/Project Name: Wisconsin Air National Guard
Facility License, Permit or Monitoring Number: _____

Grid Location: _____ ft. ☐ N. ☐ S. _____ ft. ☐ E. ☐ W.

Well Name: W4
Wis. Unique Well Number: _____ DNR Well Number: _____

Type of Well: Water Table Observation Well ☒ 11; Piezometer ☐ 12

Section Location: NW 1/4 of NE 1/4 of Section 29, T 8 N, R 10 ☒ E ☐ W

Date Well Installed: 02 / 09 / 90 (m m / d d / y y)

Distance Well Is From Waste/Source Boundary: 0 ft (from UST potential source)

Well A Point of Enforcement Std. Application? ☒ Yes ☐ No

Location of Well Relative to Waste/Source: ☐ Upgradient ☒ Sidegradient ☐ Downgradient ☐ Not Known

Well Installed By: (Person's Name and Firm)
Kevin Swanson
Warzyn Engineering Inc.

A. Protective pipe, top elevation: 861.48 ft. MSL
B. Well casing, top elevation: 861.28 ft. MSL
C. Land surface elevation: 859.0 ft. MSL
D. Surface seal, bottom: _____ ft. MSL or 1.0 ft.
12. USCS classification of soil near screen:
☐ GP ☐ GM ☐ GC ☐ GW ☐ SW ☒ SP
☒ SM ☐ SC ☐ ML ☐ MH ☐ CL ☐ CH
☐ Bedrock
13. Sieve analysis attached? ☐ Yes ☒ No
1 Drilling method used: Rotary ☐ 50; Hollow Stem Auger ☒ 41; Other ☐ ___
1 Drilling fluid used: Water ☐ 02; Air ☐ 01; Drilling Mud ☐ 03; None ☒ 99
1 Drilling additives used? ☐ Yes ☒ No
Describe _____
1 Source of water (attach analysis):

E. Bentonite seal, top: 856.0 ft. MSL or 3.0 ft.
F. Fine sand, top: NA ft. MSL or _____ ft.
G. Filter pack, top: 855.5 ft. MSL or 3.5 ft.
H. Well screen, top: 854.6 ft. MSL or 4.4 ft.
I. Well screen, bottom: 839.8 ft. MSL or 19.2 ft.
J. Filter pack, bottom: 839.8 ft. MSL or 19.2 ft.
K. Borehole, bottom: 838.0 ft. MSL or 21.0 ft.
L. Borehole, diameter: 8.2 in.
M. O.D. well casing: 2.38 in.
N. I.D. well casing: 2.0 in.

1. Cap and lock? ☒ Yes ☐ No
2. Protective cover pipe:
a. Inside diameter: 3.9 in.
b. Length: 5.1 ft.
c. Material: Steel ☒ 04; Other ☐ ___
d. Additional protection? ☐ Yes ☒ No
If yes, describe: _____
3. Surface seal: Bentonite ☐ 30; Concrete ☐ 01; Soil; Other ☒ ___
4. Material between well casing and protective pipe: Bentonite ☐ 30; Annular space seal ☒; Other ☐ ___
5. Annular space seal: Granular Bentonite ☒ 33; _____ Lbs/gal mud weight ... Bentonite-sand slurry ☐ 35; _____ Lbs/gal mud weight ..... Bentonite slurry ☐ 31; _____ % Bentonite .... Bentonite-cement grout ☐ 50; 0.7 Ft³ volume added for any of the above
How installed: Tremie ☐ 01; Tremie pumped ☐ 02; Gravity ☒ 08
6. Bentonite seal: Bentonite granules ☐ 33; ☐ 1/4 in. ☐ 3/8 in. ☐ 1/2 in. Bentonite pellets ☒ 32; Other ☐ ___
7. Fine sand material: Manufacturer, product name and mesh size: NA
Volume added _____ ft³
8. Filter pack material: Manufacturer, product name and mesh size: Eau Claire #20 Flint Sand
Volume added 4.2 ft³
9. Well casing: Flush threaded PVC schedule 40 ☒ 23; Flush threaded PVC schedule 80 ☐ 24; Other ☐ ___
10. Screen material: Sch 40 PVC
Screen type: Factory cut ☒ 11; Continuous slot ☐ 01; Other ☐ ___
Manufacturer: Northern Air
Slot size: 0.010 in.
Slotted length: 14.8 ft.
11. Backfill material (below filter pack): None ☐; Natural Collapse; Other ☒

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature | Firm: Warzyn Engineering Inc.

Please complete and return both sides of this form as required by chs. 144, 147 and 160, Wis. Stats., and ch. NR 141, Wis. Adm. Code. In accordance with ch. 144, Wis Stats., failure to file this form may result in a forfeiture of not less than $10, nor more than $5,000 for each day of violation. In accordance

State of Wisconsin
Department of Natural Resources

MONITORING WELL DEVELOPMENT
Form 4400-113B 8-89

Facility/Project Name: Wisconsin Air National Guard 15073
Well Name: W4
License, Permit or Monitoring Number:
Wis. Unique Well Number:
DNR Well Number:

		Before Development	After Development
1. Can this well be purged dry?	☐ Yes ☒ No		
2. Well development method			
surged with bailer and bailed	☐ 41		
surged with bailer and pumped	☒ 61		
surged with block and bailed	☐ 42		
surged with block and pumped	☐ 62		
surged with block, bailed and pumped	☐ 70		
compressed air	☐ 20		
bailed only	☐ 10		
pumped only	☐ 51		
pumped slowly	☐ 50		
Other	☐		
3. Time spent developing well	40 min.		
4. Depth of well (from top of well casisng)	21.0 ft.		
5. Inside diameter of well	2.00 in.		
6. Volume of water in filter pack and well casing	7.5 gal.		
7. Volume of water removed from well	75.0 gal.		
8. Volume of water added (if any)	0.0 gal.		
9. Source of water added	None		
10. Analysis performed on water added? (If yes, attach results)	☐ Yes ☐ No		
11. Depth to Water (from top of well casing)		12.69 ft.	12.71 ft.
Date		03/26/90 mm dd yy	03/26/90 mm dd yy
Time		2:00 ☐ a.m. ☒ p.m.	2:40 ☐ a.m. ☒ p.m.
12. Sediment in well bottom		0.0 inches	0.0 inches
13. Water clarity		Clear ☐ 10 Turbid ☒ 15 (Describe) very	Clear ☒ 20 Turbid ☐ 25 (Describe)
Fill in if drilling fluids were used and well is at solid waste facility:			
14. Total suspended solids		____.__ mg/l	____.__ mg/l
15. COD		____.__ mg/l	____.__ mg/l

Additional comments on development:

Well developed by: Person's Name and Firm

Name: William Bachus

Firm: Warzyn Engineering, Inc.

I hereby certify that the above information is true and correct to the best of my knowledge.

Signature:

Firm:

NOTE: Shaded areas are for DNR use only. See instructions for more information.

State of Wisconsin
Department of Natural Resources

15073

MONITORING WELL DEVELOPMENT

Form 4400-113B 8-89

Facility/Project Name: Wisconsin Air National Guard

Well Name: W5

License, Permit or Monitoring Number: _____

Wis. Unique Well Number: _____ DNR Well Number: _____

1. Can this well be purged dry? ☐ Yes ☒ No

2. Well development method

surged with bailer and bailed	☐	4 1
surged with bailer and pumped	☒	6 1
surged with block and bailed	☐	4 2
surged with block and pumped	☐	6 2
surged with block, bailed and pumped	☐	7 0
compressed air	☐	2 0
bailed only	☐	1 0
pumped only	☐	5 1
pumped slowly	☐	5 0
Other _____	☐	

3. Time spent developing well: 70 min.

4. Depth of well (from top of well casisng): 23.4 ft.

5. Inside diameter of well: 2.00 in.

6. Volume of water in filter pack and well casing: 9.8 gal.

7. Volume of water removed from well: 100.0 gal.

8. Volume of water added (if any): 0.0 gal.

9. Source of water added: None

10. Analysis performed on water added? ☐ Yes ☐ No
(If yes, attach results)

	Before Development	After Development
11. Depth to Water (from top of well casing)	12.47 ft.	12.83 ft.
Date	03/26/90 (m m d d y y)	03/26/90 (m m d d y y)
Time	12:40 ☐ a.m. ☒ p.m.	1:50 ☐ a.m. ☒ p.m.
12. Sediment in well bottom	0.0 inches	0.0 inches
13. Water clarity	Clear ☐ 10 Turbid ☒ 15 (Describe) very	Clear ☒ 20 Turbid ☐ 25 (Describe)
Fill in if drilling fluids were used and well is at solid waste facility:		
14. Total suspended solids	_____.__ mg/l	_____.__ mg/l
15. COD	_____.__ mg/l	_____.__ mg/l

Additional comments on development:

Well developed by: Person's Name and Firm

Name: William Bachus

Firm: Warzyn Engineering Inc.

I hereby certify that the above information is true and correct to the best of my knowledge.

Signature: _____

Firm: _____

NOTE: Shaded areas are for DNR use only. See instructions for more information.

Wisconsin
Department of Natural Resources

MONITORING WELL CONSTRUCTION
Form 4400-113A 8-89

Facility/Project Name: Wisconsin Air National Guard
Facility License, Permit or Monitoring Number:
Grid Location: ft. N. S. / ft. E. W.
Well Name: W5
Wis. Unique Well Number: DNR Well Number:
Type of Well: Water Table Observation Well 11 / Piezometer 12
Section Location: NW 1/4 of NE 1/4 of Section 29, T 8 N, R 10 E W
Date Well Installed: 02 / 12 / 90 (m m / d d / y y)
Distance Well Is From Waste/Source Boundary: ft. (from UST potential source)
Is A Point of Enforcement Std. Application? Yes No
Location of Well Relative to Waste/Source: Upgradient, Sidegradient, Downgradient, Not Known
Well Installed By: (Person's Name and Firm): Kevin Swanson / Warzyn Engineering Inc.

A. Protective pipe, top elevation: 861.29 ft. MSL
B. Well casing, top elevation: 861.09 ft. MSL
C. Land surface elevation: 859.2 ft. MSL
D. Surface seal, bottom: 858.2 ft. MSL or 1.0 ft.

12. USCS classification of soil near screen:
GP GM GC GW SW SP
SM SC ML MH CL CH
Bedrock

13. Sieve analysis attached? Yes No

14. Drilling method used: Rotary 50, Hollow Stem Auger 41, Other

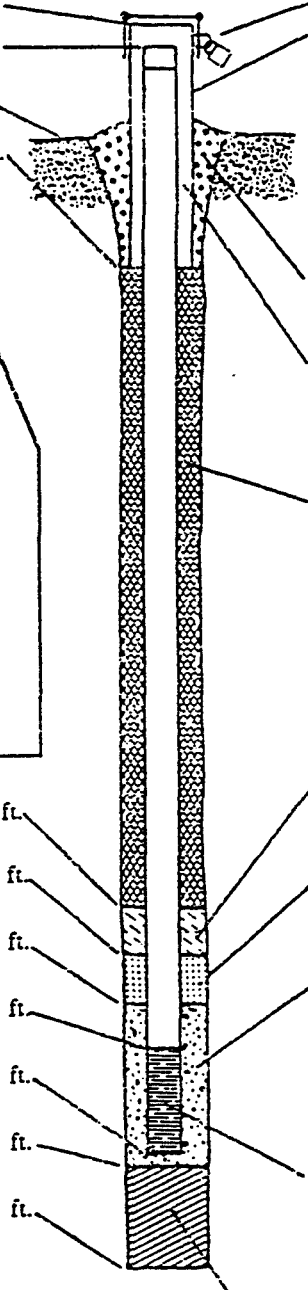
15. Drilling fluid used: Water 02, Air 01, Drilling Mud 03, None 99

16. Drilling additives used? Yes No

Describe

17. Source of water (attach analysis):

E. Bentonite seal, top: 855.7 ft. MSL or 3.5 ft.
F. Fine sand, top: NA ft. MSL or ft.
G. Filter pack, top: 855.2 ft. MSL or 4.0 ft.
H. Well screen, top: 852.8 ft. MSL or 6.4 ft.
I. Well screen, bottom: 838.7 ft. MSL or 20.5 ft.
J. Filter pack, bottom: 837.8 ft. MSL or 21.4 ft.
K. Borehole, bottom: 836.2 ft. MSL or 23.0 ft.
L. Borehole, diameter: 8.2 in.
M. O.D. well casing: 2.38 in.
N. I.D. well casing: 2.0 in.



1. Cap and lock? Yes No
2. Protective cover pipe:
a. Inside diameter: 3.9 in.
b. Length: 5.1 ft.
c. Material: Steel 04, Other
d. Additional protection? Yes No
If yes, describe:
3. Surface seal: Bentonite 30, Concrete 01, Other: Soil
4. Material between well casing and protective pipe: Bentonite 30, Annular space seal, Other
5. Annular space seal: Granular Bentonite 33, Lbs/gal mud weight ... Bentonite-sand slurry 35, Lbs/gal mud weight ..... Bentonite slurry 31, % Bentonite .... Bentonite-cement grout 50
0.7 Ft³ volume added for any of the above
How installed: Tremie 01, Tremie pumped 02, Gravity 08
6. Bentonite seal: Bentonite granules 33, 1/4 in. 3/8 in. 1/2 in. Bentonite pellets 32, Other
7. Fine sand material: Manufacturer, product name and mesh size: NA
Volume added ft³
8. Filter pack material: Manufacturer, product name and mesh size: Eau Claire #20 Flint Sand
Volume added 4.2 ft³
9. Well casing: Flush threaded PVC schedule 40 23, Flush threaded PVC schedule 80 24, Other
10. Screen material: Sch 40 PVC
Screen type: Factory cut 11, Continuous slot 01, Other
Manufacturer: Northern Air
Slot size: 0.010 in.
Slotted length: 15.0 ft.
11. Backfill material (below filter pack): None, Other: Natural Collapse

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature | Firm: Warzyn Engineering Inc.

Please complete and return both sides of this form as required by chs. 144, 147 and 160, Wis. Stats., and ch. NR 141, Wis. Adm. Code. In accordance with 144, Wis. Stats., failure to file this form may result in a forfeiture of not less than $10, nor more than $5,000 for each day of violation. In accordance

State of Wisconsin
Department of Natural Resources

MONITORING WELL DEVELOPMENT
Form 4400-113B 8-89

15073

Facility/Project Name: Wisconsin Air National Guard

Well Name: W6

License, Permit or Monitoring Number: _____

Wis. Unique Well Number: _____ DNR Well Number: _____

1. Can this well be purged dry? ☐ Yes ☒ No

2. Well development method

surged with bailer and bailed	☐	4 1
surged with bailer and pumped	☒	6 1
surged with block and bailed	☐	4 2
surged with block and pumped	☐	6 2
surged with block, bailed and pumped	☐	7 0
compressed air	☐	2 0
bailed only	☐	1 0
pumped only	☐	5 1
pumped slowly	☐	5 0
Other _____	☐	

3. Time spent developing well: 50 min.

4. Depth of well (from top of well casisng): 150.0 ft.

5. Inside diameter of well: 2.00 in.

6. Volume of water in filter pack and well casing: 5.2 gal.

7. Volume of water removed from well: 55.0 gal.

8. Volume of water added (if any): 0.0 gal.

9. Source of water added: None

10. Analysis performed on water added? ☐ Yes ☐ No
(If yes, attach results)

	Before Development	After Development
11. Depth to Water (from top of well casing)	9.16 ft.	9.49 ft.
Date	03/26/90 (m m d d y y)	03/26/90 (m m d d y y)
Time	12:40 ☐ a.m. ☒ p.m.	1:30 ☐ a.m. ☒ p.m.
12. Sediment in well bottom	0.0 inches	0.0 inches
13. Water clarity	Clear ☐ 10 Turbid ☒ 15 (Describe) very	Clear ☒ 20 Turbid ☐ 25 (Describe)
Fill in if drilling fluids were used and well is at solid waste facility:		
14. Total suspended solids	____.__ mg/l	____.__ mg/l
15. COD	____.__ mg/l	____.__ mg/l

Additional comments on development:

Well developed by: Person's Name and Firm

Name: William Bachus

Firm: Warzyn Engineering Inc.

I hereby certify that the above information is true and correct to the best of my knowledge.

Signature: _____

Firm: _____

NOTE: Shaded areas are for DNR use only. See instructions for more information.

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MONITORING WELL CONSTRUCTION
Form 4400-113A 8-89

acility/Project Name: consin Air National Guard
y License, Permit or Monitoring Number:

Grid Location: ft. ☐ N. ☐ S. / ft. ☐ E. ☐ W.

Well Name: W7
Wis. Unique Well Number: DNR Well Number:

f Well: Water Table Observation Well ☒ 11; Piezometer ☐ 12

Section Location: NW 1/4 of NE 1/4 of Section 29, T 8 N, R 10 ☒ E ☐ W

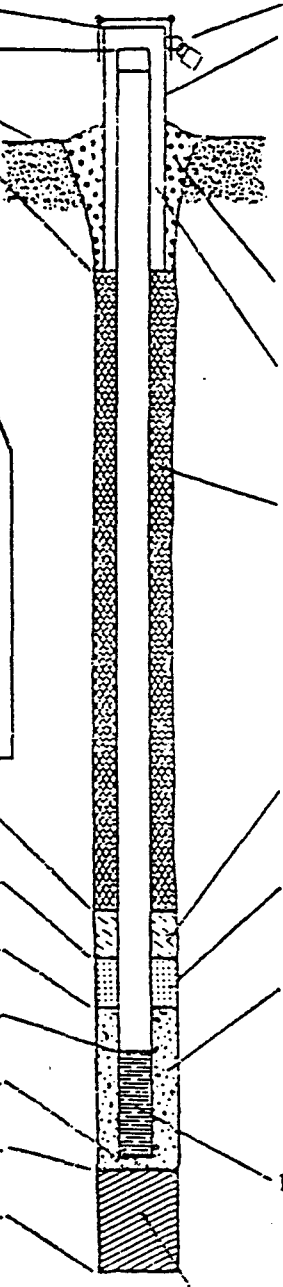
Date Well Installed: 02/12/90 (m m / d d / y y)

istance Well Is From Waste/Source Boundary: t. (from UST potential source)

Well Installed By: (Person's Name and Firm): Kevin Swanson / Warzyn Engineering Inc.

l A Point of Enforcement Std. Application? ☒ Yes ☐ No

Location of Well Relative to Waste/Source: ☒ Upgradient ☐ Sidegradient ☐ Downgradient ☐ Not Known



tective pipe, top elevation 860.19 ft. MSL
ell casing, top elevation 860.02 ft. MSL
. Land surface elevation 858.0 ft. MSL
rface seal, bottom 857.0 ft. MSL or 1.0 ft.

12. USCS classification of soil near screen:
☐ GP ☐ GM ☐ GC ☐ GW ☐ SW ☒ SP
☐ SM ☐ SC ☐ ML ☐ MH ☐ CL ☐ CH
☐ Bedrock

13. Sieve analysis attached? ☐ Yes ☒ No

rilling method used: Rotary ☐ 50; Hollow Stem Auger ☒ 41; Other ☐

Drilling fluid used: Water ☐ 02; Air ☐ 01; Drilling Mud ☐ 03; None ☒ 99

rilling additives used? ☐ Yes ☒ No

Describe

ource of water (attach analysis):

entonite seal, top 854.5 ft. MSL or 3.5 ft.
. e sand, top NA ft. MSL or ft.
. Filter pack, top 854.0 ft. MSL or 4.0 ft.
ell screen, top 852.0 ft. MSL or 6.0 ft.
Well screen, bottom 842.7 ft. MSL or 15.3 ft.
Filter pack, bottom 842.7 ft. MSL or 15.3 ft.
orehole, bottom 840.0 ft. MSL or 18.0 ft.
. Borehole, diameter 8.2 in.
D.D. well casing 2.38 in.
D. well casing 2.0 in.

1. Cap and lock? ☒ Yes ☐ No
2. Protective cover pipe:
a. Inside diameter: 3.9 in.
b. Length: 5.1 ft.
c. Material: Steel ☒ 04; Other ☐
d. Additional protection? ☐ Yes ☒ No
If yes, describe:
3. Surface seal: Bentonite ☐ 30; Concrete ☐ 01; Soil; Other ☐
4. Material between well casing and protective pipe: Bentonite ☐ 30; Annular space seal ☒; Other ☐
5. Annular space seal: Granular Bentonite ☒ 33
Lbs/gal mud weight . . . Bentonite-sand slurry ☐ 35
Lbs/gal mud weight . . . . . Bentonite slurry ☐ 31
% Bentonite . . . . Bentonite-cement grout ☐ 50
0.7 Ft³ volume added for any of the above
How installed: Tremie ☐ 01; Tremie pumped ☐ 02; Gravity ☒ 08
6. Bentonite seal: Bentonite granules ☐ 33; ☐1/4 in. ☐3/8 in. ☐1/2 in. Bentonite pellets ☒ 32; Other ☐
7. Fine sand material: Manufacturer, product name and mesh size: NA
Volume added ft³
8. Filter pack material: Manufacturer, product name and mesh size: Eau Claire #20 Flint Sand
Volume added 3.7 ft³
9. Well casing: Flush threaded PVC schedule 40 ☒ 23; Flush threaded PVC schedule 80 ☐ 24; Other ☐
10. Screen material: Sch 40 PVC
Screen type: Factory cut ☒ 11; Continuous slot ☐ 01; Other ☐
Manufacturer: Northern Air
Slot size: 0.010 in.
Slotted length: 9.3 ft.
11. Backfill material (below filter pack): None ☐; Natural Collapse; Other ☒

ereby certify that the information on this form is true and correct to the best of my knowledge.

ignature | Firm: Warzyn Engineering Inc.

se complete and return both sides of this form as required by chs. 144, 147 and 160, Wis. Stats., and ch. NR 141, Wis. Adm. Code. In accordance with .. 144, Wis Stats., failure to file this form may result in a forfeiture of not less than $10, nor more than $5,000 for each day of violation. In accordance

State of Wisconsin
Department of Natural Resources

15073

MONITORING WELL DEVELOPMENT

Form 4400-113B 8-89

Facility/Project Name: Wisconsin Air National Guard

Well Name: W7

License, Permit or Monitoring Number: _____

Wis. Unique Well Number: _____ DNR Well Number: _____

1. Can this well be purged dry? ☐ Yes ☒ No

2. Well development method

surged with bailer and bailed	☐	4 1
surged with bailer and pumped	☒	6 1
surged with block and bailed	☐	4 2
surged with block and pumped	☐	6 2
surged with block, bailed and pumped	☐	7 0
compressed air	☐	2 0
bailed only	☐	1 0
pumped only	☐	5 1
pumped slowly	☐	5 0
Other _____	☐	

3. Time spent developing well: 40 min.

4. Depth of well (from top of well casisng): 17.0 ft.

5. Inside diameter of well: 2.00 in.

6. Volume of water in filter pack and well casing: 5.4 gal.

7. Volume of water removed from well: 55.0 gal.

8. Volume of water added (if any): 0.0 gal.

9. Source of water added: None

10. Analysis performed on water added? ☐ Yes ☐ No
(If yes, attach results)

	Before Development	After Development
11. Depth to Water (from top of well casing)	10.98 ft.	11.02 ft.
Date	03/26/90 (m m d d y y)	03/26/90 (m m d d y y)
Time	2:50 ☐ a.m. ☒ p.m.	3:30 ☐ a.m. ☒ p.m.
12. Sediment in well bottom	0.0 inches	0.0 inches
13. Water clarity	Clear ☐ 10 Turbid ☒ 15 (Describe) very	Clear ☒ 20 Turbid ☐ 25 (Describe)
Fill in if drilling fluids were used and well is at solid waste facility:		
14. Total suspended solids	_____.__ mg/l	_____.__ mg/l
15. COD	_____.__ mg/l	_____.__ mg/l

Additional comments on development:

Well developed by: Person's Name and Firm

Name: William Bachus

Firm: Warzyn Engineering Inc.

I hereby certify that the above information is true and correct to the best of my knowledge.

Signature: _____

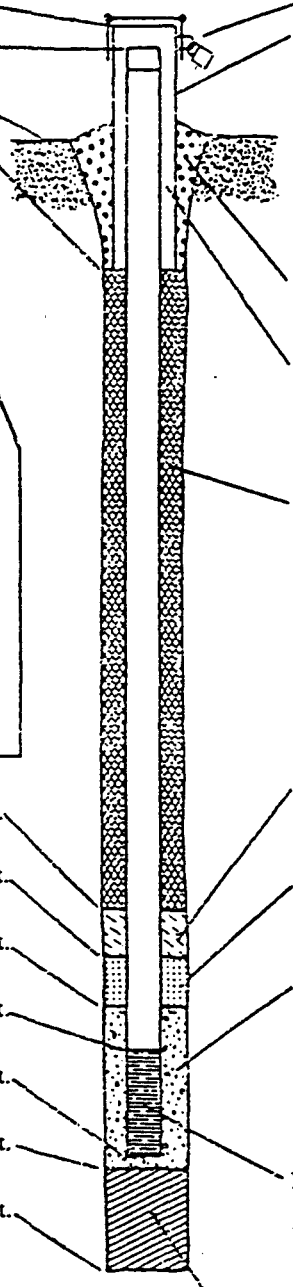
Firm: _____

NOTE: Shaded areas are for DNR use only. See instructions for more information.

f Wisconsin
ment of Natural Resources

MONITORING WELL CONSTRUCTION
Form 4400-113A 8-89

acility/Project Name isconsin Air National Guard	Grid Location _____ ft. ☐ N. ☐ S. _____ ft. ☐ E. ☐ W.	Well Name W8 (Flush Mount)
y License, Permit or Monitoring Number _____		Wis. Unique Well Number / DNR Well Number _____ / ____
ype of Well Water Table Observation Well ☒ 11 Piezometer ☐ 12	Section Location SE 1/4 of NW 1/4 of Section 29, T 8 N, R 10 ☒ E ☐ W	Date Well Installed 02 / 08 / 90 m m d d y y
ance Well Is From Waste/Source Boundary ft (from UST potential source)	Location of Well Relative to Waste/Source ☐ Upgradient ☒ Sidegradient ☒ Downgradient ☐ Not Known	Well Installed By: (Person's Name and Firm) Kevin Swanson Warzyn Engineering Inc.
l A Point of Enforcement Std. Application? ☒ Yes ☐ No		



. Protective pipe, top elevation 858.37 ft. MSL
ll casing, top elevation 858.00 ft. MSL
. Land surface elevation 858.4 ft MSL
face seal, bottom 857.4 ft. MSL or 1.0 ft.
. USCS classification of soil near screen:
☐ GP ☐ GM ☐ GC ☐ GW ☐ SW ☒ SP
☐ SM ☐ SC ☐ ML ☐ MH ☐ CL ☐ CH
☐ Bedrock
3. Sieve analysis attached? ☐ Yes ☒ No
rilling method used: Rotary ☐ 50
Hollow Stem Auger ☒ 41
Other ☐
rilling fluid used: Water ☐ 02 Air ☐ 01
Drilling Mud ☐ 03 None ☒ 99
rilling additives used? ☐ Yes ☒ No
Describe
ource of water (attach analysis):

ntonite seal, top 855.4 ft. MSL or 3.0 ft.
e sand, top NA ft. MSL or ft.
ilter pack, top 854.9 ft. MSL or 3.5 ft.
ll screen, top 853.6 ft. MSL or 4.8 ft.
Well screen, bottom 838.6 ft. MSL or 19.8 ft.
ilter pack, bottom 838.6 ft. MSL or 19.8 ft.
rehole, bottom 836.9 ft. MSL or 21.5 ft.
orehole, diameter 8.2 in.
.D. well casing 2.38 in.
D. well casing 2.0 in.

1. Cap and lock? ☒ Yes ☐ No
2. Protective cover pipe:
a. Inside diameter: 6.0 in.
b. Length: 2.0 ft.
c. Material: Steel ☒ 04
Other ☐
d. Additional protection? ☐ Yes ☒ No
If yes, describe:
3. Surface seal: Bentonite ☐ 30
Concrete ☒ 01
Other ☐
4. Material between well casing and protective pipe:
Bentonite ☐ 30
Annular space seal ☒
Other ☐
5. Annular space seal: Granular Bentonite ☒ 33
____ Lbs/gal mud weight . . . Bentonite-sand slurry ☐ 35
____ Lbs/gal mud weight . . . . . Bentonite slurry ☐ 31
____ % Bentonite . . . . Bentonite-cement grout ☐ 50
1.1 Ft^3 volume added for any of the above
How installed: Tremie ☐ 01
Tremie pumped ☐ 02
Gravity ☒ 08
6. Bentonite seal: Bentonite granules ☐ 33
☐ 1/4 in. ☐ 3/8 in. ☐ 1/2 in. Bentonite pellets ☒ 32
Other ☐
7. Fine sand material: Manufacturer, product name and mesh size
NA
Volume added ____ ft^3
8. Filter pack material: Manufacturer, product name and mesh size
Eau Claire #20 Flint Sand
Volume added 4.2 ft^3
9. Well casing: Flush threaded PVC schedule 40 ☒ 23
Flush threaded PVC schedule 80 ☐ 24
Other ☐
10. Screen material: Sch 40 PVC
Screen type: Factory cut ☒ 11
Continuous slot ☐ 01
Other ☐
Manufacturer Northern Air
Slot size: 0.010 in.
Slotted length: 15.0 ft.
11. Backfill material (below filter pack): None ☐
Natural Collapse Other ☒

reby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Firm
	Warzyn Engineering Inc.

se complete and return both sides of this form as required by chs. 144, 147 and 160, Wis. Stats., and ch. NR 141, Wis. Adm. Code. In accordance with 144, Wis Stats., failure to file this form may result in a forfeiture of not less than $10, nor more than $5,000 for each day of violation. In accordance

e of Wisconsin
artment of Natural Resources

MONITORING WELL CONSTRUCTION
Form 4400-113A 8-89

acility/Project Name: sconsin Air National Guard
ility License, Permit or Monitoring Number: _____

Grid Location: _____ ft. ☐ N. ☐ S. _____ ft. ☐ E. ☐ W.

Well Name: W9
Wis. Unique Well Number: _____ DNR Well Number: _____

e of Well: Water Table Observation Well ☒ 11; Piezometer ☐ 12

Section Location: SE 1/4 of NW 1/4 of Section 29, T 8 N, R 10 ☒ E ☐ W

Date Well Installed: 02/08/90 (m m / d d / y y)

Distance Well Is From Waste/Source Boundary: ft(from UST potential source)

Well Installed By: (Person's Name and Firm)
Kevin Swanson
Warzyn Engineering Inc.

Location of Well Relative to Waste/Source: ☐ Upgradient ☐ Sidegradient ☒ Downgradient ☐ Not Known

Well A Point of Enforcement Std. Application? ☒ Yes ☐ No

. Protective pipe, top elevation _858.86_ ft. MSL
Well casing, top elevation _858.73_ ft. MSL
. Land surface elevation _856.7_ ft. MSL
urface seal, bottom _855.7 ft. MSL or _1.0 ft.

12. USCS classification of soil near screen:
☐ GP ☐ GM ☐ GC ☐ GW ☐ SW ☒ SP
☐ SM ☐ SC ☐ ML ☐ MH ☐ CL ☐ CH
☐ Bedrock

13. Sieve analysis attached? ☐ Yes ☒ No

Drilling method used: Rotary ☐ 50; Hollow Stem Auger ☒ 41; Other ☐ ___

Drilling fluid used: Water ☐ 02; Air ☐ 01; Drilling Mud ☐ 03; None ☒ 99

Drilling additives used? ☐ Yes ☒ No

Describe _____

Source of water (attach analysis): _____

entonite seal, top _853.2 ft. MSL or _3.5 ft.
Fine sand, top NA ft. MSL or ____ ft.
. ilter pack, top _852.7 ft. MSL or _4.0 ft.
. 'ell screen, top _850.8 ft. MSL or _5.9 ft.
Well screen, bottom _841.5 ft. MSL or _15.2 ft.
ilter pack, bottom _841.5 ft. MSL or _15.2 ft.
orehole, bottom _838.2 ft. MSL or _18.5 ft.
Borehole, diameter _8.2 in.
O.D. well casing _2.38 in.
. I.D. well casing _2.0 in.

1. Cap and lock? ☒ Yes ☐ No
2. Protective cover pipe:
a. Inside diameter: 3.9 in.
b. Length: 5.1 ft.
c. Material: Steel ☒ 04; Other ☐ ___
d. Additional protection? ☐ Yes ☒ No
If yes, describe: _____
3. Surface seal: Bentonite ☐ 30; Concrete ☐ 01; Soil Other ☒ ___
4. Material between well casing and protective pipe: Bentonite ☐ 30; Annular space seal ☒; Other ☐ ___
5. Annular space seal: Granular Bentonite ☒ 33
_____ Lbs/gal mud weight . . . Bentonite-sand slurry ☐ 35
_____ Lbs/gal mud weight . . . . . Bentonite slurry ☐ 31
_____ % Bentonite . . . . Bentonite-cement grout ☐ 50
0.7 Ft^3 volume added for any of the above
How installed: Tremie ☐ 01; Tremie pumped ☐ 02; Gravity ☒ 08
6. Bentonite seal: Bentonite granules ☐ 33; ☐1/4 in. ☐3/8 in. ☐1/2 in. Bentonite pellets ☒ 32; Other ☐ ___
7. Fine sand material: Manufacturer, product name and mesh size
NA
Volume added _____ ft^3
8. Filter pack material: Manufacturer, product name and mesh size
Eau Claire #20 Flint Sand
Volume added 2.7 ft^3
9. Well casing: Flush threaded PVC schedule 40 ☒ 23; Flush threaded PVC schedule 80 ☐ 24; Other ☐ ___
10. Screen material: Sch 40 PVC
Screen type: Factory cut ☒ 11; Continuous slot ☐ 01; Other ☐ ___
Manufacturer Northern Air
Slot size: 0.010 in.
Slotted length: 9.3 ft.
11. Backfill material (below filter pack): None ☐; Natural Collapse Other ☒

...reby certify that the information on this form is true and correct to the best of my knowledge.

ignature | Firm: Warzyn Engineering Inc.

se complete and return both sides of this form as required by chs. 144, 147 and 160, Wis. Stats., and ch. NR 141, Wis. Adm. Code. In accordance with ... 144, Wis Stats., failure to file this form may result in a forfeiture of not less than $10, nor more than $5,000 for each day of violation. In accordance

State of Wisconsin
Department of Natural Resources

MONITORING WELL DEVELOPMENT

Form 4400-113B 8-89

15073

Facility/Project Name: Wisconsin Air National Guard

Well Name: W9

License, Permit or Monitoring Number:

Wis. Unique Well Number:

DNR Well Number:

1. Can this well be purged dry? ☐ Yes ☒ No

2. Well development method

surged with bailer and bailed	☐	41
surged with bailer and pumped	☒	61
surged with block and bailed	☐	42
surged with block and pumped	☐	62
surged with block, bailed and pumped	☐	70
compressed air	☐	20
bailed only	☐	10
pumped only	☐	51
pumped slowly	☐	50
Other _____	☐	

3. Time spent developing well: 55 min.

4. Depth of well (from top of well casisng): 17.0 ft.

5. Inside diameter of well: 2.00 in.

6. Volume of water in filter pack and well casing: 6.5 gal.

7. Volume of water removed from well: 100.0 gal.

8. Volume of water added (if any): 0.0 gal.

9. Source of water added: None

10. Analysis performed on water added? ☐ Yes ☐ No
(If yes, attach results)

	Before Development	After Development
11. Depth to Water (from top of well casing)	9.81 ft.	9.89 ft.
Date	03/26/90 (m m d d y y)	03/26/90 (m m d d y y)
Time	4:00 ☐ a.m. ☒ p.m.	4:55 ☐ a.m. ☒ p.m.
12. Sediment in well bottom	0.0 inches	0.0 inches
13. Water clarity	Clear ☐ 10 Turbid ☒ 15 (Describe) very	Clear ☒ 20 Turbid ☐ 25 (Describe)
Fill in if drilling fluids were used and well is at solid waste facility:		
14. Total suspended solids	____.__ mg/l	____.__ mg/l
15. COD	____.__ mg/l	____.__ mg/l

Additional comments on development:

Well developed by: Person's Name and Firm

Name: William Bachus

Firm: Warzyn Engineering Inc.

I hereby certify that the above information is true and correct to the best of my knowledge.

Signature: _____

Firm: _____

NOTE: Shaded areas are for DNR use only. See instructions for more information.

State of Wisconsin
Department of Natural Resources

MONITORING WELL CONSTRUCTION
Form 4400-113A 8-89

Facility/Project Name: Wisconsin Air National Guard
Facility License, Permit or Monitoring Number:
Grid Location: ft. ☐ N. ☐ S. / ft. ☐ E. ☐ W.
Well Name: W10
Wis. Unique Well Number: DNR Well Number:
Type of Well: Water Table Observation Well ☒ 11 / Piezometer ☐ 12
Section Location: SE 1/4 of NW 1/4 of Section 29, T 8 N, R 10 ☒ E ☐ W
Date Well Installed: 02/08/90 (mm/dd/yy)
Distance Well Is From Waste/Source Boundary: ft(from piping potential source)
Well A Point of Enforcement Std. Application? ☒ Yes ☐ No
Location of Well Relative to Waste/Source: ☐ Upgradient ☒ Sidegradient ☐ Downgradient ☐ Not Known
Well Installed By: (Person's Name and Firm): Kevin Swanson / Warzyn Engineering Inc.

A. Protective pipe, top elevation 859.54 ft. MSL
B. Well casing, top elevation 859.34 ft. MSL
C. Land surface elevation 857.5 ft. MSL
D. Surface seal, bottom 856.5 ft. MSL or 1.0 ft.
E. Bentonite seal, top 854.0 ft. MSL or 3.5 ft.
F. Fine sand, top NA ft. MSL or ft.
G. Filter pack, top 853.5 ft. MSL or 4.0 ft.
H. Well screen, top 851.4 ft. MSL or 6.1 ft.
I. Well screen, bottom 841.9 ft. MSL or 15.6 ft.
J. Filter pack, bottom 841.9 ft. MSL or 15.6 ft.
K. Borehole, bottom 840.0 ft. MSL or 17.5 ft.
L. Borehole, diameter 8.2 in.
M. O.D. well casing 2.38 in.
N. I.D. well casing 2.0 in.

12. USCS classification of soil near screen:
☐ GP ☐ GM ☐ GC ☐ GW ☐ SW ☒ SP
☐ SM ☐ SC ☐ ML ☐ MH ☐ CL ☐ CH
☐ Bedrock

13. Sieve analysis attached? ☐ Yes ☒ No

O. Drilling method used: Rotary ☐ 50 / Hollow Stem Auger ☒ 41 / Other ☐

P. Drilling fluid used: Water ☐ 02 / Air ☐ 01 / Drilling Mud ☐ 03 / None ☒ 99

Q. Drilling additives used? ☐ Yes ☒ No
Describe

R. Source of water (attach analysis):

1. Cap and lock? ☒ Yes ☐ No
2. Protective cover pipe:
a. Inside diameter: 3.9 in.
b. Length: 5.1 ft.
c. Material: Steel ☒ 04 / Other ☐
d. Additional protection? ☐ Yes ☒ No
If yes, describe:
3. Surface seal: Bentonite ☐ 30 / Concrete ☐ 01 / Soil / Other ☒
4. Material between well casing and protective pipe: Bentonite ☐ 30 / Annular space seal ☒ / Other ☐
5. Annular space seal: Granular Bentonite ☒ 33
Lbs/gal mud weight ... Bentonite-sand slurry ☐ 35
Lbs/gal mud weight ..... Bentonite slurry ☐ 31
% Bentonite .... Bentonite-cement grout ☐ 50
0.7 Ft³ volume added for any of the above
How installed: Tremie ☐ 01 / Tremie pumped ☐ 02 / Gravity ☒ 08
6. Bentonite seal: Bentonite granules ☐ 33
☐ 1/4 in. ☐ 3/8 in. ☐ 1/2 in. Bentonite pellets ☒ 32 / Other ☐
7. Fine sand material: Manufacturer, product name and mesh size: NA
Volume added ft³
8. Filter pack material: Manufacturer, product name and mesh size: Eau Claire #20 Flint Sand
Volume added 2.7 ft³
9. Well casing: Flush threaded PVC schedule 40 ☒ 23 / Flush threaded PVC schedule 80 ☐ 24 / Other ☐
10. Screen material: Sch 40 PVC
Screen type: Factory cut ☒ 11 / Continuous slot ☐ 01 / Other ☐
Manufacturer Northern Air
Slot size: 0.010 in.
Slotted length: 9.5 ft.
11. Backfill material (below filter pack): None ☐ / Natural Collapse / Other ☒

I hereby certify that the information on this form is true and correct to the best of my knowledge.
Signature | Firm: Warzyn Engineering Inc.

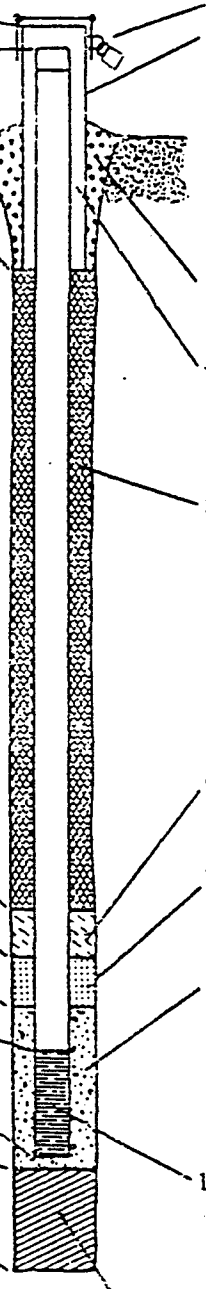
Please complete and return both sides of this form as required by chs. 144, 147 and 160, Wis. Stats., and ch. NR 141, Wis. Adm. Code. In accordance with s. 144, Wis Stats., failure to file this form may result in a forfeiture of not less than $10, nor more than $5,000 for each day of violation. In accordance

[redacted] Wisconsin
[redacted]rtment of Natural Resources

MONITORING WELL CONSTRUCTION
Form 4400-113A 8-89

Facility/Project Name	Grid Location	Well Name
[redacted]onsin Air National Guard	ft. ☐ N. ☐ S.	W11
[redacted]ity License, Permit or Monitoring Number	ft. ☐ E. ☐ W.	Wis. Unique Well Number / DNR Well Number

Well Water Table Observation Well ☒ 11 Piezometer ☐ 12	Section Location	Date Well Installed
	SE 1/4 of NW 1/4 of Section 29,	02/08/90 (m m / d d / y y)
Distance Well Is From Waste/Source Boundary	T 8 N, R 10 ☒ E ☐ W	Well Installed By: (Person's Name and Firm)
5 ft (from piping potential source)	Location of Well Relative to Waste/Source	Kevin Swanson
[redacted] A Point of Enforcement Std. Application? ☒ Yes ☐ No	☐ Upgradient ☐ Sidegradient ☒ Downgradient ☐ Not Known	Warzyn Engineering Inc.



a. [redacted]ective pipe, top elevation 859.05 ft. MSL
[redacted]ell casing, top elevation 858.86 ft. MSL
c. [redacted] surface elevation 857.0 ft. MSL
[redacted]face seal, bottom 856.0 ft. MSL or 1.0 ft.
12. USCS classification of soil near screen:
☐ GP ☐ GM ☐ GC ☐ GW ☒ SW ☒ SP
☐ SM ☐ SC ☐ ML ☐ MH ☐ CL ☐ CH
☐ Bedrock
13. [redacted]ve analysis attached? ☐ Yes ☒ No
[redacted]illing method used: Rotary ☐ 50
Hollow Stem Auger ☒ 41
Other ☐
[redacted]
Drilling fluid used: Water ☐ 02 Air ☐ 01
Drilling Mud ☐ 03 None ☒ 99
[redacted]illing additives used? ☐ Yes ☒ No
[redacted]escribe
[redacted]urce of water (attach analysis):

[redacted]entonite seal, top 853.7 ft. MSL or 3.3 ft.
Fi[redacted] sand, top NA ft. MSL or ft.
[redacted]lter pack, top 853.2 ft. MSL or 3.8 ft.
[redacted]l screen, top 850.8 ft. MSL or 6.2 ft.
W[redacted] screen, bottom 841.5 ft. MSL or 15.5 ft.
[redacted]lter pack, bottom 841.5 ft. MSL or 15.5 ft.
[redacted]chole, bottom 839.0 ft. MSL or 18.0 ft.
[redacted]rehole, diameter 8.2 in.
[redacted].D. well casing 2.38 in.
[redacted]. well casing 2.0 in.

1. Cap and lock? ☒ Yes ☐ No
2. Protective cover pipe:
a. Inside diameter: 3.9 in.
b. Length: 5.1 ft.
c. Material: Steel ☒ 04
Other ☐
d. Additional protection? ☐ Yes ☒ No
If yes, describe:
3. Surface seal: Bentonite ☐ 30
Concrete ☐ 01
Soil Other ☒
4. Material between well casing and protective pipe:
Bentonite ☐ 30
Annular space seal ☒
Other ☐
5. Annular space seal: Granular Bentonite ☒ 33
___ Lbs/gal mud weight . . . Bentonite-sand slurry ☐ 35
___ Lbs/gal mud weight . . . . . Bentonite slurry ☐ 31
___ % Bentonite . . . . Bentonite-cement grout ☐ 50
0.7 Ft^3 volume added for any of the above
How installed: Tremie ☐ 01
Tremie pumped ☐ 02
Gravity ☒ 03
6. Bentonite seal: Bentonite granules ☐ 33
☐ 1/4 in. ☐ 3/8 in. ☐ 1/2 in. Bentonite pellets ☒ 32
Other ☐
7. Fine sand material: Manufacturer, product name and mesh size
NA
Volume added ___ ft^3
8. Filter pack material: Manufacturer, product name and mesh size
Eau Claire #20 Flint Sand
Volume added 2.7 ft^3
9. Well casing: Flush threaded PVC schedule 40 ☒ 23
Flush threaded PVC schedule 80 ☐ 24
Other ☐
10. Screen material: Sch 40 PVC
Screen type: Factory cut ☒ 11
Continuous slot ☐ 01
Other ☐
Manufacturer Northern Air
Slot size: 0.010 in.
Slotted length: 9.3 ft.
11. Backfill material (below filter pack): None ☐
Natural Collapse Other ☒

I [redacted]reby certify that the information on this form is true and correct to the best of my knowledge.

[redacted]ure	Firm
	Warzyn Engineering Inc.

[redacted]e complete and return both sides of this form as required by chs. 144, 147 and 160, Wis. Stats., and ch. NR 141, Wis. Adm. Code. In accordance with [redacted]44, Wis Stats., failure to file this form may result in a forfeiture of not less than $10, nor more than $5,000 for each day of violation. In accordance

State of Wisconsin
Department of Natural Resources

MONITORING WELL DEVELOPMENT

Form 4400-113B 8-89

15073

Facility/Project Name: Wisconsin Air National Guard

Well Name: W11

License, Permit or Monitoring Number: _____

Wis. Unique Well Number: _____ DNR Well Number: _____

1. Can this well be purged dry? ☐ Yes ☒ No

2. Well development method

surged with bailer and bailed	☐	4 1
surged with bailer and pumped	☒	6 1
surged with block and bailed	☐	4 2
surged with block and pumped	☐	6 2
surged with block, bailed and pumped	☐	7 0
compressed air	☐	2 0
bailed only	☐	1 0
pumped only	☐	5 1
pumped slowly	☐	5 0
Other _____	☐	

3. Time spent developing well: 45 min.

4. Depth of well (from top of well casisng): 18.0 ft.

5. Inside diameter of well: 2.00 in.

6. Volume of water in filter pack and well casing: 7.2 gal.

7. Volume of water removed from well: 100.0 gal.

8. Volume of water added (if any): 0.0 gal.

9. Source of water added: None

10. Analysis performed on water added? ☐ Yes ☐ No
(If yes, attach results)

	Before Development	After Development
11. Depth to Water (from top of well casing)	10.17 ft.	10.23 ft.
Date	03/26/90 (m m / d d / y y)	03/26/90 (m m / d d / y y)
Time	2:50 ☐ a.m. ☒ p.m.	3:35 ☐ a.m. ☒ p.m.
12. Sediment in well bottom	0 0 inches	0.0 inches
13. Water clarity	Clear ☐ 10 Turbid ☒ 15 (Describe) very	Clear ☒ 20 Turbid ☐ 25 (Describe)

Fill in if drilling fluids were used and well is at solid waste facility:

14. Total suspended solids	____.__ mg/l	____.__ mg/l
15. COD	____.__ mg/l	____.__ mg/l

Additional comments on development:

Well developed by: Person's Name and Firm

Name: William Bachus

Firm: Warzyn Engineering Inc.

I hereby certify that the above information is true and correct to the best of my knowledge.

Signature: _____

Firm: _____

NOTE: Shaded areas are for DNR use only. See instructions for more information.

Wisconsin
Department of Natural Resources

MONITORING WELL CONSTRUCTION
Form 4400-113A 8-89

Facility/Project Name: Wisconsin Air National Guard
Facility License, Permit or Monitoring Number:
Grid Location: ft. N. S. / ft. E. W.
Well Name: W12
Wis. Unique Well Number: DNR Well Number:
Well: Water Table Observation Well 11 / Piezometer 12
Section Location: SE 1/4 of NW 1/4 of Section 29, T 8 N, R 10 E W
Date Well Installed: 02 / 07 / 90 (m m d d y y)
Distance Well Is From Waste/Source Boundary: ft. (from UST potential source)
Well Installed By: (Person's Name and Firm): Kevin Swanson / Warzyn Engineering Inc.
Is A Point of Enforcement Std. Applicable? Yes / No
Location of Well Relative to Waste/Source: Upgradient / Sidegradient / Downgradient / Not Known

Protective pipe, top elevation: 859.42 ft. MSL
Well casing, top elevation: 859.20 ft. MSL
Land surface elevation: 857.3 ft. MSL
Surface seal, bottom: 856.3 ft. MSL or 1.0 ft.

2. USCS classification of soil near screen:
GP ☐ GM ☐ GC ☐ GW ☒ SW ☒ SP
SM ☐ SC ☐ ML ☐ MH ☐ CL ☐ CH
☐ Bedrock

3. Sieve analysis attached? ☐ Yes ☒ No

4. Drilling method used: Rotary ☐ 50 / Hollow Stem Auger ☒ 41 / Other ☐

5. Drilling fluid used: Water ☐ 02 / Air ☐ 01 / Drilling Mud ☐ 03 / None ☒ 99

6. Drilling additives used? ☐ Yes ☒ No
Describe:

7. Source of water (attach analysis):

Bentonite seal, top: 853.8 ft. MSL or 3.5 ft.
Fine sand, top: NA ft. MSL or ft.
Filter pack, top: 853.3 ft. MSL or 4.0 ft.
Well screen, top: 851.7 ft. MSL or 5.6 ft.
Well screen, bottom: 842.3 ft. MSL or 15.0 ft.
Filter pack, bottom: 842.3 ft. MSL or 15.0 ft.
Borehole, bottom: 841.8 ft. MSL or 15.5 ft.
Borehole, diameter: 8.2 in.
O.D. well casing: 2.38 in.
I.D. well casing: 2.0 in.

1. Cap and lock? ☒ Yes ☐ No
2. Protective cover pipe:
a. Inside diameter: 3.9 in.
b. Length: 5.1 ft.
c. Material: Steel ☒ 04 / Other ☐
d. Additional protection? ☐ Yes ☒ No
If yes, describe:
3. Surface seal: Bentonite ☐ 30 / Concrete ☐ 01 / Soil / Other ☒
4. Material between well casing and protective pipe: Bentonite ☐ 30 / Annular space seal ☒ / Other ☐
5. Annular space seal: Granular Bentonite ☒ 33 / ____ Lbs/gal mud weight ... Bentonite-sand slurry ☐ 35 / ____ Lbs/gal mud weight ..... Bentonite slurry ☐ 31 / ____ % Bentonite .... Bentonite-cement grout ☐ 50
0.7 Ft³ volume added for any of the above
How installed: Tremie ☐ 01 / Tremie pumped ☐ 02 / Gravity ☒ 08
6. Bentonite seal: Bentonite granules ☐ 33 / ☐1/4 in. ☐3/8 in. ☐1/2 in. Bentonite pellets ☒ 32 / Other ☐
7. Fine sand material: Manufacturer, product name and mesh size: NA
Volume added ____ ft³
8. Filter pack material: Manufacturer, product name and mesh size: Eau Claire #20 Flint Sand
Volume added 2.7 ft³
9. Well casing: Flush threaded PVC schedule 40 ☒ 23 / Flush threaded PVC schedule 80 ☐ 24 / Other ☐
10. Screen material: Sch 40 PVC
Screen type: Factory cut ☒ 11 / Continuous slot ☐ 01 / Other ☐
Manufacturer: Northern Air
Slot size: 0.010 in.
Slotted length: 9.4 ft.
11. Backfill material (below filter pack): Natural Collapse / None ☐ / Other ☒

I hereby certify that the information on this form is true and correct to the best of my knowledge.
Signature
Firm: Warzyn Engineering Inc.

Complete and return both sides of this form as required by chs. 144, 147 and 160, Wis. Stats., and ch. NR 141, Wis. Adm. Code. In accordance with 144, Wis. Stats., failure to file this form may result in a forfeiture of not less than $10, nor more than $5,000 for each day of violation. In accordance

State of Wisconsin
Department of Natural Resources

MONITORING WELL DEVELOPMENT
Form 4400-113B 8-89

15073

Facility/Project Name: Wisconsin Air National Guard

Well Name: W12

License, Permit or Monitoring Number: _____

Wis. Unique Well Number: _____ DNR Well Number: ___

1. Can this well be purged dry? ☐ Yes ☒ No

2. Well development method

surged with bailer and bailed	☐	4 1
surged with bailer and pumped	☒	6 1
surged with block and bailed	☐	4 2
surged with block and pumped	☐	6 2
surged with block, bailed and pumped	☐	7 0
compressed air	☐	2 0
bailed only	☐	1 0
pumped only	☐	5 1
pumped slowly	☐	5 0
Other _____	☐	

3. Time spent developing well ___30 min.

4. Depth of well (from top of well casisng) __17.0 ft.

5. Inside diameter of well __2.00 in.

6. Volume of water in filter pack and well casing ___5.8 gal.

7. Volume of water removed from well __100.0 gal.

8. Volume of water added (if any) ___0.0 gal.

9. Source of water added None

10. Analysis performed on water added? ☐ Yes ☐ No
(If yes, attach results)

	Before Development	After Development
11. Depth to Water (from top of well casing)	__10.60 ft.	__10.64 ft.
Date	03 / 26 / 90 (m m d d y y)	03 / 26 / 90 (m m d d y y)
Time	__3:40 ☐ a.m. ☒ p.m.	__4:10 ☐ a.m. ☒ p.m.
12. Sediment in well bottom	__0.0 inches	__0.0 inches
13. Water clarity	Clear ☐ 10 Turbid ☒ 15 (Describe) very	Clear ☒ 20 Turbid ☐ 25 (Describe)

Fill in if drilling fluids were used and well is at solid waste facility:

14. Total suspended solids	_____.__ mg/l	_____.__ mg/l
15. COD	_____.__ mg/l	_____.__ mg/l

Additional comments on development:

Well developed by: Person's Name and Firm

Name: William Bachus

Firm: Warzyn Engineering Inc.

I hereby certify that the above information is true and correct to the best of my knowledge.

Signature: _____

Firm: _____

NOTE: Shaded areas are for DNR use only. See instructions for more information.

[redacted] of Wisconsin
[redacted] partment of Natural Resources

MONITORING WELL CONSTRUCTION
Form 4400-113A 8-89

Facility/Project Name: [redacted]consin Air National Guard
Facility License, Permit or Monitoring Number:

Grid Location: ____ ft. ☐ N. ☐ S. ____ ft. ☐ E. ☐ W.

Well Name: W13
Wis. Unique Well Number: DNR Well Number:

Type of Well: Water Table Observation Well ☒ 11 Piezometer ☐ 12

Section Location: SE 1/4 of NW 1/4 of Section 29, T 8 N, R 10 ☒ E ☐ W

Date Well Installed: 02/07/90 (mm/dd/yy)

Distance Well Is From Waste/Source Boundary: 5 [redacted](from UST potential source)

Well Installed By: (Person's Name and Firm)
Kevin Swanson
Warzyn Engineering Inc.

Is Well A Point of Enforcement Std. Application? ☒ Yes ☐ No

Location of Well Relative to Waste/Source: ☐ Upgradient ☐ Sidegradient ☒ Downgradient ☐ Not Known

A. [redacted]tective pipe, top elevation 861.29 ft. MSL
B. Well casing, top elevation 861.07 ft. MSL
C. [redacted]d surface elevation 859.1 ft. MSL
D. [redacted]rface seal, bottom 858.1 ft. MSL or 1.0 ft.

12. USCS classification of soil near screen:
☐ GP ☐ GM ☐ GC ☐ GW ☐ SW ☒ SP
☐ SM ☐ SC ☐ ML ☐ MH ☐ CL ☐ CH
☐ Bedrock

13. [redacted]eve analysis attached? ☐ Yes ☒ No

[redacted]Drilling method used: Rotary ☐ 50; Hollow Stem Auger ☒ 41; Other ☐ [redacted]

[redacted]Drilling fluid used: Water ☐ 02 Air ☐ 01 Drilling Mud ☐ 03 None ☒ 99

[redacted]Drilling additives used? ☐ Yes ☒ No

[redacted]escribe

[redacted]ource of water (attach analysis):

[redacted]entonite seal, top 855.6 ft. MSL or 3.5 ft.

[redacted] sand, top NA ft. MSL or ____ ft.

[redacted]ilter pack, top 855.1 ft. MSL or 4.0 ft.

[redacted]ll screen, top 853.6 ft. MSL or 5.5 ft.

W[redacted] screen, bottom 839.1 ft. MSL or 20.0 ft.

[redacted]ilter pack, bottom 839.1 ft. MSL or 20.0 ft.

[redacted]chole, bottom 836.1 ft. MSL or 23.0 ft.

[redacted]ehole, diameter 8.2 in.

O.D. well casing 2.38 in.

[redacted]. well casing 2.0 in.

1. Cap and lock? ☒ Yes ☐ No
2. Protective cover pipe:
a. Inside diameter: 3.9 in.
b. Length: 5.1 ft.
c. Material: Steel ☒ 04; Other ☐ [redacted]
d. Additional protection? ☐ Yes ☒ No
If yes, describe:
3. Surface seal: Bentonite ☐ 30; Concrete ☐ 01; Soil Other ☒ [redacted]
4. Material between well casing and protective pipe: Bentonite ☐ 30; Annular space seal ☒; Other ☐ [redacted]
5. Annular space seal: Granular Bentonite ☒ 33
____ Lbs/gal mud weight . . . Bentonite-sand slurry ☐ 35
____ Lbs/gal mud weight . . . . . Bentonite slurry ☐ 31
____ % Bentonite . . . . . Bentonite-cement grout ☐ 50
0.7 Ft³ volume added for any of the above
How installed: Tremie ☐ 01; Tremie pumped ☐ 02; Gravity ☒ 08
6. Bentonite seal: Bentonite granules ☐ 33
☐ 1/4 in. ☐ 3/8 in. ☐ 1/2 in. Bentonite pellets ☒ 32
Other ☐ [redacted]
7. Fine sand material: Manufacturer, product name and mesh size
NA
Volume added ____ ft³
8. Filter pack material: Manufacturer, product name and mesh size
Eau Claire #20 Flint Sand
Volume added 3.7 ft³
9. Well casing: Flush threaded PVC schedule 40 ☒ 23; Flush threaded PVC schedule 80 ☐ 24; Other ☐ [redacted]
10. Screen material: Sch 40 PVC
Screen type: Factory cut ☒ 11; Continuous slot ☐ 01; Other ☐ [redacted]
Manufacturer Northern Air
Slot size: 0.010 in.
Slotted length: 14.5 ft.
11. Backfill material (below filter pack): None ☐; Natural Collapse Other ☒

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature | Firm: Warzyn Engineering Inc.

Please complete and return both sides of this form as required by chs. 144, 147 and 160, Wis. Stats., and ch. NR 141, Wis. Adm. Code. In accordance with 144, Wis. Stats., failure to file this form may result in a forfeiture of not less than $10, nor more than $5,000 for each day of violation. In accordance

State of Wisconsin
Department of Natural Resources

15073

MONITORING WELL DEVELOPMENT
Form 4400-113B 8-89

Facility/Project Name	Well Name	
Wisconsin Air National Guard	W13	
License, Permit or Monitoring Number	Wis. Unique Well Number	DNR Well Number
_____	_____	___

1. Can this well be purged dry? ☐ Yes ☒ No

2. Well development method

surged with bailer and bailed	☐	4 1
surged with bailer and pumped	☒	6 1
surged with block and bailed	☐	4 2
surged with block and pumped	☐	6 2
surged with block, bailed and pumped	☐	7 0
compressed air	☐	2 0
bailed only	☐	1 0
pumped only	☐	5 1
pumped slowly	☐	5 0
Other _____	☐	___

3. Time spent developing well __50__ min.

4. Depth of well (from top of well casisng) __21.5__ ft.

5. Inside diameter of well __2.00__ in.

6. Volume of water in filter pack and well casing __8.0__ gal.

7. Volume of water removed from well __80.0__ gal.

8. Volume of water added (if any) __0.0__ gal.

9. Source of water added None

10. Analysis performed on water added? ☐ Yes ☐ No
(If yes, attach results)

	Before Development	After Development
11. Depth to Water (from top of well casing)	__12.52__ ft.	__12.54__ ft.
Date	03 / 26 / 90 (m m d d y y)	03 / 26 / 90 (m m d d y y)
Time	10:00 ☒ a.m. ☐ p.m.	10:50 ☒ a.m. ☐ p.m.
12. Sediment in well bottom	__0.0__ inches	__0.0__ inches
13. Water clarity	Clear ☐ 10 Turbid ☒ 15 (Describe) very	Clear ☐ 20 Turbid ☒ 25 (Describe) slight
Fill in if drilling fluids were used and well is at solid waste facility:		
14. Total suspended solids	_____.__ mg/l	_____.__ mg/l
15. COD	_____.__ mg/l	_____.__ mg/l

Additional comments on development:

Well developed by: Person's Name and Firm	I hereby certify that the above information is true and correct to the best of my knowledge.
Name: William Bachus	Signature: _____
Firm: Warzyn Engineering Inc.	Firm: _____

NOTE: Shaded areas are for DNR use only. See instructions for more information.

f Wisconsin
rtment of Natural Resources

MONITORING WELL CONSTRUCTION
Form 4400-113A 8-89

acility/Project Name
onsin Air National Guard

ity License, Permit or Monitoring Number

Grid Location
ft. ☐ N. ☐ S.
ft. ☐ E. ☐ W.

Well Name
W14

Wis. Unique Well Number | DNR Well Number

f Well Water Table Observation Well ☒ 11
Piezometer ☐ 12

Section Location
SE 1/4 of NW 1/4 of Section 29,
T 8 N, R 10 ☒ E ☐ W

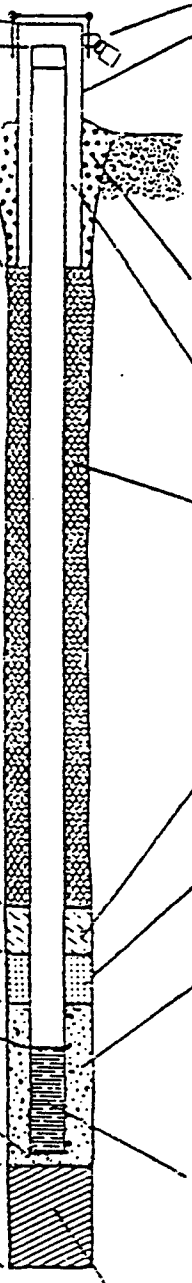
Date Well Installed 02/13/90 (m m / d d / y y)

istance Well Is From Waste/Source Boundary
from nearest UST potential source) ft.

Location of Well Relative to Waste/Source
☐ Upgradient ☒ Sidegradient
☐ Downgradient ☐ Not Known

Well Installed By: (Person's Name and Firm)
Kevin Swanson
Warzyn Engineering Inc.

Is A Point of Enforcement Std. Application?
☒ Yes ☐ No



P tective pipe, top elevation 863.87 ft. MSL
Well casing, top elevation 863.66 ft. MSL
Land surface elevation 861.7 ft. MSL
rface seal, bottom 860.7 ft. MSL or 1.0 ft.

2. USCS classification of soil near screen:
☐ GP ☐ GM ☐ GC ☐ GW ☐ SW ☒ SP
☐ SM ☐ SC ☐ ML ☐ MH ☐ CL ☐ CH
☐ Bedrock

3. ieve analysis attached? ☐ Yes ☒ No

rilling method used: Rotary ☐ 50
Hollow Stem Auger ☒ 41
Other ☐

Drilling fluid used: Water ☐ 02 Air ☐ 01
Drilling Mud ☐ 03 None ☒ 99

rilling additives used? ☐ Yes ☒ No

escribe

ource of water (attach analysis):

ntonite seal, top 855.7 ft. MSL or 6.0 ft.

F e sand, top NA ft. MSL or ft.

ilter pack, top 855.2 ft. MSL or 6.5 ft.

ll screen, top 853.3 ft. MSL or 8.4 ft.

W screen, bottom 839.1 ft. MSL or 22.6 ft.

lter pack, bottom 838.2 ft. MSL or 23.5 ft.

rehole, bottom 837.7 ft. MSL or 24.0 ft.

Borehole, diameter 8.2 in.

.D. well casing 2.38 in.

D. well casing 2.0 in.

1. Cap and lock? ☒ Yes ☐ No

2. Protective cover pipe:
a. Inside diameter: 3.9 in.
b. Length: 5.1 ft.
c. Material: Steel ☒ 04
Other ☐
d. Additional protection? ☐ Yes ☒ No
If yes, describe:

3. Surface seal: Bentonite ☐ 30
Concrete ☐ 01
Soil Other ☒

4. Material between well casing and protective pipe:
Bentonite ☐ 30
Annular space seal ☒
Other ☐

5. Annular space seal: Granular Bentonite ☒ 33
Lbs/gal mud weight . . . Bentonite-sand slurry ☐ 35
Lbs/gal mud weight . . . . . Bentonite slurry ☐ 31
% Bentonite . . . . Bentonite-cement grout ☐ 50
1.1 Ft^3 volume added for any of the above
How installed: Tremie ☐ 01
Tremie pumped ☐ 02
Gravity ☒ 08

6. Bentonite seal: Bentonite granules ☐ 33
☐ 1/4 in. ☐ 3/8 in. ☐ 1/2 in. Bentonite pellets ☒ 32
Other ☐

7. Fine sand material: Manufacturer, product name and mesh size
NA
Volume added ft³

8. Filter pack material: Manufacturer, product name and mesh size
Eau Claire #20 Flint Sand
Volume added 4.2 ft³

9. Well casing: Flush threaded PVC schedule 40 ☒ 23
Flush threaded PVC schedule 80 ☐ 24
Other ☐

10. Screen material: Sch 40 PVC
Screen type: Factory cut ☒ 11
Continuous slot ☐ 01
Other ☐
Manufacturer Northern Air
Slot size: 0.010 in.
Slotted length: 14.2 ft.

11. Backfill material (below filter pack): None ☐
Natural Collapse Other ☒

reby certify that the information on this form is true and correct to the best of my knowledge.

ture | Firm: Warzyn Engineering Inc.

e complete and return both sides of this form as required by chs. 144, 147 and 160, Wis. Stats., and ch. NR 141, Wis. Adm. Code. In accordance with 144, Wis Stats., failure to file this form may result in a forfeiture of not less than $10, nor more than $5,000 for each day of violation. In accordance

State of Wisconsin
Department of Natural Resources

MONITORING WELL DEVELOPMENT
Form 4400-113B 8-89

15073

Facility/Project Name: Wisconsin Air National Guard

Well Name: W14

License, Permit or Monitoring Number: _____

Wis. Unique Well Number: _____ DNR Well Number: ____

1. Can this well be purged dry? ☐ Yes ☒ No

2. Well development method

surged with bailer and bailed	☐	4 1
surged with bailer and pumped	☒	6 1
surged with block and bailed	☐	4 2
surged with block and pumped	☐	6 2
surged with block, bailed and pumped	☐	7 0
compressed air	☐	2 0
bailed only	☐	1 0
pumped only	☐	5 1
pumped slowly	☐	5 0
Other _____	☐	____

3. Time spent developing well: 40 min.

4. Depth of well (from top of well casisng): 25.5 ft.

5. Inside diameter of well: 2.00 in.

6. Volume of water in filter pack and well casing: 9.0 gal.

7. Volume of water removed from well: 100.0 gal.

8. Volume of water added (if any): 0.0 gal.

9. Source of water added: None

10. Analysis performed on water added? ☐ Yes ☐ No
(If yes, attach results)

	Before Development	After Development
11. Depth to Water (from top of well casing)	15.54 ft.	15.58 ft.
Date	03 / 26 / 90 (m m / d d / y y)	03 / 26 / 90 (m m / d d / y y)
Time	10:00 ☒ a.m. ☐ p.m.	10:40 ☒ a.m. ☐ p.m.
12. Sediment in well bottom	0.0 inches	0.0 inches
13. Water clarity	Clear ☐ 10 Turbid ☒ 15 (Describe) very turbid	Clear ☒ 20 Turbid ☐ 25 (Describe) no turbidity

Fill in if drilling fluids were used and well is at solid waste facility:

14. Total suspended solids	____.__ mg/l	____.__ mg/l
15. COD	____.__ mg/l	____.__ mg/l

Additional comments on development:

Well developed by: Person's Name and Firm

Name: William Bachus

Firm: Warzyn Engineering Inc.

I hereby certify that the above information is true and correct to the best of my knowledge.

Signature: _____

Firm: _____

NOTE: Shaded areas are for DNR use only. See instructions for more information.

Environmental & Foundation Drilling, Inc.
3802 Packers Ave. Madison, WI 53704

FILE 15073 F2

WELL DEVELOPMENT

PROJECT: Traux Air National Guard
LOCATION:

JOB # #0350
DATE: 2-7-90, 2-13-90

WELL #	D T W PRE-DEV	D T W POST-DEV	D T B PRE-DEV	D T B POST-DEV	VOL TAKEN	COLOR	TURBIDITY	ODOR-FILM?	TIME
13	13'3"	13'4"	22'0"	21'10"	16gal.	Lt. Br. / Lt. Br	Turbid / Turbid	None	1 Hr.
12	11'6"	11'6½"	17'4"	17'4"	15.3g.	Brown / Brown	Turbid / Turbid	None	½ Hr.
11	11'3"	11'2"	17'10"	17'8"	15gal	Lt. Br. / Lt. Br.	Turbid / Turbid	None	¾ Hr.
10	11'4"	11'4"	17'8"	17'6"	16gal	Lt. Green / Lt. Green	Turbid / Turbid	Green Film / odor	½ Hr.
9	10'10"	10'10"	17'0"	16'11"	15gal	Lt. Brown / Lt. Brown	Turbid / Turbid	slight film. / No Order	1 Hr.
4	12'3"	13'1"	21'3"	21'2"	17gal	Lt. Br/Orange / Lt Br/Orange	Turbid / Turbid	Slight Film / No Odor	½ Hr.
3	13'5"	13'6"	23'9"	23'6½"	17gal	Lt. Brown / Lt. Brown	Turbid / Turbid	None	½ Hr.
1	13'8"	13'5½"	22'5"	22'3"	17gal	Lt. Br/Gray / Lt. Br/Gray	Turbid / Turbid	None	1 Hr.

ALL measurements taken from the top of the well casing.
D T W = Depth to Water
D T B = Depth to Bottom (indicates amount of sediment at well bottom)
TURBIDITY = Clarity before/after development

All water was disposed of in City of Madison Sanitary Sewer

Environmental & Foundation Drilling, Inc.
3802 Packers Ave. Madison, WI 53704

WELL DEVELOPMENT

PROJECT: Truax Air National Guard. JOB # 0350
LOCATION: DATE: 2-7-90, 2-13-90

WELL #	D T W PRE-DEV	D T W POST-DEV	D T B PRE-DEV	D T B POST-DEV	VOL TAKEN	COLOR	TURBIDITY	ODOR-FILM?	TIME
6	9'10"	10'0"	15'4"	15'3½"	14Gal.	Lt. Br / Lt. Br	turbid / Turbid	None	½ Hr.
5	13'3"	12'11"	23'6"	23'5"	17Gal	Br./Orange / Br./Orange	turbid / Sl. Turbid	slight film / odor	45 Min.
7	11'8"	11'4"	17'6"	17'4½"	13Gal.	Lt. Br / Lt. Br	Turbid / Turbid	None	45 Min.
14	16'4"	16'0"	25'7"	25'5"	16Gal	Lt. Br (Reddish) / Lt. Br. Reddish	Sl. Turbid / Sl. Turbid	None	½ Hr.
2	16'3"	25'1"	25'8"	25'7"	45 Gal	Lt. Br. / Lt. Br.	Turbid / Turbid	None	½ Hr.
8	9'8"	9'6"	18'5"	17'11"	5Gal.	Brown/Green / Brown/Green	Turbid / Turbid	strong odor / Green film	1 Hr.

ALL measurements taken from the top of the well casing.
D T W = Depth to Water
D T B = Depth to Bottom (indicates amount of sediment at well bottom)
TURBIDITY = Clarity before/after development

All water was disposed of in city of Madison Sanitary Sewer

APPENDIX C

Soil and Groundwater Analytical Results

WARZYN ENGINEERING INC. • ONE SCIENCE COURT • UNIVERSITY RESEARCH PARK • P.O. BOX 5385 • MADISON, WISCONSIN 53705 • (608) 273-0440

VOLATILE ORGANIC COMPOUND RESULTS
WI LAB CERTIFICATION ID#: 113138300
PROJECT: WISCONSIN AIR NATIONAL GUARD
LOCATION: MADISON, WISCONSIN
C#: 15073.00

CK'D: BC APP'D: DAE
DATE ISSUED: 11/14/90

BMQL - DETECTED, VALUE BELOW METHOD QUANTITATION LIMIT.
X = ANALYZED, BUT NOT DETECTED.

(1) SAMPLE CHROMATOGRAM CONTAINS UNIDENTIFIED COMPOUNDS.

METHOD REFERENCE: SW846, "TEST METHODS FOR EVALUATING SOLID WASTE", SEPTEMBER, 1986. METHODS 8010 AND 8020 WITH MODIFICATIONS.

WARZYN ENGINEERING INC. • ONE SCIENCE COURT • UNIVERSITY RESEARCH PARK • P.O. BOX 5385 • MADISON, WISCONSIN 53705 • (608) 273-0440

ANALYTICAL LABORATORY RESULTS
WI LAB CERTIFICATION ID#: 113138300

PROJECT: WISCONSIN AIR NATIONAL GUARD
LOCATION: MADISON, WISCONSIN

PROJECT #: 15073.00
DATE SAMPLED: 3/26/90
CK'D: BJC APP'D:
DATE ISSUED: 4/11/90

LAB NO.	SAMPLE DESCRIPTION	HYDROCARBON IDENTIFICATION
785-017	W-8 PRODUCT	PRODUCT FINGERPRINT MATCHES GASOLINE REFERENCE STANDARD.
785-018	W-10 PRODUCT	PRODUCT FINGERPRINT MATCHES GASOLINE REFERENCE STANDARD.

NOTE: THE ANALYSIS OF SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS IS A SCREENING PROCEDURE. ANALYTICAL RESULTS ARE COMPARED AND QUANTIFIED AGAINST KNOWN REFERENCE STANDARD MIXTURES. DUE TO VARIABLES SUCH AS DIFFERENCES IN PETROLEUM PRODUCT FORMULATIONS, WEATHERING AND OTHER ENVIRONMENTAL FACTORS, POSITIVE IDENTIFICATION AS ONE OF THE TARGET HYDROCARBON MIXTURES MAY NOT BE POSSIBLE. THE VALUE REPORTED IS TENTATIVELY IDENTIFIED.

WARZYN ENGINEERING INC. • ONE SCIENCE COURT • UNIVERSITY RESEARCH PARK • P.O. BOX 5385 • MADISON, WISCONSIN 53705 • (608) 273-0440

TOTAL PETROLEUM HYDROCARBONS
WI LAB CERTIFICATION ID#: 113138300
PROJECT: WISCONSIN AIR NATIONAL GUARD
LOCATION: MADISON, WISCONSIN
C#: 15073.00

CK'D: BJC APP'D: MJL
DATE ISSUED: 3/5/90

METHOD
REFERENCE: SW846, "TEST METHODS FOR EVALUATING SOLID WASTES", SEPTEMBER, 1986. METHOD 3550.

ASTM, "ANNUAL BOOK OF ASTM STANDARDS", 1983. METHOD D-3328 WITH MODIFICATIONS.

NOTE: THE ANALYSIS OF SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS IS A SCREENING PROCEDURE. ANALYTICAL RESULTS ARE COMPARED AND QUANTIFIED AGAINST KNOWN REFERENCE STANDARD MIXTURES. DUE TO VARIABLES SUCH AS DIFFERENCES IN PETROLEUM PRODUCT FORMULATIONS, WEATHERING AND OTHER ENVIRONMENTAL FACTORS, POSITIVE IDENTIFICATION AS ONE OF THE TARGET HYDROCARBON MIXTURES MAY NOT BE POSSIBLE. THE VALUES REPORTED ARE TENTATIVELY IDENTIFIED WITH ESTIMATED CONCENTRATIONS.

BMQL = DETECTED, BUT BELOW METHOD QUANTITATION LIMIT.
X = ANALYZED, BUT NOT DETECTED.

COMPOUND	REPORTABLE DETECTION LIMIT (MG/KG AS REC'D)	608-010 W6 1-2.5' 2/12/90	608-011 W5 8.5-10' 2/12/90	608-012 W7 5-6.5' 2/12/90
TOTAL HYDROCARBON AS:				
GASOLINE	5.00	X	X	X
KEROSENE	5.00	X	X	X
#2 FUEL OIL	5.00	X	X	X
#6 FUEL OIL	20.0	X	X	X

WARZYN ENGINEERING INC. • ONE SCIENCE COURT • UNIVERSITY RESEARCH PARK • P.O. BOX 5385 • MADISON, WISCONSIN 53705 • (608) 273-0440

TOTAL PETROLEUM HYDROCARBONS
WI LAB CERTIFICATION ID#: 113138300
PROJECT: WISCONSIN AIR NATIONAL GUARD
LOCATION: MADISON, WISCONSIN
C#: 15073.00

CK'D: BJC APP'D: MJL
DATE ISSUED: 2/5/90

METHOD
REFERENCE: SW846, "TEST METHODS FOR EVALUATING SOLID WASTES", SEPTEMBER, 1986. METHOD 3550.

ASTM, "ANNUAL BOOK OF ASTM STANDARDS", 1983. METHOD D-3328 WITH MODIFICATIONS.

NOTE: THE ANALYSIS OF SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS IS A SCREENING PROCEDURE. ANALYTICAL RESULTS ARE COMPARED AND QUANTIFIED AGAINST KNOWN REFERENCE STANDARD MIXTURES. DUE TO VARIABLES SUCH AS DIFFERENCES IN PETROLEUM PRODUCT FORMULATIONS, WEATHERING AND OTHER ENVIRONMENTAL FACTORS, POSITIVE IDENTIFICATION AS ONE OF THE TARGET HYDROCARBON MIXTURES MAY NOT BE POSSIBLE. THE VALUES REPORTED ARE TENTATIVELY IDENTIFIED WITH ESTIMATED CONCENTRATIONS.

BMQL = DETECTED, BUT BELOW METHOD QUANTITATION LIMIT.
X = ANALYZED, BUT NOT DETECTED.

COMPOUND	REPORTABLE DETECTION LIMIT (MG/KG AS REC'D)	608-007 W3 8.5-10' 2/9/90	608-008 W1 13.5-15' 2/9/90	608-009 W2 13.5-15' 2/12/90
TOTAL HYDROCARBON AS:				
GASOLINE	5.00	X	X	X
KEROSENE	5.00	X	X	X
#2 FUEL OIL	5.00	X	X	X
#6 FUEL OIL	20.0	X	X	X

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TOTAL PETROLEUM HYDROCARBONS
WI LAB CERTIFICATION ID#: 113138300
PROJECT: WISCONSIN AIR NATIONAL GUARD
LOCATION: MADISON, WISCONSIN
C#: 15073.00

CK'D: BJC APP'D: MJL
DATE ISSUED: 3/5/90

METHOD
REFERENCE: SW846, "TEST METHODS FOR EVALUATING SOLID WASTES", SEPTEMBER, 1986. METHOD 3550.

ASTM, "ANNUAL BOOK OF ASTM STANDARDS", 1983. METHOD D-3328 WITH MODIFICATIONS.

NOTE: THE ANALYSIS OF SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS IS A SCREENING PROCEDURE. ANALYTICAL RESULTS ARE COMPARED AND QUANTIFIED AGAINST KNOWN REFERENCE STANDARD MIXTURES. DUE TO VARIABLES SUCH AS DIFFERENCES IN PETROLEUM PRODUCT FORMULATIONS, WEATHERING AND OTHER ENVIRONMENTAL FACTORS, POSITIVE IDENTIFICATION AS ONE OF THE TARGET HYDROCARBON MIXTURES MAY NOT BE POSSIBLE. THE VALUES REPORTED ARE TENTATIVELY IDENTIFIED WITH ESTIMATED CONCENTRATIONS.

BMQL = DETECTED, BUT BELOW METHOD QUANTITATION LIMIT.
X = ANALYZED, BUT NOT DETECTED.

COMPOUND	REPORTABLE DETECTION LIMIT (MG/KG AS REC'D)	608-001 W13 8.5-10' 2/7/90	608-002 W12 8.5-10' 2/7/90	608-003 W10 6-7.5' 2/8/90
TOTAL HYDROCARBON AS:				
GASOLINE	5.00	X	X	X
KEROSENE	5.00	X	X	393
#2 FUEL OIL	5.00	X	X	X
#6 FUEL OIL	20.0	X	X	102

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TOTAL PETROLEUM HYDROCARBONS
WI LAB CERTIFICATION ID#: 113138300
PROJECT: WISCONSIN AIR NATIONAL GUARD
LOCATION: MADISON, WISCONSIN
C#: 15073.00

CK'D: BJC APP'D: MJL
DATE ISSUED: 3/5/90

METHOD
REFERENCE: SW846, "TEST METHODS FOR EVALUATING SOLID WASTES", SEPTEMBER, 1986. METHOD 3550.

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NOTE: THE ANALYSIS OF SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS IS A SCREENING PROCEDURE. ANALYTICAL RESULTS ARE COMPARED AND QUANTIFIED AGAINST KNOWN REFERENCE STANDARD MIXTURES. DUE TO VARIABLES SUCH AS DIFFERENCES IN PETROLEUM PRODUCT FORMULATIONS, WEATHERING AND OTHER ENVIRONMENTAL FACTORS, POSITIVE IDENTIFICATION AS ONE OF THE TARGET HYDROCARBON MIXTURES MAY NOT BE POSSIBLE. THE VALUES REPORTED ARE TENTATIVELY IDENTIFIED WITH ESTIMATED CONCENTRATIONS.

BMQL = DETECTED, BUT BELOW METHOD QUANTITATION LIMIT.
X = ANALYZED, BUT NOT DETECTED.

COMPOUND	REPORTABLE DETECTION LIMIT (MG/KG AS REC'D)	608-004 W8 5-6.5' 2/8/90	608-005 W9 8.5-10' 2/8/90	608-006 W4 3.5-5' 2/9/90
TOTAL HYDROCARBON AS:				
GASOLINE	5.00	X	X	X
KEROSENE	5.00	494	X	X
#2 FUEL OIL	5.00	X	X	X
#6 FUEL OIL	20.0	57.0	X	X

[redacted]

[redacted]
P.O. Box [redacted]
Madison, Wisconsin 53705
(608) 273-0440

W.A.N.G.

CHAIN OF CUSTODY RECORD

PROJ. NO.: 15073.00

PROJECT NAME: WI Air Nat. Guard

LOCATION: Madison, WI

SAMPLERS: *(Signature)* Wm Backus

LAB NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	VOC						REMARKS GW
785-001	3-26-90	10:45		X	W-14	2	X						1:1 HCL
-002		L		X	W-14 Dup	2	X						1:1 HCL
-003		11:00			W-13	2	X						
-004		12:25			W-2	2	X						
-005		11:40			W-1	2	X						1:1 HCL
-006		11:45			W-3	2	X						
-007		13:40			W-6	2	X						
-008		13:50			W-5	2	X						
-009		L			W-5 Dup	2	X						
-010		14:45			W-4	2	X						
-011		15:05		X	W-7	2	X						

Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*	Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*
Wm Backus	3-26-90 / 17:45				

Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*	Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*

Relinquished by: *(Signature)*	Date / Time	Received for Laboratory by: *(Signature)*	Date / Time
		Kari-Ann Fink	3/27/90 8:00am

Remarks: Kept on ice.

PROJECT MANAGER: M. Collentine

Distribution: White — Accompanies Shipment; Yellow — Laboratory File; Pink — Coordinator Field Files

№ 8 3821

Univ[illegible] Research
P.O. Box 5385
Madison, Wisconsin 53705
(608) 273-0440

CHAIN OF CUSTODY RECORD

PROJ. NO.	PROJECT NAME	LOCATION
15073.00	WAPC	Madison, WI

SAMPLERS: (Signature) Wm Buckua

· 2 of 2

LAB NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	VOC	Finger Print						REMARKS
785-012	3-26-90	1655		X	W-9	2	X							GW
-013		1535		X	W-11	2	X							
-014		1605		X	W-12	2	X							
-015		1640		X	Bailer Blank	2	X							
-016		0830		X	Trip Blank	1	X							
-017		1530		X	W-8 Product	1		X						
-018		1545		X	W-10 Product	1		X						

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Wm Buckua	3-26-90 17:45				
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)		Date / Time	
		Kari-Ann Fink		3/27/90 8:00 am	

Remarks: kept on ice

PROJECT MANAGER: M. Collentine

Distribution: White — [illegible]

No 8 3822

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VOLATILE ORGANIC COMPOUND RESULTS
WI LAB CERTIFICATION ID#: 113138300
PROJECT: WISCONSIN AIR NATIONAL GUARD
LOCATION: MADISON, WISCONSIN
C#: 15073.00

CK'D: BJC APP'D: PJS
DATE ISSUED: 4/11/90

COMPOUND	REPORTABLE DETECTION LIMIT (UG/L)	785-013 W-11 3/26/90	785-014 W-12 3/26/90
BENZENE	1.00	X	X
BROMOCHLOROMETHANE	1.00	X	X
BROMODICHLOROMETHANE	1.00	X	X
BROMOFORM	1.00	X	X
BROMOMETHANE	1.00	X	X
CARBON TETRACHLORIDE	1.00	X	X
CHLOROBENZENE	1.00	X	X
CHLORODIBROMOMETHANE	1.00	X	X
CHLOROETHANE	1.00	X	X
2-CHLOROETHYLVINYL ETHER	10.0	X	X
CHLOROFORM	1.00	X	X
CHLOROMETHANE	1.00	X	X
1,2-DIBROMO-3-CHLOROPROPANE	2.00	X	X
1,2-DICHLOROBENZENE	1.00	X	X
1,3-DICHLOROBENZENE	1.00	X	X
1,4-DICHLOROBENZENE	1.00	X	X
1,1-DICHLOROETHANE	1.00	X	X
1,2-DICHLOROETHANE	1.00	X	X
1,1-DICHLOROETHENE	1.00	X	X
CIS-1,2-DICHLOROETHENE	1.00	X	X
TRANS-1,2-DICHLOROETHENE	1.00	X	X
1,2-DICHLOROPROPANE	1.00	X	X
CIS-1,3-DICHLOROPROPENE	1.00	X	X
TRANS-1,3-DICHLOROPROPENE	1.00	X	X
ETHYL BENZENE	1.00	X	X
METHYLENE CHLORIDE	5.00	X	X
1,1,1,2-TETRACHLOROETHANE	1.00	X	X
1,1,2,2-TETRACHLOROETHANE	1.00	X	X
TETRACHLOROETHENE	1.00	X	X
TOLUENE	1.00	X	X
1,1,1-TRICHLOROETHANE	1.00	X	X
1,1,2-TRICHLOROETHANE	1.00	X	X
TRICHLOROETHENE	1.00	X	X
TRICHLOROFLUOROMETHANE	1.00	X	X
VINYL CHLORIDE	1.00	X	X
XYLENES	1.00	X	X

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VOLATILE ORGANIC COMPOUND RESULTS
WI LAB CERTIFICATION ID#: 113138300
PROJECT: WISCONSIN AIR NATIONAL GUARD
LOCATION: MADISON, WISCONSIN
C#: 15073.00

CK'D: BJC APP'D: DAF
DATE ISSUED: 4/11/91

COMPOUND	REPORTABLE DETECTION LIMIT (UG/L)	785-015 BAILER BLANK 3/26/90	785-016 TRIP BLANK 3/26/90
BENZENE	1.00	X	X
BROMOCHLOROMETHANE	1.00	X	X
BROMODICHLOROMETHANE	1.00	X	X
BROMOFORM	1.00	X	X
BROMOMETHANE	1.00	X	X
CARBON TETRACHLORIDE	1.00	X	X
CHLOROBENZENE	1.00	X	X
CHLORODIBROMOMETHANE	1.00	X	X
CHLOROETHANE	1.00	X	X
2-CHLOROETHYLVINYL ETHER	10.0	X	X
CHLOROFORM	1.00	X	X
CHLOROMETHANE	1.00	X	X
1,2-DIBROMO-3-CHLOROPROPANE	2.00	X	X
1,2-DICHLOROBENZENE	1.00	X	X
1,3-DICHLOROBENZENE	1.00	X	X
1,4-DICHLOROBENZENE	1.00	X	X
1,1-DICHLOROETHANE	1.00	X	X
1,2-DICHLOROETHANE	1.00	X	X
1,1-DICHLOROETHENE	1.00	X	X
CIS-1,2-DICHLOROETHENE	1.00	X	X
TRANS-1,2-DICHLOROETHENE	1.00	X	X
1,2-DICHLOROPROPANE	1.00	X	X
CIS-1,3-DICHLOROPROPENE	1.00	X	X
TRANS-1,3-DICHLOROPROPENE	1.00	X	X
ETHYL BENZENE	1.00	X	X
METHYLENE CHLORIDE	5.00	X	X
1,1,1,2-TETRACHLOROETHANE	1.00	X	X
1,1,2,2-TETRACHLOROETHANE	1.00	X	X
TETRACHLOROETHENE	1.00	X	X
TOLUENE	1.00	X	X
1,1,1-TRICHLOROETHANE	1.00	X	X
1,1,2-TRICHLOROETHANE	1.00	X	X
TRICHLOROETHENE	1.00	X	X
TRICHLOROFLUOROMETHANE	1.00	X	X
VINYL CHLORIDE	1.00	X	X
XYLENES	1.00	X	X

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VOLATILE ORGANIC COMPOUND RESULTS
WI LAB CERTIFICATION ID#: 113138300
PROJECT: WISCONSIN AIR NATIONAL GUARD
LOCATION: MADISON, WISCONSIN
C#: 15073.00

CK'D: BJC APP'D: PMF
DATE ISSUED: 4/11/90

COMPOUND	REPORTABLE DETECTION LIMIT (UG/L)	785-004 W-2 3/26/90	785-005(1) W-1 3/26/90	785-006 W-3 3/26/90
BENZENE	1.00	X	BMQL	X
BROMOCHLOROMETHANE	1.00	X	X	X
BROMODICHLOROMETHANE	1.00	X	X	X
BROMOFORM	1.00	X	X	X
BROMOMETHANE	1.00	X	X	X
CARBON TETRACHLORIDE	1.00	X	BMQL	X
CHLOROBENZENE	1.00	X	X	X
CHLORODIBROMOMETHANE	1.00	X	X	X
CHLOROETHANE	1.00	X	X	X
2-CHLOROETHYLVINYL ETHER	10.0	X	X	X
CHLOROFORM	1.00	X	X	X
CHLOROMETHANE	1.00	X	X	X
1,2-DIBROMO-3-CHLOROPROPANE	2.00	X	X	X
1,2-DICHLOROBENZENE	1.00	X	X	X
1,3-DICHLOROBENZENE	1.00	X	X	X
1,4-DICHLOROBENZENE	1.00	X	X	X
1,1-DICHLOROETHANE	1.00	X	X	X
1,2-DICHLOROETHANE	1.00	X	X	X
1,1-DICHLOROETHENE	1.00	X	BMQL	X
CIS-1,2-DICHLOROETHENE	1.00	X	35.9	X
TRANS-1,2-DICHLOROETHENE	1.00	X	X	X
1,2-DICHLOROPROPANE	1.00	X	X	X
CIS-1,3-DICHLOROPROPENE	1.00	X	X	X
TRANS-1,3-DICHLOROPROPENE	1.00	X	X	X
ETHYL BENZENE	1.00	X	X	X
METHYLENE CHLORIDE	5.00	X	X	X
1,1,1,2-TETRACHLOROETHANE	1.00	X	X	X
1,1,2,2-TETRACHLOROETHANE	1.00	X	X	X
TETRACHLOROETHENE	1.00	X	X	X
TOLUENE	1.00	X	X	X
1,1,1-TRICHLOROETHANE	1.00	X	X	X
1,1,2-TRICHLOROETHANE	1.00	X	X	X
TRICHLOROETHENE	1.00	X	X	X
TRICHLOROFLUOROMETHANE	1.00	X	X	X
VINYL CHLORIDE	1.00	X	X	X
XYLENES	1.00	X	X	X

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VOLATILE ORGANIC COMPOUND RESULTS
WI LAB CERTIFICATION ID#: 113138300
PROJECT: WISCONSIN AIR NATIONAL GUARD
LOCATION: MADISON, WISCONSIN
C#: 15073.00

CK'D: CAPP'D:
DATE ISSUED: 4/11/90

COMPOUND	REPORTABLE DETECTION LIMIT (UG/L)	785-001 W-14 3/26/90	785-002 W-14 DUP 3/26/90	785-003 W-13 3/26/90
BENZENE	1.00	X	X	X
BROMOCHLOROMETHANE	1.00	X	X	X
BROMODICHLOROMETHANE	1.00	X	X	X
BROMOFORM	1.00	X	X	X
BROMOMETHANE	1.00	X	X	X
CARBON TETRACHLORIDE	1.00	X	X	X
CHLOROBENZENE	1.00	X	X	X
CHLORODIBROMOMETHANE	1.00	X	X	X
CHLOROETHANE	1.00	X	X	X
2-CHLOROETHYLVINYL ETHER	10.0	X	X	X
CHLOROFORM	1.00	X	X	X
CHLOROMETHANE	1.00	X	X	X
1,2-DIBROMO-3-CHLOROPROPANE	2.00	X	X	X
1,2-DICHLOROBENZENE	1.00	X	X	X
1,3-DICHLOROBENZENE	1.00	X	X	X
1,4-DICHLOROBENZENE	1.00	X	X	X
1,1-DICHLOROETHANE	1.00	X	X	X
1,2-DICHLOROETHANE	1.00	X	X	X
1,1-DICHLOROETHENE	1.00	X	X	X
CIS-1,2-DICHLOROETHENE	1.00	BMQL	BMQL	X
TRANS-1,2-DICHLOROETHENE	1.00	X	X	X
1,2-DICHLOROPROPANE	1.00	X	X	X
CIS-1,3-DICHLOROPROPENE	1.00	X	X	X
TRANS-1,3-DICHLOROPROPENE	1.00	X	X	X
ETHYL BENZENE	1.00	X	X	X
METHYLENE CHLORIDE	5.00	X	X	X
1,1,1,2-TETRACHLOROETHANE	1.00	X	X	X
1,1,2,2-TETRACHLOROETHANE	1.00	X	X	X
TETRACHLOROETHENE	1.00	X	X	2.00
TOLUENE	1.00	X	X	X
1,1,1-TRICHLOROETHANE	1.00	X	X	X
1,1,2-TRICHLOROETHANE	1.00	X	X	X
TRICHLOROETHENE	1.00	X	X	X
TRICHLOROFLUOROMETHANE	1.00	X	X	X
VINYL CHLORIDE	1.00	X	BMQL	X
XYLENES	1.00	X	X	X

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VOLATILE ORGANIC COMPOUND RESULTS
WI LAB CERTIFICATION ID#: 113138300
PROJECT: WISCONSIN AIR NATIONAL GUARD
LOCATION: MADISON, WISCONSIN
C#: 15073.00

CK'D: BJC APP'D: DAE
DATE ISSUED: 4/11/90

COMPOUND	REPORTABLE DETECTION LIMIT (UG/L)	785-010 W-4 3/26/90	785-011 W-7 3/26/90	785-012(1) W-9 3/26/90
BENZENE	1.00	X	X	9.79
BROMOCHLOROMETHANE	1.00	X	X	X
BROMODICHLOROMETHANE	1.00	X	X	X
BROMOFORM	1.00	X	X	X
BROMOMETHANE	1.00	X	X	X
CARBON TETRACHLORIDE	1.00	X	X	X
CHLOROBENZENE	1.00	X	X	X
CHLORODIBROMOMETHANE	1.00	X	X	X
CHLOROETHANE	1.00	X	X	X
2-CHLOROETHYLVINYL ETHER	10.0	X	X	X
CHLOROFORM	1.00	X	X	X
CHLOROMETHANE	1.00	X	X	X
1,2-DIBROMO-3-CHLOROPROPANE	2.00	X	X	X
1,2-DICHLOROBENZENE	1.00	X	X	X
1,3-DICHLOROBENZENE	1.00	X	X	X
1,4-DICHLOROBENZENE	1.00	X	X	X
1,1-DICHLOROETHANE	1.00	X	X	X
1,2-DICHLOROETHANE	1.00	X	X	X
1,1-DICHLOROETHENE	1.00	X	X	X
CIS-1,2-DICHLOROETHENE	1.00	X	X	X
TRANS-1,2-DICHLOROETHENE	1.00	X	X	X
1,2-DICHLOROPROPANE	1.00	X	X	X
CIS-1,3-DICHLOROPROPENE	1.00	X	X	X
TRANS-1,3-DICHLOROPROPENE	1.00	X	X	X
ETHYL BENZENE	1.00	X	X	27.3
METHYLENE CHLORIDE	5.00	X	X	X
1,1,1,2-TETRACHLOROETHANE	1.00	X	X	X
1,1,2,2-TETRACHLOROETHANE	1.00	X	X	X
TETRACHLOROETHENE	1.00	X	BMQL	X
TOLUENE	1.00	X	X	3.07
1,1,1-TRICHLOROETHANE	1.00	X	X	X
1,1,2-TRICHLOROETHANE	1.00	X	X	X
TRICHLOROETHENE	1.00	2.36	X	X
TRICHLOROFLUOROMETHANE	1.00	X	X	X
VINYL CHLORIDE	1.00	X	X	X
XYLENES	1.00	X	X	235

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VOLATILE ORGANIC COMPOUND RESULTS
WI LAB CERTIFICATION ID#: 113138300
PROJECT: WISCONSIN AIR NATIONAL GUARD
LOCATION: MADISON, WISCONSIN
C#: 15073.00

CK'D: BJC APP'D: [illegible]
DATE ISSUED: 4/11/90

COMPOUND	REPORTABLE DETECTION LIMIT (UG/L)	785-007(1) W-6 3/26/90	785-008 W-5 3/26/90	785-009 W-5 DUP 3/26/90
BENZENE	1.00	X	X	X
BROMOCHLOROMETHANE	1.00	X	X	X
BROMODICHLOROMETHANE	1.00	X	X	X
BROMOFORM	1.00	X	X	X
BROMOMETHANE	1.00	X	X	X
CARBON TETRACHLORIDE	1.00	X	X	X
CHLOROBENZENE	1.00	X	X	X
CHLORODIBROMOMETHANE	1.00	X	X	X
CHLOROETHANE	1.00	X	X	X
2-CHLOROETHYLVINYL ETHER	10.0	X	X	X
CHLOROFORM	1.00	X	X	X
CHLOROMETHANE	1.00	X	X	X
1,2-DIBROMO-3-CHLOROPROPANE	2.00	X	X	X
1,2-DICHLOROBENZENE	1.00	X	X	X
1,3-DICHLOROBENZENE	1.00	X	X	X
1,4-DICHLOROBENZENE	1.00	X	X	X
1,1-DICHLOROETHANE	1.00	X	X	X
1,2-DICHLOROETHANE	1.00	X	X	X
1,1-DICHLOROETHENE	1.00	X	X	X
CIS-1,2-DICHLOROETHENE	1.00	1.80	X	X
TRANS-1,2-DICHLOROETHENE	1.00	X	X	X
1,2-DICHLOROPROPANE	1.00	X	X	X
CIS-1,3-DICHLOROPROPENE	1.00	X	X	X
TRANS-1,3-DICHLOROPROPENE	1.00	X	X	X
ETHYL BENZENE	1.00	X	X	X
METHYLENE CHLORIDE	5.00	X	X	X
1,1,1,2-TETRACHLOROETHANE	1.00	X	X	X
1,1,2,2-TETRACHLOROETHANE	1.00	X	X	X
TETRACHLOROETHENE	1.00	X	X	X
TOLUENE	1.00	1.77	X	X
1,1,1-TRICHLOROETHANE	1.00	X	X	X
1,1,2-TRICHLOROETHANE	1.00	X	X	X
TRICHLOROETHENE	1.00	1.34	11.8	9.18
TRICHLOROFLUOROMETHANE	1.00	X	X	X
VINYL CHLORIDE	1.00	1.90	X	X
XYLENES	1.00	6.82	BMQL	X

[redacted]

[redacted]
Madison, Wisconsin 53705
(608) 273-0440

CHAIN OF CUSTODY RECORD

PROJ. NO. 15073.00

PROJECT NAME: Wisconsin Air National Guard

LOCATION: Madison Wisconsin

SAMPLERS: (Signature) Kevin Swansen

LAB NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	TPH						REMARKS
608-001	2/7/90	11:15AM		X	W13 depth 8.5-10 ft	1 Jar	✓						Soil
002	2/7/90	2:00PM		X	W12 depth 8.5-10 ft	1 Jar	✓						Hold while we decide parameters to analyze.
999-212	2/7/90	4:00PM		X	W11 depth 8.5-10 ft	1 Jar							

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Kevin Swansen	7 Feb 6:05pm				

Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time
		Kari-Ann Fink	2/21/90 1:50pm

Remarks

PROJECT MANAGER: Mike Collentine

Distribution: White – Accompanies Shipment; Yellow — Laboratory File; Pink — Coordinator Field Files

№ 9 01165

Univ esearc
P.O. Box 5385
Madison, Wisconsin 53705
(608) 273-0440

CHAIN OF CUSTODY RECORD

PROJ. NO. 150730.00 | PROJECT NAME: Wisc. Air National Guard | LOCATION: Truax Field, Madison WI

SAMPLERS: (Signature) Kevin Swanson

LAB NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	TPH	REMARKS
608003	2/8/90	11am		X	W10, 6-7.5 ft	1	✓	soil *Hold for analysis request
-004	2/8/90	2pm		X	W8, 5-6.5 ft	1	✓	"
999-213	2/8/90	2pm		X	W8, 8.5-10 ft	1		"
608005	2/8/90	4:30pm		X	W9, 8.5-10 ft	1	✓	"

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Kevin Swanson	2/8/90 6:45pm				

Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time
		Kari-Ann Finke	2/21/90 1:50pm

Remarks

PROJECT MANAGER:

Distribution: White — Company Shipment; Yellow — Laboratory File; Pink — Coordinator Field Files

No 9 01166

[redacted] Driver [redacted] earch
[redacted] Box 53[redacted]
Madison, Wisconsin 53705
(608) 273-0440

CHAIN OF CUSTODY RECORD

PROJ. NO. 15073

PROJECT NAME (WARG) Wisc. Air Nat'l Guard

LOCATION: TRUAX Field; Madison WI

SAMPLERS: (Signature) Kevin Swanson

LAB NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	TPH						REMARKS
608006	2/9/90	9:30		X	W4 depth 3.5 - 5 ft	1	✓						hold for analysis request
999-214	2/9/90	9:30		X	W4 depth 8.5 - 10 ft	1							"
608007	2/9/90	1:00		X	W3 depth 8.5 - 10 ft	1	✓						"
1r-008	2/9/90	3:30		X	W1 depth 13.5 - 15 ft	1	✓						"

soil

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Kevin Swanson	2/9/90 5:50pm				
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)		Date / Time	
		Kari-Ann Finke		2/21/90 1:50 pm	

Remarks

PROJECT MANAGER: (Mike Collentine)

Distribution: White – Accompanies Shipment; Yellow — Laboratory File; Pink — Coordinator Field Files

№ 9 01167

University Research Park
P.O. Box 5385
Madison, Wisconsin 53705
(608) 273-0440

CHAIN OF CUSTODY RECORD

PROJ. NO. 15073

PROJECT NAME: Wis Air Natl Guard

LOCATION: Truax Field; Madison WI

SAMPLERS: (Signature) Kevin Swanson

LAB NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	TPH	REMARKS
609009	2/12/90	9:00AM		✓	W2; depth 13.5-15 ft	1	✓	Hold for Analysis Request
-010	2/12/90	11:30		✓	W6 depth 1-2.5 ft	1	✓	"
-011	2/12/90	3:00pm		✓	W5 depth 8.5-10 ft	1	✓	"
-012	2/12/90	4:30		✓	W7 depth 5-6.5 ft	1	✓	"

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Kevin Swanson	2/12/90 6:30pm				
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)		Date / Time	
		Kari-Ann Linke		2/21/90 1:50 pm	

Remarks

PROJECT MANAGER:

[redacted]ributi[redacted]hite — [redacted]mpani[redacted]ment [redacted]v — L[redacted]ory Fil[redacted]ink — Coordinator Field Files [redacted]

№ 8 [redacted]6879

Univ[redacted] Research
[redacted] Box [redacted]
Madison, Wisconsin 53705
(608) 273-0440

CHAIN OF CUSTODY RECORD

PROJ. NO. 15073

PROJECT NAME: Wis Air Natl Guard

LOCATION: Truax Field, Madison

SAMPLERS: (Signature) Kevin Swanson

LAB NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	REMARKS
999-215	2/13/90	9:00AM			W14 depth 13.5-15'	1	Soil Held for Analytical Request
-216	2/13/90	11:00AM			W8 top of water column	1	well water + organic liquid, Held for analytical request

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Kevin Swanson	2/13/90 3:00pm				
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)		Date / Time	
		Kari-Ann Fink		2/21/90 1:50pm	

Remarks

PROJECT MANAGER: Mike Collafine

Distribution: White – Accompanies Shipment; Yellow – Laboratory File; Pink – Coordinator Field Files

№ 9 01158

APPENDIX D

Midwest Petroleum Services, Inc.
Reports of Tank Tightness Testing

#401-1

MIDWEST PETROLEUM SERVICE, INC.

REPORT OF AINLAY TTT TANK TEST

Company: Wisconsin Air National Guard
Address: Truax Field
City: Madison State: WI

Brand Name:
Grade of
Product: Water

60 Minute Temperature Check

Start Time: 11:45
Completion Time: 12:45

A	B	C	D	E	F
	Temperatures				
Probes	Start of Test	End of Test	Temp. Shift (B from C) + or -	Multiply Column D by E	Add up for Weighted Shift
Top	39.33	39.30	-.03	x .25	-.0075
Middle	39.23	39.17	-.06	x .50	-.03
Bottom	39.24	39.25	+.01	x .25	+.0025

1. Add the three results in Column F (Weighted Ave. Temp. Shift: -.035
   Tank dia. and lgth: 42" Gallon Capacity: 550
3. Exact Water Level in tank bottom.
   Test Start: Full Test End: Full

60 Minute Volume Check

Start Time: 11:45
Completion Time: 12:45

4. Exact amount of liquid lost and replaced (-) or gained and removed (+) in fill pipe to restore original level : +.006
5. API Gravity of tested liquid in graduate : N/A
6. Temperature of tested liquid in graduate : 39
7. Subtract Line 6 from 60 degrees. (Result is + or -). : N/A
8. Multiply Line 7 x .1 (+ x - = -/+ x + = +). : N/A
9. Line 5 + or - Line 8 (API gravity adjusted for temperature). : 53.7
10. With Line 9 enter Table C, Read Coefficient of Expansion. : .00000084
11. Multiply Line 10 by Line 2 (Gallons) (Volume change for each degree of temperature change. : .0044
12. Multiply Line 11 by Line 1 (Volume change due to temperature). : -.000015
13. Change sign of Line 12 (See Sec. 9.4) and add to line 4 mathematically (net change in gallons), + or - : +.006015

    Double Check sign: - Product Lost
    + Product Gained

Note: NFPA Publication # 329, 4-3.10.1 does not call for a precision test to show a loss of more than .05 gallons (189 ml) per hour.

Therefore, since tested tank had a ~~loss~~/gain of (Line 13): +.006 gallons per hour it Does: X Does Not: meet the NFPA criterion for tank tightness.

Additional Remarks: 4" opening to test from.

This certifies that the tanks described were tested by the undersigned and that the stated results represent the true state of the tanks on this date to the best of my knowledge.

Midwest Petroleum Service, Inc.

Tester

Month: 01 Day: 10 Year: 90

401-2

MIDWEST PETROLEUM SERVICE, INC

REPORT OF AINLAY TIT TANK TEST

Company: Wisconsin Air National Guard
Address: Truax Field
City: Madison State: WI

Brand Name:
Grade of
Product: Waste Oil & Water

60 Minute Temperature Check

Start Time: 10:15
Completion Time: 11:15

A	B	C	D	E	F
	Temperatures				
Probes	Start of Test	End of Test	Temp. Shift: (B from C) + or -	Multiply Column D by E	Add up for Weight Shift
Top	32.83	32.36	-.47	x .25	-.1175
Middle	32.40	32.16	-.24	x .50	-.12
Bottom	34.35	34.32	-.03	x .25	-.0075

1. Add the three results in Column F (Weighted Ave. Temp. Shift: -.2375
   Tank dia. and lgth: 42" Gallon Capacity: 250
3. Exact Water Level in tank bottom.
   Test Start: 17" Test End: 17"

60 Minute Volume Check

Start Time: 10:15
Completion Time: 11:15

4. Exact amount of liquid lost and replaced (-) or gained and removed (+) in fill pipe to restore original level	: -.014
5. API Gravity of tested liquid in graduate	: 31
6. Temperature of tested liquid in graduate	: 37.5
7. Subtract Line 6 from 60 degrees. (Result is + or -).	: N/A
8. Multiply Line 7 x .1 (+ x - = -/+ x + = +).	: N/A
9. Line 5 + or - Line 8 (API gravity adjusted for temperature).	: 32.6
10. With Line 9 enter Table C, Read Coefficient of Expansion.	: .00045352
11. Multiply Line 10 by Line 2 (Gallons) (Volume change for each degree of temperature change.	: .05669
12. Multiply Line 11 by Line 1 (Volume change due to temperature).	: 0.010067
13. Change sign of Line 12 (See Sec. 9.4) and add to line 4 mathematically (net change in gallons), + or - Double Check sign: - Product Lost + Product Gained	: -0.0129933

Note: NFPA Publication # 329, 4-3.10.1 does not call for a precision test to show a loss of more than .05 gallons (189 ml) per hour.

Therefore, since tested tank had a loss/gain of (Line 13): -0.0129933 gallons per hour it Does: Does Not: meet the NFPA criterion for tightness

Additional
Remarks: Tank has 17" of water in for test purpose - a one inch piece of conduit for the vent and a 2" fill.

This certifies that the tanks described were tested by the undersigned and that the stated results represent the true state of the tanks on this date to the best of my knowledge.

Midwest Petroleum Service, Inc.

Dale Hamburg, Tester

Month: 01 Day: 11 Year: 90

MIDWEST PETROLEUM SERVICE, INC.

REPORT OF AINLAY TTT TANK TEST

Company: Wisconsin Air National Guard
Address: Truax Field
City: Madison State: Wisconsin

Brand Name:
Grade of
Product: JP - 4 Tank #2

60 Minute Temperature Check

Start Time: 11:15
Completion Time: 4:15

A	B	C	D	E	F
	Temperatures				
Probes	Start of Test	End of Test	Temp. Shift: (B from C) + or -	Multiply Column D by E	Add up for Weight Shift
Top	32.37	32.40	+.03	x .25	+.0075
Middle	32.36	32.39	+.03	x .50	+.015
Bottom	31.98	32.02	+.04	x .25	+.01

1. Add the three results in Column F (Weighted Ave. Temp. Shift: +.0325
   Tank dia. and lgth: 10' Gallon Capacity: 50,000
3. Exact Water Level in tank bottom.
   Test Start: -0- Test End: -0-

60 Minute Volume Check

Start Time: 11:15
Completion Time: 4:15

4. Exact amount of liquid lost and replaced (-) or gained and removed (+) in fill pipe to restore original level : +.84
5. API Gravity of tested liquid in graduate : 50.5
6. Temperature of tested liquid in graduate : 34.5
7. Subtract Line 6 from 60 degrees. (Result is + or -). : N/A
8. Multiply Line 7 x .1 (+ x - = -/+ x + = +). : N/A
9. Line 5 + or - Line 8 (API gravity adjusted for temperature). : 53.4
10. With Line 9 enter Table C, Read Coefficient of Expansion. : .00064815
11. Multiply Line 10 by Line 2 (Gallons) (Volume change for each degree of temperature change. : 32.405
12. Multiply Line 11 by Line 1 (Volume change due to temperature). : +1.053
13. Change sign of Line 12 (See Sec. 9.4) and add to line 4 mathematically (net change in gallons), + or - : -.213 - 5 = -.0426

    Double Check sign: - Product Lost
    + Product Gained

Note: NFPA Publication # 329, 4-3.10.1 does not call for a precision test to show a loss of more than .05 gallons (189 ml) per hour.

Therefore, since tested tank had a loss/~~gain~~ of (Line 13): -.0426 gallons per hour it Does: X Does Not: meet the NFPA criterion for tank tightness.

Additional
Remarks: Tested through 8" opening in manhole cover - Tanks last inspected in July of 1987. Found leak in tank on West end at a fitting on the tank which has nipple screwed into it. Should be repaired when tanks are inspected or sooner.

This certifies that the tanks described were tested by the undersigned and that the stated results represent the true state of the tanks on this date to the best of my knowledge.

Midwest Petroleum Service, Inc.

_____, Tester

Month: 01 Day: 04 Year: 90

MIDWEST PETROLEUM SERVICE, INC.

REPORT OF AINLAY TTT TANK TEST

Company: Wisconsin Air National Guard
Address: Truax Field
City: Madison State: Wisconsin

Brand Name:
Grade of
Product: JP 4 Tank #3

60 Minute Temperature Check

Start Time: 10:00
Completion Time: 3:00

A	B	C	D	E	F
	Temperatures				
Probes	Start of Test	End of Test	Temp. Shift: (B from C) + or -	Multiply Column D by E	Add up for Weight Shift
Top	39.20	39.17	-.03	x .25	-.0075
Middle	39.29	39.15	-.14	x .50	-.07
Bottom	38.85	38.74	-.11	x .25	-.0275

1. Add the three results in Column F (Weighted Ave. Temp. Shift: -.105
   Tank dia. and lgth: 10' Gallon Capacity: 50,000
3. Exact Water Level in tank bottom.
   Test Start: -0- Test End: -0-

60 Minute Volume Check

Start Time: 10:00
Completion Time: 3:00

4. Exact amount of liquid lost and replaced (-) or gained and removed (+) in fill pipe to restore original level : -1.48
5. API Gravity of tested liquid in graduate : 50
6. Temperature of tested liquid in graduate : 30°
7. Subtract Line 6 from 60 degrees. (Result is + or -). : N/A
8. Multiply Line 7 x .1 (+ x - = -/+ x + = +). : N/A
9. Line 5 + or - Line 8 (API gravity adjusted for temperature). : 53.4
10. With Line 9 enter Table C, Read Coefficient of Expansion. : .00064815
11. Multiply Line 10 by Line 2 (Gallons) (Volume change for each degree of temperature change. : 32.405
12. Multiply Line 11 by Line 1 (Volume change due to temperature). : 3.40
13. Change sign of Line 12 (See Sec. 9.4) and add to line 4 mathematically (net change in gallons), + or - : 1.92 ÷ 5 = .38

    Double Check sign: - Product Lost
    + Product Gained

Note: NFPA Publication # 329, 4-3.10.1 does not call for a precision test to show a loss of more than .05 gallons (189 ml) per hour.

Therefore, since tested tank had a ~~loss~~/gain of (Line 13): +.38 gallons per hour it Does: X Does Not: meet the NFPA criterion for tank tightness.

Additional
Remarks: Turbine pump in pump house mounted in tank. Has 4" fill with drop tube Test tank through 8" opening in pit on top of manhole cover. Has 6" vents, tank cleaned & inspected 1987 July, tanks installed 1952. 5 hour test.

This certifies that the tanks described were tested by the undersigned and that the stated results represent the true state of the tanks on this date to the best of my knowledge.

Midwest Petroleum Service, Inc.

[signature], Tester

Month: 12 Day: 20 Year: 89

413-1

MIDWEST PETROLEUM SERVICE, INC.

REPORT OF AINLAY TTT TANK TEST

Company: Wisconsin Air National Guard
Address: Truax Field
City: Madison State: WI

Brand Name:
Grade of
Product: Water

60 Minute Temperature Check

Start Time: 12:10
Completion Time: 1:10

A	B	C	D	E	F
	Temperatures				
Probes	Start of Test	End of Test	Temp. Shift: (B from C) + or -	Multiply Column D by E	Add up for Weight Shift
Top	40.74	40.58	-.16	x .25	-.04
Middle	40.62	40.60	-.02	x .50	-.01
Bottom	40.65	40.65	0	x .25	0

1. Add the three results in Column F (Weighted Ave. Temp. Shift: -.05
   Tank dia. and lgth: 42" Gallon Capacity: 300
3. Exact Water Level in tank bottom.
   Test Start: Full Test End: Full

60 Minute Volume Check

Start Time: 12:10
Completion Time: 1:10

4. Exact amount of liquid lost and replaced (-) or gained and removed (+) in fill pipe to restore original level	: -.011
5. API Gravity of tested liquid in graduate	: N/A
6. Temperature of tested liquid in graduate	: 40
7. Subtract Line 6 from 60 degrees. (Result is + or -).	: N/A
8. Multiply Line 7 x .1 (+ x - = -/+ x + = +).	: N/A
9. Line 5 + or - Line 8 (API gravity adjusted for temperature).	: N/A
10. With Line 9 enter Table C, Read Coefficient of Expansion.	: .00000407
11. Multiply Line 10 by Line 2 (Gallons) (Volume change for each degree of temperature change.	: .0012
12. Multiply Line 11 by Line 1 (Volume change due to temperature).	: -.00006
13. Change sign of Line 12 (See Sec. 9.4) and add to line 4 mathematically (net change in gallons), + or -	: +.01106

Double Check sign: - Product Lost
+ Product Gained

Note: NFPA Publication # 329, 4-3.10.1 does not call for a precision test to show a loss of more than .05 gallons (189 ml) per hour

Therefore, since tested tank had a ~~loss~~/gain of (Line 13): +.01106 gallons per hour it Does: X Does Not: meet the NFPA criterion for tank tightness.

Additional Remarks: 5 year old tank.

This certifies that the tanks described were tested by the undersigned and that the stated results represent the true state of the tanks on this date to the best of my knowledge.

Midwest Petroleum Service, Inc.

Dale Thompson, Tester

Month: 01 Day: 11 Year: 90

#1000-5

MIDWEST PETROLEUM SERVICE, INC.

REPORT OF AINLAY TTT TANK TEST

Company: Wisconsin Air National Guard
Address: Truax Field
City: Madison State: WI

Brand Name: N/A
Grade of Product: Water

60 Minute Temperature Check

Start Time: 11:15
Completion Time: 12:15

A	B	C	D	E	F
	Temperatures				
Probes	Start of Test	End of Test	Temp. Shift: (B from C) + or -	Multiply Column D by E	Add up for Weight Shift
Top	34.85	34.64	-.21	x .25	-.05
Middle	37.22	36.99	-.23	x .50	-.115
Bottom	39.05	38.96	-.09	x .25	-.0225

1. Add the three results in Column F (Weighted Ave. Temp. Shift: -.1875
   Tank dia. and lgth: 44" Gallon Capacity: 250
3. Exact Water Level in tank bottom.
   Test Start: Full Test End: Full

60 Minute Volume Check

Start Time: 11:15
Completion Time: 12:15

4. Exact amount of liquid lost and replaced (-) or gained and removed (+) in fill pipe to restore original level : -.004
5. API Gravity of tested liquid in graduate : N/A
6. Temperature of tested liquid in graduate : 39°
7. Subtract Line 6 from 60 degrees. (Result is + or -). : N/A
8. Multiply Line 7 x .1 (+ x - = -/+ x + = +). : N/A
9. Line 5 + or - Line 8 (API gravity adjusted for temperature). : N/A
10. With Line 9 enter Table C, Read Coefficient of Expansion. : .00000084
11. Multiply Line 10 by Line 2 (Gallons) (Volume change for each degree of temperature change. : .0002
12. Multiply Line 11 by Line 1 (Volume change due to temperature). : -.00003
13. Change sign of Line 12 (See Sec. 9.4) and add to line 4 mathematically (net change in gallons), + or - : -.0039

    Double Check sign: - Product Lost
    + Product Gained

Note: NFPA Publication # 329, 4-3.10.1 does not call for a precision test to show a loss of more than .05 gallons (189 ml) per hour.

Therefore, since tested tank had a loss/~~gain~~ of (Line 13): -.0039 gallons per hour it Does: X Does Not: meet the NFPA criterion for tank tightness.

Additional
Remarks: Added approximately 2.5 gallons to top off. Level in manometer slowly leveled off after sitting approximately 30 minutes.

This certifies that the tanks described were tested by the undersigned and that the stated results represent the true state of the tanks on this date to the best of my knowledge.

Midwest Petroleum Service, Inc.

Tester

Month: 1 Day: 18 Year: 90

MIDWEST PETROLEUM SERVICE, INC.

REPORT OF AINLAY TTT TANK TEST

Company: Wisconsin Air National Guard
Address: Truax Field
City: Madison State: Wisconsin

Brand Name:
Grade of
Product: JP 4 Tank #4

60 Minute Temperature Check

Start Time: 10:00
Completion Time: 3:00

A	B	C	D	E	F
	Temperatures				
Probes	Start of Test	End of Test	Temp. Shift: (B from C) + or -	Multiply Column D by E	Add up for Weight Shift
Top	37.11	37.03	-.08	x .25	-.02
Middle	37.09	37.00	-.09	x .50	-.045
Bottom	36.78	36.70	-.08	x .25	-.02

1. Add the three results in Column F (Weighted Ave. Temp. Shift: -.085
   Tank dia. and lgth: 120" Gallon Capacity: 50,000
3. Exact Water Level in tank bottom.
   Test Start: -0- Test End: -0-

60 Minute Volume Check

Start Time: 10:00
Completion Time: 3:00

4. Exact amount of liquid lost and replaced (-) or gained and removed (+) in fill pipe to restore original level : .52 - 5 = (-.104)
5. API Gravity of tested liquid in graduate : 50
6. Temperature of tested liquid in graduate : 30
7. Subtract Line 6 from 60 degrees. (Result is + or -). : N/A
8. Multiply Line 7 x .1 (+ x - = -/+ x + = +). : N/A
9. Line 5 + or - Line 8 (API gravity adjusted for temperature). : 53.4
10. With Line 9 enter Table C, Read Coefficient of Expansion. : .00064815
11. Multiply Line 10 by Line 2 (Gallons) (Volume change for each degree of temperature change. : 32.405
12. Multiply Line 11 by Line 1 (Volume change due to temperature). : 2.75 ÷ 5 = (-.55)
13. Change sign of Line 12 (See Sec. 9.4) and add to line 4 mathematically (net change in gallons), + or - : +.446

    Double Check sign: - Product Lost
    + Product Gained

Note: NFPA Publication # 329, 4-3.10.1 does not call for a precision test to show a loss of more than .05 gallons (189 ml) per hour.

Therefore, since tested tank had a ~~loss~~/gain of (Line 13): +.446 gallons per hour it Does: X Does Not: meet the NFPA criterion for tank tightness.

Additional
Remarks: Turbine pump in pump house mounted in tank. Has 4" fill with drop tube Test tank through 8" opening in pit on top of manhole cover. Has 6" vents, tank cleaned & inspected 1987 July, tanks installed 1952. 5 hour test.

This certifies that the tanks described were tested by the undersigned and that the stated results represent the true state of the tanks on this date to the best of my knowledge.

Midwest Petroleum Service, Inc.

_____, Tester

Month: 12 Day: 20 Year: 89

#1201-1
BCE Storage

OK - M. Collentine
FILE 15073

MIDWEST PETROLEUM SERVICE, INC.

REPORT OF AINLAY TTT TANK TEST

Company: Wis Air Natnl Guard
Address: Truax Field
City: Madison State: WI

Brand Name:
Grade of
Product: Waste Oil

60 Minute Temperature Check

Start Time: 10:55
Completion Time: 11:55

A	B	C	D	E	F
	Temperatures				
Probes	Start of Test	End of Test	Temp. Shift: (B from C) + or -	Multiply Column D by E	Add up for Weight Shift
Top	34.93	34.97	+.04	x .25	+.01
Middle	37.42	37.43	+.01	x .50	+.005
Bottom	40.33	40.26	-.07	x .25	-.0175

1. Add the three results in Column F (Weighted Ave. Temp. Shift: -.0025
   Tank dia. and lgth: 96" Gallon Capacity: 3000
3. Exact Water Level in tank bottom.
   Test Start: 19" Test End: 19"

60 Minute Volume Check

Start Time: 10:55
Completion Time: 11:55

4. Exact amount of liquid lost and replaced (-) or gained and removed (+) in fill pipe to restore original level : -.335
5. API Gravity of tested liquid in graduate : 38.2
6. Temperature of tested liquid in graduate : 42 Degrees
7. Subtract Line 6 from 60 degrees. (Result is + or -). : N/A
8. Multiply Line 7 x .1 (+ x - = -/+ x + = +). : N/A
9. Line 5 + or - Line 8 (API gravity adjusted for temperature). : 39.4
10. With Line 9 enter Table C, Read Coefficient of Expansion. : .00048275
11. Multiply Line 10 by Line 2 (Gallons) (Volume change for each degree of temperature change. : 1.4481
12. Multiply Line 11 by Line 1 (Volume change due to temperature). : -.00362
13. Change sign of Line 12 (See Sec. 9.4) and add to line 4 mathematically (net change in gallons), + or - : -.3313

    Double Check sign: - Product Lost
    + Product Gained

Note: NFPA Publication # 329, 4-3.10.1 does not call for a precision test to show a loss of more than .05 gallons (189 ml) per hour.

Therefore, since tested tank had a loss/~~gain~~ of (Line 13): -.33 gallons per hour it ~~Does~~: Does Not: meet the NFPA criterion for tank tightness.

Additional
Remarks: Added 10 gallons of water to top off tank. 1 1/2" vent pipe hit and bent. Product would not stop dropping in fill pipe so I dropped level to top of tank to test.

This certifies that the tanks described were tested by the undersigned and that the stated results represent the true state of the tanks on this date to the best of my knowledge.

Midwest Petroleum Service, Inc.

_____, Tester

Month: 02 Day: 01 Year: 90

APPENDIX E

Well Constructors Reports For Nearby Private Supply Wells

WELL CONSTRUCTOR'S REPORT TO WISCONSIN STATE BOARD OF HEALTH
See Instructions on Reverse Side

JUL 10 1946

1. County Dane { Town / ~~Village~~ / ~~City~~ } Burke

2. Location W½ S W¼ Sec 28 T 8 N R 10

3. Owner or Agent Fred R Carmack

4. Address E Washington Ave Madison Wis

5. From well to nearest: Building 15 ft; sewer 50 ft; drain 15 ft; septic tank 60 ft; dry well or filter bed 60 ft; abandoned well ____ ft.

6. Well is intended to supply water for: ____

7. DRILLHOLE OR EXCAVATION:

Dia. (in.)	From (ft.)	To (ft.)
8	0	10
5	10	60

8. CASING AND LINER PIPE OR CURBING:

Dia. (in.)	Kind	From (ft.)	To (ft.)
5	Standard Weight		
	Weight Iron Pipe	0	58

9. GROUT:

Kind	From (ft.)	To (ft.)
Drill Cuttings	0	10

10. FORMATIONS:

Kind	Thickness (ft.)	Total Depth (ft.)
Gravel	0	10
Sandstone (Broken)	30	40
Sandstone (Firm)	20	60

11. MISCELLANEOUS DATA:

Yield test: 10 Hrs. at 30 GPM.

Depth from surface to water: 26 ft.

Water-level when pumping: 32 ft.

Water sample sent to laboratory at Madison Wis on 7/8 1946

Construction of the well was completed on July 6th 1946

The well is terminated 6 inches (above) (below) the permanent grade.

Was the well disinfected upon completion? Yes X No ____

Was the well sealed watertight upon completion? Yes X No ____

Signature Ervine Winchell
Registered Well Driller

% Coos Apts R.4.

Ervine Winchell
Complete Mail Address

Madison, Wis.

WELL CONSTRUCTOR'S REPORT TO WISCONSIN STATE BOARD OF HEALTH
See Instructions on Reverse Side.

OCT 4 1947

1. County Dane { Town / ~~Village~~ / ~~City~~ } Burke

2. Location S.W. 1/4, Sec. 28, T8, R10E

3. Owner ~~or Agent~~ Sunnyside School

4. Address R.F.D. Madison 4 Wis. (E. Washington Ave.)

5. From well to nearest: Building 20 ft; sewer 20 ft; drain ____ ft; septic tank 60 ft; dry well or filter bed 100 ft; abandoned well ____ ft.

6. Well is intended to supply water for: School

7. DRILLHOLE OR EXCAVATION:

Dia. (in.)	From (ft.)	To (ft.)
6	-10	127

8. CASING AND LINER PIPE OR CURBING:

Dia. (in.)	Kind	From (ft.)	To (ft.)
6	Std. Wt. Pipe	-10	107
4	Std. Wt Pipe	-10	117

9. GROUT:

Kind	From (ft.)	To (ft.)
Cement	-10	117

10. FORMATIONS:

Kind	Thickness (ft.)	Total Depth (ft.)
Existing Well	-127	127
Sandstone from 107' to 127'		

11. MISCELLANEOUS DATA:

Yield test: 8 Hrs. at 15 GPM. Pe

Depth from surface to water: 21 ft.

Water-level when pumping: 31 ft.

Water sample sent to laboratory at Madison on Sept. 22 1947

Construction of the well was completed on Sept 20 1947

The well is terminated 6+ inches (above) ~~(below)~~ the permanent grade. pump room floor

Was the well disinfected upon completion? Yes ✓ No ____

Was the well sealed watertight upon completion? Yes ✓ No ____

Signature H. Armbright
Registered Well Driller
by L.T.W.

844 E. Dayton St.
Complete Mail Address
Madison, 3, Wis

INSTRUCTIONS

ALL INFORMATION INDICATED ON THE FACE OF THIS FORM MUST BE GIVEN

PLEASE BE GUIDED BY THE FOLLOWING:

Numbers below correspond to numbers of items of the form on the opposite side.

1. Name of the County and the name of the Town, Village or City. Indicate which is given.
2. If Rural: Number and the ¼ of the Section, the number of the Town North, and the number of the Range East or West.
   If Urban: Name of the Street and the number of the Premise.
3. Name of the Owner. If the name of the owner cannot be given, give instead the name of the Agent. Indicate which is given.
4. Name of the Street and the number of the Premise or the number of the Mail Route, the name of the Post Office and the name of the State.
5. Distance, in feet, from the well to the nearest building and to each source of pollution shown.
6. Indicate: Home, farm, school, tavern, creamery, community, industry, etc.
7. Show the diameter and depth of the initial drillhole or excavation and each reduction in size to bottom. If well was reconstructed, show diameter and depth of original well on first line.
8. Show diameter and kind of casing pipe, liner pipe or curbing and actual position in the well, measured from the surface.
9. Show kind of material (mud or cement) used in sealing the annular space, from and to what depths from the surface. If neither was used indicate "none".
10. Show thickness of each formation and the total depth at the base thereof.
11. Provide the data indicated.

Your opinion concerning other pollution hazards, information concerning difficulties encountered, and data relating to nearby wells, screens, seals, type of casing joints, method of finishing the well, amount of cement used in grouting, blasting, subsurface pumprooms, connecting pits, etc., may be given here:

This well was reconstructed because sewage water gained access to it through underground channels. In checking the existing casing for depth which was found to be 107', a broken joint was found to exist at 70' depth. On recommendation of the State Board of Health, a 4" liner pipe having welded joints was set in cement grout to a depth of 117'.

The capacity of the well was reduced somewhat, necessitating replacement of the existing shallow-well type pump with a deep well piston type pump.

If more space is needed another sheet may be attached.

JAN

LL CONSTRUCTOR'S REPORT

ORM 3300-15

NOTE
WHITE COPY – DIVISION'S COPY
GREEN COPY – DRILLER'S COPY
YELLOW COPY – OWNER'S COPY

STATE OF WISCONSIN
DEPARTMENT OF NATURAL RESOURCES
Box 450
Madison, Wisconsin 53701

COUNTY	CHECK ONE	NAME
Dane	☒ Town ☐ Village ☐ City	Burke

LOCATION – ¼ Section	¼ Section	Section	Township	Range
SW	SW	28	8-N	10-E

R – Grid or street no. | Street name

) – If available subdivision name, lot & block no.: Hwy 51

3. OWNER AT TIME OF DRILLING: Lee Zeiss

ADDRESS: 2311 N. Stoughton Rd.

POST OFFICE: (Hwy 51 N) Madison Wis 53704

Distance in feet from well to nearest: (Record answer in appropriate block)	BUILDING	SANITARY SEWER C. I.	SANITARY SEWER TILE	FLOOR DRAIN C. I.	FLOOR DRAIN TILE	FOUNDATION DRAIN SEWER CONNECTED	FOUNDATION DRAIN INDEPENDENT	WASTE WATER DRAIN C. I.	WASTE WATER DRAIN TILE
	10	—	—	—	—	—	—	—	—

CLEAR WATER DRAIN C. I.	CLEAR WATER DRAIN TILE	SEPTIC TANK	PRIVY	SEEPAGE PIT	ABSORPTION FIELD	BARN	SILO	ABANDONED WELL	SINK HOLE
—	—	56	—	60	—	—	—	—	—

OTHER POLLUTION SOURCES (Give description such as dump, quarry, drainage well, stream, pond, lake, etc.)

Well is intended to supply water for: Home

7. DRILLHOLE

Dia. (in.)	From (ft.)	To (ft.)	Dia. (in.)	From (ft.)	To (ft.)
8	Surface	45			
6	45	102			

8. CASING, LINER, CURBING, AND SCREEN

Dia. (in.)	Kind and Weight	From (ft.)	To (ft.)
6	Std Blk Pipe	Surface	45
	18.97 lbs Steel		
	Plain End		
	Welded Joint		

9. FORMATIONS

Kind	From (ft.)	To (ft.)
Sandy Topsoil	Surface	20
Lime Rock	20	65
Sand Rock	65	102

GROUT OR OTHER SEALING MATERIAL

Kind	From (ft.)	To (ft.)
Bentonite & Cuttings	Surface	15
Neat Cement	15	45

10. TYPE OF DRILLING MACHINE USED

☐ Cable Tool ☐ Direct Rotary ☐ Reverse Rotary
☐ Rotary – air w/drilling mud ☒ Rotary – hammer with drilling mud & air ☐ Jetting with ☐ Air ☐ Water

Well construction completed on Nov. 4 19 71

Well is terminated 8 inches ☒ above ☐ below final grade

Well disinfected upon completion ☒ Yes ☐ No

Well sealed watertight upon completion ☒ Yes ☐ No

11. MISCELLANEOUS DATA

Yield test: 3 Hrs. at 20 GPM

Depth from surface to normal water level 49 ft.

Depth to water level when pumping 68 ft.

Water sample sent to Madison laboratory on: Nov. 5 19 71

In your opinion concerning other pollution hazards, information concerning difficulties encountered, and data relating to nearby wells, screens, seals, type of casing joints, method of finishing the well, amount of cement used in grouting, blasting, sub-surface pumprooms, access pits, etc., should be given on reverse side.

SIGNATURE: Sam Vander Hakin Jr. Registered Well Driller

COMPLETE MAIL ADDRESS: ROTARY DRILLERS, INC. ROUTE 1 - BOX 87

Please do not write in space below

COLIFORM TEST RESULT	GAS – 24 HRS.	GAS – 48 HRS.	CONFIRMED	REMARKS

JUN 29 1944

WELL CONSTRUCTOR'S REPORT TO WISCONSIN STATE BOARD OF HEALTH

1. County Dane (Town ~~Village~~ ~~City~~ Burke

2. Location SW.SW. ¼ Sec. 28 T 8, R 10 E

3. Owner ~~or Agent~~ Mrs. Ellen Onsgard

4. Address 850 E. Gorham St.

5. Sewer ___ ft; drain ___ ft; septic tank ___ ft; disposal unit ___ ft; barnyard ___ ft; abandoned well ___ ft; other ___ ft. Explain on obverse side.

DRILLHOLE OR EXCAVATION Dia. (in.)	From (ft.)	To (ft.)
5	0	133

CASING PIPE, LINER PIPE OR CURBING Dia. (in.)	Kind	From (ft.)	To (ft.)
5	Std. Wt. Pipe	0	~~0~~ 133

FORMATIONS Kind	From (ft.)	To (ft.)
Sand	0	133

GROUT Kind	From (ft.)	To (ft.)
none		

Yield test: 24 Hrs. at 15 GPM.
To static water-level 12 ft.
Drawdown - - - - - - 20 ft.
Water sample was sent to the State Laboratory at Madison
Construction of the well was completed on Dec. 7 1943
The well is terminated 12 inches (above) (~~below~~) the permanent grade.
Was the well disinfected upon completion? - - - - Yes ✓ No ___
Was the well sealed watertight upon completion? - - Yes ✓ No ___
This report was prepared by or under the supervision of:

Henry E. Onsgard
Registered Well Driller

Permit No. 201 Date 6-25 1944

(over)

JUN 29 1944

WELL CONSTRUCTOR'S REPORT TO WISCONSIN STATE BOARD OF HEALTH

1. County Dane (Town ~~Village~~ ~~City~~) Burke

2. Location SW.SW 1/4 Sec. 28 T 8, R 10 E

3. Owner ~~or Agent~~ Mrs. Ellen Onsgard

4. Address 850 E. Gorham St.

5. Sewer ___ ft; drain ___ ft; septic tank ___ ft; disposal unit ___ ft; barn-yard ___ ft; abandoned well ___ ft; other ___ ft. Explain on obverse side.

DRILLHOLE OR EXCAVATION Dia. (in.)	From (ft.)	To (ft.)	CASING PIPE, LINER PIPE OR CURBING Dia. (in.)	Kind	From (ft.)	To (ft.)
5	0	133	5	Std. Wt. Pipe	0	~~126~~ 133

FORMATIONS Kind	From (ft.)	To (ft.)
Sand	0	133

GROUT Kind	From (ft.)	To (ft.)
none		

Yield test: 24 Hrs. at 15 GPM.
To static water-level 12 ft.
Drawdown - - - - - - 20 ft.
Water sample was sent to the State Laboratory at Madison
Construction of the well was completed on Dec. 7 1943
The well is terminated 12 inches (above) (~~below~~) the permanent grade.
Was the well disinfected upon completion? - - - - Yes ✓ No ___
Was the well sealed watertight upon completion? - - Yes ✓ No ___
This report was prepared by or under the supervision of:

Henry E. Onsgard
Registered Well Driller

Permit No. 201 Date 6-25 1944

County ____ Twp. ____ Sec. ____ (Office Record—Do not fill in)

TO THE WISCONSIN STATE BOARD OF HEALTH, WELL DRILLING DIVISION, MADISON, WIS.

WELL LOG PREMISES DIAGRAM, and REPORT

For Official Record of the Board

(TO BE USED FOR THAT PURPOSE ONLY)

Owner Godfrey Birrenbette (If a joint ownership give name of responsible official. Also name of each individual holding an interest. Use separate sheet and attach hereto.)

Address Burke Dane (City, village, township, county)

Madison Route 1#

Driller Ernest Kearney

Address Madison Wisc.

Date of Report 1-25-39 19 39

Registration No. 68

Give below the location of the property on which well is drilled.

If incorporated village or city: Name ____ Lot ____ Blk. ____ Street and No. ____

If unincorporated hamlet Name Dane County Burke Twp. 31 Highway

If Lake Shore Plat Name of Plat ____ Lake ____ Lot ____ Blk. ____ Street ____

If Farm County ____ Twp. ____ Sec. ____ Highway ____

If School County ____ Twp. ____ Sec. ____ District ____

If other public building Kind ____ County ____ Twp. ____ Sec. ____

Miscellaneous Kind ____ County ____ Twp. ____ Sec. ____

WELL LOG and REPORT

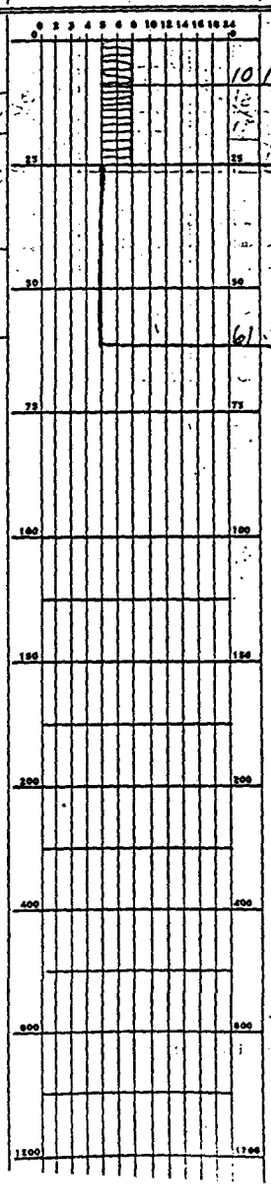
Kind of casing and liner in feet. Kind of shoe. Indicate grout, screen, seal, etc.

25 feet Youngstown Casing

Koppers Wood Shoe

Good Grout

WELL DIAGRAM
Vertical Lines = in. Dia.
Horizontal Lines = ft. Depth



Give depth of formations in feet. State if dry or water bearing.

0 – 10 Clay

10 – 61 Dry sand Rock

61 – 75 Water bearing rock

Record of FINAL Pumping Test

Duration of test. Hours 4

Pumping Rate. G. P. M. 10

Depth of pump in well. Ft. 36

Standing water-level (from surface.) Ft. 26

Water level when pumping Ft. 34

Water. End of test. Check:
Clear ✓
Cloudy ____
Turbid ____

Was well sterilized before test?
Yes ✓ No ____
Date 1-24-39

To which Laboratory was sample sent?
Madison
Date 1-25-39

Was the well sealed on completion?
Yes ✓ No ____

How high did you leave casing above grade?
12"

Well was completed 1-25 19 39

Well Driller:
Ernest Kearney
Signature.

(Be sure to complete the report on the reverse side)

State of Wisconsin
Department of Natural Resources
Box 450
Madison, Wisconsin 53701

NOTE:
White Copy – Division's Copy
Green Copy – Driller's Copy
Yellow Copy – Owner's Copy

WELL CONSTRUCTOR'S REPORT
Form 3300-15
Rev. 10-75

COUNTY: DANE
CHECK (✓) ONE: ☑ Town ☐ Village ☐ City
Name: BURKE

LOCATION: ¼ Section: NW | Section: 28 | Township: 8N | Range: 10E
OR – Grid or Street No. | Street Name:
AND – If available subdivision name, lot & block No.: BURKE Rd

3. NAME ☐ OWNER ☐ AGENT AT TIME OF DRILLING CHECK (✓) ONE: DAVE WIGANOWSKI
ADDRESS:
POST OFFICE: SUN PRAIRIE, WIS

4. Distance in feet from well to nearest: (Record answer in appropriate block)

Building	Sanitary Bldg. Drain		Sanitary Bldg. Sewer		Floor Drain Connected To:		Storm Bldg. Drain		Storm Bldg. Sewer	
	C.I.	Other	C.I.	Other	C.I. Sewer	Other Sewer	C.I.	Other	C.I.	Other
20										

Street Sewer		Other Sewers		Foundation Drain Connected to:		Sewage Sump		Clearwater Sump	Septic Tank	Holding Tank	Sewage Absorption Unit	
San.	Storm	C.I.	Other	Sewer	Sewage Sump	C.I.	Other		57		Seepage Pit	
				Clearwater	Clearwater						Seepage Bed	79
				Dr.	Sump						Seepage Trench	

Privy	Pet Waste Pit	Pit: Nonconforming Existing	Subsurface Pumproom Nonconforming Existing	Barn Gutter	Animal Barn Pen	Animal Yard	Silo With Pit	Glass Lined Storage Facility	Silo w/o Pit	Earthen Silage Storage Trench Or Pit
		Well								
		Pump								
		Tank								

Temporary Manure Stack	Watertight Liquid Manure Tank	Solid Manure Storage Structure	Subsurface Gasoline or Oil Tank	Waste Pond or Land Disposal Unit (Specify Type)	Other (Give Description)

Well is intended to supply water for: Home

DRILLHOLE

Dia. (in.)	From (ft.)	To (ft.)	Dia. (in.)	From (ft.)	To (ft.)
8	Surface	52			
6	52	103			

7. CASING, LINER, CURBING AND SCREEN
Material, Weight, Specification & Method of Assembly

Dia. (in.)	Material, Weight, Specification & Method of Assembly	From (ft.)	To (ft.)
6	STD BLK P.P.E.	Surface	52
	.280 wall		
	18.97 WT.		
	Weld FTS		
	USP A-53		

5. GROUT OR OTHER SEALING MATERIAL

Kind	From (ft.)	To (ft.)
Mud + Cuttings	Surface	52

9. FORMATIONS

Kind	From (ft.)	To (ft.)
Clay	Surface	8
Clay + SAND	8	50
SAND Rock	50	103

10. TYPE OF DRILLING MACHINE USED

☐ Cable Tool	☑ Rotary-hammer w/drilling mud & air	☐ Jetting with Air / Wa
☐ Rotary-air w/drilling mud	☐ Rotary-hammer & air	
☐ Rotary-w/drilling mud	☐ Reverse Rotary	

Well construction completed on: 10-4 19

11. MISCELLANEOUS DATA

Yield Test: 2 Hrs. at 15 GPM
Depth from surface to normal water level: 33 Ft.
Depth of water level when pumping: 65 Ft. Stabilized ☑ Yes ☐ No

Well is terminated: 12 inches ☑ above ☐ below final grade
Well disinfected upon completion ☑ Yes ☐ No
Well sealed watertight upon completion ☑ Yes ☐ No

Water sample sent to: MADISON laboratory on: 10-8

Your opinion concerning other pollution hazards, information concerning difficulties encountered, and data relating to nearby wells, screens, seals, metho finishing the well, amount of cement used in grouting, blasting, etc., should be given on reverse side.

Complete Mail Address: SAM'S ROTARY DRILLERS, ROUTE 1 • WISCONSIN 53956

State of Wisconsin
Department of Natural Resources
Box 7921
Madison, Wisconsin 53707

NOTE:
White Copy – Division's Copy
Green Copy – Driller's Copy
Yellow Copy – Owner's Copy

SEP 13 1977

WELL CONSTRUCTOR'S REPORT

Form 3300–15 Rev. 12-76

COUNTY: Dane

CHECK (✓) ONE: [x] Town [ ] Village [ ] City — Name: Burke

LOCATION — ¼ Section: NW — Section: 28 — Township: 8 — Range: 10

OR – Grid or Street No. — Street Name: Hwy 51

AND – If available subdivision name, lot & block No.

3. NAME [ ] OWNER [ ] AGENT AT TIME OF DRILLING CHECK (✓) ONE: Ray Lier

ADDRESS

POST OFFICE: Madison, Wis

Distance in feet from well to nearest: (Record answer in appropriate block)

Building	Sanitary Bldg. Drain C.I.	Sanitary Bldg. Drain Other	Sanitary Bldg. Sewer C.I.	Sanitary Bldg. Sewer Other	Floor Drain Connected To: C.I. Sewer	Floor Drain Connected To: Other Sewer	Storm Bldg. Drain C.I.	Storm Bldg. Drain Other	Storm Bldg. Sewer C.I.	Storm Bldg. Sewer Other
6										

Street Sewer San.	Street Sewer Storm	Other Sewers C.I.	Other Sewers Other	Foundation Drain Connected to: Sewer	Foundation Drain Connected to: Clearwater Dr.	Foundation Drain Connected to: Sewage Sump	Foundation Drain Connected to: Clearwater Sump	Sewage Sump C.I.	Sewage Sump Other	Clearwater Sump	Septic Tank	Holding Tank	Sewage Absorption Unit
											140		Seepage Pit: — Seepage Bed: 166 — Seepage Trench:

Privy	Pet Waste Pit	Pit: Nonconforming Existing (Well / Pump / Tank)	Subsurface Pumproom Nonconforming Existing	Barn Gutter	Animal Barn Pen	Animal Yard	Silo With Pit	Glass Lined Storage Facility	Silo w/o Pit	Earthen Silage Storage Trench Or Pit

Temporary Manure Stack	Watertight Liquid Manure Tank	Solid Manure Storage Structure	Subsurface Gasoline or Oil Tank	Waste Pond or Land Disposal Unit (Specify Type)	Other (Give Description)

Well is intended to supply water for: Factory

DRILLHOLE

Dia. (in.)	From (ft.)	To (ft.)	Dia. (in.)	From (ft.)	To (ft.)
8	Surface	172			
6	172	205			

7. CASING, LINER, CURBING AND SCREEN

Dia. (in.)	Material, Weight, Specification & Method of Assembly	From (ft.)	To (ft.)
6	Std Blk pipe .280 wall weld jts. A-53	Surface	172

GROUT OR OTHER SEALING MATERIAL

Kind	From (ft.)	To (ft.)
Mud & Cuttings	Surface	172

9. FORMATIONS

Kind	From (ft.)	To (ft.)
clay	Surface	11
Sand	11	47
clay	47	122
clay & Sand	122	160
Sand	160	170
Sand Rock	170	205

10. TYPE OF DRILLING MACHINE USED

[ ] Cable Tool
[ ] Rotary-air w/drilling mud
[ ] Rotary-w/drilling mud
[x] Rotary-hammer ~~w/drilling~~ mud & air
[ ] Rotary-hammer & air
[ ] Reverse Rotary
[ ] Jetting with [ ] Air [ ] Water

MISCELLANEOUS DATA

Yield Test: 2 Hrs. at 40 GPM

Depth from surface to normal water level: 10 Ft.

Depth of water level when pumping: 60 Ft. Stabilized [x] Yes [ ] No

Well construction completed on 8-26 1977

Well is terminated 12 inches [x] above [ ] below final grade

Well disinfected upon completion [x] Yes [ ] No

Well sealed watertight upon completion [x] Yes [ ] No

Water sample sent to Madison laboratory on 8-29 1977

Your opinion concerning other pollution hazards, information concerning difficulties encountered, and data relating to nearby wells, screens, seals, method of finishing the well, amount of cement used in grouting, blasting, etc., should be given on reverse side.

Signature: Sam Vander Heiden — Registered Well Driller

Complete Mail Address: SAM'S ROTARY DRILLERS, ROUTE, RANDOLPH, WISCONSIN 53956

WELL CONSTRUCTOR'S REPORT TO WISCONSIN STATE BOARD OF HEALTH

Wel 6

See Instructions on Reverse Side

1. County Dane — Town ☒ / Village ☐ / City ☐ Burke (Check one and give name)

2. Location Hy - 51 NW 1/4 Sec 28 T8N R10E
Name of street and number of premise or Section, Town and Range numbers

3. Owner ☒ or Agent ☐ Raymond Zinn
Name of individual, partnership or firm

4. Mail Address R-1 Madison
Complete address required

5. From well to nearest: Building 8 ft; sewer ____ ft; drain ____ ft; septic tank 40 ft; dry well or filter bed 60 ft; abandoned well ____ ft.

6. Well is intended to supply water for: Home

7. DRILLHOLE:

Dia. (in.)	From (ft.)	To (ft.)	Dia. (in.)	From (ft.)	To (ft.)
10	0	18			
6		113			

8. CASING AND LINER PIPE OR CURBING:

Dia. (in.)	Kind and Weight	From (ft.)	To (ft.)
6	1945	0	56

9. GROUT:

Kind	From (ft.)	To (ft.)
Clay	0	18

10. FORMATIONS:

Kind	From (ft.)	To (ft.)
Top Soil Heavy Clay	0	18
Sand & gravel	18	56
Sand Stone	56	113

11. MISCELLANEOUS DATA:

Yield test: 8 Hrs. at 6 GPM.

Depth from surface to water-level: 40 ft.

Water-level when pumping: 40 ft.

Water sample was sent to the state laboratory at: Madison (City) on 5-28 19 60

Construction of the well was completed on: 5-28 19 60

The well is terminated 8 inches ☒ above, below ☐ the permanent ground surface.

Was the well disinfected upon completion? Yes ✓ No ____

Was the well sealed watertight upon completion? Yes ✓ No ____

Signature Ernie Kearney
Registered Well Driller

R-1 Madison 4 Wis
Complete Mail Address

Please do not write in space below

Rec'd ____ No ____

Ans'd ____

Interpretation ____

	10 ml	10 ml	10 ml	10 ml	10 ml
Gas—24 hrs.					
48 hrs.					
Confirm					
B. Coli					

Examiner ____

WELL CONSTRUCTOR'S REPORT TO WISCONSIN STATE BOARD OF HEALTH

Wel 6

See Instructions on Reverse Side

1. County Dane — Town ☒ Burke; Village ☐; City ☐ (Check one and give name)

2. Location Hy Hay 51 NW 1/4 Sec 28 T8N R10E
Name of street and number of premise or Section, Town and Range numbers

3. Owner ☐ or Agent ☐ Leo Zuern
Name of individual, partnership or firm

4. Mail Address R-1 Madison
Complete address required

5. From well to nearest: Building 7 ft; sewer ____ ft; drain ____ ft; septic tank 60 ft; dry well or filter bed ____ ft; abandoned well ____ ft.

6. Well is intended to supply water for: Home

7. DRILLHOLE:

Dia. (in.)	From (ft.)	To (ft.)	Dia. (in.)	From (ft.)	To (ft.)
10	0	20			
6		108			

8. CASING AND LINER PIPE OR CURBING:

Dia. (in.)	Kind and Weight	From (ft.)	To (ft.)
6	1945	0	57

9. GROUT:

Kind	From (ft.)	To (ft.)
Clay	0	20

10. FORMATIONS:

Kind	From (ft.)	To (ft.)
Top Soil	0	20
Sand + Gravel	20	57
Sand Stone	57	108

11. MISCELLANEOUS DATA:

Yield test: 8 Hrs. at 6 GPM.

Depth from surface to water-level: 42 ft.

Water-level when pumping: 42 ft.

Water sample was sent to the state laboratory at: Madison (City) on 12-19 1962

Construction of the well was completed on: 12-19 1962

The well is terminated 8 inches ☒ above, below ☐ the permanent ground surface.

Was the well disinfected upon completion? Yes ✓ No ____

Was the well sealed watertight upon completion? Yes ✓ No ____

Signature Ervin Kearney
Registered Well Driller

R-1 Madison 4, Wisc.
Complete Mail Address

Please do not write in space below

Rec'd ____ No ____

Ans'd ____

Interpretation ____

	10 ml	10 ml	10 ml	10 ml	10 ml
Gas—24 hrs.					
48 hrs.					
Confirm					
B. Coli					

State of Wisconsin
Department of Natural Resources
Box 7921
Madison, Wisconsin 53707

NOTE:
White Copy – Division's Copy
Green Copy – Driller's Copy
Yellow Copy – Owner's Copy

WELL CONSTRUCTOR'S REPORT
Form 3300-15 Rev. 12-76

AUG 04 1978

COUNTY Dane | CHECK (✓) ONE: ☑ Town ☐ Village ☐ City | Name Burke

LOCATION ¼ Section SE | Section 28 | Township 8N 9 | Range 10E

OR – Grid or Street No. | Street Name

AND – If available subdivision name, lot & block No. 22 Terrace Park

3. NAME ☐ OWNER ☐ AGENT AT TIME OF DRILLING CHECK (✓) ONE
John Kattenberg (Bldr)
ADDRESS
POST OFFICE Madison, Wis.

1. Distance in feet from well to nearest: (Record answer in appropriate block)

Building	Sanitary Bldg. Drain C.I.	Sanitary Bldg. Drain Other	Sanitary Bldg. Sewer C.I.	Sanitary Bldg. Sewer Other	Floor Drain Connected To: C.I. Sewer	Floor Drain Connected To: Other Sewer	Storm Bldg. Drain C.I.	Storm Bldg. Drain Other	Storm Bldg. Sewer C.I.	Storm Bldg. Sewer Other

Street Sewer: San., Storm | Other Sewers: C.I., Other | Foundation Drain Connected to: Sewer, Clearwater Dr., Sewage Sump, Clearwater Sump | Sewage Sump: C.I., Other | Clearwater Sump | Septic Tank | Holding Tank | Sewage Absorption Unit: Seepage Pit, Seepage Bed, Seepage Trench

NONE

Privy | Pet Waste Pit | Pit: Nonconforming Existing — Well, Pump, Tank | Subsurface Pumproom Nonconforming Existing | Barn Gutter | Animal Barn Pen | Animal Yard | Silo With Pit | Glass Lined Storage Facility | Silo w/o Pit | Earthen Silage Storage Trench Or Pit

Temporary Manure Stack | Watertight Liquid Manure Tank | Solid Manure Storage Structure | Subsurface Gasoline or Oil Tank | Waste Pond or Land Disposal Unit (Specify Type) | Other (Give Description)

Well is intended to supply water for: Home

6. DRILLHOLE

Dia. (in.)	From (ft.)	To (ft.)	Dia. (in.)	From (ft.)	To (ft.)
8	Surface	78			
6	78	155			

7. CASING, LINER, CURBING AND SCREEN

Dia. (in.)	Material, Weight, Specification & Method of Assembly	From (ft.)	To (ft.)
6	STD BlK Pipe	Surface	78
	.280 Wall		
	Weld JTS		
	A53		

9. FORMATIONS

Kind	From (ft.)	To (ft.)
Sandy Clay	Surface	5
Sand + Gravel	5	42
Sand	42	76
Sand Rock	76	155

GROUT OR OTHER SEALING MATERIAL

Kind	From (ft.)	To (ft.)
Mud + cuttings	Surface	78

10. TYPE OF DRILLING MACHINE USED

☐ Cable Tool
☐ Rotary-air w/drilling mud
☐ Rotary-w/drilling mud
☑ Rotary-hammer w/drilling mud & air
☐ Rotary-hammer & air
☐ Reverse Rotary
☐ Jetting with ☐ Air ☐ Water

Well construction completed on 6-23 1978

11. MISCELLANEOUS DATA

Yield Test: 2 Hrs. at 20 GPM

Well is terminated 12 inches ☑ above ☐ below final grade

Depth from surface to normal water level 60 Ft.

Well disinfected upon completion ☑ Yes ☐ No

Depth of water level when pumping 90 Ft. Stabilized ☑ Yes ☐ No

Well sealed watertight upon completion ☑ Yes ☐ No

Water sample sent to Madison laboratory on 6-27 1978

Your opinion concerning other pollution hazards, information concerning difficulties encountered, and data relating to nearby wells, screens, seals, method of finishing the well, amount of cement used in grouting, blasting, etc., should be given on reverse side.

Signature [signature] Registered Well Driller

Complete Mail Address RT 2 Randolph Wis.

[redacted]L CONSTRUCTOR'S REPORT

JAN 5 1970

STATE OF WISCONSIN
DEPARTMENT OF NATURAL RESOURCES
Box 450
Madison, Wisconsin 53701

e1-6

WHITE COPY – DIVISION'S COPY
GREEN COPY – DRILLER'S COPY
YELLOW COPY – OWNER'S COPY

COUNTY	CHECK ONE	NAME
[redacted]ane	☒ Town ☐ Village ☐ City	Burke

LOCATION (Number and Street or ¼ section, section, township and range. Also give subdivision name, lot and block numbers when available.)

[redacted]¼-NE¼-SW¼-SE¼-SEC 28-R10E-T8N East Washington Ave.

OWNER AT TIME OF DRILLING

[redacted]st Federal Savings & Loan

OWNER'S COMPLETE MAIL ADDRESS

[redacted]2 State St. Madison, Wis. 53711

Distance in feet from well to nearest: (Record answer in appropriate block)	BUILDING	SANITARY SEWER C. I.	SANITARY SEWER TILE	FLOOR DRAIN C. I.	FLOOR DRAIN TILE	FOUNDATION DRAIN SEWER CONNECTED	FOUNDATION DRAIN INDEPENDENT	WASTE WATER DRAIN C. I.	WASTE WATER DRAIN TILE
	50	60	none	none		none	none	none	none

WATER DRAIN C. I.	WATER DRAIN TILE	SEPTIC TANK	PRIVY	SEEPAGE PIT	ABSORPTION FIELD	BARN	SILO	ABANDONED WELL	SINK HOLE
[redacted]ne	none	77	none	none	85	none	none	none	none

[redacted]R POLLUTION SOURCES (Give description such as dump, quarry, drainage well, stream, pond, lake, etc.)

[redacted]one

[redacted]ell is intended to supply water for:

[redacted]ranch Bank

DRILLHOLE

Dia. (in.)	From (ft.)	To (ft.)	Dia. (in.)	From (ft.)	To (ft.)
[redacted]8	Surface	106	6	106	131

CASING, LINER, CURBING, AND SCREEN

Dia. (in.)	Kind and Weight	From (ft.)	To (ft.)
[redacted]6	P.E. New Black Steel	Surface	106
	18.97#'		

GROUT OR OTHER SEALING MATERIAL

Kind	From (ft.)	To (ft.)
[redacted]rill cuttings	Surface	106

10. FORMATIONS

Kind	From (ft.)	To (ft.)
Fill	Surface	2
Sand	2	18
Clay-Sand-Gravel	18	31
Sand & Gravel	31	103
Sandstone	103	120
Sandstone & Chert	120	131
DRILLED BY ROTARY		

MISCELLANEOUS DATA

[redacted] test: 4 Hrs. at 20 GPM

[redacted]epth from surface to normal water level 22' ft.

[redacted]h to water level when pumping 30 ft.

Well construction completed on December 19 1969

Well is terminated 16 inches ☒ above ☐ below final grade

Well disinfected upon completion ☒ Yes ☐ No

Well sealed watertight upon completion ☒ Yes ☐ No

[redacted]ater sample sent to Madison laboratory on: December 22 19 69

[redacted]r opinion concerning other pollution hazards, information concerning difficulties encountered, and data relating to nearby [redacted]ells, screens, seals, type of casing joints, method of finishing the well, amount of cement used in grouting, blasting, sub-[redacted]ace pumprooms, access pits, etc., should be given on reverse side.

[redacted]IATURE

[redacted]Darwin H. Middlehaun Registered Well Driller

COMPLETE MAIL ADDRESS OUR LAKES WELL DRILLING CO.
4918 VERONA ROAD
MADISON, WISCONSIN 53711

Please do not write in space below

[redacted]OLIFORM TEST RESULT	GAS — 24 HRS.	GAS — 48 HRS.	CONFIRMED	REMARKS

WELL CONSTRUCTOR'S REPORT TO WISCONSIN STATE BOARD OF HEALTH

See Instructions on Reverse Side

RECEIVED
AUG 13 1948
BUREAU
SAN. ENG.

1. County Dane { Town / ~~Village~~ / ~~City~~ } of Burke

2. Location Parcel in SW ¼ of SE ¼ of Section 28, T. 8 N., R. 10 E.

3. Owner or Agent Melvin Randall,

4. Address Route 1, Madison, Wis.

5. From well to nearest: Building 5 ft; sewer ____ ft; drain ____ ft; septic tank 30 ft; dry well or filter bed 75 ft; abandoned well ____ ft.

6. Well is intended to supply water for: Residence

7. DRILLHOLE OR EXCAVATION:

Dia. (in.)	From (ft.)	To (ft.)
5	0	119

8. CASING AND LINER PIPE OR CURBING:

Dia. (in.)	Kind	From (ft.)	To (ft.)
5	Wrought steel	0	97

9. GROUT:

Kind	From (ft.)	To (ft.)
None		

10. FORMATIONS:

Kind	Thickness (ft.)	Total Depth (ft.)
Sand	73	73
Sandstone	46	119

11. MISCELLANEOUS DATA:

Yield test: 4 Hrs. at 10 GPM.

Depth from surface to water: 27 ft.

Water-level when pumping: 30 ft.

Water sample sent to laboratory at Madison on June 4, 1948

Construction of the well was completed on May 26, 1948

The well is terminated 12 inches (above) (~~below~~) the permanent grade.

Was the well disinfected upon completion? Yes X No

Was the well sealed watertight upon completion? Yes X No

Signature Henry Armbricht
Registered Well Driller

HENRY ARMBRICHT

844 E. Dayton St.,
Complete Mail Address

Madison 3, Wis.

WELL CONSTRUCTION REPORT

WISCONSIN STATE BOARD OF HEALTH

WELL DRILLING DIVISION

JAN 10 1940

Note: Section 32 of the Wisconsin Well Drilling Sanitary Code, having the force and effect of law, provides that within thirty days after completion of every well the driller shall submit a report covering all essential details of construction to the State Board of Health on a form provided by the Board.

Owner Fred Niebuhr — Driller Henry Arnbrecht

Street or RFD Route #50, — Post Office Madison, Wis.

Post Office Madison, Wis. — Date Dec. 16, 1939 — Permit No. 102

LOCATION OF PREMISES

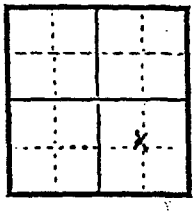
Dane — County

Burke — Town

On U.S. #51, 5 miles east of Madison

Describe further by subdivision, plat, district, lake, lot, block, nearest principal highway, etc., whichever apply.

The square below represents a section of land divided into 40 acre tracts. Mark the position of the premises in the section.



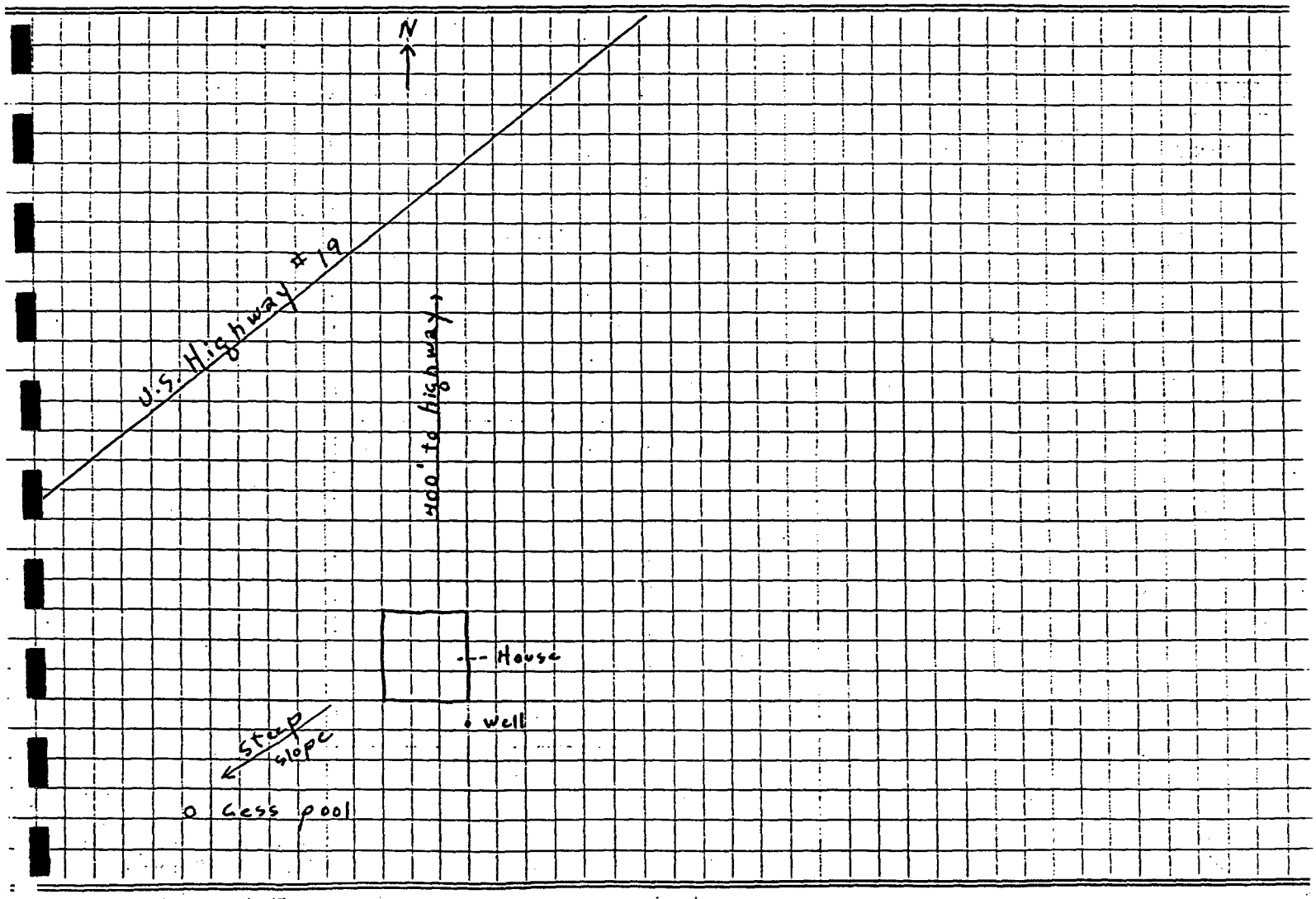
Sec. 28

Twp. 8 N

Range 10 { E / W

DIAGRAM OF PREMISES

See discussion and illustration in Part III Well Drilling Code. In making the diagram in the space below consider 10 ft. as the distance between lines. Be sure to indicate NORTH.



Additional copies of this form may be obtained in lots of 12 for 25¢. Send remittance with order to State Board of Health, Well Drilling Division, Madison, Wis.

WELL CONSTRUCTION REPORT
WISCONSIN STATE BOARD OF HEALTH
WELL DRILLING DIVISION

Note: Section 32 of the Wisconsin Well Drilling Sanitary Code, having the force and effect of law, provides that within thirty days after completion of every well the driller shall submit a report covering all essential details of construction to the State Board of Health on a form provided by the Board.

Owner A. LARSON — Driller F. S. NAGEL & SON

~~Street~~ or RFD 1 — Post Office MADISON

Post Office MADISON — Date 7-5-41 — Permit No. 20

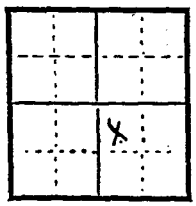
LOCATION OF PREMISES

DANE (County) — BURKE (Town)

FARM ON SUNPRAIRIE ROAD

Describe further by subdivision, plat, district, lake, lot, block, nearest principal highway, etc., whichever apply.

The square below represents a section of land divided into 40 acre tracts. Mark the position of the premises in the section.



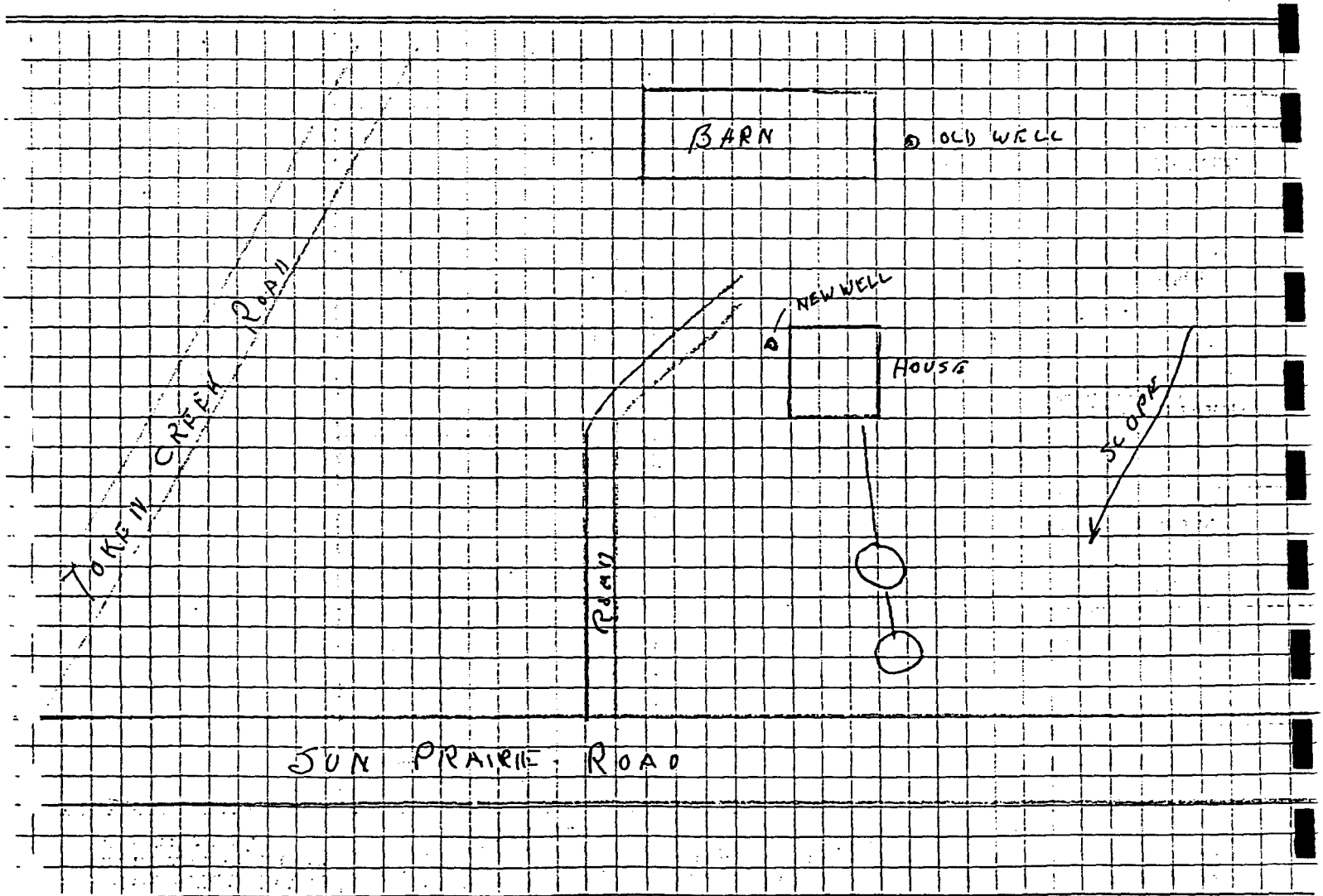
Sec. 28

Twp. 8

Range 10 { E / W

DIAGRAM OF PREMISES

See discussion and illustration in Part III Well Drilling Code. In making the diagram in the space below consider 10 ft. as the distance between lines. Be sure to indicate NORTH.



Additional copies of this form may be obtained in lots of 12 for 25¢. Send remittance with order to State Board of Health, Well Drilling Division, Madison, Wis.

WELL CONSTRUCTOR'S REPORT

Wel-6

WHITE COPY – DIVISION'S COPY
GREEN COPY – DRILLER'S COPY
YELLOW COPY – OWNER'S COPY

STATE OF WISCONSIN
DEPARTMENT OF NATURAL RESOURCES
Box 450
Madison, Wisconsin 53701

COUNTY: Dane

CHECK ONE: ☒ Town ☐ Village ☐ City

NAME: Burke

LOCATION (Number and Street or ¼ section, section, township and range. Also give subdivision name, lot and block numbers when available.)

SE¼-NW¼-NW¼-SE¼-SEC 28-R10E-T8N Hy 151

OWNER AT TIME OF DRILLING

1st National Bank of Madison

OWNER'S COMPLETE MAIL ADDRESS

Operations Building-102 No. Hamilton, Madison, Wis. 53700

Distance in feet from well to nearest: (Record answer in appropriate block)

BUILDING	SANITARY SEWER C. I.	SANITARY SEWER TILE	FLOOR DRAIN C. I.	FLOOR DRAIN TILE	FOUNDATION DRAIN SEWER CONNECTED	FOUNDATION DRAIN INDEPENDENT	WASTE WATER DRAIN C. I.	WASTE WATER DRAIN TILE
18	none	none	none		none	none	none	none

SURFACE WATER DRAIN C. I.	SURFACE WATER DRAIN TILE	SEPTIC TANK	PRIVY	SEEPAGE PIT	ABSORPTION FIELD	BARN	SILO	ABANDONED WELL	SINK HOLE
none	none	none	none	none	none	none	none	none	none

WATER POLLUTION SOURCES (Give description such as dump, quarry, drainage well, stream, pond, lake, etc.)

none

Well is intended to supply water for:

Branch Bank

DRILLHOLE

Dia. (in.)	From (ft.)	To (ft.)	Dia. (in.)	From (ft.)	To (ft.)
8	Surface	44' 9"	6	44' 9"	131

CASING, LINER, CURBING, AND SCREEN

Dia. (in.)	Kind and Weight	From (ft.)	To (ft.)
6	P.E. New Black Steel 18.97#'	Surface	44' 9"

GROUT OR OTHER SEALING MATERIAL

Kind	From (ft.)	To (ft.)
Neat forced cement	Surface	44' 9"

10. FORMATIONS

Kind	From (ft.)	To (ft.)
Top Soil	Surface	1
Clay	1	6
Sandy Clay	6	15
Lime Rock	15	25
Sandstone	25	131
DRILLED BY ROTARY		

Well construction completed on June 30 19 69

11. MISCELLANEOUS DATA

Yield test: 4 Hrs. at 15 GPM

Depth from surface to normal water level 39 ft.

Depth to water level when pumping 49 ft.

Well is terminated 10 inches ☒ above ☐ below final grade

Well disinfected upon completion ☒ Yes ☐ No

Well sealed watertight upon completion ☒ Yes ☐ No

Water sample sent to Madison laboratory on: June 30 1969

Your opinion concerning other pollution hazards, information concerning difficulties encountered, and data relating to nearby wells, screens, seals, type of casing joints, method of finishing the well, amount of cement used in grouting, blasting, sub surface pumprooms, access pits, etc., should be given on reverse side.

SIGNATURE

Marvin A. Moldenhauer Registered Well Driller

COMPLETE MAIL ADDRESS Jefferson Well Drilling C
1207 So. Main St.
Jefferson, Wis. 53549

Please do not write in space below

COLIFORM TEST RESULT	GAS — 24 HRS.	GAS — 48 HRS.	CONFIRMED	REMARKS

State of Wisconsin
Department of Natural Resources
Private Water Supply
Box 7921
Madison, Wisconsin 53707

NOTE:
White Copy – Division's Copy
Green Copy – Driller's Copy
Yellow Copy – Owner's Copy

(1)

INSTRUCTOR'S REPORT

-15 Rev. 2-79

SEP 10 1984

OCT 16 1985

COUNTY: Dane

CHECK (✓) ONE: ☒ Town ☐ Village ☐ City

Name: Burke

LOCATION: ¼ Section or Gov't. Lot: N.E. | Section: 28 | Township: 8N | Range: 10E

OR – Grid or Street No. | Street or Road Name

AND – If available subdivision name, lot & block No.

3. NAME ☒ OWNER ☐ AGENT AT TIME OF DRILLING CHECK (✓) ONE: Kelly Genter

ADDRESS: 3509 Portage Ave.

POST OFFICE: Madison. Wi. ZIP CODE: 53704

4. Distance in feet from well to nearest: (Record answer in appropriate block)

Building	Sanitary Bldg. Drain C.I.	Sanitary Bldg. Drain Other	Sanitary Bldg. Sewer C.I.	Sanitary Bldg. Sewer Other	Floor Drain Connected To: C.I. Sewer	Floor Drain Connected To: Other Sewer	Storm Bldg. Drain C.I.	Storm Bldg. Drain Other	Storm Bldg. Sewer C.I.	Storm Bldg. Sewer Other
7			18							

Street Sewer San.	Street Sewer Storm	Other Sewers C.I.	Other Sewers Other.	Foundation Drain Connected to: Sewer	Foundation Drain Connected to: Sewage Sump	Foundation Drain Connected to: Clearwater Dr.	Foundation Drain Connected to: Clearwater Sump	Sewage Sump C.I.	Sewage Sump Other	Clearwater Sump	Septic Tank	Holding Tank	Sewage Absorption Unit	Manure Hopper or Retention or Pneumatic Tank
5													Seepage Pit / Seepage Bed / Seepage Trench	

Privy	Pet Waste Pit	Pit: Nonconforming Existing	Subsurface Pumproom Nonconforming Existing	Barn Gutter	Animal Barn Pen	Animal Yard	Silo with Pit	Glass Lined Storage Facility	Silo w/o Pit	Earthen Silage Storage Trench Or Pit	Earthen Manure Basin
		Well / Pump / Tank									

Temporary Manure Stack or Platform	Watertight Liquid Manure Tank or Basin	Manure Pressure Pipe	Subsurface Gasoline or Oil Tank	Waste Pond or Land Disposal Unit (Specify Type)	Manure Storage Basin / Concrete Floor Only / Concrete Floor and Partial Concrete Walls	Other (Describe)

5. Well is intended to supply water for: House

6. DRILLHOLE

Dia. (in.)	From (ft.)	To (ft.)	Dia. (in.)	From (ft.)	To (ft.)
8	Surface	63			
6	63	105			

7. CASING, LINER, CURBING AND SCREEN
Material, Weight, Specification

Dia. (in.)	Mfg. & Method of Assembly	From (ft.)	To (ft.)
6	Std. Blk Pipe 280 Wall weld jts. A-53	Surface	63

8. GROUT OR OTHER SEALING MATERIAL

Kind	From (ft.)	To (ft.)
mud & cuttings	Surface	8
cement	8	63

9. FORMATIONS

Kind	From (ft.)	To (ft.)
clay	Surface	7
sand	7	18
soft sand rock	18	55
sandrock	55	105

10. TYPE OF DRILLING MACHINE USED

☐ Cable Tool
☐ Rotary-air w/drilling mud
☐ Rotary-w/drilling mud
☒ Rotary-hammer w/drilling mud & air
☐ Rotary-hammer & air
☐ Reverse Rotary
☐ Jetting with: ☐ Air ☐ Water

Well construction completed on July 26 19 84

11. MISCELLANEOUS DATA

Yield Test: 2 Hrs. at 21 GPM

Depth from surface to normal water level 30 Ft.

Depth of water level when pumping 70 Ft. Stabilized ☒ Yes ☐ No

Well is terminated 12 inches ☒ above ☐ below final grade

Well disinfected upon completion ☒ Yes ☐ No

Well sealed watertight upon completion ☒ Yes ☐ No

Water sample sent to NOV laboratory on 19 84

Your opinion concerning other pollution hazards, information concerning difficulties encountered, and data relating to nearby wells, screens, seals, method of finishing the well, amount of cement used in grouting, blasting, etc., should be given on reverse side.

Signature: [signature] Registered Well Driller

Business Name and Complete Mailing Address:
SAM'S ROTARY DRILLERS
ROUTE 2
RANDOLPH, WISCONSIN 53956

WELL CONSTRUCTOR'S REPORT TO WISCONSIN STATE BOARD OF HEALTH

Wel 6

See Instructions on Reverse Side

1. County Dane — Town ☐ Village ☐ City ☑ Madison (Check one and give name)

2. Location Sec 28 T8N R10E NE ¼
Name of street and number of premise or Section, Town and Range numbers

3. Owner ☑ or Agent ☐ Pete Lukken
Name of individual, partnership or firm

4. Mail Address Portage Rd. Madison,
Complete address required

5. From well to nearest: Building 6 ft; sewer ____ ft; drain ____ ft; septic tank 50 ft; dry well or filter bed 65 ft; abandoned well ____ ft.

6. Well is intended to supply water for: Private home

7. DRILLHOLE:

Dia. (in.)	From (ft.)	To (ft.)	Dia. (in.)	From (ft.)	To (ft.)
10	0	68			
6	68	118			

8. CASING AND LINER PIPE OR CURBING:

Dia. (in.)	Kind and Weight	From (ft.)	To (ft.)
6	Std. Well Casing	0	70

9. GROUT:

Kind	From (ft.)	To (ft.)
Cement	14	68
rock Cutting	0	14

10. FORMATIONS:

Kind	From (ft.)	To (ft.)
Clay & Stone	0	19
Yellow Lime	19	55
Soft Sandstone	55	58
Sandstone Firm	58	76
Hard Rock	76	90
White Sandstone	90	118

11. MISCELLANEOUS DATA:

Yield test: 5 2 Hrs. at 12 GPM.

Depth from surface to water-level: 45 ft.

Water-level when pumping: 46 ft.

Water sample was sent to the state laboratory at: Madison (City) on Oct. 1963

Construction of the well was completed on: Nov. 1963

The well is terminated 10 inches ☑ above, below ☐ the permanent ground surface.

Was the well disinfected upon completion? Yes ✓ No ____

Was the well sealed watertight upon completion? Yes ✓ No ____

Signature Wm. Selmer
Registered Well Driller

811 Gay St. Madison Wis.
Complete Mail Address

Please do not write in space below

Rec'd ____ No. ____

Ans'd ____

Interpretation ____

	10 ml	10 ml	10 ml	10 ml	10 ml
Gas—24 hrs.					
48 hrs.					
Confirm					
B. Coli					

Examiner ____

WELL CONSTRUCTOR'S REPORT TO WISCONSIN STATE BOARD OF HEALTH Wel 6

See Instructions on Reverse Side

RECEIVED MAR - 2 1964 SANITARY ENGINEERING

1. County Dane — Town ☑ Village ☐ City ☐ Burke (Check one and give name)
2. Location Sec 28 T8N R10E (Name of street and number of premise or Section, Town and Range numbers)
3. Owner ☑ or Agent ☐ Donald Ruland (Name of individual, partnership or firm)
4. Mail Address David Rd, Madison, Wis. (Complete address required)
5. From well to nearest: Building 20 ft; sewer ___ ft; drain ___ ft; septic tank ___ ft; dry well or filter bed 50 ft; abandoned well ___ ft.
6. Well is intended to supply water for: private home

7. DRILLHOLE:

Dia. (in.)	From (ft.)	To (ft.)	Dia. (in.)	From (ft.)	To (ft.)
10	0	42	6	42	120

8. CASING AND LINER PIPE OR CURBING:

Dia. (in.)	Kind and Weight	From (ft.)	To (ft.)
6	Standard	0	47

9. GROUT:

Kind	From (ft.)	To (ft.)
cement	0	42

10. FORMATIONS:

Kind	From (ft.)	To (ft.)
Clay	0	12
Sandstone	12	50
Lime & Shellrock	50	95
Sandstone	95	120

Construction of the well was completed on: Aug 3 1962

The well is terminated 8 inches ☑ above, below ☐ the permanent ground surface.

Was the well disinfected upon completion? Yes ✓ No ___

Was the well sealed watertight upon completion? Yes ✓ No ___

11. MISCELLANEOUS DATA:

Yield test: 18 Hrs. at 10 GPM.

Depth from surface to water-level: 39 ft.

Water-level when pumping: 39 ft.

Water sample was sent to the state laboratory at: Madison (City) on Aug 1962

Signature Wm C Selmer — Registered Well Driller 48

409 Rethke Ave Madison, Wis 53714 — Complete Mail Address

Please do not write in space below

Rec'd ___ No. ___

Ans'd ___

Interpretation ___

	10 ml	10 ml	10 ml	10 ml	10 ml
Gas—24 hrs.					
48 hrs.					
Confirm					
B. Coli					

Examiner ___

County ____ Twp. ____ Sec. ____
(Office Record—Do not fill in)

TO THE WISCONSIN STATE BOARD OF HEALTH, WELL DRILLING DIVISION, MADISON, WIS.

WELL LOG PREMISES DIAGRAM, and REPORT

For Official Record of the Board

(TO BE USED FOR THAT PURPOSE ONLY)

Owner Leo Geier (If a joint ownership give name of responsible official. Also name of each individual holding an interest. Use a separate sheet and attach hereto.)

Driller Fosbender Bros

Address Madison R. 1 (City, village, township, county) DANE

Address R. 4 Franklin Sta Wis

Date of Report Nov 1-3 1937

Registration No. 101

Give below the location of the property on which well is drilled.

If incorporated village or city: ____ Name ____ Lot ____ Blk. ____ Street and No. ____

If unincorporated hamlet ____ Name ____ County ____ Twp. ____ Highway ____

If Lake Shore Plat ____ Name of Plat ____ Lake ____ Lot ____ Blk. ____ Street ____

If Farm DANE County BURKE Twp. 28 & 29 Sec. 51 Highway

If School ____ County ____ Twp. ____ Sec. ____ District ____

If other public building ____ Kind ____ County ____ Twp. ____ Sec. ____

Miscellaneous ____ Kind ____ County ____ Twp. ____ Sec. ____

WELL LOG and REPORT

Kind of casing and liner in feet. Kind of shoe. Indicate grout, screen, seal, etc.	WELL DIAGRAM Vertical Lines = in. Dia. Horizontal Lines = ft. Depth	Give depth of formations in feet. State if dry or water bearing.	Record of FINAL Pumping Test
Well drillers 6" Pipe 183 ft Steel Shoe	0 2 3 4 5 6 8 10 12 14 16 24	Virgil Limestone Red sand & clay 130 Coarse sand 20 Gray clay 5 Gray sand 10 Gravel & clay 10 Red shale & sandstone 12 Brown sandstone 38 White sandstone 44	Duration of test. Hours 2
	25		Pumping Rate. G. P. M. 20
	50		Depth of pump in well. Ft. ____
	75		Standing water-level (from surface.) Ft. 17½
	100		Water level when pumping Ft. 17½
	150		Water. End of test. Check: Clear X Cloudy ____ Turbid ____
	200	267 Total Depth	Was well sterilized before test? Yes X No ____ Date ____
	400		To which Laboratory was sample sent? Wisconsin Date Nov 16 1937
	600		Was the well sealed on completion? Yes X No ____
	1200		How high did you leave casing above grade? 1'
			Well was completed Nov 13 1937
			Well Driller: Michael Fosbender Signature.
			(Be sure to complete the report on the reverse side)

MAY 15 1944

WELL CONSTRUCTOR'S REPORT TO WISCONSIN STATE BOARD OF HEALTH

1. County [illegible] (Town / Village / City) [illegible] (810-102)
2. Location Sec. 29 - 35, [illegible] 28 [illegible]
3. Owner or Agent A. H. [illegible]
4. Address: Madison [illegible] Route 1
5. Sewer __ ft; drain __ ft; septic tank __ ft; disposal unit 60 ft; barn-yard __ ft; abandoned well __ ft; other __ ft. Explain on obverse side.

DRILLHOLE OR EXCAVATION Dia. (in.)	From (ft.)	To (ft.)	CASING PIPE, LINER PIPE OR CURBING Dia. (in.)	Kind	From (ft.)	To (ft.)
5	0	90	5	Std Steel Casing	0	93
5	90	93				

FORMATIONS Kind	From (ft.)	To (ft.)
Sand	0	90
Coarse gravel	90	93

GROUT Kind	From (ft.)	To (ft.)
Sand	0	90

~~Yield test: 4 Hrs. at 10 GPM.~~
To static water-level 38 ft.
Drawdown - - - - - - - 2 ft.
~~Water sample was sent to the~~
State Laboratory at Madison.
Construction of the well was completed on 5-14- 1943
The well is terminated 8 inches (above)(~~below~~) the permanent grade.
Was the well disinfected upon completion? - - - - Yes ✓ No ____
Was the well sealed watertight upon completion? - - Yes ✓ No
This report was prepared by or under the supervision of:

Erwin Kearney
Registered Well Driller

Permit No. 206 Date 5-14 1943

SE¼, NE¼, NW¼, NE¼, NE¼SE¼ sec. 29, T. 8 N., R. 10 E.
Fasbender Bros., drillers, 1937
Samples examined by F. T. Thwaites, Nos. 98791-98827

DNT 55

+869'ETM

0-40	40		Silt, sandy, light pink, dolomitic
40-50	10		Sand, fine to silty, pink-gray, dolomitic
50-80	30		Silt, pink, dolomitic, pebbles of dolomite
80-100	20		Silt, gray, dolomitic
100-150	50		Sand, very fine to coarse, gray, dolomitic
150-160	10		Silt, sandy, gray, dolomitic
160-165	5		Sandstone, medium to fine, gray, dolomitic
165-170	5		Shale, gray, dolomitic
170-180	10		Sandstone, fine, light gray, dolomitic
180-269	89		Sandstone, fine to medium, light gray, slightly dolomitic

6" pipe

183

6" hole

No DNR Well Construction Report Received

APPENDIX F

Flush Mount Well Construction Variance Letter from the WDNR

State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES
Carroll D. Besadny, Secretary

Southern District Headquarters
3911 Fish Hatchery Road
Fitchburg, WI 53711
TELEFAX NO. 608-275-3338

June 21, 1990

File Ref: 4400

Mr. Kevin Swanson
Warzyn Engineering
One Science Court
P.O. Box 5385
Madison, WI 53705

SUBJECT: Request for Variance for Flush With Grade Monitoring Wells at the Wisconsin International Guard Facility in Madison

Dear Mr. Swanson:

We have received and reviewed your request for variance from monitoring well construction specifications in Wisconsin Administrative Code, NR 141.13(3b) for two flushed monitoring wells (W6 and W8) installed at the Wisconsin National Guard facility at Truax Field in Madison, Wisconsin. Based on the amount of vehicle traffic in the vicinity of these wells and likelihood to damage to above-ground wells, your request for variance is hereby approved.

If you have any questions, feel free to give me a call at 275-3332.

Sincerely,

Theodore J. Amman

Theodore J. Amman
Environmental Specialist

TJA:ct
9007\SW1SWAN.TXA
cc: Mike Lemcke - WR/2