Natural Resource Technology, Inc.
N R T

June 27, 2003
(1609)

VIA ELECTRONIC MAIL

Mr. Tom Wetland
Wisconsin Department of Natural Resources
Plymouth Service Center
1155 Pilgrim Parkway
Plymouth, WI 53073

RE: Combustible Gas Monitoring Results and Proposed Engineering Controls; Valley Area Power Plant Improvements, Milwaukee, Wisconsin

Dear Mr. Wetland:

Natural Resource Technology, Inc. (NRT) has prepared this summary of combustible gas monitoring results and proposed engineering controls for the proposed Valley Area Power Plant (site) improvements. This letter report serves as a supplement to the information previously provided to the Wisconsin Department of Natural Resources (Department) in a May 12, 2003 request for an exemption to construct on a historic fill site. This request was submitted to the Department on behalf of Wisconsin Electric Power Co. (d.b.a. We Energies).

SITE BACKGROUND

The site proposed for redevelopment is owned by Wisconsin Electric Power Company and is located adjacent to the Marquette Interchange, which is currently under the design phase of a major reconstruction. Due to this reconstruction, plans have been developed to remove and/or relocate several existing above ground structures at the site. We Energies intends to construct and/or relocate a diesel fuel storage tank and fueling area, a tractor shed, demineralized water storage tank, and a wastewater storage tank following demolition and approval of the exemption for development at a historic fill site. The locations of the existing and proposed structures are depicted on the site development layout plan included as Appendix D of the May 12, 2003 submittal to the Department.

The proposed tractor shed, demineralized water storage tank, and wastewater storage tank will be constructed on piers. The tractor shed is a completely enclosed building with the potential for combustible gases to accumulate within the building. Other structures, including the diesel fuel storage tank will be slab on grade foundations.

COMBUSTIBLE GAS MONITORING

Groundwater monitoring wells previously installed on the site (TW-1, TW-2, TW-5, TW-6, W-1, W-2, W-3, W-4, W-5, W-6, and MW-7) were equipped with a labcock assembly at the top of each well casing to facilitate combustible gas monitoring. The well locations and the approximate location of the proposed tractor shed are shown on the attached Figure 1. Wells W-2 and W-3 are located adjacent to the approximate footprint of the proposed tractor shed, while the other well locations are situated north, south and northeast of the proposed building.

The labcock assembly provides a positive seal of the casing and has a ball valve that allows sampling of the gases present inside the well casing. Gas measurements were measured directly through the labcock assemblies, and no air was purged from the wells prior to collecting vapor samples data.

Combustible gas levels were measured on five consecutive days (June 16 through 20, 2003) with a LANDTECH GEM-500 ™ gauge. Following three consecutive days of gas measurements with the labcock assembly in place, the labcock device was removed for two additional consecutive days of gas measurements. The combustible gas monitoring device was calibrated before and after each set of field measurements. Measurements of the lower explosive limit (LEL) of combustible gases which may accumulate in the wells, the LEL as methane, the percent of methane by volume, carbon dioxide, and oxygen levels were measured and recorded at each well. The LEL for methane is 5 percent methane by volume. Therefore, the percentage of methane in the sample, as well as the percentage of methane as compared to the LEL, has been evaluated assuming that a 5 percent methane reading equals the LEL of combustible gases (i.e. 2.5 percent methane is 50 percent (one half) of the LEL). The combustible gas results are summarized on Table 1.

Significant methane levels (i.e. greater than 25 percent of the LEL for methane) were recorded at three of the sampling locations. Wells TW-1, W-2, W-4, and W-5 had methane levels ranging from 1.1 to 13.9 percent, which correspond to levels of 20 percent to 280 percent of the LEL (Table 1). With the exception of well W-2, no measurable levels of methane were detected in these same wells on the days when labcock assemblies were left off of the wells, suggesting that engineering controls that allow methane to vent from the area beneath the proposed tractor shed would alleviate the potential for combustible gases to accumulate and enter the building.

Methane production can vary seasonally, and installation of a clay or asphalt cap could increase the potential for lateral migration of methane. Methane has the potential to migrate beneath the ground surface at significant distances from its source. For these reasons, engineering controls have been recommended for the site development to reduce the potential for methane accumulation beneath the proposed tractor shed and to divert combustible gases from entering the building.

PROPOSED TRACTOR SHED CONSTRUCTION AND ENGINEERING CONTROLS

Foundation

The foundation of the tractor shed will consist of drilled piers and poured concrete grade beam footings at the exterior with either concrete masonry walls or poured in-place stem walls supporting the aboveground steel-frame walls.

Ground Slab

The floor slab will be a cast-in-place (slab on grade) with a minimum mesh reinforcement. Below the concrete, a minimum 30-mil thick polyethylene (PE) vapor barrier (Solmax 430 or similar) will be placed with all the joints sealed. The vapor barrier shall be permanently affixed to the building perimeter stem walls to eliminate the possibility of vapor migration alongside the stem walls and into the building. A 4-inch sand cushion will be placed below the PE, and immediately below the PE vapor barrier will be a non-woven geotextile fabric (Synthetic Industries #801 or similar). A 12-inch thick compacted open-graded stone layer shall be placed below the geotextile. The geotextile will be placed below the vapor barrier on top of the underlying stone to protect the PE from puncture.

Flexible fittings or connections shall be incorporated into the design where piping shall penetrate walls or the floor slab. A water/vapor barrier "boot" shall be constructed outside the stem walls or floor slab at all utility installations to prevent vapor movement into the building.

Ventilation System

In accordance with RR-685, a venting system will be installed beneath the floor slab of the building. The subgrade venting system incorporates the layers discussed above in the "ground slab" section of this letter. The venting system consists of the 12-inch layer of open-graded stone placed beneath the floor slab and vapor barrier. The open-graded material will be covered with the non-woven geotextile fabric to provide a perforation cushion between the stone and the vapor barrier. The PE can be welded to pipe boots where utilities penetrate the floor slab. A 4-inch diameter perforated polyethylene pipe will be embedded in the stone, extending lengthwise through the building area and around the interior perimeter adjacent to the subgrade stem walls. The piping system shall exit the building through piping extending to the roof to an exterior passive vent (wind turbine).

All appliances and electrical connections within the tractor shed shall be explosion proof (spark proof), with no equipment requiring a pilot light. Also, the tractor shed doors are generally open during operating hours, thereby providing ventilation to the interior of the building.

Utility Installation

A minimum 4-foot long compacted clay collar or equal shall be placed in all subsurface utility trenches as they enter the building to prevent the migration of methane gas through utility bedding. The physical characteristics of the collar and its installation shall meet NR 504.06(2)(a)(f).

Utilities that penetrate the floor slab of the structure shall be fitted with boots, which shall be fusion welded to the underlying vapor barrier.

Combustible Gas Monitoring

The exhaust of the passive methane ventilation outlet and the ambient air inside the building shall be monitored for percent methane on a quarterly basis, with results submitted to WDNR on a quarterly basis. Methane monitoring will be performed for a minimum of four quarters, after which the effectiveness of the system and the need for additional monitoring will be evaluated. The methane alarm system will also be installed within the building. The alarm system will be checked periodically and in accordance with the manufacturer's recommendations. The alarm system will be equipped with an emergency power back up.

FUTURE DEVELOPMENT

We Energies intends to construct a fly ash services facility west of the proposed tractor shed in October 2003. Additional information regarding subsurface conditions at this location will be forwarded to the Department as it becomes available. However, We Energies intends to proceed with construction of the tractor shed and storage tank foundations upon your review of the information provided herein.

NRT appreciates the prompt attention you have given this matter. Please do not hesitate to contact us should you have any questions or require any additional information.

Sincerely,

NATURAL RESOURCE TECHNOLOGY, INC.

Katherine M. Juno, P.G.
Senior Geologist

Stacy A. Schmoldt, P.E.
Senior Engineer

Attachment: Table 1: Combustible Gas Monitoring Results
Figure 1: Updated Sample Location Plan

Cc: Mr. Trent Kohl, We Energies (w/att.)

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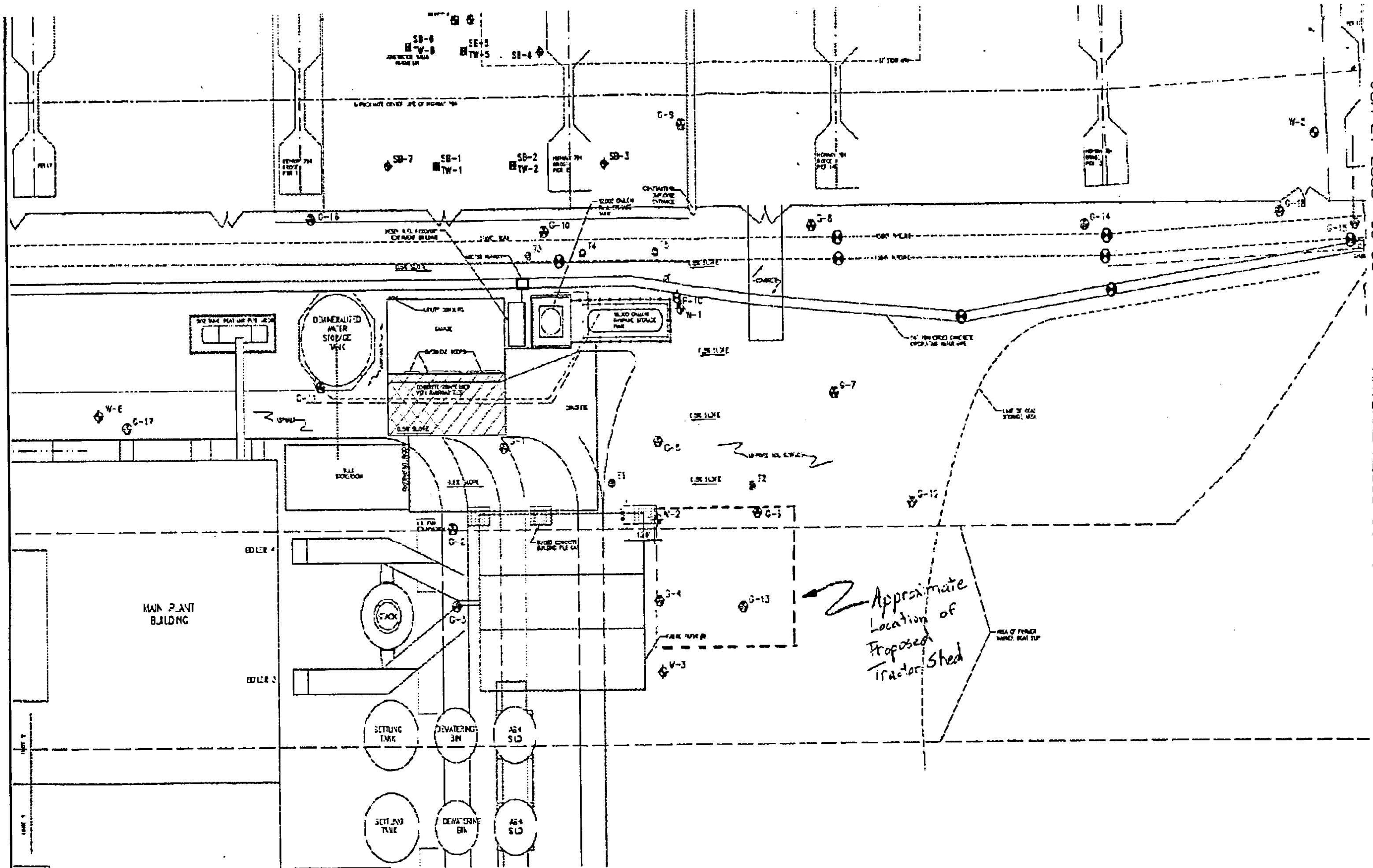
1609 Methane Monitoring Results-Table 1
We Energies Valley Area Power Plant, Milwaukee, Wisconsin
6/16/2003-6/20/2003

Sample Location	Date	% Methane (CH_4)	% Carbon Dioxide (CO_2)	% Oxygen (O_2)	% Lower Explosive Limit (LEL)	Balance
TW-1	6/16/03	4.5	1.7	14.8	90.0	79.0
	6/17/03	5.5	1.4	14.1	104.0	79.0
	6/18/03	2.2	2.0	15.2	44.0	80.6
	6/19/03*	0.0	0.0	21.0	0.0	79.0
	6/20/03*	0.0	0.2	20.3	0.0	79.5
TW-2	6/16/03	0.0	0.4	20.1	0.0	79.5
	6/17/03	0.0	0.4	20.2	0.0	79.4
	6/18/03	0.0	0.4	19.4	0.0	80.2
	6/19/03*	0.0	0.0	21.0	0.0	79.0
	6/20/03*	0.0	0.0	20.5	0.0	79.5
TW-5	6/16/03	0.0	12.0	2.6	0.0	85.4
	6/17/03	0.0	10.4	3.7	0.0	85.9
	6/18/03	0.0	10.4	5.6	0.0	84.0
	6/19/03*	0.0	0.0	20.7	0.0	79.3
	6/20/03*	0.0	0.4	19.6	0.0	80.0
TW-6	6/16/03	0.4	13.3	0.0	8.0	86.3
	6/17/03	0.3	10.5	4.6	6.0	84.6
	6/18/03	0.2	9.1	6.1	4.0	84.6
	6/19/03*	0.3	13.9	0.2	6.0	85.6
	6/20/03*	0.0	3.6	14.7	0.0	81.7
W-1	6/16/03	0.0	0.0	20.5	0.0	79.5
	6/17/03	0.0	0.2	20.2	0.0	79.6
	6/18/03	0.0	0.0	20.1	0.0	79.9
	6/19/03*	0.0	0.0	20.7	0.0	79.3
	6/20/03*	0.0	0.0	20.5	0.0	79.5
W-2	6/16/03	1.4	2.8	14.8	28.0	81.0
	6/17/03	2.5	2.9	13.4	50.0	81.2
	6/18/03	3.8	7.2	5.7	76.0	83.3
	6/19/03*	3.7	12.0	0.1	74.0	84.2
	6/20/03*	2.7	10.2	4.0	54.0	83.1
W-3	6/16/03	0.0	13.7	3.0	0.0	83.3
	6/17/03	0.0	14.5	2.2	0.0	83.3
	6/18/03	0.0	14.8	1.7	0.0	83.5
	6/19/03*	0.0	4.7	14.7	0.0	80.6
	6/20/03*	0.0	4.9	15.3	0.0	79.8
W-4	6/16/03	1.1	0.9	18.8	20.0	79.2
	6/17/03	3.4	1.5	15.9	68.0	79.2
	6/18/03	4.2	1.8	14.4	84.0	79.6
	6/19/03*	0.0	0.0	20.8	0.0	79.2
	6/20/03*	0.0	0.0	20.3	0.0	79.7
W-5	6/16/03	5.3	4.0	16.3	106.0	74.4
	6/17/03	10.6	6.5	13.4	212.0	69.5
	6/18/03	13.9	8.0	10.9	280.0	67.2
	6/19/03*	0.0	0.0	20.9	0.0	79.1
	6/20/03*	0.0	0.0	20.6	0.0	79.4
W-6	6/16/03	0.0	0.4	18.4	0.0	81.2
	6/17/03	0.0	0.5	17.9	0.0	81.6
	6/18/03	0.0	0.4	18.6	0.0	81.0
	6/19/03*	0.0	0.4	18.9	0.0	80.7
	6/20/03*	0.0	1.3	15.6	0.0	83.1
MW-7	6/16/03	0.4	5.8	5.2	8.0	88.6
	6/17/03	1.0	6.0	4.0	20.0	89.0
	6/18/03	0.5	5.7	7.7	10.0	86.1
	6/19/03*	0.0	0.0	20.6	0.0	79.4
	6/20/03	0.0	1.7	16.5	0.0	81.8

W/1609/Data/1609 MMtbl 030616 (O:BGH/C:GRL)

Notes:
1. Asterik (*)Indicates: Field measurements taken without the well cap and ball valve.
2. Percent Lower Explosive Limit is % of 5% Methane
3. "Balance" is equal to the total remaining gas measured after CH4 (methane), CO2 (carbon dioxide), and O2 (oxygen).
4. Instrument used was the LANDTEC, GEM-500™



LEGEND

- MW-7 MONITORING WELL
- PZ-2 PIEZOMETER
- SB-1 / TW-1 SOIL BORING AND TEMPORARY WELL
- W-1 MONITORING WELL (STS)
- P-1C PIEZOMETER (STS)
- G-1 GEOPROBE (STS)
- T1 TEST PIT (STS) (APPROXIMATE LOCATION)
- APRIL, 2004 EXCAVATION (WE ENERGIES) (APPROXIMATE LOCATION)

SOURCE NOTE:
THIS DRAWING WAS DEVELOPED FROM A DRAWING BY STS CONSULTANTS LTD. STS PROJECT NUMBER 84380WF, CADFILE C522.DWG AND C523.DWG, XREF=35EXSTBS, 35EXTBSXS, DRAWINGS DATED 2-5-99.

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SCALE IN FEET

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UPDATED SAMPLE LOCATION PLAN

EXEMPTION REQUEST FOR DEVELOPMENT
VALLEY AREA POWER PLANT
WE ENERGIES
MILWAUKEE, WISCONSIN

PROJECT NO. 1626/11
DRAWN BY: TAS 06/24/03
CHECKED BY: BDH 06/24/03
APPROVED BY: SAS 06/24/03