Memo To: Fred Boglione
From R. Leonard
Subject: Loow and NFSS background soil and water samples
cc: J. Leithner , R. Pilon, S. Yaksich, M. Masset W. Kowalewski, M. Rhodes

I have reviewed background soil data and water data for LOOW and NFSS for natural representativeness and applicability for both sites as a whole recognizing that NFSS is a small subset of the entire LOOW. EA Engineering took two background soil samples for the LOOW site. They were BKGD 1 on Creek road near Lewiston Porter School and BKGD 2, 70 feet North of Cain Road. (Att. 1) Atemporary well was also installed at BKGD 2 at a depth of 14 feet,

As a Soil Scientist with the USDA Imapped the soils on the entire LOOW in the mid 60,s and was a coauthor of the Niagara County Soil Survey. The background soils are truly representative of the natural soils mapped I then looked at the chemical data for these locations .No organics were found in any of the soil samples except for a number of PAH,s PAH,s at these levels are ubiquitious in the natural and cultural environment. Note that PAH. s were found at depths of up to 15 feet in these truly natural soils and were of natural origin. Metals data are enclosed as Att. 1. Anumber of metals exceeded TAGM soil cleanup levels including calcium , chromium, copper , iron, magnesium nickel , and zinc Since these are without a doubt natural soils , the average levels for these paraameters should be substituted for TAGM levels as cleanup levels. Since these soils represent over 80% of the natural soils on
the LOOW site and over 95 % of the natural soils on the NFSS site , there is no need to obtain any more back ground soil samples.

I also looked at the chemical data from the temporary well installed at BKGRD 2. there were no organics found above detection limits at this well. Icompared metal levels with New York state ground water standards as shown in Att. 3. Although low flow sampling appeared to be done, huge differences in results for filtered and unfiltered samples are evident.(iron ,copper, lead, manganese, and selenium) As always for over 25 years I maintain that comparing unfiltered metal levels to standards is completely in error. Note that total levels for iron, and manganese exceed standards, whereas dissolved levels do not. I suggest that if NY state insists on using unfiltered results that background for unfiltered samples be used
for groundwater cleanup standards instead of the NY standards. Sodium levels for both filtered and unfiltered samples exceed NY standards This is to be entirely expected since the ~~Onondaga~~ NIAGARA escarpment
within two miles south of the site has released soluble salts for millions of years including calcium, manganese, magnesium, iron and sodium. Much of the calcium iron manganese and magnesium have reprecipated north of the escarpment resulting in the high measured levels at the LOOW and NFSS sites. This well installed at 14 feet is a good representation of the groundwater quality found in the discontinuous pockets of sand and gravel found in an otherwise impermeable clayey glacial till and lacustrine soil environment

There is a permanent background well (B02W20S) installed at NFSS which is screened between 8.5 and 18.0 feet below theground surface in sand and silt This well also is representative of ground water in water bearing pockets in what is referred to as the " upper ground water zone" (5.5 to 27.6 feet below the ground surface) Apparently organic parameters were not measured in this well . Metal levels except for iron and manganese have historically been below NY ground water standards. Radiation levels are at background. This is a good background well for all of LOOW and has added advantage of being permanent. There is also adeep well (BO2W20 D)at this location installed in the fractured Queenstown shale bedrock 44.5 feet below the ground surface This well is not sampled presently because of low levels of contaminants found in shallower wells. It 'would suffice as a good background bedrock well for the entire LOOW and NFSS if required .

In summary, I beleive that there is no need for any more background soil samples or monitoring wells either at LOOW or NFSS. this should result in considerable cost savings.

Richard P. Leonard

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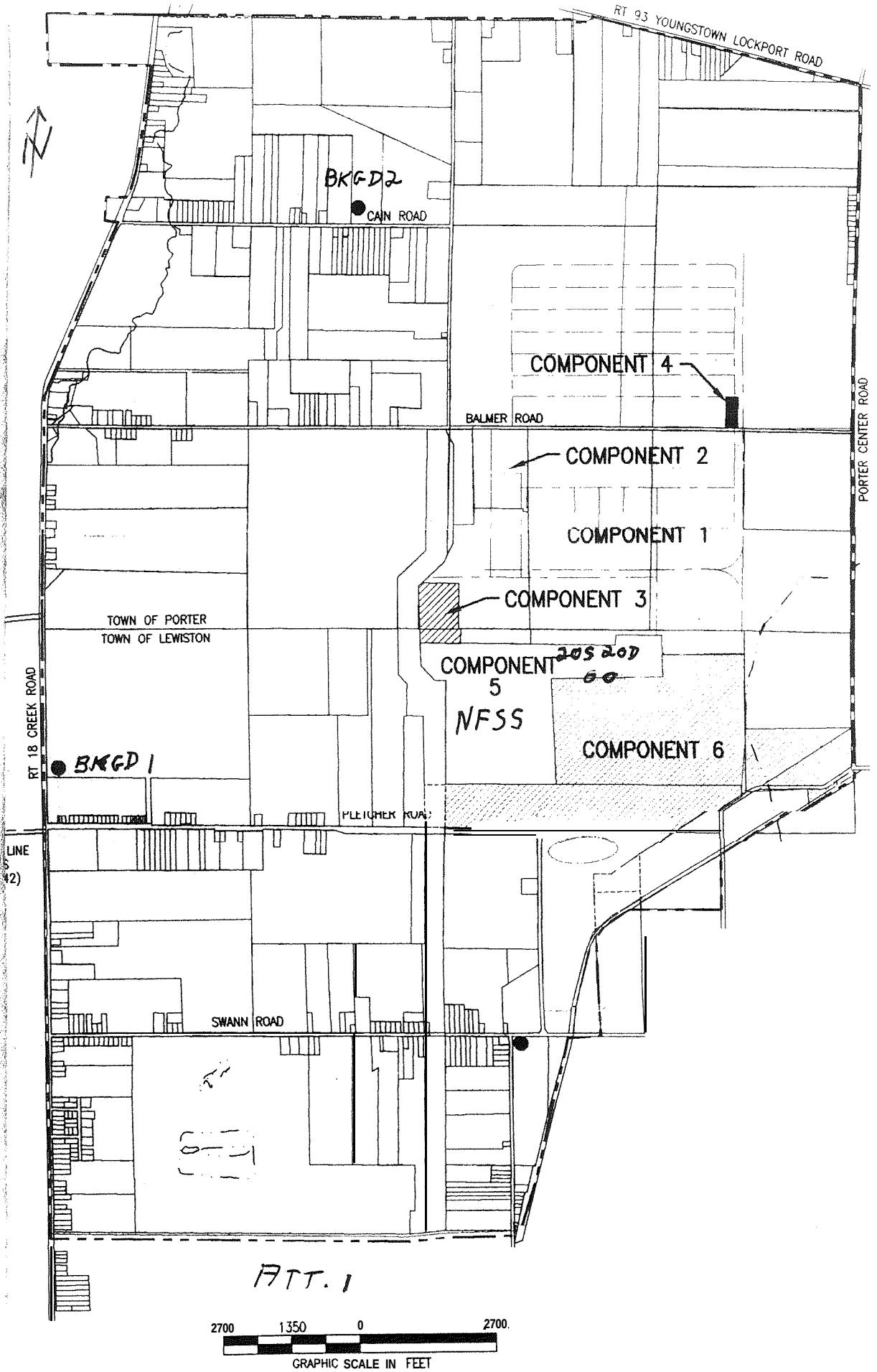
5-/31/00



ACKGROUND SAMPLE LOCATIONS FOR SURFACE SOIL, SUBSURFACE SOIL AND GROUND WATER

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ATT. 2

Laboratory Analysis RESULTS FOR SOIL SAMPLES
BACKGROUND SAMPLES

METHOD	ANALYTE	UNIT	BKGD-1-0-0.5	BKGD-1 12-14	BKGD-2-14	BKGD-2-2	TAGM SOIL CLEANUP No. 4046
E160.3	PERCENT MOISTURE	%	14.6	15.7	17.2	14.9	
SW6010	ALUMINUM	MG/KG	18400	10700	5260	13800	33,000
SW6010	ANTIMONY	MG/KG	3.65 BN	0.63 BN	1.52 BN	0.5 BN	*
SW6010	ARSENIC	MGIKG	3.8	3.7	3.1	3.8	7.5
SW6010	BARIUM	MG/KG	148E	97.9 E	58.5 E	129E	300
SW6010	BERYLLIUM	MGIKG	0.77	0.4 B	0.12 B	0.71	0.16
SW6010	BORON	MG/KG	2.7 BN	3.5 BN	1.4 BN	1.3 UN	—
SW6010	CADMIUM	MG/KG	1.08 UN	0.07 UN	1.07 UN	0.07 UN	1.0
SW6010	CALCIUM	MG/KG	3890	54700	45400	7930	35,000
SW6010	CHROMIUM	MGIKG	23.6 N	15.2 N	8 N	17.5 N	10.0
SW6010	COBALT	MGIKG	12.8	12	4.9 B	10.1	30.0
SW6010	COPPER	MGIKG	32.9	38	20.6	30.7	25.0
SW6010	IRON	MG/KG	36400	25100	15000	29300	2,000
SW6010	LEAD	MG/KG	8.1	5.7	3.6	11.8	500
SW6010	LITHIUM	MGIKG	27.1	25.3	12.6	17.9	—
SW6010	MAGNESIUM	MGIKG	6300	6780	8860	5120	5,000
SW6010	MANGANESE	MG/KG	699	687	605	455	5,000
SW6010	NICKEL	MGIKG	28.5	19.9	10.2	22.9	13.0
SW6010	POTASSIUM	MGIKG	1420 N	1620 N	999 N	747 N	43,000
SW6010	SELENIUM	MG/KG	1.52 UP	0.23 UN	0.23 BN	0.46 UN	2.0
SW6010	SILVER	MGIKG	0.13 u	0.11 u	0.12 u	0.11 u	*
SW6010	SODIUM	MGIKG	154	195	205	154	8,000
SW6010	VANADIUM	MGIKG	30.7	20.1	11.3	26.2	150
SW6010	ZINC	MGIKG	66.1 N	266 N	30 N	40.4 N	20
SW7471	MERCURY	UG/KG	0.07 u	0.05 u	0.07 U	0.05 U	0.1
SW7841	THALLIUM	UG/KG	0.13 u	0.11 u	0.12 U	0.11 U	*
SW8081	4,4'-DDD	UG/KG	3.43 u	0.38 U	0.39 u	0.38 U	

* MAX BKGD LEVELS

ATI 3

Table 3-2.2 (continued)

Compound	Final MCL	Final MCLG	Final SMCL	MCL	BKGD GW-02 T	BKGD GW-02 D	New York[a] Water Quality Regulation Standard	New York[a] Water Quality Regulation Guidance Value	RCRA Action Level[b] Non-Carcinogenic Effects	RCRA Action Level[b] Carcinogenic Effects
Covver	1,300[h]	1,300	1,000		130 E	2 U	200		1,300	
Iron			300		58,300	52 U	300			
Lead	15[h]	0			16.3	1 U	25			
Manganese			50		3040	280	300		175	
Mercury	2	2			0.1 U	0.15	2		10.5	
Nickel	100	100			45.9	5 U			700	
Selenium	50	50			6.4	3.1	10		175	
Silver	50		100		1 U	1 U	50		175	
Sodium					102,000	86300	20,000			
Thallium	2	0.5			1 U	1 U		4	2.45	
Zinc			5,000		134	12	300		10,500	
INORGANIC COMPOUNDS										
Ammonia							2,000[l]			
Chloride			250,000				250,000			
Fluorine	4,000		2,000							
Nitrate	10,000	10,000					10,000[l]			

T - TOTAL
D - DISSOLVED
U - UNDETECTED

17 .3 CONT.

ug/l

Table 3-2.2 (continued)

Compound	Final MCL	Final MCLG	Final SMCL	MCL	BKGD GW-02 T	BKGD GW-02 D	New York[a] Water Quality Regulation Standard	New York[a] Water Quality Regulation Guidance Value	RCRA Action Level[b] Non-Carcinogenic Effects	RCRA Action Level[b] Carcinogenic Effects
Theophyline								40		
Thiram							1.8		175	
Toxaphene	3	0					ND			0.03
Tributyltrn oside								50	1.05	
2(2,4,5-Trichlorophenoxy) acetic acid	50	50					35		350	
2,4,5-Trichlorophenoxypropionic acid							0.26		280	
Trifluralin							35		262	
METALS										
Aluminum			50-200		30,300	167			35,000	
Antimony	6	6			4.3	1.7		3	14	
Arsenic	50			0	19.5	2.7	25		10.5	0.02
Barium	2,000	2,000			149	32.8	1,000		2,450[g]	
Beryllium	4	4			0.34	0.2U			175	0.01
Boron					78.7	44.5	1,000		3150	
Cadmium	5	5			0.6	0.6	10		17.5	0.005
Chromium	100	100			35.4	4U	50		35,000	
Chromium (VI)									175	0.0008

T - TOTAL
D - DISSOLVED