

Report. 932109. 1983-03-15.

GW - Feb - Sampling

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Woodward-Clyde Consultants

15 March 1983
82C4495-2G

Mr. James B. Marean
New York State Electric
and Gas Corporation
87-89 Chenango Street
Binghamton, NY 13902

RE: Results of February 1983 Sampling,
Lockport Coal Tar Site

Dear Mr. Marean:

Woodward-Clyde Consultants is pleased to present the results of sampling at the Lockport Coal Tar Site. Samples of ground water, seepage along the Erie Canal wall, and a soil sample were collected on February 2-3, 1983. Samples of ground water were collected from monitoring wells MW-1, MW-2, MW-3, MW-4, and IW-2 (see Figure 1). Prior to collection of samples, three volumes of water present in the well casing was bailed utilizing a PVC bailer. Two samples were collected at each well: one sample utilizing a teflon bailer was collected to fill two septum vials for the analysis of aromatic organic compounds; and one gallon of sample was collected utilizing a PVC bailer for the other analyses. To minimize the opportunity for cross-contamination of well samples the collection of water for monitoring wells was sequenced from the least potentially contaminated to the more highly potentially contaminated wells. Prior to utilizing the bailers, the bailers were rinsed in deionized water and a minimum of two bail fulls were discarded before a sample was collected.

Two seep samples were collected from the base of the south wall of the Lockport Canal north of the Transit Street bridge. Seep 1 was located 100 feet northeast of the Transit Street bridge and Seep 2 was located 169 feet north of the bridge (Figure 1). At Seep 1, there were numerous places where seepage of oily material was evident but none could be found which would allow collection of

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directly into a sampling container. Thus, field personnel constructed a small embankment such that seepage ponded and the sample collected represents the ponded seepage that was scooped into the sampling containers. Distinct drip points at Seep 2 allowed field personnel to collect seepage samples directly into the glass sampling containers utilizing a funnel and some flexible tubing. Both samples of seepage represent seepage that was entering the canal from the bedding plane fractures of the De Cew formation. In addition to these water samples, a sample of soil was collected by NYSEG personnel at the substation. The soil contained organic oils and tars that are presumed to be typical for residual coal tar wastes that were generated at that site.

The samples of ground water, seepage, and soils were analyzed for specific pollutants, including metals, aromatic organic compounds, phenolic compounds, and the base neutral compounds of the priority pollutants. In addition, a C₅ to C₂₂ chromatogram scan was performed to characterize the range of organic compounds that were detected in ground water, the seeps, and the soil sample. The chromatograms of the samples from MW-1, MW-2, MW-3, MW-4, IW-2, Seep 1, and Seep 2 (no organic compounds were detected MW-4) were compared to the chromatogram of the soil sample collected at the substation. The analysis laboratory reported that the all chromatograms were virtually identical to the chromatogram of the soil sample. The results of the pollutant analysis shown in Table 1 (see attached laboratory report for complete analytical results) show that pollutants characteristic of coal tars occur in the soil sample, the seep samples, and MW-2, and MW-3. Base neutral compounds characteristic of coal tars were not detected in wells IW-2, and MW-4. Due to an accident at the laboratory, the base neutral compounds were not analyzed for sample MW-2.

The results of the sampling and analysis at the Lockport Coal Tar Site during February 1983, suggest the following:

- o coal tar waste occurs at the soils in the substation at shallow depths,

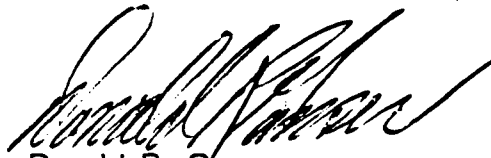
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- o ground water at the substation (MW-3) is contaminated by the same chemicals found at the substation soils,
- o upgradient ground water (MW-4) is not contaminated by coal tar,
- o seepage at the canal contains coal tar chemicals and the organic fraction consists mostly of coal tar, and
- o the measured concentrations in MW-2 and MW-1 suggest that pathways for coal tar migration at Lockport are highly selective along fractures.

The results of these analyses have raised some additional questions concerning the movement of coal tar at the Lockport site. In light of the initial conclusions that we have made, we are reviewing data collected previously to identify, if possible, the direction of migration of coal tar from the site to the canal. We are also reviewing data that has been collected by others on the hydrodynamics of coal tar migration in the unsaturated and saturated zone.

Please call us if you have any questions.

Very truly yours,



Donald R. Ganser,
Project Manager

DRG/cd
C229/96

Enclosure

Table 1
Chemical Parameters Detected in One or More Samples at the
Lockport Coal Tar Site
February 2-3, 1983

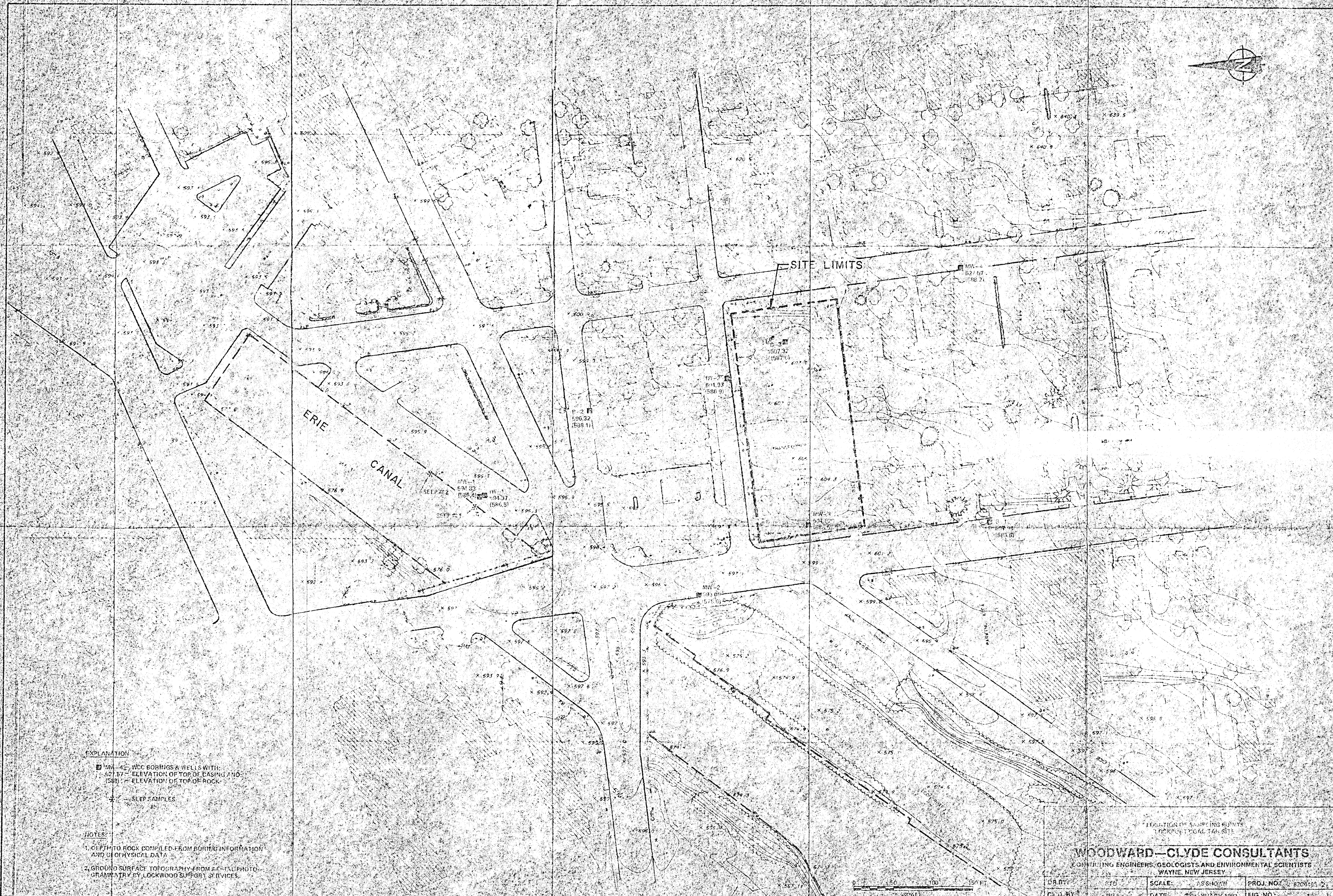
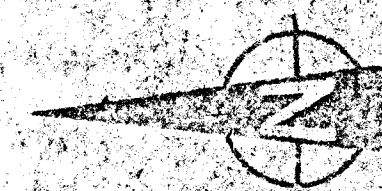
Parameter	Units ^a	Soil	Sample Location						
			Seep 1	Seep 2	MW-1	MW-2	MW-3	MW-4	IW-2
Total Phenol	ppm	8.4 ^b	1.971	0.045	0.028	0.030	0.747	ND	0.016
BOD (5 day)	ppm	NA	420	15.6	11.7	19.2	120	6.3	7.2
Chromium (total)	ppm	9.5 ^b	1.45	ND	ND	ND	ND	ND	ND
Chromium (hexavalent)	ppm	NA	0.28	ND	ND	ND	ND	ND	ND
Copper	ppm	16.5 ^b	1.53	ND	ND	ND	ND	ND	ND
Zinc	ppm	30 ^b	7.2	0.03	ND	ND	ND	ND	0.08
Antimony	ppm	26 ^b	0.9	ND	ND	ND	0.3	0.4	ND
Method 602 (Aromatics)									
Benzene	ppm	ND	0.059	ND	0.066	ND	3.05	ND	0.014
Toluene	ppm	0.071 ^b	ND	ND	0.120	ND	2.38	ND	0.003
Ethyl Benzene	ppm	0.072 ^b	ND	ND	0.033	ND	0.73	ND	ND
p-Xylene	ppm	ND	0.072	0.002	0.019	ND	0.20	ND	ND
o-Xylene	ppm	ND	0.120	0.025	0.032	ND	0.39	ND	0.002
Styrene	ppm	ND	ND	ND	0.004	ND	0.51	ND	ND
n-Propylbenzene	ppm	ND	ND	ND	0.003	ND	0.03	ND	ND
Method 604 (phenolics)									
Phenol	ppm	ND	ND	0.03	ND	ND	ND	ND	ND
4-chloro-3-Methylphenol	ppm	ND	0.60	ND	ND	ND	ND	ND	ND
Dinitrophenol	ppm	ND	3.5	ND	ND	ND	ND	ND	ND
Pentachlorophenol	ppm	ND	2.7	ND	ND	ND	ND	ND	ND
Base Neutrals									
Acenaphthene	ppb	48,000	310	140	ND	ND	190	ND	ND
Acenaphthylene	ppb	16,000	440	110	ND	NA	570	ND	ND
Anthracene	ppb	15,000	110	27	ND	NA	130	ND	ND
Benzo (A) Anthracene	ppb	20,000	100	16	ND	NA	81	ND	ND
Benzo (A) pyrene	ppb	14,000	ND	ND	ND	NA	51	ND	ND
3,4-Benzofluoranthene	ppb	19,000	13	13	ND	NA	69	ND	ND
Benzoperylene	ppb	5,600	ND	ND	ND	NA	43	ND	ND
Benzo (K) fluoranthene	ppb	19,000	13	13	ND	NA	69	ND	ND
Bis(2-Ethylhexyl)Phthalate	ppb	ND	84	ND	ND	NA	ND	ND	ND
Chrysene	ppb	14,000	67	10	ND	NA	60	ND	ND
Fluoranthene	ppb	32,000	240	37	ND	NA	120	ND	ND
Indeno (1,2,3-CD) Pyrene	ppb	9,600	ND	ND	ND	NA	ND	ND	ND
Naphthalene	ppb	220,000	3,100	79	250	NA	5,700	ND	ND
Phenanthrene	ppb	96,000	750	120	ND	NA	500	ND	ND
Pyrene	ppb	52,000	320	44	ND	NA	140	ND	ND

NOTES:

- a. ppm means mg/l for water samples and mg/kg for soil sample.
ppb means µg/l for water samples and µg/kg for soil sample.

- b. Sample collected November 23, 1982, delivered to laboratory December 6, 1982.

NA means not analyzed
ND means not detected



EXPLANATION

■ MW-1, 2, 3, 4 WDC BORINGS & WELLS WITH:
627.57' ELEVATION OF TOP OF CASING AND
588.11' ELEVATION OF TOP OF ROCK
* S-1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100

--- SLEEP SAMPLES

NOTES

1. DEPTH TO ROCK COMPILED FROM BORING INFORMATION AND GEOPHYSICAL DATA

2. GROUND SURFACE TOPOGRAPHY FROM AERIAL PHOTOGRAMMETRY BY LOCKWOOD SURVEY SERVICES

LOCATION OF SAMPLING POINTS
LOCKPORT CANAL TAIL SITE

WOODWARD-CLYDE CONSULTANTS
CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS
WAYNE, NEW JERSEY

DR. BY	STB	SCALE: AS SHOWN	PROJ. NO. 8206-95-2
CK. BY	HIS	DATE: 23 JANUARY 1983	FIG. NO. 1