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20 May 1983

Mr. John P. Pilney
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W.O. No. 2181-02-01

Dear Mr. Pilney:

Attached please find two brief WESTON reports for your review. Attachment No. 1 is a report of WESTON's preliminary evaluation of ground water and soil analytical data for samples taken at the Chemolite Plant in Cottage Grove, Minnesota. Attachment No. 2 is an outline of WESTON's recommended course of action for preliminary evaluation of the "new" drum location at the Chemolite Plant.

Should you have any questions, please do not hesitate to contact me.

Very truly yours,

ROY F. WESTON, INC.

Abraham Thomas

Abraham Thomas, P.G.
Project Manager
Geosciences Department

AT:d

Attachments

Exhibit
1283
State of Minnesota v. 3M Co.,
Court File No. 27-CV-10-28862

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HENNEPIN COUNTY DISTRICT COURT, NO. 27-CV-10-28862

ATTACHMENT 1

PRELIMINARY EVALUATION OF SOIL
AND GROUND-WATER ANALYTICAL DATA

Chemolite Ground-Water Data

Samples of ground water were obtained from the three new monitoring wells constructed at the Chemolite Plant during August of 1982. It is WESTON's understanding that the samples were taken by Pace Laboratory after pumping a minimum of three volumes of standing water in each well using a submersible pump (services provided by Mantyla Well Drilling). Samples for all analyses except the volatiles fraction (VOA) of the USEPA Priority Pollutants List were taken directly from the pump discharge--VOA samples were obtained by bailing the sample. Field blanks of distilled water were prepared. Samples were submitted to the Rocky Mountain Analytical Laboratory in Arvada, Colorado, for anlaysis for all organic compounds listed on the USEPA Priority Pollutant List. Table 1-1 summarized the results obtained by the Rocky Mountain Analytical Laboratory, for only those compounds detected in one or more samples. The remaining 28 volatile compounds, 46 base/neutral extractable compounds, 11 acid extractable compounds, 20 pesticides and PCB aroclors, and dioxin, were not detected in any sample or in the field blank.

With the exception of the detection of 3.7 µg/l of PCB-1254 in Well MW-13, all results indicate excellent water quality with respect to Priority Pollutant Organics. The detection of dichloroethyl compounds in Wells MW-11 and MW-12 at the limit of detection may be real, but they also could be the result of very slight laboratory cross contamination. Detection of five pesticide/PCB compounds during analysis is potentially a cause for concern. However, two of the four pesticide compounds were detected only in the field blank, and a third compound (4,4'-DDE) was detected in the blank at a concentration higher than in the only sample in which it was detected. Clearly, laboratory contamination is an obvious source of the pesticides detected. Monitor Well MW-12 was resampled for anlaysis of PCB by the Pace Laboratory, and no PCB was detected at a detection limit of 0.1 µg/l.

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HENNEPIN COUNTY DISTRICT COURT, NO. 27-CV-10-28862 WE10268752

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Table 1-1

SUMMARY OF GROUND-WATER ANALYTICAL RESULTS[1]
ROCKY MOUNTAIN ANALYTICAL LAB

Compound	MW-11	MW-12	MW-13	Blank
1,1-Dichloroethane	<1	1	<1	NA[2]
1,2-Dichloroethane	2	<1	<1	NA
1,2-(Trans)Dichloroethylene	1	<1	<1	NA
Aldrin	<0.003	<0.003	<0.003	0.012
4,4'-DDE	0.060	<0.006	<0.006	0.094
4,4,4'-DDD	0.29	<0.016	<0.016	<0.016
Heptachlor	<0.02	<0.02	<0.02	0.006
PCB-1254	<0.5	<0.5	3.7	<0.5

[1] All results in micrograms per liter (ppb)

[2] Blank for VOA fraction not analyzed

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HENNEPIN COUNTY DISTRICT COURT, NO. 27-CV-10-28862
WE10268753
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Table 1-2

SUMMARY OF GROUND-WATER ANALYTICAL RESULTS[1]
PACE LABORATORY

Compound	MW-11	MW-12	MW-13
Cyanide (mg/l)	0.03	<0.02	<0.02
Phenol (mg/l)	0.002	<0.002	<0.002
Arsenic	<1	<1	<1
Barium	78	47	83
Cadmium	<0.1	<0.1	<0.1
Chromium	<1	<1	<1
Lead	6	5	3
Mercury	<0.2	<0.2	<0.2
Selenium	<2	<2	<2
Silver	<0.2	<0.2	<0.2

[1] All results in micrograms per liter (ppb) unless otherwise noted.

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HENNEPIN COUNTY DISTRICT COURT, NO. 27-CV-10-28862
WE10268754
1283.0004

Table 1-3

SUMMARY OF GROUND-WATER ANALYTICAL RESULTS[1]
MPCA LABORATORY

Compound	MW-11	MW-12	MW-13
1,1,2-Trichloroethane	NA	NA	0.2
(cis)-1,3-Dichloro-1-propene			
Acetone	<10	<10	12
Methyl Ethyl Ketone	3.1	< 2.5	3.8
Benzene	< 0.25	< 0.25	0.46
Toluene	0.51	0.50	1.50
Tetrahydrofuran	4.9	< 2.5	6.4

[1] All results in micrograms per liter (ppb)

CONFIDENTIAL - SUBJECT TO PROTECTIVE ORDER ENTERED IN
HENNEPIN COUNTY DISTRICT COURT, NO. 27-CV-10-28862
WE10268755
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Additional samples of ground water from the three new monitor wells were submitted to the Pace Laboratory for analysis of cyanide, phenol and Safe Drinking Water trace metals. The results are contained in Table 1-2.

A trace of cyanide and phenol were detected at the limit of detection in Well MW-11. Only Barium and Lead among the trace metals were detected quantitatively, and were found at levels well below the Safe Drinking Water Standards of 1,000 ppb for Barium and 50 ppb for Lead. The water quality in the three wells is excellent with respect to these 10 compounds.

Sample splits were provided to MPCA for analysis in the State Laboratory. Analysis of the MW-13 sample for 40 volatile halogenated hydrocarbons detected only two compounds, 1,1,2-trichloroethane and (cis)-1,3-dichloro-1-propene--these two compounds co-elute, and were present at a combined total of 0.2 ppb, the detection limit for both compounds. Analysis of this sample verified the excellent water quality in Well MW-13 with respect to these compounds.

Analysis of all three samples for 16 non-halogenated volatile hydrocarbons detected quantifiable levels of five compounds, as shown in Table 1-3. Benzene and Toluene, the only priority pollutants detected in these analyses, were detected at levels below the detection limits obtained by the Rocky Mountain Laboratory. (The Rocky Mountain Laboratory detection limits were in compliance with USEPA Standard Analytical Protocols for Purge and Trap GC/MS analyses of these two compounds.) Detection of acetone at slightly above the limit of detection may indicate a residue from sample bottle preapration. Detection of Methyl Ethyl Ketone (MEK), a Chemolite-used chemical, and Tetrahydrofuran in Wells MW-11 and MW-13 is cause for potential concern.

Conclusion

The water quality in all three monitor wells is generally excellent. Detection of MEK and Tetrahydrofuran in MW-11 and MW-12 is a cause for potential concern.

Recommendation

Resample all three monitor wells for confirming anlayses of MEK and Tetrahydrofuran.

CONFIDENTIAL - SUBJECT TO PROTECTIVE ORDER ENTERED IN HENNEPIN COUNTY DISTRICT COURT, NO. 27-CV-10-28862

WE10268756

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Chemolite Soil Data

Soils at three previously used waste disposal sites at the Chemolite Plant were sampled during July and August, 1982. These three sites were the sludge mound, the phenol pit and the burn pit. Three exploratory soil borings were drilled through the sludge mound, while two borings were drilled through the burn pit and only one could be drilled at the phenol pit (the second boring was terminated at 10 feet below grade when a sewer pipe was struck). All borings were drilled by the Soil Exploration Company, of St. Paul, Minnesota, using hollow stem auger methods. Soils were sampled on a continuous basis using split-spoon samplers and standard penetration tests. Split spoons were scrubbed in an Alconox solution and double-rinsed in potable water between samples to avoid cross-contamination of soil samples. Soils were retained as discrete one-foot increment samples in screw-top jars pending selection for analysis.

Where there was insufficient sample in any given one foot increment to accomplish the desired analysis, samples were quantitatively composited with the next adjacent sample. Samples were selected to characterize the following environments:

- Cover material at the sludge mound (Code 1)
- Sludge material within the sludge mound (Code 2)
- In-place soils beneath the sludge mound (Code 3)
- Disposed materials within the phenol pit area (Code 4)
- In-place soils beneath the phenol pit (Code 5)
- Disposed materials within the burn pit (Code 6)
- In-place soils beneath the burn pit (Code 7).

The code designations are for reference in Table 1-4.

CONFIDENTIAL - SUBJECT TO PROTECTIVE ORDER ENTERED IN HENNEPIN COUNTY DISTRICT COURT, NO. 27-CV-10-28862 WE10268757

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Fifteen soil samples were selected for analysis of volatile organic and Acid Extractable Compounds from the USEPA Priority Pollutants List. The environment of each sample is coded as shown above. Table 1-4 presents a summary of the chemical data only for compounds detected at quantifiable levels. Of the 31 volatile organics tested, only four were detected, and of the 11 acid extractable compounds none were detected. None of the 42 analytes were detected in the cover material at the sludge mound (Code 1) in the disposed materials within the phenol pit area (Code 4), in the in-place soils beneath the phenol pit area (Code 5), or in the in-place soils beneath the burn pit. Methylene chloride is the most ubiquitous compound, being detected in 8 of the 15 samples analyzed, and is present dominantly in the low part-per-billion range. Chloroform and toluene were detected in only one sample within the sludge mound, and only in the very low part-per-billion range. 1,1,1-trichloroethane was detected in six of 15 samples at low part per billion levels, with five of those being associated with the sludge mound.

At all three sites the moisture content of in-place soils beneath the sites was significantly lower than within the sites. For example, the average moisture content of the seven samples of sludge within the sludge mound was 45.6 percent, while the two sub-soil samples averaged 4.2 percent in moisture content. These results indicate that the sludge mound is effectively "self-sealed" with virtually no water available in the sub-soils to transport contaminants vertically the 100 or more feet to the water table. Similar results were found at the other two sites. These results confirm the results of construction of lysimeters in the sub-soils beneath each site--no moisture has been able to be collected to-date from these lysimeters.

Samples 1, 2, 4, 5, 7, 8 and 9, all from the disposed materials within the sludge mound, contained 10 fluorinated compounds as listed below:

- Hexadecafluoroheptane
- Rentadecafluoroctanal
- Octafluorocyclobutane
- 1,1,2,3,3,3-Hexafluoro-1-propene
- Tetradecafluorohexane
- Pentadecafluoroctanoic Acid
- Undecafluoro-4-trifluoromethylpentane
- Tricosafluorododecanoic Acid
- Decafluorocyclopentane.

All these compounds are Chemolite process intermediates, possess very low aqueous solubilities, and are not listed hazardous materials.

CONFIDENTIAL - SUBJECT TO PROTECTIVE ORDER ENTERED IN HENNEPIN COUNTY DISTRICT COURT, NO. 27-CV-10-28862 WE10268758

CONFIDENTIAL - SUBJECT TO PROTECTIVE ORDER ENTERED IN HENNEPIN COUNTY DISTRICT COURT, NO. 27-CV-10-28862

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Table 1-4

SUMMARY OF SOIL ANALYTICAL RESULTS[1]
ROCKY MOUNTAIN ANALYTICAL LABORATORY

Sample	Environment Code	Chloroform	Methylene Chloride	Toluene	1,1,1-Trichloroethane
1	2	<0.001	<0.010	<0.001	0.018
2	2	<0.001	0.130	<0.001	0.039
3	3	<0.001	<0.010	<0.001	0.012
4	2	<0.001	0.058	<0.001	<0.001
5	2	<0.001	0.089	<0.001	<0.001
6	3	<0.001	0.020	<0.001	<0.001
7	2	<0.001	0.018	<0.001	<0.001
8	2	0.002	0.096	0.011	<0.001
9	2	<0.001	0.150	<0.001	0.043
10	3	<0.001	0.015	<0.001	0.003
14	6	<0.001	<0.010	<0.001	0.033

[1]All results in milligrams per kilogram (ppm)

WE10268759

ATTACHMENT 2

PROPOSED WORK PLAN
PRELIMINARY EVALUATION OF "NEW" DRUM SITE
CHEMOLITE PLANT

Introduction

In early spring of 1983, a new waste disposal site was discovered at the Chemolite Plant. The site is located in a deep, steep-sided, normally heavily vegetated ravine near the Mississippi River on the western side of the plant, directly uphill from plant production Well No. 6. The site was detectable on none of the over 100 available aerial photographs of the plant, and was not mentioned by any plant personnel during interviews conducted during winter and spring of 1982.

Approximately 100 drums were found in the ravine, most of them at least partially buried. Most of the drums are empty, while those which are partially filled appear to contain either set-up latex resins or off-spec granular pigments. At the time of WESTON's inspection of the site in late April, 1983, a very small spring seep was discharging less than about one gallon per minute of clear water in the ravine. Previous chemical testing of water from Well No. 6 has never disclosed the presence of Priority Pollutants potentially emanating from the drums, although dilution of pumpage with water captured from the nearby Mississippi River may mask any impact of the drums upon Well No. 6 water quality.

Preliminary Site Evaluation

WESTON proposes a preliminary well construction sampling and anlaysis program for an initial assessment of the potential water qualtiy impact from the drum site. Work elements are outlined below:

- Obtain hand operated bucket auger soil samples to a depth of two feet at three locations in the disposal ravine. Potential analyses to be performed on soils composites from each location include USEPA Priority Pollutants List VOA and Acid Extractable fractions.

CONFIDENTIAL - SUBJECT TO PROTECTIVE ORDER ENTERED IN
HENNEPIN COUNTY DISTRICT COURT, NO. 27-CV-10-28862
WE10268760
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- Sample the contents of up to five drums containing materials other than latex resins. Composite the samples and analyze for USEPA Priority Pollutants List VOA and Acid Extractable Fractions, as well as analyzing for Safe Drinking Water Act trace metals on an EP Extract of the composite sample.

- Sample any surface water seepage which may be present, and analyze for the USEPA Priority Pollutants List VOA and Acid Extractable Fractions.

- Construct one monitor well at the foot of the ravine, upgradient of Well No. 6. Sample the ground water and analyze for the complete USEPA Priority Pollutants List.

WESTON will provide drilling and well construction specifications for bidding and well construction purposes.

CONFIDENTIAL - SUBJECT TO PROTECTIVE ORDER ENTERED IN HENNEPIN COUNTY DISTRICT COURT, NO. 27-CV-10-28862

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