



February 19, 2010

Robin Mongeon, P.E.
NH Department of Environmental Services
Waste Management Division
29 Hazen Drive, P.O. Box 95
Concord, NH 03302-0095

Re: 1,4-Dioxane Analysis Results
Savage Well Superfund Site, Operable Unit-2 (OU-2)

Dear Ms. Mongeon:

On behalf of Hitchiner Manufacturing Company, Inc. and Thomas & Betts Corporation (Settling Parties), Gradient is submitting this report in response to your July 9, 2009 letter request to perform 1,4-dioxane sampling and analysis from the Savage Well treatment system and select groundwater monitoring well locations within OU-2. Samples were collected in October 2009 (treatment system sampling) and late November/early December 2009 (monitoring well sampling).

Several monitoring wells, MW-17C, MW-102, MW-106, MW-107C, MW-111A, MW-111B, MW-111C, and MW-114, which were previously sampled for 1,4-dioxane in 2003 were re-sampled as part of the annual sampling event performed in late November/early December 2009. In addition, as requested by DES, samples were also collected for 1,4-dioxane analysis at the following locations:

- Influent and effluent from the treatment plan (samples SYS-EFF; EW-1, EW-2, and EW-3);
- Layers 1 & 2 monitoring wells: MW-24A, 105A and 109A;
- Layer 3 monitoring wells: MW-14B, 20B, 102B, 105, 106, 109B, 114, 115B, and 116A;
- Layers 4 & 5 monitoring wells: MW-107B, 107C, 111B and 111C; and
- Bedrock monitoring wells: MW-14R and 19B.

To address DES concerns regarding the 2003 1,4-dioxane reporting limit of 10 $\mu\text{g/L}$, all 2009 analyses were performed using a method capable of quantifying 1,4-dioxane below the New Hampshire Ambient Groundwater Quality Standard (AGQS) of 3 $\mu\text{g/L}$. The analyses were performed by Alpha Analytical (Westborough, MA) using United States Environmental Protection Agency (US EPA) Method 8270C with Selected Ion Monitoring (SIM). The reporting limit was 0.50 $\mu\text{g/L}$ for these analyses, well below the AGQS. In addition, a performance evaluation (PE) sample (EW-4) was sent to the laboratory to check the accuracy of the 1,4-dioxane analytical method, at DES' request.

The 1,4-dioxane results reported for the 2003 and 2009 sampling events are summarized in Table 1. All 2003 and 2009 monitoring well locations and results are also presented on Figure 1. Our evaluation of the results indicates:

- The PE sample (EW-4) results met the 1,4-dioxane acceptance limits. The true concentration of 1,4-dioxane in the PE sample was 1,000 $\mu\text{g/L}$, and the result

reported by Alpha Analytical was 1,090 µg/L (109% recovery), indicating a slight high bias in the reported concentration.

- The three influent samples (from each of the extraction wells) and one effluent sample collected in October 2009 from the treatment system were non-detect for 1,4-dioxane, indicating that 1,4-dioxane is not present in measurable levels in the system influent and effluent.
- In 2009, 1,4-dioxane was detected at relatively low concentrations in 10 of the 17 monitoring wells sampled, ranging from 0.524 to 8.73 µg/L. Further,
 - ▶ 1,4-dioxane was not detected in seven out of 17 monitoring wells sampled;
 - ▶ Concentrations were below the AGQS of 3 µg/L in five out of 17 monitoring wells;
 - ▶ The AGQS was exceeded in six monitoring wells: MW-116A, MW-14B, MW-14R, MW-19B, MW-20B, and MW-24A (see Table 1); and
 - ▶ The highest detected value (8.73 µg/L) was recorded at MW-14R.
- In the December 2003 sampling event, 1,4-dioxane was detected at relatively low concentrations in only two of the nine monitoring wells sampled at the time (detection limit of 10 µg/L). When comparing 2003 and 2009 results, the following observations are noted:
 - ▶ Concentrations were non-detect in both rounds of sampling at monitoring wells MW-107C and MW-111B;
 - ▶ Concentrations at monitoring wells MW-111C and MW-114 decreased from 6 to 2.5 µg/L and 9 to 0.656 µg/L, respectively, between 2003 and 2009; and
 - ▶ At MW-106, the concentration was previously non-detect (at a detection limit of 10 µg/L) and was detected at 0.524 µg/L in 2009.

Overall, these data indicate that low levels of 1,4-dioxane are present in OU-2, concentrations are declining temporally, and 1,4-dioxane is not present in the influent or effluent associated with the groundwater treatment system. The declining trend of 1,4-dioxane is anticipated to continue over time, with the low levels encountered further attenuating due to plume dilution and dispersion. Consequently, no remedial actions are needed to address 1,4-dioxane at the site.

Yours truly,
GRADIENT



Manu Sharma, P.E.
Principal

cc: M. Jasinski
G. Smith
J. Peltonen
T. Sullivan
O. Chopra

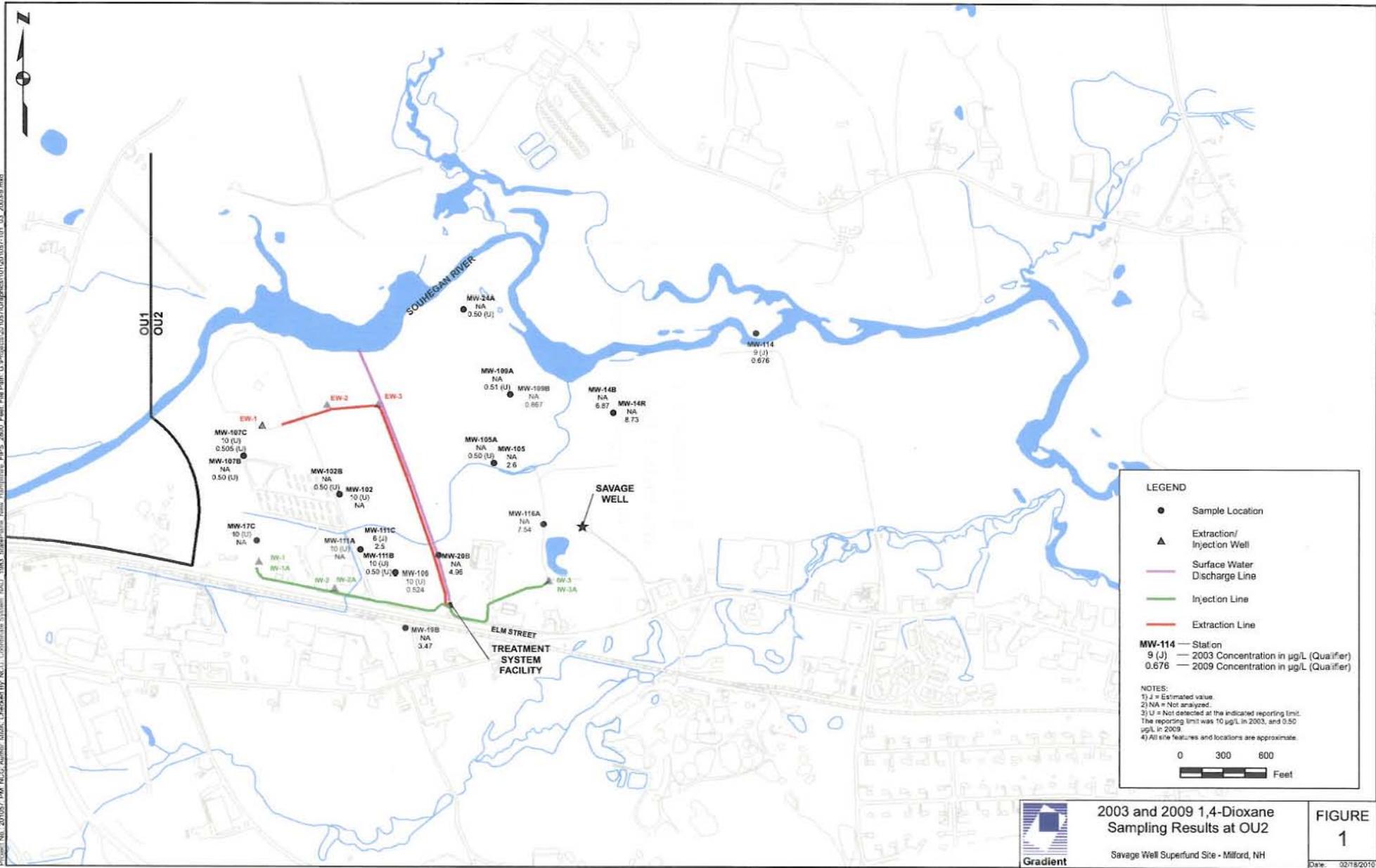
Table 1
1,4 Dioxane Results (ug/L)
2003 and 2009 Sampling
Savage Well Superfund Site, Milford, NH

Sample Location	Sampling Date	1,4-dioxane (ug/L)
Treatment System Results		
SYS-EFF	10/7/2009	0.50 U
EW-1	10/7/2009	0.50 U
EW-2	10/7/2009	0.50 U
EW-3	10/7/2009	0.50 U
Monitoring Well Results		
MW-102	12/1/2003	10 U
MW-102	--	NA
MW-102B	--	NA
MW-102B	12/1/2009	0.50 U
MW-105	--	NA
MW-105	11/30/2009	2.6
MW-105A	--	NA
MW-105A	11/30/2009	0.50 U
MW-106	12/1/2003	10 U
MW-106	12/1/2009	0.524
MW-107B	--	NA
MW-107B	12/2/2009	0.50 U
MW-107C	12/10/2003	10 U
MW-107C	12/2/2009	0.505 U
MW-109A	--	NA
MW-109A	12/1/2009	0.51 U
MW-109B	--	NA
MW-109B	12/1/2009	0.867
MW-111A	12/8/2003	10 U
MW-111A	--	NA
MW-111B	12/8/2003	10 U
MW-111B	12/2/2009	0.50 U
MW-111C	12/8/2003	6 J
MW-111C	12/2/2009	2.5
MW-114	12/9/2003	9 J
MW-114	11/30/2009	0.676
MW-116A	--	NA
MW-116A	12/2/2009	7.54
MW-14B	--	NA
MW-14B	12/1/2009	6.87
MW-14R	--	NA
MW-14R	11/30/2009	8.73
MW-17C	12/1/2003	10 U
MW-17C	--	NA
MW-19B	--	NA
MW-19B	11/30/2009	3.47
MW-20B	--	NA
MW-20B	12/1/2009	4.96
MW-24A	--	NA
MW-24A	12/2/2009	0.50 U

Notes:

Bolded results indicate that the result is above the 1,4-dioxane AGQS of 3 ug/L.
J - Estimated value. Result is reported between the laboratory reporting limit and method detection limit.
NA - Not analyzed. Well location not sampled during collection event.
U - Not detected at the indicated reporting limit. The reporting limit was 10 ug/L in 2003, and in 2009, the reporting limits was reduced to 0.50 ug/L.

Project No. 201007, PM, RCG, Author: MJB, Checked by: MCT, Continuous System: NAD, 1983, Merged: New Hampshire - PHS 2800, Well File Path: G:\Projects\201007\Output\Map\100100107_01_03_2003.mxd



LEGEND

- Sample Location
- ▲ Extraction/Injection Well
- Surface Water Discharge Line
- Injection Line
- Extraction Line

MW-114 — Station
 9 (J) — 2003 Concentration in µg/L (Qualifier)
 0.676 — 2009 Concentration in µg/L (Qualifier)

NOTES:
 1) J = Estimated value.
 2) NA = Not analyzed.
 3) U = Not detected at the indicated reporting limit. The reporting limit was 10 µg/L in 2003, and 0.50 µg/L in 2009.
 4) All site features and locations are approximate.

0 300 600 Feet