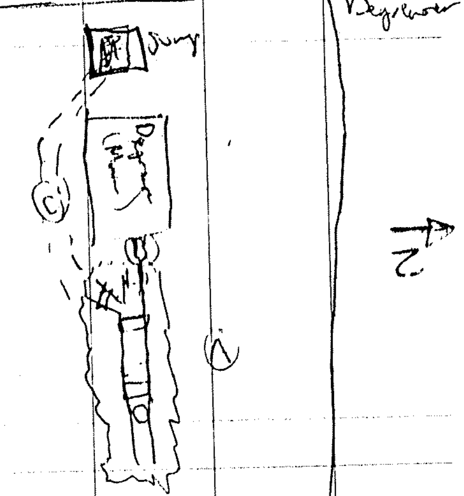
AVX 10/17/91

(1) 3 - liquid/vapor TCA degreaser
(2) 1 - ultrasonic cleaner
(A) TCA Dip (waste to bucket)
(B) Isopropyl Alcohol (waste to bucket)
(C) Water Rinse (waste to POTW)
(3) 1 - 1 tq/vat TCA Dip (to bucket)
1 - TCA Ultrasonic rinse (to bucket)
1 - wash up sink (to POTW)
(4) 1 - liq/vapor TCA Degreaser
(5) Waste Storage - some liquid on floor (rain?)
(6) TCA Still area adjacent to storage pad. Runoff from pad over to ditch
(7) Virgin Flammable storage, floor drain to locked valve

Vac Air Alloys 10/22/91

Vac Truck on site @ 0820 hrs.
Truck → IVS (Dunkirk) 814-2 Hauler lisc.
Jetstream Pressure Washer already on site
(1) 83 Location - Near main (High Temp Alloys) Degreaser



Vacuum Truck started at 0852 hrs.
Trichlor odor noticeable
Pipe at the location is Ductile Iron
About 1-2 inches of sediment was observed in broken out section of pipe at (A)
Upstream section of pipe at (B) cleaned w/ Jet Spray
(C) 0925

Pg 54 Vac Air Alloys 10/22/91

Turnings noted in sludge in lengthy pipe (A). No TCE odor

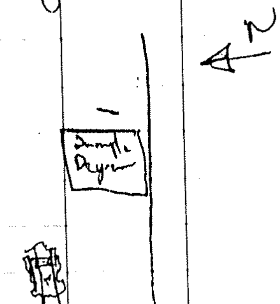
Stretch (C) run and completed video by 0950 hr.

(B) was permanently closed with a rubber endcap and metal band.

~~[illegible]~~ floor

Concrete in this area is 6" thick.

(2) Location: Pressure washer located in plant between High Temp Degreaser and Sample Degreaser

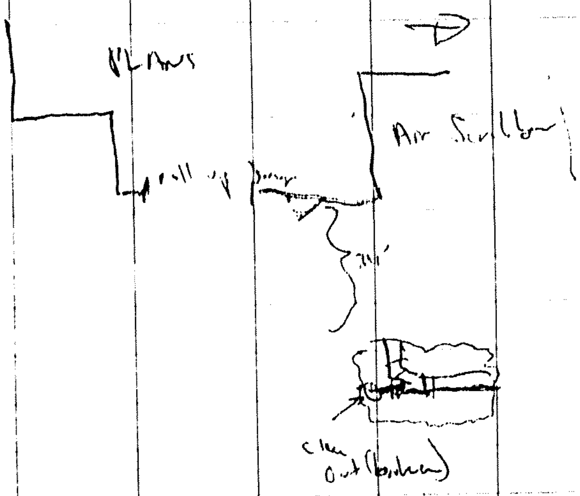


Vac Air Alloys Pg 55

Pressure Wash was run up to the next opening (Location 1)

~~Opened stretch~~

Meanwhile vacuum truck set up at end of Plant Toward south end.



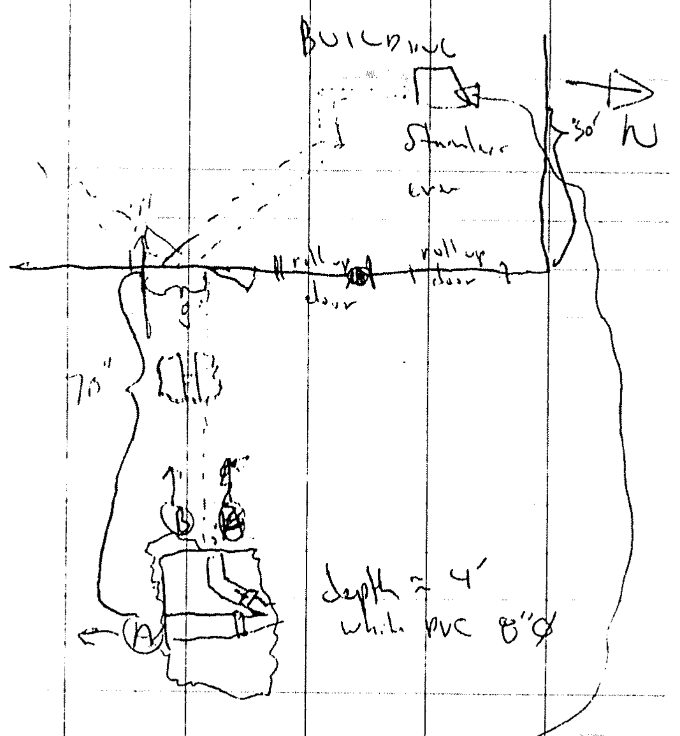
8" Ø PVC pipe
About 3' below grade

Sediment in pipe smelled strongly of oil. Possible faint odor of solvent. ~~Sediment~~
Pipe half full of sediment

- This operation started @ 1245 hrs
- They did multiple runs on the stretch because of severe clogging.
- Kevin Nike pulled material from cleanout – smelled strongly of TCE and appeared quite oily.
- They did 4 runs on this reach.
- Time completed 1340 hrs.

(3) Vac truck same location as #(2) pressure washer also there. 4 runs on this reach. Done at 1457 hrs.

(4) Next hole located at Pad east of Stainless area (at Northeast corner of building) Done 1600 hrs (3 runs) Vacuum Truck located at ... Downstream near pump station bay ... [illegible]



Current location of Crane – Old degreaser was located just East of this. Operated circa 1975

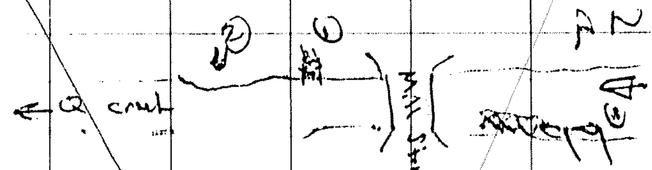
Pg 58

Vac Air Alloys 10/22/01

~~[illegible]~~ Sent "Data Needs for Trial Burns" to Vac Air

1800 gallon discharged to storage tank nearest road.

Fitzpatrick & Weller Pg 59



- I walked stream and noted pipe at (1) above about 25' west of Mill St. bridge. Ambient stream T° = 16°C. Trickle of discharge noted ≈ 1 gal/10 min. Discharge temperature 17°C. (Image 0911)

- Noted other pipe (CMP) at (2). No flow, no evidence of past flow

- I walked upstream, saw large runway with high turbidity, pronounced rainbow oil sheen. On south side of creek, ~~[illegible]~~

New York State Department of Environmental Conservation

Division of Fisheries - Region 9
128 South Street
Olean, NY 14760-3632
(716) 372-0645

Thomas C. Jorling
Commissioner

September 8, 1992

Mr. Mark A. Lindberg
Fine Line Technical Services
12492 Smith Road
Medina, NY 14103

Dear Mr. Lindberg:

Mr. Mooradian has asked me to gather the information you requested concerning Conewango Creek. Enclosed you will find some survey forms that list fish species present.

Sincerely,

Emilio Rende

Emilio Rende
Fish and Wildlife Tech.
Region 9 - Olean

ER/ded
Encl.

Station location is on the east side of the City of Jamestown (toward Village of Falconer)

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

FISH COLLECTION OR SMALL STREAM SURVEY

PEM 87 014

Survey Allegany Date 8/5/87 Authority McKeown, Pomeroy, Veno, Dlugos

Name and key Chadakoin River (Pa.53-13-4) Quad Jamestown

Station location Opposite Junction of James and Second Sts. County Chautauqua

Length 330' Width $\bar{x}$=50' Depth _____ Acres _____

Flow _____ Temp: A _____ W 82°F Time (EST) 10:20-10:50

Gear Georator Backpack Efficiency (yg trout) _____

Young trout per acre (adjusted total) _____

Factors: W _____ N _____ H _____ F _____ Total _____

General notes: Assessment of influence of Carlson Plant on Fishery

Conductivity - 225 moh

pH - 9.0

D.O. - 6 ppm

Very difficult to sample due to presence of deep pools.

752

Stocking policy:

94-14-7 (5/76)
Formerly FW-88

Name of species	Abundance	Number and description
Notropis atherinoides	1	
Notropis cornutus	3	
Semotilus atromaculatus	4	
Pimephales notatus	4	
Hypentelium nigricans	12	
Lepomis gibbosus	2	
Perca flavecens	2	

For location, see map of Kennedy Quad

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

FISH COLLECTION OR SMALL STREAM SURVEY

Survey Allegany Date 7-21-74 Authority Veno, Lindell, Ahlstedt

Name and key Conewango Cr. (Pa. 53) Quad Kennedy
Goodwin's Landing to

Station location Little Conewango Creek (Cld) County Cattaraugus

Length 2½mi. Width _____ Depth _____ Acres _____

Flow _____ Temp: A 82° W 78° Time (EST) 12:00-2:30PM

Gear 230 AC Boat shocker Efficiency (yg trout) _____

Young trout per acre (adjusted total) _____

Factors: W _____ N _____ H _____ F _____ Total _____

General notes:

Water is well below normal and very turbid.

Many grass pickerel we sighted & captured. Also one Northern was taken. In the past, these species have never been seen or taken from this section.

No young musky's or norlunge sighted or captured.

Limited shocking in Little Conewango because it was very shallow

844

Stocking policy:

DFG-88

Name of species	Abundance	Number and description
Esox masquinongy	3	28.2" 25.2" (28.1"-LV Clip)
Esox lucius	1	23.9"
Stizostedion vitreum	1	19.1"
Esox americanus vermiculatus	31	6.9" 6.9" 7.2" 4.4" 6.5" 4.0" 4.5" 6.8" 6.5" 6.4" 4.0" 5.0" 9.2" 6.9" 3.6" 5.0" 4.0" 6.5" 6.9" 4.3" 4.5" 6.5" 6.9" 7.5" 6.5" 4.0" 4.3" 6.7" 7.0" 5.7" 3.5"
Micropterus salmoides	2	9"-10"
Cyprinus carpio	A	
Moxostoma ~~carinatum~~ spp.	A	
Catostomus commersoni	R	
Lepomis gibbosus	R	
Carpiodes cyprinus	A	

Req. 356. FG9Je38. 6-13-38-10,000 (16-9943) Survey Allegheny-Chemung

Drainage Allegheny Coll. no. S.C. Bishop 184

Locality Pa.63 (Conewango Creek) 1/2 mi. below mth. of T12

County Chautauqua Quadrangle Jamestown Elevation 1260'

Water White; turbid Flow ---- Width 100'

Vegetation None

Bottom Grav. rubble;mud Current Slow to moderate

Shore Wooded; pasture Distance from shore 30'

Temperature: Air 80' Water 76.5 Time 5.00P Weather Cloudy

Depth of capture -2' Depth of water -5'

Method of capture 10' seine

Collected by Royce; Stone Date Sept. 2, 1937

Orig. preserv. Formalin Time 4:30-5:00 P.M.

General notes: History of stocking and angling; fishing conditions and size of fish, etc.

748.1

Name of species	Abundance	Seine	Gill net	Number and description
*Micropterus dolomieu	C-			1 yg = 65mm
*Huro salmoides	C-			1 yg = 80mm
*Pomoxis sparoides	C-			5 yg-juv
*Pomoxis annularis	R			1 juv.
Moxostoma erythrurum	C-			3 yg.-juv.
*Hyborhynchus notatus	C plus			5 yg.-ad.
*Notropis cornutus frontalis	C			11 Yg-juv
Nocomis micropogon	C			7 yg
*Notropis r. rubellus	C-			1 yg
*Notropis v. volucellus	R			1 juv.
*Boleosoma n. nigrum	C-			1 yg
*Percina c. caprodes	C-			2 juv-ad
*Hybopsis a. amblops	R			1 juv.
Notropis whipplii spelopterus				1 juv.
*Campostoma anomalum	C-			3 yg-juv

Cat. No. 7371-7385 Inc.

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

FISH COLLECTION OR SMALL STREAM SURVEY

Survey Allegany Date 6/12/78 Authority Veno, Klesa, Fuerst

Name and key Conewango Cr. (Pa.63) Quad Jamestown

Station location Trib. 5 to just above Riverside Bridge (60'avg.) County Chautauqua

Length ____ Width 40-70' Depth 4'-8' (4'avg) Acres ____

Flow ____ Temp: A 83° W 72° Time (EST) 11:30AM-2:30PM

Gear 230 AC Boat Shocker Efficiency (yg trout) ____

Young trout per acre (adjusted total) ____

Factors: W ____ N ____ H ____ F ____ Total ____

General notes:

Water is below normal & very turbid
Shocking for statewide toxic substances monitoring program.

Stocking policy:

FW-88

733

Name of species	Abundance	Number and description
Micropterus dolomieui	2	10.1" 9.2"
Stizostedion vitreum	2	19.1" 18.8"
Esox lucius	2	23.8" 27.5"
Ictalurus nebulosus	2	9.3" 9.9"
Moxostoma carinatum	C	16
Hypentelium nigricans	2	9.6" 9.2"
Cyprinus carpio	C	13

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

FISH COLLECTION OR SMALL STREAM SURVEY

Survey Allegany Date 9-6-77 Authority Veno, Dougherty, EVANS

Name and key Conewango Cr. (Pa.63) Trib. 5 Quad Jamestown

Station location Trib. to 3 on Rt. 60 below Fulton bridge County Chautauqua

Length 3 3/4mi Width 50'-100' Avg. 75' Depth 6'-10' Avg. 5' Acres

Flow Temp: A 80° W 71° Time (EST) 1:00-3:00PM

Gear 230 AC Boat shocker Efficiency (yg trout)

Young trout per acre (adjusted total)

Factors: W N H F Total

General notes:

Water is very turbid. Bank cover has many oak and also hickory. Not to much grasses to hold the bank from erosion. Much of the bank to river is raw.

It looks like very good musky water with many snags. Brushes, water is deep and sluggish. Game species very scarce and also forage is very scarce.

Talked to former owner about people fishing. He claims not to many fish, but when they do fish, they just catch bullhead. Asked him if anyone ever caught any muskies. He said they did rarely - quite a few years ago.

A very strong odor coming from discharge into the river from a plant known as Jamestown Rendering Plant.

Stocking policy:

94-14-7 (5/76)
Formerly FW-88

733

Name of species	Abundance	Number and description
Cyprinus carpio	C	10
Moxostoma sp.	R	1

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

FISH COLLECTION OR SMALL STREAM SURVEY

Survey Allegany Date 6/8/76 Authority Veno, Lindell, Evans

Name and key Conewango Cr. (Pa.63) Quad Kennedy

Station location Goodwins Landing County Catt.

Length 2.0mi. Width _____ Depth _____ Acres _____

Flow _____ Temp: A 80° W 70° Time (EST) 11:00AM-1:00PM

Gear _____ Efficiency (yg trout) _____

Young trout per acre (adjusted total) _____

Factors: W _____ N _____ H _____ F _____ Total _____

General notes:

Water is below normal
*Turbid
Shocked at least three more muskies, could not capture them.
No norlunge captured or sighted.
Could not shock Little Conewango Cr. because it was very shallow and log jam.
Number of mud pickerel sighted a few were captured.

844

Stocking policy:

FW-88

Name of species	Abundance	Number and description
Esox masquinongy	2	22.5" 28.5" (No mark)
Stizostedion vitreum	3	19.5" 17.2" 20.1"
Micropterus salmonides	2	14.8" 4.3"
Micropterus dolomieui	1	8.4"
Esox americanus V.	5	7.2" 6.1" 6.2" 7.0" 8.3"
Carpiodes cyprinus	a	
Cyprinus carpio	C	
Ictalurus nebulosus	R	
Lepomis gibbosus	R	
Lepomis macrochirus	R	
Pomoxis annularis	R	
Umbra ~~pygmaea~~ limi	R	

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

FISH COLLECTION OR SMALL STREAM SURVEY

Survey Allegany Date 6/12/78 Authority Veno, Klesa, Fuerst

Name and key Conewango Cr. (Pa.63) Quad Jamestown

Station location Trib. 5 to just above Riverside Bridge County Chautauqua

Length ____ Width (60' avg.) 40-70' Depth 4'-8' (4' avg) Acres ____

Flow ____ Temp: A 83° W 72° Time (EST) 11:30AM-2:30PM

Gear 230 AC Boat Shocker Efficiency (yg trout) ____

Young trout per acre (adjusted total) ____

Factors: W ____ N ____ H ____ F ____ Total ____

General notes:

Water is below normal & very turbid
Shocking for statewide toxic substances monitoring program

Stocking policy:

94-14-7 (5/76)
Formerly FW-88

733

Name of species	Abundance	Number and description
Micropterus dolomieui	2	10.1" 9.2"
Stizostedion vitreum	2	19.1" 18.8"
Esox lucius	2	23.8" 27.5"
Ictalurus nebulosus	2	9.3" 9.9"
Moxostoma carinatum	C	16
Hypentelium nigricans	2	9.6" 9.2"
Cyprinus carpio	C	13

Station location is in Village of Falconer

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

FISH COLLECTION OR SMALL STREAM SURVEY

PEM 87 013

Survey Allegany Date 8/5/87 (Pa.53-13-4) Authority McKeown, Pomeroy, Veno, Dlugos

Name and key Chadakoin River Quad Jamestown

Station location Behind County Highway Department County Chautauqua

Length 570' Width _____ Depth _____ Acres _____

Flow 115.75 cfs Temp: A _____ W 81°F Time (EST) 12:55-13:15

Gear Georator Backpack Efficiency (yg trout) _____

Young trout per acre (adjusted total) _____

Factors: W _____ N _____ H _____ F _____ Total _____

General notes: Assessment of influence of Carlson Generating Station on fishery

Water temp - 81°F

pH - 9.5

D.O. - 6.0 ppm

Conductivity - 320 moh

Flow

L. - 50'

W. - 44'6", 40'8", 45'

D. - 20", 20", 18.5", 13", 5½", 3", 13½", 17½", 18", 11½", 9", 21"

t - 18.03, 25.73, 17.53

$$F = \frac{50' \times 43.39' \times 1.09'}{20.43} = 115.75 \text{ cfs}$$

7.53

Stocking policy:

94-14-7 (5/76)
Formerly FW-88

Name of Species	Abundance
Campostoma anomalum	17
Rhinichthys atratulus	2
Notropis cornutus	23
Pimephales notatus	19
Catostomus commersoni	8
Moxostoma sp.	2
Ictalurus natalis	1
Lepomis gibbosus	4
Micropterus salmoides	1
Percina caprodes	4
Etheostoma blenniodes	2
E. flabellare	2

Req. 356. FSUJe38. 6-15-38-10,000 (16-9943) Survey Allegheny-Chemung

Drainage Allegheny Coll. no. S.C. Bishop #183

Locality Pa.65 (Conewango) at bridge at Kennedy just above t 16

County Chautauqua Quadrangle Jamestown Elevation 1255'

Water White;turbid Flow — Width 30-70'

Vegetation Sperse:- algae

Bottom Sand to rubble Current slow to rapid

Shore Willow & meadow Distance from shore —

Temperature: Air 83 Water 73 Time 11:45 Weather Cloudy

Depth of capture -5' Depth of water -5'

Method of capture 10' seine

Collected by James & Westman Date Sept. 2, 1937

Orig. preserv. Formalin Time 11:20-12:00A.M.

General notes: History of stocking and angling; fishing conditions and size of fish, etc.

Minnows extremely scarce here except for Nocomis Notropis cornutus and Campostoma anomalum in small riffle pools. One sunfish taken under overhanging willows in deep area.

748.3

Name of species	Abundance	Seine	Gill net	Number and description
*Notropis cornutus frontalis	C			4 yg-juv
*Notropis cornutus chrysocephalus	R			2 juv.
*Notropis r. rubellus	R			2 juv - ad
*Nocomis micropogon	C-			1 juv
*Boleosoma n. nigrum	R			1 juv
*Etheostoma b. blennioides	C-			2 yg - juv
*Poecilichthys z sonalis	C-			2 juv
*Catonotus f. flabellaris	R			1 ad
*Campostoma anomalum	C-			2 yg-juv
*Eupomotis gibbosus	?R			1 juv
R#Ameiurus n. nebulosus		few		
R#Esox masquinongy ohiensis				
R#Salmo fario				
R#Salmo gairdnerii				
*Rhinichthys atratulus meleagris				1 juv
Crayfish				1 sp.
*Nocomis micropogon				3 yg - juv

Cat. No. 7399 - 7415 Inc.

Req. 356. FG9Je38. 6-13-38-10,000 (16-3943) Survey Allegheny-Chemung

Drainage Allegheny Coll. no S.G. Bishop # 185

Locality Pa 63 (Conewango) at T 7 & T 8

County Chautauqua Quadrangle Jamestown Elevation 1250'

Water White; turbid Flow — Width 75-100'

Vegetation None

Bottom Gravel & Mud Current Slow

Shore Pasture; wooded Distance from shore 30'

Temperature: Air 85 Water 79 Time 3:15P Weather Cloudy

Depth of capture -3' Depth of water -5'

Method of capture 15' seine

Collected by W.F.Royce; Stone Date Sept. 2, 1937

Orig. preserv. Formalin Time 2:30-3:15 P.M.

General notes: History of stocking and angling; fishing conditions and size of fish, etc.

Good gravel bar at this point. Suckers common including Moxostoma

735.1

Name of species	Abundance	Seine	Gill net	Number and description
Micropterus dolomieu	C-			2 yr = 122 & 122mm 5 yg-juv.yg=67.72.46
*Huro salmoides	C-			3 yg.=52,82,86mm
*Catostomus c.commersonnii	C			5 yg-juv.yg=56 & 62mm
*Hypentelium nigricans	C-			3 yg-juv.yg.=57mm
Moxostoma erythrurum	C			Sev.yg-juv.yg=57 to 46 mm.
Percopsis omiscomaycus	C-			8 yg.
Notropis cornutus frontalis	C			Sev. juv-ad
*Notropis v. volucellus	C-			3 juv.
*Hyborhynchus notatus	C			5 yg-ad
*Semotilus a. atromaculatus	R			1 juv.
Parexoglossum laurae	C-			3 yg-ad.yg.=49 mm
Nocomis micropogon	C			7 yg
*Campostoma anomalum	R			2 juv.-ad.ad=146 mm
*Boleosoma n. nigrum	C-			1 juv.
*Catonotus f. flabellaris	R			1 juv.
Percina c. caprodes	C			9 juv-ad.
Hadropterus maculatus	C-			9 yg-juv
*Poecilichthys coeruleus				1 yg
*Cambarus sp.				1 sp.

Cat. No.7272-7290 Inc.

Req. 356. FG9Je38. 6-13-38-10,000 (16-9943) Survey Allegheny-Chemung

Drainage Allegheny Coll. no. S.C. Bishop #186

Locality Pa. 53 (Conewango Crk) 1/8 mi. below T 14

County Chautauqua Quadrangle Jamestown Elevation 1211'

Water White; turbid Flow —— Width 35-50'

Vegetation None

Bottom Mud; grav. shale Current Slow to moderate

Shore Wooded Distance from shore ——

Temperature: Air 84 Water 72 Time 12:45P Weather Clear

Depth of capture -3' Depth of water -5'

Method of capture 15' seine

Collected by Stone; Royce Date Sept. 2, 1937

Orig. preserv. Formalin Time 11:30-1:00P.M.

General notes: History of stocking and angling; fishing conditions and size of fish, etc.

Minnows C-; bottom covered with debris consisting mostly of logs and sticks.

7-40-38

Name of species	Abundance	Seine	Gill net	Number and description
*Micropterus dolomieu	C-			6 yg ≤ 48,39,38mm
*Pomoxis sparoides	R			3 yg
Notropis cornutus frontalis	C			Sev yg - ad
Notropis deliciosus stramineus	C-			2 juv-ad
Hybognathus notatus	C			Sev juv-ad
Nocomis micropogon	C			7 yg-juv
Percopsis omiscomaycus	C			M yg-ad
*Semotilus a. atromaculatus	R			1 juv
*Parexoglossum laurae	Rplus			1 yg
*Campostoma anomalum	C-			5 yg.-juv.
Hybopsis a. amblops	C			Sev juv-ad
Poecilichthys z. zonalis	C			9 ad
Catonotus f. flabellaris	C			4 juv-ad
*Boleosoma n. nigrum	C			2 yg-juv
Hadropterus maculatus	R			1 juv
#Ameiurus n. nebulosus	C			Run small in size
*Catostomus c. commersonnii	R plus			2 yg = 58 & 71 mm
Moxostoma anisurum	R			1 yg = 65 mm
*Notropis v. volucellus	C-			4 juv
Notropis r. rubellus	C-			1 juv

Cat. No. 7335 - 7354 Inc.

1 Sept. 1966

From: D. R. Malmrose, CO
To: M. Lipsedenty

Subj: Pollution - Flakeboard Co., Fremsburg, N.Y.

The three water samples are labled #1, #2 & #3.

#1 sample taken approx. 100 yds. above point of discharge.
#2 sample taken directly at discharge
#3 sample taken approx. 200 yds. below point of discharge.

Samples taken at approx. 12 midnite on 8/31/66

I talked with a Mr. Allen Goodine this morning, just prior to our phone call. He readily addmitted discharging this wax emulsion. Mr. Goodine is staying at the Village Plaza in Falconer, N.Y.

Don Malmrose

E. L. Kellogg Corp
Sierra-Pacific Albany, Oregon

Nopco wax

December 16, 1966

Pollution Report to Mr. G.E. Burdick
From Scottsville Pollution Unit

Re: Conewango Creek (Pa. 63) - Allegheny and Chemung Watersheds Report
Item #4 - Class C - Official Classifications of the Conewango Cr. Drainage Basin, N.Y.S. Water Pollution Control Board
Flakebord Corp., Frewsburg, N.Y. (Linn-Pacific, Albany, Oregon)

An investigation was made on Sept. 1, 1966, at the request of Conservation Officer Donald R. Malmrose. He had received a complaint of a fish kill, but had not been able to verify it on his investigation of the complaint; he had, however, observed the discharge of a waste material into the stream.

The Flakebord plant is located on the east side of the Frewsburg-Falconer Rd., just south of the stream. The company had been manufacturing boards from wood chips, but at the time of the investigation the plant was shut down and all the equipment was being crated for shipment to South America; these operations were under the charge of the Linn-Pacific firm. According to Mr. Allen Goodine, the superintendent, a few days previously about 1000 gallons of Nopco Wax, a synthetic wax emulsion used to impregnate the boards to retard absorbtion of moisture, had been dumped in a small pit on the grounds; the emulsion overflowed the pit and found its way into a watercourse, northeast of the plant building, leading to the stream. A small flow was still entering the stream by this route on the day of the investigation.

No dead or dying fish were found anywhere. The analytical data are given in the following table:

Station	Time (EDS)	Depth	Temp. °F	Dissolved Oxygen ppm.	5-day (68°F) B.O.D. ppm.
About 100-150 yards above entry of wastes	6:30 P.M.	1'	76	3.84*	3.6
Emulsion in pit	4:00 P.M.	—	—	—	187000
Bridge on N.Y. 60, about 3 miles below entry of waste	5:00 P.M. 5:25 P.M.	1' 6'	75 73	1.60* 0.22*	7.9 8.0
Bridge on Riverside Road, about 3 miles below preceding	5:50 P.M.	1'	76	9.8	9.7

* In contravention of standards

The dissolved oxygen concentrations at the bridge on N.Y.60 were low; the concentration of 0.22 part per million at the 6-ft. depth would be lethal to fish life, but the concentration of 1.60 part per million at the 1 ft. depth, although

not favorable, would probably not be lethal to warm water fish. Both concentrations were in contravention of standards. The residual oxygen demands were relatively high, and higher than the oxygen demand of the upstream sample.

The dissolved oxygen concentration of 3.84 parts per million in the upstream sample, a value just in contravention of standards, was relatively low, and there was a significant residual oxygen demand. These values probably reflect the contributions from upstream communities.

The dissolved oxygen concentration of 9.8 parts per million at the bridge 3 miles below the bridge on N.Y.60 was high, but the residual oxygen demand was also high, being equivalent to 9.7 parts per million of 5-day (68°F.) B.O.D. The data do not permit a conclusion as to the origin of this high oxygen demand, since an exhaustive search for other contributors was not made.

Bio-assays with blacknose dace indicated that the wax emulsion was not toxic.

No dead fish were found.

Summary and Conclusions

Low dissolved oxygen concentrations, together with significant residual oxygen demands, were found at the bridge on N.Y.60. Part of the oxygen demand was undoubtedly due to the wax emulsion discharged from the Flakebord plant, but there was also a contribution from further upstream.

It is questionable if an action for violation of Section 180 of the Conservation Law could be sustained on the data.

Contravention of standards with respect to the dissolved oxygen concentration existed both above and below the Flakebord plant.

M. Lipschuetz
Senior Analytical Chemist

A. L. Cooper
Senior Aquatic Biologist

ML lw
Original & 2 copies to Mr. G.E. Burdick
Copy to: Regional Supervisor James Lindsey
Attention: Regional Conservation Officer E.E. Cone, Jr.
Regional Fisheries Manager Wm. Shepherd

9/2/66

5-day B.O.D. (68°F)

Flakeboard Corp., Foreverburg - Conservancy Co - 9/1/66

STATION	Bottle Number	Bottle Volume Ml.	Aliquot Ml.	TITRATION O2 Burette From	Burette To	Total Ml.	Oxygen p.p.m	B.O.D. p.p.m	
		295		0.0	3.9	3.9	7.85	—	
	21	305	0						
	33	320	50	3.9	6.6	2.7	5.43	8.5	Al
(23)	36		100	6.6	8.4	1.8	3.62	6.8 (7.3)	
	76	304	50	8.4	10.8	2.4	4.83	7.5	Av
(33)	81	306	100	10.8	12.6	1.8	3.62	6.3 (8.0)	
	85	300	50	12.6	15.9	3.3	6.64	3.6	40
(50)	93	305	100	15.9	18.5	2.6	5.23	4.4	3.6
	82	308	0	18.5	22.4	3.9	7.85	—	
	69	305	0	0.0	3.9	3.9	7.85	—	
Waste 100 x	68		1	3.9	4.8	0.9	1.81	181000	
	37	300	5	Complete depletion					
including dil.	71	305	10						
	45	310	50						
	26	305	1	Not run					
Waste sample	25	315	3						
	23	300	5						
	58	304	0	4.8	8.8	4.0	8.05	—	
Following incubated without dilution; residual D.O.'s on 9/7/66:									
(17) ~~50~~	17		249	8.8	8.9	0.1	0.08	9.7	
			249 ml titrated						

Flakeboard Corp, Foreverburg - Conservancy Co - 9/1/66, Albany, Oregon

Bridge on W.Y. 60, at Foreverburg

5:00P - 1' - 75°F - (23)

D.O = 0.00 - 0.89 = 0.89
Bl = 0.70 - 0.79 = 0.09
} = 0.80 ml. 0.0250 N $Na_2S_2O_3$ = 1.60 ppm D.O.

5:25P - 6' - 73°F - (33) (1 ft of bottom)

D.O = .40 - .60 = .20
Bl = .60 - .69 = .09
} = .11 0.0250 N $Na_2S_2O_3$ = .22 ppm D.O.

Next bridge down

5:50P - 1' - 76°F (17)

D.O = 0.00 - 5.00 = 5.00
Bl = 5.00 - 5.10 = 0.10
} = 4.90 ml. $Na_2S_2O_3$ = 9.8 ppm D.O

About 300 yds above Foreverburg - Falconville (above Flakeboard discharge)

6:30P - 1' - 76°F - (50)

D.O = 4.50 - 6.50 = 2.00
Bl = 0.30 - 0.38 = 0.08
} = 1.92 ml. $Na_2S_2O_3$ = 3.84 ppm D.O

Frewsburg

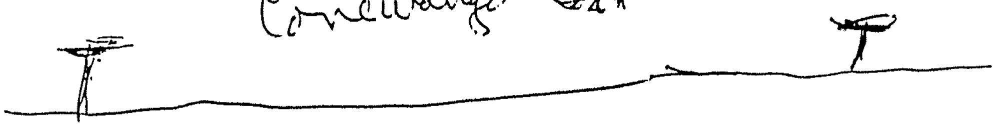
Flakeboard Co

Mr. Goodine out of business

Renowning
,000 gall wax emulsion

white liquid

Concurrent Co.



~~Ufalla~~

B.O.D.

STATION	Bottle Number	Bottle Volume Ml.	Aliquot Ml.	TITRATION Burette From	To	Total Ml.	Oxygen p.p.m	B.O.D. p.p.m

9/7/66

Bio-assay using synthetic wax emulsion discharged to [illegible] Creek at Frewsburg, N.Y. by Flakeboard [illegible] Dilution water from [illegible] Creek [illegible] [illegible] [illegible]
50 ml. emulsion to 950 ml dil. water

Started at 10:55 A – No observable distress at start. 5:00 P – No observable distress – Gentle aeration set up for over night.
9/8 – 9:15 A – Fish O.K. Test ended.

Temp. assay soln – 72°F at start + about 71°F at end of test.

100 ml emulsion to 900 ml dil. water

Started at 10:55 A – No observable distress at start. 5:00 P. No observable distress – Gentle aeration set up for over night.
9/8 – 9:15 A – Fish jumped out of test jar sometime during night – found dead on assay table by test jar.

APPENDIX B

FRESHWATER WETLAND DATA SHEET CLASSIFICATION FOR

WETLAND NAME Frenchburg I WETLAND IDENTIFICATION # JA-6

LOCATION:

Quad: (USGS) (DOT) Jamestown County Clinton

Town Carroll Miles 0.1 Dir. NE From Frenchburg

DATE(S) OF FIELD RECONNAISSANCE AND PERSONNEL:

Date(s)	Weather	Investigator(s)
4/25/82	Flurries 30's	K. Taft

WETLAND SIZE 279.7 acres

WETLAND CLASS I II III IV (circle)

VEGETATIVE COMMUNITY:

COVERTYPES (Dominant species and calculated percentage, additional species inventory on page 3)

Wet meadow (1) 16.0%

Sensitive fern

Carex sp.

Emergent Marsh (2) ____ %

Deciduous Swamp (3) 50.0 %

Swamp white oak

Red/Green ash

Coniferous Swamp (4) 2.0 %

Pine

Shrub swamp (5) 23.0 %

Silky dogwood

Tag alder

Submergent and/or floating (6) ____ %

Wetland open water (7) 3.0 %

ECOLOGICAL ASSOCIATIONS:

Covertype Groups

1+2 = 16.0 %
3+4+5= 77.0 %
6+7 = 3.0 %

Kettlehole Bog ____

Associated with Open Water Yes

Water Conservancy Pond

Proximity to Mud Flat ____

Island Present ____

Adjacent to Class C(T) or Higher Stream ____

1. Resident Animal Habitat For:

Wood duck
Mallard duck
Hooded merganser
Great heron
Muskrat
Mink
White-tailed deer
Cottontail rabbit
Fox squirrel
Gray fox

2. Migration Habitat For:

Wood duck
Mallard duck
Hooded merganser

		Yes	No	Unknown
3.	Endangered or threatened plant and/or animal species present			X
4.	Vulnerable animal and/or plant species present			X
5.	Unusual animal species abundance or diversity for State or ecological region of State		X	
6.	Unusual animal species abundance or diversity for county	X		
7.	Archeological or paleontological significance			X
8.	Significant (unusual or excellent representation) geological feature		X	
9.	Alkalinity of at least 50 ppm			X
10.	Adjacent to naturally fertile upland	X		
11.	Storm water retention facility	X		
12.	Adjacent or contiguous to surface water used as public water supply		X	
13.	Provides pollutant treatment	X		
14.	Provides aquifer recharge	X		
15.	Within urbanized area		X	
16.	Visible from important highway or passenger railroad		X	
17.	One of 3 largest wetlands of same covertype within a city/town	X		
18.	One of 3 largest wetlands of any covertype in a city/town	X		
19.	Within a town where wetland acreage is less than 1% of total		X	
20.	Within a publicly owned recreation area		X	
21.	On publicly owned land open to public use		X	

CLASS I X

1. Classic Kettlehole bog
2. Res.hab., thr./endg. anim. sp.
3. Thr./endg. plant sp.
4. Unus. abund./div. anim. sp. in region or state
5. Significant flood protection for substantially developed area
6. Adj./contig. to reservoir or public water supply or hydraulically connected to public water supply aquifer
7. Four or more Class II characteristics

CLASS II

8. Emgt. marsh; pur. loosestrife and/or phragmites max. 66% of covertype
9. Two or more wetland structural groups
10. Contig. to tidal wetlands
11. Assoc. with ext. perm. open water
12. Adj./contig. C(t) or higher stream
13. ( ) mig. hab. thr./endg. anim. sp.
14. ( ) Res. hab. vuln. anim. sp.; state
15. ( ) Vuln. plant sp.; state
16. Unus. abund/dv. anim. sp.; county
17. Archeo./paleo. significance
18. Unusual geologic feature
19. Flood protection value; agr., light or planned development area
20. Hydraulically connected to aquifer
21. Tertiary treatment capacity for a sewage disposal syst.
22. Within urbanized area
23. One of 3 lgst. wetlands; city, town, NYC Borough
24. In publicly owned recreation area

CLASS III

25. Emgt. marsh, pur. loosestrife and/or phragmites min. 66% of covertype
26. Deciduous swamp
27. Shrub swamp
28. Floating and/or submergent veg.
29. Wetland open water
30. Contains island
31. Total alkalinity at least 50 PPM
32. Adj. to fert. upland; high base soils
33. Res./mig. hab. of vuln. anim. sp. Res. for region; mig. for region or state
34. Vuln. plant sp.; region
35. Part of significantly polluted permanent open water system in which pollution reduction occurrs
36. Visible & aesthetic/open space value
37. One of 3 lgst. wetlands of same covertype within a town
38. Wetland acreage max. 1% of total town acreage
39. Publicly owned land open to pub. use

EXPLANATORY NARRATIVE FOR SPECIAL FEATURES AND CLASSIFICATION, ADDITIONAL SPECIES INVENTORY (List Codominants, understudy, ground cover, & occasional species as necessary for each covertype); include soils information, if available:

12 - Leachate from landfill
14 - Jamaica Aquifer - Village of Freeport's water supply wells - should be checked by an hydraulic engineer

COVERTYPE MAP OF WETLAND (Use numerical designators under vegetative community section).

North

Quadrangle name: [illegible]

Scale: 1" = 2000'

Mapped by: K. C. Taft

Date: 11-21-83

NYS DEPARTMENT OF ENVIRONMENTAL CONSERVATION
FRESHWATER WETLAND DATA AND CLASSIFICATION FORM

WETLAND NAME Rock Hollow Road Swamp WETLAND IDENTIFICATION # JA 9
394

LOCATION:

Quad: (USGS) (DOT) Jamestown County Chautauqua

Town Carroll, Kiantone Miles .5 Dir. NW From Frewsburg

DATE(S) OF FIELD RECONNAISSANCE AND PERSONNEL:

Date(s)	Weather	Investigator(s)
12/28/82	warm, windy, overcast	K.C. Taft
1/31/83	30° overcast windy occ. snow	K.C. Taft

WETLAND SIZE 1275 acres

WETLAND CLASS (I) II III IV (circle)

VEGETATIVE COMMUNITY:

COVERTYPES (Dominant species and calculated percentage, additional species inventory on page 3)

Wet meadow (1) 17 %

Carex spp.

Solidago sp.

Emergent Marsh (2) 9 %

Carex spp.

Scirpus sp.

Deciduous Swamp (3) 27 %

Acer rubrum Fraxinus sp.

Quercus sp.

Coniferous Swamp (4) 6 %

Shrub swamp (5) 37 %

Salix discolor

Typha latifolia

Submergent and/or floating (6) ____ %

Wetland open water (7) 2 %

ECOLOGICAL ASSOCIATIONS:

Covertype Groups

1+2 = 26 %
3+4+5= 70 %
6+7 = 2 %

Kettlehole Bog

Associated with Open Water Yes

Water Conewango Creek

Proximity to Mud Flat

Island Present Yes

Adjacent to Class C(T) or Higher Stream n/a

SPECIAL FEATURE:

1. Resident Animal Habitat For: Beaver, Muskrat, Gray fox, Snowshoe hare, white tailed deer, raccoon, Opossum, Skunk, Mink, Woodduck, Hooded merganser, mallard, G.B. Heron, Green heron, Marsh hawk, woodcock, Snipe, Ruffed grouse, Pheasant, Frogs, Salamanders, Turtles

2. Migration Habitat For: Woodduck, Mallard, Black duck, Hooded merganser, Great blue heron, Woodcock, Snipe

	Yes	No	Unknown
3. Endangered or threatened plant and/or animal species present			X
4. Vulnerable animal and/or plant species present			X
5. Unusual animal species abundance or diversity for State or ecological region of State	X		
6. Unusual animal species abundance or diversity for county	X		
7. Archeological or paleontological significance	X		
8. Significant (unusual or excellent representation) geological feature			X
9. Alkalinity of at least 50 ppm			X
10. Adjacent to naturally fertile upland	X		
11. Storm water retention facility	X		
12. Adjacent or contiguous to surface water used as public water supply		X	
13. Provides pollutant treatment	X		
14. Provides aquifer recharge	X		
15. Within urbanized area	X		
16. Visible from important highway or passenger railroad	X		
17. One of 3 largest wetlands of same covertype within a city/town	X		
18. One of 3 largest wetlands of any covertype in a city/town	X		
19. Within a town where wetland acreage is less than 1% of total		X	
20. Within a publicly owned recreation area		X	
21. On publicly owned land open to public use		X	

WETLAND CLASSIFICATION MATRIX (Circle attributes and check class; a wetland with no Class I, II, III characteristics is a Class IV Wetland)

CLASS I X

1. Classic Kettlehole bog
2. Res.hab., thr./endg. anim. sp.
3. Thr./endg. plant sp.
4. (circled) Unus. abund./div. anim. sp. in region or state
5. (circled) Significant flood protection for substantially developed area
6. (circled) Adj./contig. to reservoir or public water supply or hydraulically connected to public water supply aquifer
7. (circled) Four or more Class II characteristics

CLASS II ____

8. Emgt. marsh; pur. loosestrife and/or phragmites max. 66% of covertype
9. (circled) Two or more wetland structural groups
10. Contig. to tidal wetlands
11. (circled) Assoc. with ext. perm. open water
12. Adj./contig. C(t) or higher stream
13. ( ) mig. hab. thr./endg. anim. sp.
14. ( ) Res. hab. vuln. anim. sp.; state
15. ( ) Vuln. plant sp.; state
16. (circled) Unus. abund/dv. anim. sp.; county
17. (circled) Archeo./paleo. significance
18. Unusual geologic feature
19. Flood protection value; agr., light or planned development area
20. (circled) Hydraulically connected to aquifer
21. Tertiary treatment capacity for a sewage disposal syst.
22. Within urbanized area
23. (circled) One of 3 lgst. wetlands; city, town, NYC Borough
24. In publicly owned recreation area

CLASS III ____

25. Emgt. marsh, pur. loosestrife and/or phragmites min. 66% of covertype
26. Deciduous swamp
27. (circled) Shrub swamp
28. Floating and/or submergent veg.
29. Wetland open water
30. (circled) Contains island
31. Total alkalinity at least 50 PPM
32. (circled) Adj. to fert. upland; high base soils
33. Res./mig. hab. of vuln. anim. sp. Res. for region; mig. for region or state
34. Vuln. plant sp.; region
35. Part of significantly polluted permanent open water system in which pollution reduction occurrs
36. Visible & aesthetic/open space value
37. (circled) One of 3 lgst. wetlands of same covertype within a town
38. Wetland acreage max. 1% of total town acreage
39. Publicly owned land open to pub. use

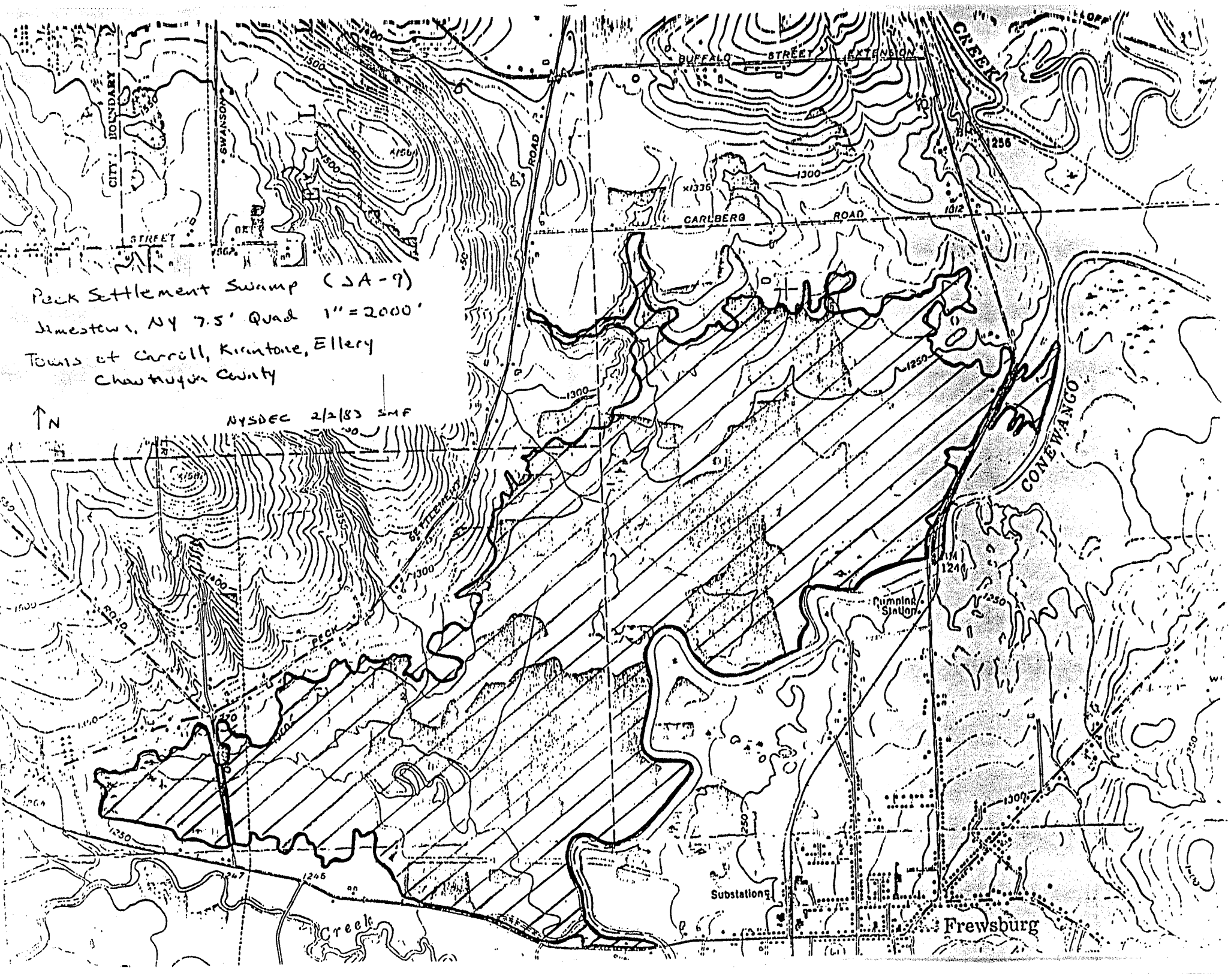
EXPLANATORY NARRATIVE FOR SPECIAL FEATURES AND CLASSIFICATION, ADDITIONAL SPECIES INVENTORY (List Codominants, understudy, ground cover, & occasional species as necessary for each covertype); include soils information, if available:

(21) Frewsburg water supply well on west side of Rt 62 north of village

4; (16) Due to covertype diversity + size of wetland

(17) NYS Museum Archaeological Site Map (1 mi diam. locat.

6; 20 - Should be investigated by an hydraulic engineer - near Frewsburg water supply wells


Peck Settlement Swamp (JA-9)
Jamestown, NY 7.5' Quad 1" = 2000'
Towns of Carroll, Kiantone, Ellery
Chautauqua County
↑N
NYSDEC 2/2/83 SMF
BUFFALO STREET EXTENSION
CARLBERG ROAD
CONEWANGO CREEK
PECK
Pumping Station
Substation
Frewsburg
Creek

FRESHWATER WETLAND DATA AND CLASSIFICATION FORM

WETLAND NAME Frewsburg II Wetland WETLAND IDENTIFICATION # JA-10 fit

LOCATION:

Quad: (USGS) (DOT) Jamestown County Chautauqua

Town Carroll Miles 6 Dir. From Frewsburg

DATE(S) OF FIELD RECONNAISSANCE AND PERSONNEL:

Date(s)	Weather	Investigator(s)
1/31/83	Windy 20's	K. Taft

WETLAND SIZE 257.6 acres

WETLAND CLASS I (II) III IV (circle)

VEGETATIVE COMMUNITY:

COVERTYPES (Dominant species and calculated percentage, additional species inventory on page 3)

Wet meadow (1) 11.0 %

Carex spp.

Emergent Marsh (2) 1.0 %

Deciduous Swamp (3) 7.0 %

Red/Green ash

Silver maple

Coniferous Swamp (4) 8.0 %

Eastern hemlock

White pine

Shrub swamp (5) 72.0 %

Silky dogwood

Cinnamon fern Sensitive fern

Submergent and/or floating (6) ____ %

Wetland open water (7) 1.0 %

ECOLOGICAL ASSOCIATIONS:

Covertype Groups

1+2 = 12.0 %
3+4+5= 87.0 %
6+7 = 1.0 %

Kettlehole Bog

Associated with Open Water

Water Conewango Creek

Proximity to Mud Flat

Island Present Yes

Adjacent to Class C(T) or Higher Stream

1. Resident Animal Habitat For:

Beaver White-tailed deer Songbirds
Muskrat Ruffed grouse
Raccoon Woodcock
Opossum Wood duck

2. Migration Habitat For:

Wood duck
Teal
Mallard duck
Woodcock

	Yes	No	Unknown
3. Endangered or threatened plant and/or animal species present			X
4. Vulnerable animal and/or plant species present			X
5. Unusual animal species abundance or diversity for State or ecological region of State		X	
6. Unusual animal species abundance or diversity for county		X	
7. Archeological or paleontological significance		X	
8. Significant (unusual or excellent representation) geological feature		X	
9. Alkalinity of at least 50 ppm			X
10. Adjacent to naturally fertile upland	X		
11. Storm water retention facility	X		
12. Adjacent or contiguous to surface water used as public water supply		X	
13. Provides pollutant treatment		X	
14. Provides aquifer recharge	X		
15. Within urbanized area		X	
16. Visible from important highway or passenger railroad		X	
17. One of 3 largest wetlands of same covertype within a city/town	X		
18. One of 3 largest wetlands of any covertype in a city/town		X	
19. Within a town where wetland acreage is less than 1% of total		X	
20. Within a publicly owned recreation area		X	
21. On publicly owned land open to public use		X	

Class I, II, III characteristics is a Class II Wetland;

CLASS I___

1. Classic Kettlehole bog
2. Res.hab., thr./endg. anim. sp.
3. Thr./endg. plant sp.
4. Unus. abund./div. anim. sp. in region or state
5. Significant flood protection for substantially developed area
6. Adj./contig. to reservoir or public water supply or hydraulically connected to public water supply aquifer
7. Four or more Class II characteristics

CLASS II X

8. Emgt. marsh; pur. loosestrife and/or phragmites max. 66% of covertype
9. Two or more wetland structural groups
10. Contig. to tidal wetlands
11. Assoc. with ext. perm. open water
12. Adj./contig. C(t) or higher stream
13. ( ) mig. hab. thr./endg. anim. sp.
14. ( ) Res. hab. vuln. anim. sp.; state
15. ( ) Vuln. plant sp.; state
16. Unus. abund/dv. anim. sp.; county
17. Archeo./paleo. significance
18. Unusual geologic feature
19. Flood protection value; agr., light or planned development area
20. Hydraulically connected to aquifer
21. Tertiary treatment capacity for a sewage disposal syst.
22. Within urbanized area
23. One of 3 lgst. wetlands; city, town, NYC Borough
24. In publicly owned recreation area

CLASS III___

25. Emgt. marsh, pur. loosestrife and/or phragmites min. 66% of covertype
26. Deciduous swamp
27. Shrub swamp
28. Floating and/or submergent veg.
29. Wetland open water
30. Contains island
31. Total alkalinity at least 50 PPM
32. Adj. to fert. upland; high base soils
33. Res./mig. hab. of vuln. anim. sp. Res. for region; mig. for region or state
34. Vuln. plant sp.; region
35. Part of significantly polluted permanent open water system in which pollution reduction occurrs
36. Visible & aesthetic/ open space value
37. One of 3 lgst. wetlands of same covertype within a town
38. Wetland acreage max. 1% of total town acreage
39. Publicly owned land open to pub. use

EXPLANATORY NARRATIVE FOR SPECIAL FEATURES AND CLASSIFICATION, ADDITIONAL SPECIES INVENTORY (List Codominants, understudy, ground cover, & occasional species as necessary for each covertype); include soils information, if available:

20 Should be checked by an hydraulic engineer

COVERTYPE MAP OF WETLAND (Use numerical designators under vegetative community section).

North

Quadrangle name: Jamestown

Scale: 1":2000'

Mapped by: K. Taft

Date: 1/31/83

JA-4

FRESHWATER WETLAND DATA

WETLAND NAME: Black Ash Brook Wetland

DEC #

LOCATION:

Quad: (USGS)(DOT) Jamestown

County: Chautauqua

Town: Kiantone Carrol

Miles .5 Dir. S From Frewsburg

INVESTIGATOR(S): G. Noble

K.T. & T. Durczak

DATE(S) OF FIELD RECONNAISSANCE:

Date(s)	Weather
Burgeson Swamp &	
other files	

SIZE OF WETLAND: 280.0± Acres

VEGETATION COMMUNITY:

1. Covertypes (estimated percentage)
   - a. Wet meadow 22%
   - b. Emergent marsh ___%
   - c. Deciduous swamp (71.5%)
   - d. Coniferous swamp 3%
   - e. Shrubs swamp 6%
   - f. Submergent &/or floating .5%
   - g. Wetland open water ___%

ECOLOGICAL ASSOCIATIONS:

2. Covertype Groups
   - a. + b. = 22%
   - c. + d. + e. = 71.5%
   - f. + g. = .5%
3. Classic Kettlehole bog ___
4. Associated with open water ___
   Water Canadaway Cr...
5. Proximity to Mud Flats ___
6. Island present ___
7. Adjacent to Class C(T) or higher stream
   E... ... ...

SPECIAL FEATURES -

8. Resident Animal Habitat for:

Beaver	Woodduck
muskrat	Woodcock
W.t.deer	Snipe
Raccoon	R. Grouse
Opposum	G.B.Her...
C.t. rabbit	

9. Traditional Migration Habitat for:
   Woodduck
   Mallard
   Blackduck
   Hooded Merganser
   Woodcock
   Snipe

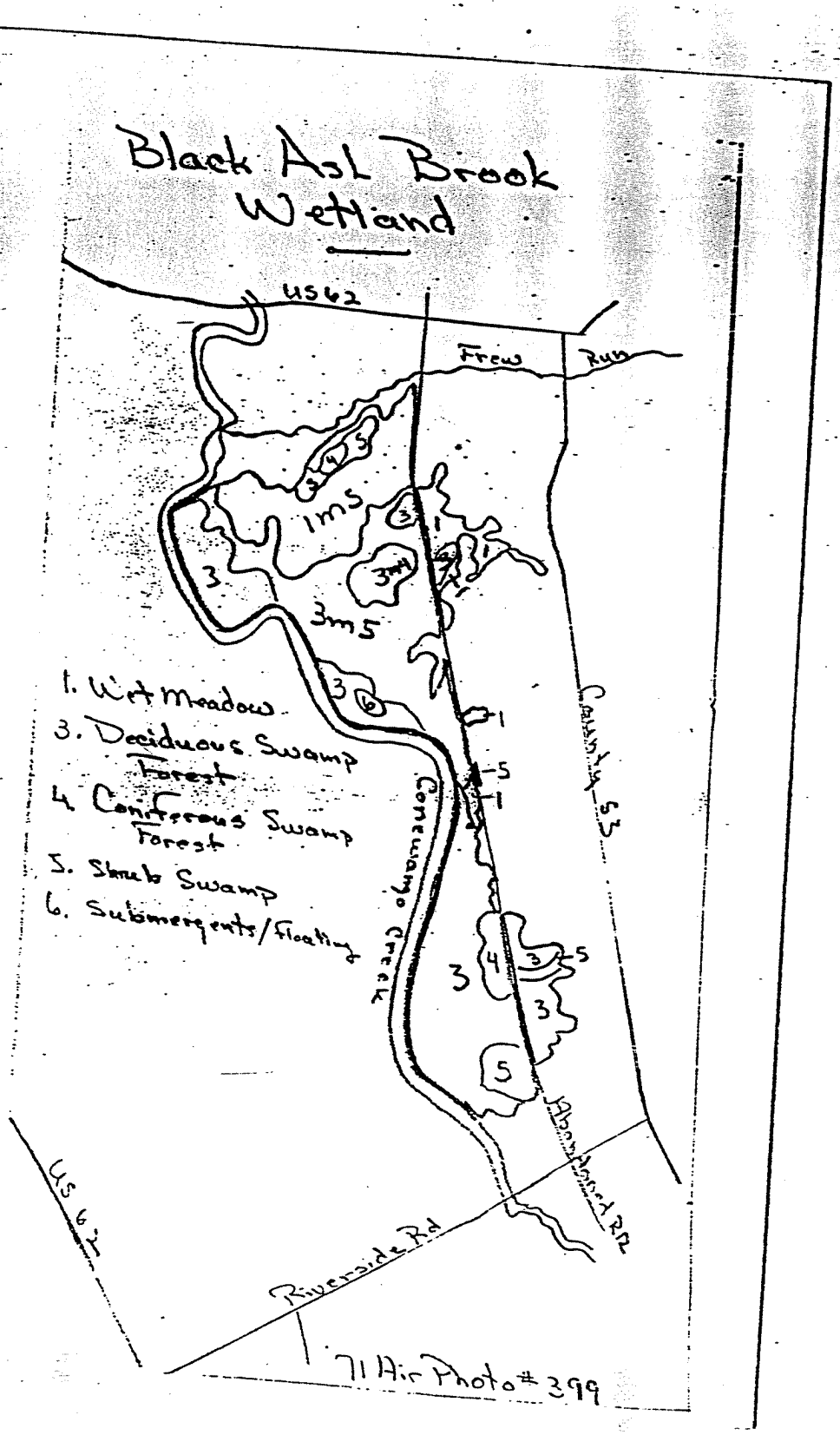
		YES	NO
10.	Endangered or threatened species present		Y
11.	Vulnerable species present		Y
12.	Unusual animal species abundance or diversity for State or major geo-ecological Region of State		Y
13.	Unusual animal species abundance or diversity for County.	Y	
14.	Demonstrable Archeo-logical or paleontologi-cal significance.		
15.	Significant (unusual or excellent representation) geological feature		Y
16.	Alkalinity of at least 50 ppm		?
17.	Adjacent to Naturally Fertile Upland		?

ROLOGICAL + POLLUTION CONTROL FEATURES

	YES	NO
18. Natural storm water retention facility.		Y
19. Adjacent or contiguous to surface water used as public water supply.		Y
20. Provides treatment for pollutants.		Y
21. Provides recharge for aquifer.	Y	
DISTRIBUTION AND LOCATION:		
22. Within urbanized area		Y
23. Visible from Interstate Highway, parkway, designated scenic highway, or passenger railroad.		Y
24. One of three largest wetlands, or three largest of same covertype within a city or town, or in a town where wetlands acreage is less then 1% of total.	Y	
25. Within a publicly owned Recreation area.		Y
26. On Publicly owned land open to public use.		Y

EXPLANATION AND SUPPORT FOR ITEMS 8 THRU 26 ABOVE AND OTHER CONTENTS
(attach Floristic checklists and additional sheets as necessary. Also note human influences having an effect upon the above noted values, and any two or more values which are redundant):

JA-4


Black Ash Brook Wetland
US62
Frew Run
1
3
4
5
6
Conneaut Creek
Riverside Rd
US 6
Ashtabula RR
71 Air Photo # 399
1. Wet Meadow
3. Deciduous Swamp Forest
4. Coniferous Swamp Forest
5. Shrub Swamp
6. Submergents/floating

SA-4

FRESHWATER WETLAND CLASSIFICATION

Instructions: Circle the numbers of the applicable classification characteristics and place a check next to the appropriate class. Note that the number of species to which characteristics 13, 14 or 15 apply shall be identified in the parentheses with each species considered a separate Class II characteristic in determining iten 7. Complete the information on the FRESHWATER WETLAND DATA SHEET to substantiate your conclusions. A wetland with no Class I, II or III characteristics is a Class IV wetland.

(City/Town/Village) Livonia
County Livingston
Quad. name Dansville

Wetland name Black Hill Brook
Wetland no. _____
Wetland Class 1 Superceded? (yes) _____

Inspection Dates _____
Notes attached (yes) X (no) _____
Prepared KC Tast Date 2/11/8[illegible]

CLASS I X

1. Classic kettlehole bog
2. Res. hab., thr./endg. anim. sp.
3. Thr./endg. plant sp.
4. Unus. abund./div. anim. sp. in region or state
5. Significant flood protection for substantially developed area
6. Adj./contig. to reservoir or public water supply or hydraulically connected to public water supply aquifer.
7. 4 or more Class II characteristics

CLASS II _____

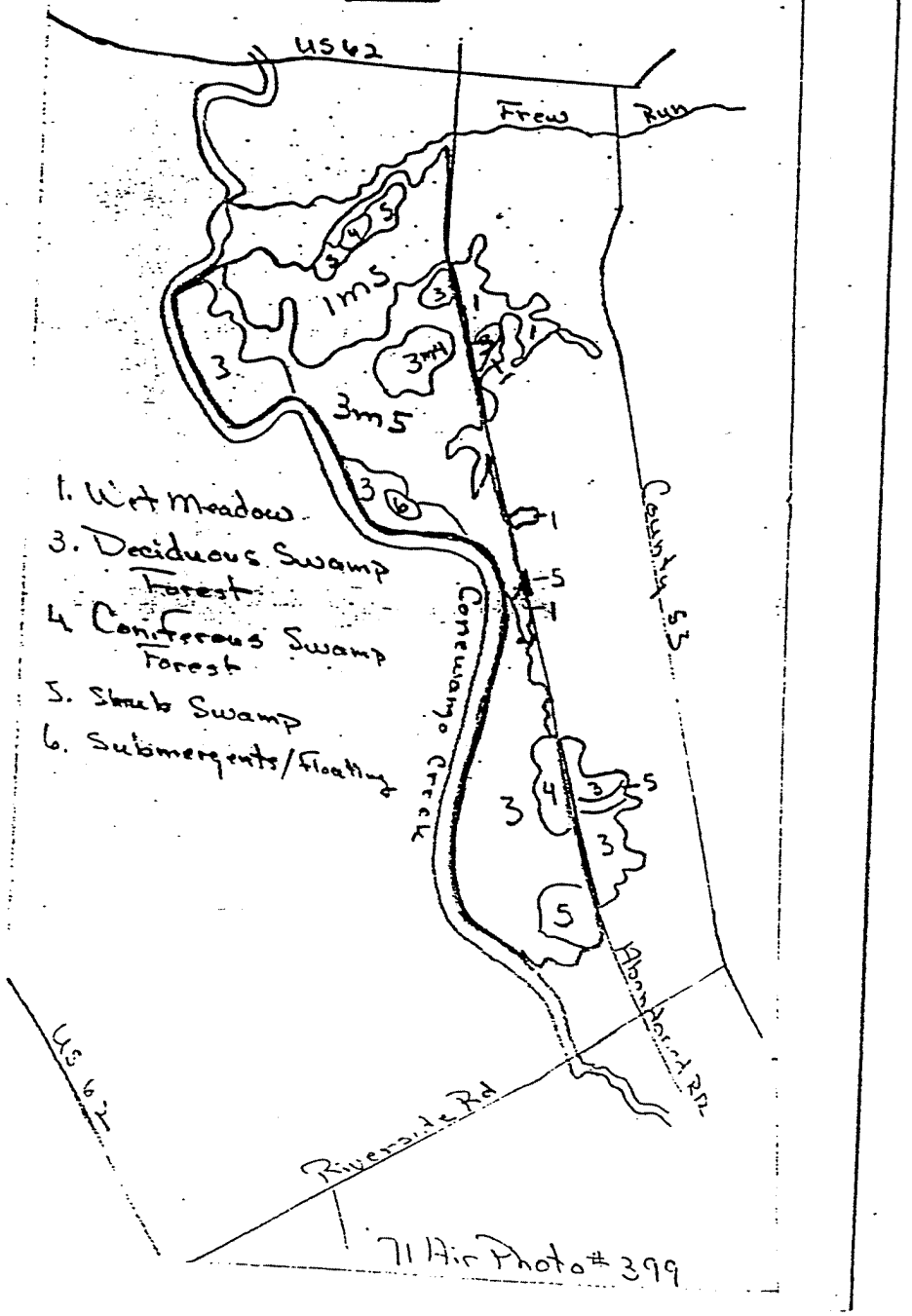
8. Emgt. marsh; pur. loosestrife and/or phragmites max. 66% of covertype
9. 2 or more wetland structural groups
10. Contig. to tidal wetlands
11. Assoc. with ext. perm. open water
12. Adj./contig. C(t) or higher stream
13. ( ) Mig. hab. thr./endg. anim. sp.
14. ( ) Res. hab. vuln. anim. sp.; state
15. ( ) Vuln. plant sp.; state
16. Unus. abund./div. anim. sp.; county
17. Archeo./paleo. significance
18. Unusual geological feature
19. Flood protection value; agr., light or planned development area
20. Hydraulically connected to aquifer
21. Tertiary treatment capacity for a sewage disposal system
22. Within urbanized area
23. 1 of 3 lgst. wetlands; city, town
24. In publicly owned recreation area

CLASS III _____

25. Emgt. marsh, pur. loosestrife and/or phragmites min. 66% of covertype
26. Deciduous swamp
27. Shrub swamp
28. Floating and/or submergent veg.
29. Wetland open water
30. Contains island
31. Total alkalinity at least 50 PPM
32. Adj. to fert. upland; high base soils
33. Res./mig. hab. of vuln. anim. sp. Res. for region; mig. for region or state
34. Vuln. plant sp.; region
35. Part of significantly polluted permanent open water system in which pollution reduction occurs
36. Visible and aesthetic/open space value
37. 1 of 3 lgst. wetlands of same covertype within a town
38. Wetland acreage max. 1% of total town acreage
39. Publicly owned land open to public use

JA-17

Black Ash Brook Wetland



ROLOGICAL + POLLUTION CONTROL FEATURES

		YES	NO
18.	Natural storm water retention facility.		Y
19.	Adjacent or contiguous to surface water used as public water supply.		Y
20.	Provides treatment for pollutants.		Y
21.	Provides recharge for aquifer.	Y	
	DISTRIBUTION AND LOCATION:		
22.	Within urbanized area		Y
23.	Visible from Interstate Highway, parkway, designated scenic highway, or passenger railroad.		X
24.	One of three largest wetlands, or three largest of same covertype within a city or town, or in a town where wetlands acreage is less than 1% of total.	Y	
25.	Within a publicly owned Recreation area.		Y
26.	On Publicly owned land open to public use.		Y

EXPLANATION AND SUPPORT FOR ITEMS 8 THRU 26 ABOVE AND OTHER COMMENTS
(attach Floristic checklists and additional sheets as necessary. Also note human influences having an effect upon the above noted values, and any two or more values which are redundant):

12 [illegible]

21 [illegible]

Add Additional Sheets As Necessary

JA-17

FRESHWATER WETLAND DATA

JA-17

WETLAND NAME: Black Ash Brook Wetland

DEC #

LOCATION:

Quad: (USGS)(DOT) Jamestown

County: Chautauqua

Town: ~~Kiantone~~ Carroll

Miles .5 Dir. S From Frewsburg

INVESTIGATOR(S): G. Noble

K. Taft, T. Juszczak

DATE(S) OF FIELD RECONNAISSANCE:

Date(s)	Weather
Rutigan Swamp &	
Other Files	

SIZE OF WETLAND: 280.0± Acres

VEGETATION COMMUNITY:

1. Covertypes (estimated percentage)
   - a. Wet meadow 22%
   - b. Emergent marsh %
   - c. Deciduous swamp (65%)
   - d. Coniferous swamp 3%
   - e. Shrubs swamp 6%
   - f. Submergent &/or floating 5%
   - g. Wetland open water %

ECOLOGICAL ASSOCIATIONS:

2. Covertype Groups
   - a. + b. = 22%
   - c. + d. + e. = 74%
   - f. + g. = 5%
3. Classic Kettlehole bog
4. Associated with open water
   Water
5. Proximity to Mud Flats
6. Island present
7. Adjacent to Class C(T) or higher stream

SPECIAL FEATURES

8. Resident Animal Habitat for:

Beaver, Muskrat, W.t. deer, Raccoon, Opposum, C.t. rabbit, Woodduck, Woodcock, Snipe, R. Grouse, G[illegible]

9. Traditional Migration Habitat for:

Woodduck
Mallard
Blackduck
Heron[illegible]
Snipe

		YES	NO
10.	Endangered or threatened species present		Y
11.	Vulnerable species present		Y
12.	Unusual animal species abundance or diversity for State or major geo-ecological Region of State		Y
13.	Unusual animal species abundance or diversity for County.	Y	
14.	Demonstrable Archeological or paleontological significance.		
15.	Significant (unusual or excellent representation) geological feature		
16.	Alkalinity of at least 50 ppm		
17.	Adjacent to Naturally Fertile Upland		

JA-17

FRESHWATER WETLAND CLASSIFICATION

Instructions: Circle the numbers of the applicable classification characteristics and place a check next to the appropriate class. Note that the number of species to which characteristics 13, 14 or 15 apply shall be identified in the parentheses with each species considered a separate Class II characteristic in determining item 7. Complete the information on the FRESHWATER WETLAND DATA SHEET to substantiate your conclusions. A wetland with no Class I, II or III characteristics is a Class IV wetland.

(City (Town) Village) Kiantone
County Chautauqua
Quad. name Jamestown

Wetland name Black Ash Brook
Wetland no. _____
Wetland Class 1 Superceded? (yes) ____

Inspection Dates _____
Notes attached (yes) X (no) ____
Prepared KC Taft Date 3/4/83

CLASS I X

1. Classic kettlehole bog
2. Res. hab., thr./endg. anim. sp.
3. Thr./endg. plant sp.
4. Unus. abund./div. anim. sp. in region or state
5. Significant flood protection for substantially developed area
6. Adj./contig. to reservoir or public water supply or hydraulically connected to public water supply aquifer.
7. 4 or more Class II characteristics

CLASS II ____

8. Emgt. marsh; pur. loosestrife and/or phragmites max. 66% of covertype
9. 2 or more wetland structural groups
10. Contig. to tidal wetlands
11. Assoc. with ext. perm. open water
12. Adj./contig. C(t) or higher stream
13. ( ) Mig. hab. thr./endg. anim. sp.
14. ( ) Res. hab. vuln. anim. sp.; state
15. ( ) Vuln. plant sp.; state
16. Unus. abund./div. anim. sp.; county
17. Archeo./paleo. significance
18. Unusual geological feature
19. Flood protection value; agr., light or planned development area
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22. Within urbanized area
23. 1 of 3 lgst. wetlands; city, town
24. In publicly owned recreation area

CLASS III ____

25. Emgt. marsh, pur. loosestrife and/or phragmites min. 66% of covertype
26. Deciduous swamp
27. Shrub swamp
28. Floating and/or submergent veg.
29. Wetland open water
30. Contains island
31. Total alkalinity at least 50 PPM
32. Adj. to fert. upland; high base soils
33. Res./mig. hab. of vuln. anim. sp. Res. for region; mig. for region or state
34. Vuln. plant sp.; region
35. Part of significantly polluted permanent open water system in which pollution reduction occurs
36. Visible and aesthetic/open space value
37. 1 of 3 lgst. wetlands of same covertype within a town
38. Wetland acreage max. 1% of total town acreage
39. Publicly owned land open to public use

GPS

CRA

CONESTOGA-ROVERS & ASSOCIATES
7703 Niagara Falls Boulevard
Niagara Falls, New York 14304
(716) 283-6720 Fax: (716) 283-6724

November 30, 1993

Reference No. 2326

Mr. Greg Sutton
Environmental Engineer II
NEW YORK STATE DEPARTMENT
OF ENVIRONMENTAL CONSERVATION
270 Michigan Avenue
Buffalo, NY 14203-2999

Dear Mr. Sutton:

Re: Quarterly Progress Report
September 1993 through November 1993
Remedial Investigation/Feasibility Study
VacAir Alloys, Frewsburg Plant Site
Site I.D. #907016

Keywell Corporation (Keywell) and the New York State Department of Environmental Conservation (NYSDEC) entered into an Order on Consent (Order), Index No. B9-0333-90-05 to perform a Remedial Investigation/Feasibility Study (RI/FS) for Keywell's VacAir Alloys Division Plant Site (Site) located in Frewsburg, New York. Implementation of the RI/FS work activities began in October 1992, as identified in the NYSDEC approved RI/FS Work Plan dated August 24, 1992 and modified by letters dated September 21, 1992, October 6, 1992, October 9, 1992 and November 10, 1992. Pursuant to the Order, this progress report has been prepared to summarize RI/FS activities implemented during the period of September 1, 1993 through November 30, 1993.

1.0 ACTIONS WHICH HAVE BEEN TAKEN TOWARD ACHIEVING COMPLIANCE WITH THE ORDER DURING THE PERIOD FROM SEPTEMBER 1, 1993 TO NOVEMBER 30, 1993

1.1 RI TASK 1 - PROJECT SPECIFICATION PLANS

This task is completed.

1.2 RI TASK 2 - COMMUNITY RELATIONS

No formal community relations activities were required during this reporting quarter.

1.3 RI TASK 3 - CURRENT SITUATION

This task is complete.

1.4 RI TASK 4 - CONTRACTOR PROCUREMENT

This task is complete.

1.5 RI - TASK 5 - SITE INVESTIGATION

This task is complete.

1.6 RI TASK 6 - SAMPLE ANALYSES

This task is complete.

1.7 RI TASK 7 - DATA EVALUATION

This task is complete.

1.8 RI TASK 8 - ASSESSMENT OF RISKS

1.8.1 Public Health Evaluation (PHE)

This task is complete.

1.9 RI TASK 9 -
IDENTIFICATION OF PRELIMINARY ACTION OBJECTIVES

This task is complete.

1.10 RI TASK 10 -
PRELIMINARY EVALUATION FOR TREATABILITY STUDIES

This task is complete.

1.11 RI TASK 11 - RI REPORT

By letter dated October 18, 1993, the NYSDEC provided comments on the draft RI Report dated July 1993. Responses to these comments were submitted to the NYSDEC by letter dated November 19, 1993.

1.12 FS TASKS

The draft Feasibility Study (FS) Report was submitted to the NYSDEC by cover letter dated November 8, 1993.

2.0 ANALYTICAL RESULTS OF SAMPLING AND TESTING AND OTHER DATA RECEIVED IN THE QUARTER FROM SEPTEMBER 1, 1993 TO NOVEMBER 30, 1993

No analytical data were received during this reporting quarter. All RI/FS field sampling and analyses work is complete.

3.0 SUMMARY OF DELIVERABLES SUBMITTED DURING SEPTEMBER 1, 1993 TO NOVEMBER 30, 1993

Deliverables submitted during this reporting quarter consist of the following documents:

i) the quarterly progress report for the period of June 1, 1993 through August 31, 1993, dated September 3, 1993;

ii) draft "Feasibility Study Report", dated November 8, 1993; and

iii) responses to NYSDEC comments on the draft RI Report dated November 19, 1993.

4.0 RI/FS ACTIVITIES SCHEDULED FOR THE QUARTER FROM DECEMBER 1,1993 TO FEBRUARY 28, 1994

4.1 RI TASK 1 - PROJECT SPECIFIC PLANS

Work on this task is complete.

4.2 RI TASK 2 - COMMUNITY RELATIONS

No work on this task is scheduled for the next quarter.

4.3 RI TASK 3 - DESCRIPTION OF THE CURRENT SITUATION

Work on this task is complete.

4.4 RI TASK 4 - CONTRACTOR PROCUREMENT

Work on this task is complete.

4.5 RI TASK 5 - SITE INVESTIGATION

All work under this RI task has been completed.

4.6 RI TASK 6 - SAMPLE ANALYSES

Work on this task is complete.

4.7 RI TASK 7 - DATA EVALUATION

Work on this task is complete.

4.8 RI TASK 8 - ASSESSMENT OF RISKS

Work on this task is complete.

4.9 RI TASK 9 - IDENTIFICATION OF PRELIMINARY REMEDIAL ACTION OBJECTIVES

This task is complete.

4.10 RI TASK 10 - PRELIMINARY EVALUATION FOR TREATABILITY STUDIES

This task is complete.

4.11 RI TASK 11 - RI REPORT

Discussions with NYSDEC concerning the revision of draft RI Report are ongoing.

4.12 FEASIBILITY STUDY

Response to NYSDEC comments, if any, on the draft FS Report.

5.0 PERCENTAGE OF COMPLETION, DELAYS AND EFFORTS MADE TO MITIGATE DELAYS

Estimated percentage of completion (task by task).

A. RI Task 1 - 100 percent complete.

B. RI Task 2 - Participation will be provided on an as-needed basis.

C. RI Task 3 - 100 percent complete.

D. RI Task 4 - 100 percent complete.

E. RI Task 5 - 100 percent complete.

F. RI Tasks 6 and 7

i) Sample Analyses and Validation - 100 percent complete.

ii) Data Evaluation and Presentation - 100 percent complete.

G. RI Task 8 - Assessment of Risks - 100 percent complete.

H. RI Task 9 - Identification of Preliminary Remedial Action Objectives - 100 percent complete.

I. RI Task 10 - Preliminary Evaluation for Treatability Studies - 100 percent complete.

J. Task 11 - RI Report - The draft RI report is 100 percent complete.

K. Feasibility Study - The draft FS Report is 100 percent complete.

There are no anticipated delays at this time.

If you have any questions on this matter, please contact the undersigned at 716-283-6720.

Yours very truly,

CONESTOGA-ROVERS & ASSOCIATES

Wai Chin Lachell

Wai Chin Lachell

WCL/ms/1
cc: K. Watson
M. Lozier, Keywell
D. Trostle, Keywell
Assistant Counsel, Division of Environ. Enforcement, NYSDEC - Buffalo
Director, Bureau of Env. Exposure Investigation, NYSDOH - Albany
Section Chief, Division of Haz. Waste Remediation, NYSDEC - Albany

CRA

CONESTOGA-ROVERS & ASSOCIATES
7703 Niagara Falls Boulevard
Niagara Falls, New York 14304
(716) 283-6720 Fax: (716) 283-6724

September 3, 1993

Reference No. 2326

PREVIOUSLY TRANSMITTED
BY TELECOPIER

Mr. Greg Sutton
Environmental Engineer II
NEW YORK STATE DEPARTMENT
OF ENVIRONMENTAL CONSERVATION
270 Michigan Avenue
Buffalo, NY 14203-2999

Dear Mr. Sutton:

Re: Quarterly Progress Report
June 1993 through August 1993
Remedial Investigation/Feasibility Study
VacAir Alloys, Frewsburg Plant Site
Site I.D. #907016

Keywell Corporation (Keywell) and the New York State Department of Environmental Conservation (NYSDEC) entered into an Order on Consent (Order), Index No. B9-0333-90-05 to perform a Remedial Investigation/Feasibility Study (RI/FS) for Keywell's VacAir Alloys Division Plant Site (Site) located in Frewsburg, New York. Implementation of the RI/FS work activities began in October 1992, as identified in the NYSDEC approved RI/FS Work Plan dated August 24, 1992 and modified by letters dated September 21, 1992, October 6, 1992, October 9, 1992 and November 10, 1992. Pursuant to the Order, this progress report has been prepared to summarize RI/FS activities implemented during the period of June 1, 1993 through August 31, 1993.

1.0 ACTIONS WHICH HAVE BEEN TAKEN TOWARD ACHIEVING COMPLIANCE WITH THE ORDER DURING THE PERIOD FROM JUNE 1, 1993 AND ENDING AUGUST 31, 1993

1.1 RI TASK 1 - PROJECT SPECIFICATION PLANS

This task is completed.

1.2 RI TASK 2 - COMMUNITY RELATIONS

No formal community relations activities were required during this reporting quarter.

1.3 RI TASK 3 - CURRENT SITUATION

This task is complete.

1.4 RI TASK 4 - CONTRACTOR PROCUREMENT

This task is complete.

1.5 RI - TASK 5 - SITE INVESTIGATION

One additional well (well MW-12) was installed off-Site on the west side of Frewsburg-Falconer Road across from MW-4. Well installation was completed on June 11, 1993. Attachment 1 to this progress report presents a report of the well installation and sampling results.

1.6 RI TASK 6 - SAMPLE ANALYSES

This task is complete.

1.7 RI TASK 7 - DATA EVALUATION

This task is complete.

1.8 RI TASK 8 - ASSESSMENT OF RISKS

1.8.1 Public Health Evaluation (PHE)

The PHE and the environmental assessment are complete.

1.9 RI TASK 9 -
IDENTIFICATION OF PRELIMINARY ACTION OBJECTIVES

By letter dated March 1, 1993, the RI/FS Preliminary Remedial Action Objectives, Technical Memorandum No. 1, were submitted to NYSDEC. NYSDEC commented on the document by letter dated March 12, 1993. After a series of exchanges by telephone conversations and correspondence concerning the

NYSDEC comments and concerns, the document was revised and resubmitted to the NYSDEC by cover letter dated June 25, 1993.

1.10 RI TASK 10 -
PRELIMINARY EVALUATION FOR TREATABILITY STUDIES

By letter dated May 18, 1993, the NYSDEC provided comments on the "Preliminary Evaluation of Remedial Technologies and Need for Treatability Studies Report, Technical Memorandum No. 2", dated March 31, 1993. Responses to the NYSDEC comments and revised tables to the document were submitted to NYSDEC by letter dated June 8, 1993.

NYSDEC approved the responses and the document by letter dated June 28, 1993.

1.11 RI TASK 11 - RI REPORT

Preparation of the RI report is complete. The draft RI report was submitted to the NYSDEC on July 12, 1993.

1.12 FS TASKS

Work on the Feasibility Study (FS) tasks is on-going.

1.13 PROPOSED PROJECT SCHEDULE

At this time, all of the tasks associated with the RI/FS being performed at the VacAir Site have been completed on schedule. No project delays have occurred and it is anticipated that all deliverables required under the Order will be submitted according to the project schedule.

2.0 ANALYTICAL RESULTS OF SAMPLING AND TESTING AND OTHER DATA RECEIVED IN THE QUARTER FROM JUNE 1, 1993 TO AUGUST 31, 1993

Analytical data for samples collected from the newly installed MW-12 monitoring well have been received. Attachment 1 summarizes the results obtained from groundwater samples collected from MW-12.

3.0 SUMMARY OF DELIVERABLES SUBMITTED FROM JUNE 1, 1993

Deliverables submitted during this third reporting quarter consist of the following documents:

i) the quarterly progress report for the period of March 1, 1992 through May 31, 1991, dated June 7, 1993;

ii) a revised "Remedial Investigation/Feasibility Study, Preliminary Remedial Action Objectives, Technical Memorandum No. 1", dated June 25, 1993;

iii) "Remedial Investigation/Feasibility Study, Preliminary Evaluation of Remedial Technologies and Need for Treatability Studies, Technical Memorandum No. 2", dated March 31, 1993;

iv) "Remedial Investigation/Feasibility Study, Remedial Investigation (RI) Report", dated July 12, 1993; and

v) associated correspondence related to the above-mentioned reports.

4.0 RI/FS ACTIVITIES SCHEDULED FOR THE QUARTER FROM SEPTEMBER 1,1993 TO NOVEMBER 30, 1993

4.1 RI TASK 1 - PROJECT SPECIFIC PLANS

Work on this task is complete.

4.2 RI TASK 2 - COMMUNITY RELATIONS

No work on this task is scheduled for the next quarter.

4.3 RI TASK 3 -
DESCRIPTION OF THE CURRENT SITUATION

Work on this task is complete.

4.4 RI TASK 4 - CONTRACTOR PROCUREMENT

Work on this task is complete.

4.5 RI TASK 5 - SITE INVESTIGATION

All work under this RI task has been completed.

4.6 RI TASK 6 - SAMPLE ANALYSES

Work on this task is complete.

4.7 RI TASK 7 - DATA EVALUATION

Work on this task is complete.

4.8 RI TASK 8 - ASSESSMENT OF RISKS

Work on this task is complete.

4.9 RI TASK 9 - IDENTIFICATION OF PRELIMINARY
REMEDIAL ACTION OBJECTIVES

This task is complete.

4.10 RI TASK 10 - PRELIMINARY EVALUATION FOR TREATABILITY STUDIES

This task is complete.

4.11 RI TASK 11 - RI REPORT

Preparation of the RI Report is complete.

4.12 FEASIBILITY STUDY

Work on the FS is ongoing.

5.0 PERCENTAGE OF COMPLETION, DELAYS AND EFFORTS MADE TO MITIGATE DELAYS

Estimated percentage of completion (task by task).

A. RI Task 1 - 100 percent complete.

B. RI Task 2 - Participation will be provided on an as-needed basis.

C. RI Task 3 - 100 percent complete.

D. RI Task 4 - 100 percent complete.

E. RI Task 5 - 100 percent complete.

F. RI Tasks 6 and 7

i) Sample Analyses and Validation - 100 percent complete.

ii) Data Evaluation and Presentation - 100 percent complete.

G. RI Task 8 - Assessment of Risks - 100 percent complete.

H. RI Task 9 - Identification of Preliminary Remedial Action Objectives - 100 percent complete.

I. RI Task 10 - Preliminary Evaluation for Treatability Studies - 100 percent complete.

J. Task 11 - RI Report - The RI report is 100 percent complete.

K. Feasibility Study - The FS is 50 percent complete. Preparation for the FS is ongoing.

L. Additional Well Installation - 100 percent complete. Work on this task is currently underway. Data/information obtained during installation and sampling of this well is included in this report as Attachment 1.

There are no anticipated delays at this time.

If you have any questions on this matter, please contact the undersigned at 716-283-6720.

Yours very truly,

CONESTOGA-ROVERS & ASSOCIATES

Wai Chin Lachell

Wai Chin Lachell

WCL/ms/1
cc: K. Watson, Piper & Marbury
M. Lozier, Keywell
D. Trostle, Keywell
Assistant Counsel, Division of Environmental Enforcement, NYSDEC
Director, Bureau of Env. Exposure Investigation, NYSDOH
Section Chief, Division of Haz. Waste Remediation, NYSDEC

ATTACHMENT 1

SUPPLEMENTAL REPORT
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
VACAIR ALLOYS DIVISION
FREWSBURG, NEW YORK

1.0 INTRODUCTION

Keywell Corporation (Keywell) and the New York State Department of Environmental Conservation (NYSDEC) entered into an Order on Consent (Index No. B9-0333-90-05) to perform a Remedial Investigation/Feasibility Study (RI/FS) for Keywell's VacAir Alloys Division Plant Site (Site) located in Frewsburg, New York. Implementation of the RI/FS work activities began in October 1992, as specified in the approved RI/FS Work Plan. By letter dated April 7, 1993, the NYSDEC requested the installation of additional monitoring wells.

It was agreed by letters dated May 5, 1993 and May 20, 1993 that one additional monitoring well (MW-12) would be installed off-Site, west of Frewsburg-Falconer Road, across from well MW-4. It was further agreed that data/information obtained during installation and sampling of this well would be provided to the NYSDEC in a letter report so as not to interfere with the completion of the RI Report.

This report summarizes the information/data obtained as part of this well installation and sampling program and includes:

i) a description of well installation activities;

ii) the well instrumentation and stratigraphic log for MW-12;

iii) one round of groundwater level data from all Water Table Aquifer wells and groundwater contours drawing; and

iv) analytical results from the groundwater samples collected and a data validation report.

2.0 FIELD ACTIVITIES

2.1 WELL INSTALLATION

The additional monitoring well, designated as MW-12, was installed on the west side of Falconer-Frewsburg Road, at the north end of the parking area used for access to the Conewango River. MW-12 was installed approximately three feet

west of BH-G which was installed as part of the RI/FS program in November 1993. Figure 1 shows the location of the MW-12. MW-12 was installed on June 11, 1993 according to the procedures and protocols established for the approved RI/FS Work Plan and associated project-specific documents. Empire Soils Investigations performed the drilling activities.

Since the well was being installed adjacent to BH-G, which was continuously split-spoon sampled and screened for organic vapors, the borehole for MW-12 was advanced to 14 feet below ground surface (BGS) without continuous sampling. A split-spoon sample was collected from 14 to 16 feet BGS to confirm the presence of the clayey confining layer. At the completion of drilling activities, a monitoring well was installed consisting of a 5 foot long, 2-inch diameter number 10 slotted stainless steel well screen coupled to an appropriate length of 2-inch diameter stainless steel riser pipe. The bottom of the well screen was set at 13.8 feet BGS. A sandpack consisting of number 4 quartzite sand was installed around the well screen and extended to a depth of 7.5 feet BGS. A 2-foot thick bentonite pellet seal was placed above the sandpack. After hydrating the bentonite pellets the remaining 3.5 feet of the open annulus of the borehole was backfilled with cement/bentonite grout. The well was finished as an above-grade well. A locking protective casing was installed over the well casing. A 2-foot square concrete pad was placed around the base of the protective casing. A copy of the stratigraphic and instrumentation log for MW-12 is included as Appendix A to this report. Following installation, the well was allowed to set for two hours prior to development.

Development was performed in the afternoon of June 11, 1993. Development consisted of the removal of 10 well volumes of groundwater from the well. Development was performed using a precleaned bailer. As each well volume was removed pH, conductivity, temperature and turbidity were measured and recorded. Stabilization according to pH, conductivity and temperature was reached after the fourth well volume. However, turbidity remained high throughout the well development. Development was completed after removing the maximum ten well volumes of groundwater from the well. Table 1 provides a summary of data from the development of MW-12.

The top of casing elevation (TOC) was surveyed to establish this reference point to be used to calculate groundwater table elevations. The survey used the TOC elevation of existing monitoring well MW-7 as a bench mark. Since MW-12 is located immediately adjacent to BH-G, the horizontal coordinates and ground surface elevation were assumed to be the same for MW-12. The TOC elevation for MW-12 was determined to be 1243.08 feet above mean sea level (AMSL).

2.2 SAMPLE COLLECTION

MW-12 was purged and sampled on June 14, 1993 using a clean disposable teflon bailer. Prior to beginning to purge the well, a field blank was collected by pouring laboratory supplied organic free water into the bailer and then from the bailer directly into the sample bottles. Purging consisted of the removal of five well volumes of groundwater from the well. As each well volume was removed the pH, conductivity, temperature and turbidity of the groundwater was measured. Data collected while purging MW-12 is included on Table 1.

Immediately following purging, MW-12 was sampled. Samples were collected in sample bottles supplied by the laboratory. Samples were collected with the bailer used during purging. Samples collected from the well included a blind field duplicate sample labeled MW-13 and a Matrix Spike/Matrix Spike Duplicate (MS/MSD) sample. Following sampling the sample bottles were labeled placed in a cooler with ice and shipped via overnight courier to H2M Laboratories in Melville, New York following chain of custody procedures. The samples were analyzed for the Target Compound List (TCL) Volatile Organic Contaminants (VOCs) only.

The results of the samples collected from MW-12 indicate that trichloroethene (TCE) and total 1,2-dichloroethene (1,2-DCE) are present in the groundwater at MW-12. TCE was detected in the sample and duplicate at concentrations of 3400 µg/L and 3500 µg/L respectively. 1,2-DCE was detected in the sample and duplicate sample at concentrations of 41 µg/L and 37 µg/L respectively. All other VOCs were non-detect at a detection limit of 10 µg/L. The rinse blank from the bailer used at MW-12 was non-detect for all VOCs at the 10 µg/L detection limit. A summary of detected compounds is found on Table 2. Appendix B presents results of the data validation and assessment.

2.3 HYDRAULIC MONITORING

Following sampling, a complete round of water levels was collected from all of the existing monitoring wells located at the Site. Sufficient time was allowed for MW-12 to recover fully prior to measuring the static water level. The static water level in MW-12 has been observed to be at or near the elevation of the ground surface. Based upon the water level round performed on June 14, 1993, groundwater contours in the shallow water table have been interpolated. These contours are presented on Figure 2. The water level data collected on June 14, 1993 is shown on Table 3.

2.4 FIELD PERMEABILITY TESTING

A slug test was performed at MW-12 on August 11, 1993. First a recording pressure transducer was installed in the well. After the water level returned to static, a PVC slug was quickly lowered into the water column, "instantaneously" raising the water level by a known volume of displacement. The water level recorder monitored the subsequent decrease in the water level (falling head test) as the well level returned to static. Once the water level returned to static, the slug was quickly removed from the well, instantaneously lowering the water level by a known volume of displacement. The water level recorder monitored the increasing water level (rising head test) until the well level returned to static. This process was then repeated to ensure that a good data set had been collected. The data from the water level recorder was downloaded onto a computer disc and was imported into a computer software program which calculated an estimated hydraulic conductivity for MW-12 for a rising head test based upon the method developed by Bower and Rice (1979). The estimated hydraulic conductivity of MW-12 was 1.5×10^{-4} cm/sec. Appendix C presents the data used in estimating the hydraulic conductivity.

3.0 CONCLUSIONS

Based on the information obtained, the conclusions of the RI Report, dated July 1993, have not changed.

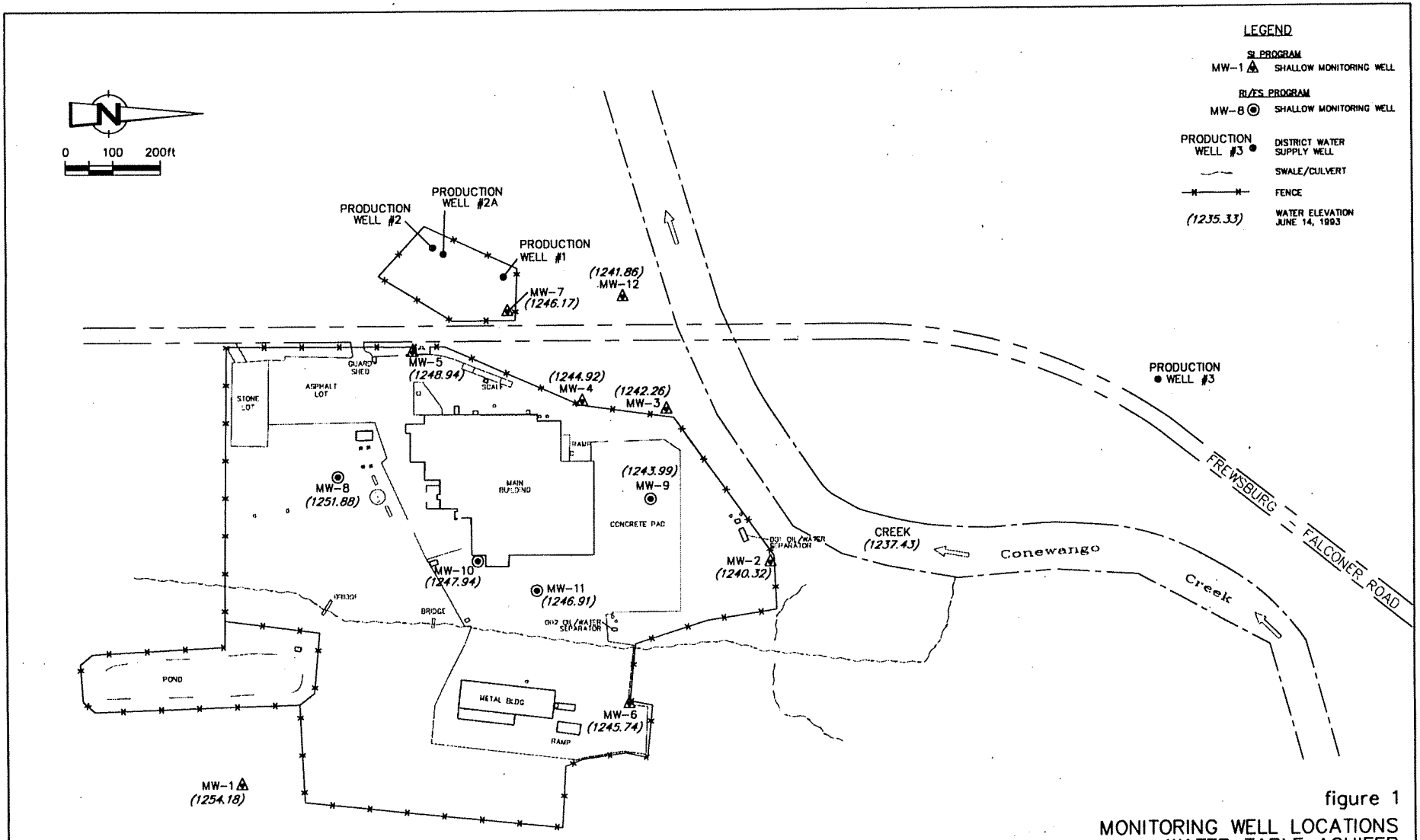


figure 1

MONITORING WELL LOCATIONS
WATER TABLE AQUIFER
REMEDIAL INVESTIGATION PROGRAM
VACAIR ALLOYS DIVISION
Frewsburg, New York

CRA

2328(L) SEP 1/93(NF) REV.0 (P-11)

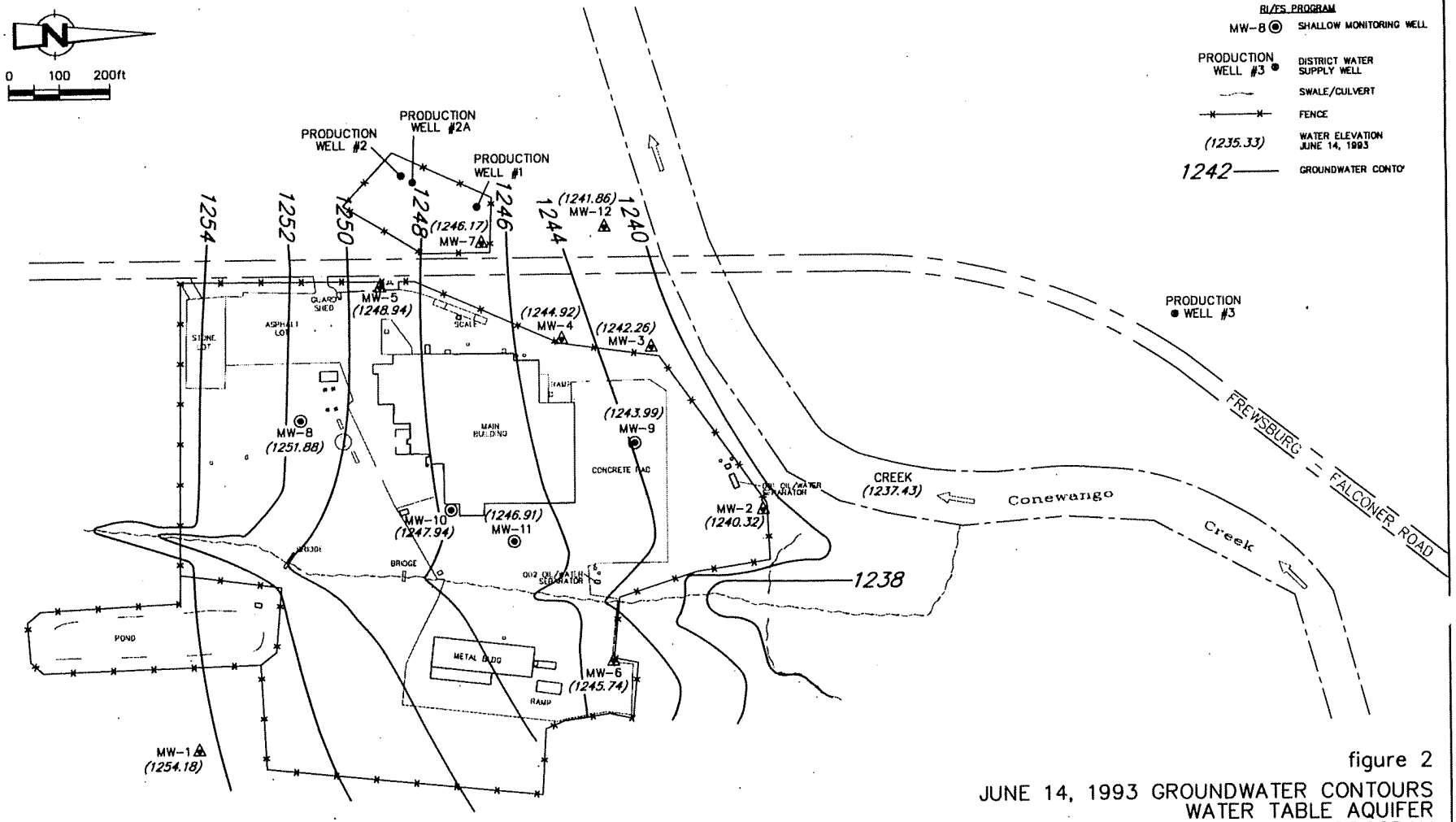


figure 2

JUNE 14, 1993 GROUNDWATER CONTOURS
WATER TABLE AQUIFER
REMEDIAL INVESTIGATION PROGRAM
VACAIR ALLOYS DIVISION
Frewsburg, New York

CRA

2326(L) SEP 1/93(NF) REV.0 (P-12)

TABLE 1

MW-12 WELL DEVELOPMENT AND PURGING RECORD
VACAIR ALLOYS, FREWSBURG, NEW YORK
JUNE 1993

Date	*Time*	*Well Volume Number*	*Total Gallons*	*Temperature (°C)*	*pH (Units)*	*Conductivity (µmohs)*	*Turbidity (NTU's)*
			Well Development Data				
06/11/93	1353	1	2.3	14.6	6.65	419	>200
06/11/93	1400	2	4.6	12.3	6.62	396	>200
06/11/93	1407	3	6.9	12.1	6.54	380	>200
06/11/93	1415	4	9.2	12.3	6.56	378	>200
06/11/93	1424	5	11.5	12.5	6.51	377	>200
06/11/93	1432	6	13.8	11.7	6.45	374	>200
06/11/93	1438	7	16.1	11.9	6.47	377	>200
06/11/93	1447	8	18.4	11.7	6.59	384	>200
06/11/93	1453	9	20.7	11.6	6.48	385	>200
06/11/93	1500	10	23.0	11.8	6.55	393	>200
			Well Purging Data				
06/14/93	1324	1	2.3	-	6.66	418	89
06/14/93	1330	2	4.6	11.7	6.46	411	125
06/14/93	1338	3	6.9	11.6	6.54	403	142
06/14/93	1345	4	9.2	12.0	6.56	408	100
06/14/93	1355	5	11.5	11.5	6.58	428	45

TABLE 2

SUMMARY OF DETECTED COMPOUNDS
VACAIR ALLOYS, FREWSBURG, NEW YORK

Compounds	*Units*	*MW-12*	*MW-12 Dup.*
Trichloroethene	µg/L	3400	3500
Total 1,2-Dichloroethene	µg/L	41	37

TABLE 3

GROUNDWATER ELEVATIONS ON JUNE 14, 1993
VACAIR ALLOYS, FREWSBURG, NEW YORK

Location	*Reference Elevation ((TOC) Ft. AMSL)*	*Groundwater Elevation (Ft. AMSL)*
MW-1	1260.6	1254.18
MW-2	1251.6	1240.32
MW-3	1252.3	1242.26
MW-4	1250.1	1244.92
MW-4D	1249.37	1240.35
MW-5	1256.5	1248.94
MW-5D	1255.14	1244.16
MW-6	1253.7	1245.74
MW-7	1253.76	1246.17
MW-8	1256.65	1251.88
MW-9	1249.20	1243.99
MW-10	1253.50	1247.94
MW-11	1251.02	1246.91
MW-12	1243.08	1241.86
Conewango River	1248.7	1237.43

APPENDIX A

WELL LOG

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

(L-54)

PROJECT NAME: VAC-AIR
PROJECT NO.: 2326
CLIENT: S.G. KEYWELL
LOCATION: ADJACENT TO BH-G

HOLE DESIGNATION: MW-12
DATE COMPLETED: JUNE 11, 1993
DRILLING METHOD: 4 1/4" ID HSA
CRA SUPERVISOR: D. OSCAR

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE STATE	SAMPLE 'N' VALUE	SAMPLE PID / OVA (ppm)
	REFERENCE POINT (Top of Riser)	1243.08					
	GROUND SURFACE	1241.9					
	For stratigraphy from 0.0 to 14.0 ft BGS see BH-G						
2.5			CEMENT/ BENTONITE GROUT				
5.0			8"ø BOREHOLE				
7.5			BENTONITE PELLET SEAL				
10.0			2"ø STEEL CASING				
12.5			SAND PACK				
			WELL SCREEN				
	Gray to brown CLAY, some silt, little fine sand, moist, NATIVE	1227.9		1SS		9	
15.0			2"ø BOREHOLE				
	END OF HOLE @ 16.0 FT. BGS	1225.9					
17.5			SCREEN DETAILS: Screened Interval: 8.8 to 13.8' BGS Length -5.0' Diameter -2.0" Slot # 10 Material -Stainless steel Sand pack interval: 7.5 to 14.0' BGS Material -# 4 QROK				
20.0							
22.5							
25.0							
27.5							
30.0							
32.5							

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS ⬭ WATER FOUND ▽ STATIC WATER LEVEL ▼

APPENDIX B

DATA ASSESSMENT AND VALIDATION
MW-12 GROUNDWATER SAMPLING

APPENDIX B

DATA ASSESSMENT AND VALIDATION
MW-12 GROUNDWATER SAMPLING
VACAIR ALLOYS DIVISION
FREWSBURG, NEW YORK
AUGUST 11, 1993

The following memo details the analytical data assessment and validation for results obtained by H2M Labs, Inc. on samples collected during June 1993 at the VacAir Alloys Site. The samples submitted for analysis consisted of the following:

Matrix	*Investigative Samples*	*Rinsate Blanks*	*Field Duplicate*	*Total*
Water	1	1	1	3

A summary of the analytical methods and parameters for which the samples were submitted is presented in Table 1. Trip blanks were not submitted with the investigative samples, however, a rinsate blank was submitted and confirmed that there was no cross-contamination during sample transport.

Evaluation of the data was based on information derived from the finished data sheets, chain of custody forms, blank data, and recovery data for matrix and surrogate spikes. The assessment of analytical and in-house data included checks for: adherence to accuracy and precision criteria; transmittal errors; and anomalously high and low parameters values.

The QA/QC criteria by which these data have been assessed are outlined in the methods referenced in Table 1 and the documents entitled:

i) "Laboratory Data Validation Functional Guidelines for Evaluating Organic Analyses" (February 1, 1988), Prepared by the USEPA Data Validation Work Group.

ii) "National Functional Guidelines for Organic Data Review", 12/90 (Rev. 6/91).

Items i) and ii) will hereinafter be referred to as the "Guidelines".

1. SAMPLE HOLDING TIMES - Based on the criteria outlined in the relevant methods and NYSDEC sample holding time protocols, the following sample holding time requirements have been established for groundwater matrices.

Volatile Organic Compounds (VOCs)	7 days from VTSR[1] to analyses

[1] VTSR - Verified Time of Sample Receipt.

By comparing the VTSR of all samples (from the notation appearing on the chain of custody documents) with the reported dates of extraction and/or analysis, it is noted that all samples submitted for VOC determinations were analyzed prior to expiration of their prescribed holding times.

2. GC/MS TUNING, CALIBRATIONS, INTERNAL STANDARDS AND CHECK STANDARDS (VOCs) - To ensure that the data produced by the instrument may be correctly interpreted and quantitated, the tuning and performance criteria presented in the method and "Guidelines" have been assessed herein. These criteria have been established to assure mass resolution, identification, quantitation, and to some degree sensitivity.

   A review of the GC/MS tuning, calibration, internal standards, and check standard data accompanying the H2M work orders, indicated that all tuning, calibration, internal standard and check standard criteria were met during the VOC analysis. Acetone, 2-butanone and xylene check standard recoveries yielded outlying recoveries, bias high. Due to the non-detect results of acetone, 2-butanone and xylene in the samples, no qualification was necessary.

3. SURROGATE SPIKE RECOVERIES - Laboratory performance on individual samples is assessed on the basis of surrogate spike recoveries. When properly employed in conjunction with sample preparation, surrogates can be used to determine the effectiveness of sample cleanup or matrix modifying techniques. In addition, fortifying the sample with a known amount of the surrogate compound prior to sample preparation serves as an indicator of the efficiency of analyte extraction, dissolution, or other analyte-matrix separation technique.

   All samples submitted for VOC determinations were spiked with the surrogate compounds bromofluorobenzene, toulene-d8, and 1,2-dichloroethane-d4. Sample MW-12 yielded outlying toluene-d8 recovery by one percent. Due to the negligible effects of one percent, sample results were not qualified. All remaining surrogate recoveries were within method control limits, indicating acceptable laboratory performance.

4. METHOD BLANK ANALYSES - Method blank analyses were assessed to determine the existence and magnitude of sample contamination due to laboratory conditions or procedures. All method blanks were prepared from deionized water, and analyzed at a minimum frequency of one per 20 investigative samples per day of analysis.

   All VOC method blank results showed non-detect quantities of the compounds of interest. This indicated that the potential for sample contamination attributable to laboratory conditions or procedures was minimal during VOC analysis.

5. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD) - The recoveries of MS/MSD analyses are used to assess the analytical accuracy on an individual sample basis, while the percent reproducibility (RPD) between the MS and MSD indicates the analytical precision achieved for that sample. MS/MSD samples were performed at a frequency of one per 20 determinations.

   MW-12 was analyzed as an MS/MSD sample for VOCs. Trichloroethene yielded outlying MS and MSD recoveries due to high sample concentrations exceeding the calibration range. As a result, the spiking concentration of trichloroethene was masked in the undiluted sample, therefore not evaluated herein. The RPD result for benzene MS/MSD recoveries was outside of laboratory control limits by one percent. However, due to acceptable MS/MSD recoveries, and the negligible effects of one percent, sample results were not qualified. All remaining MS/MSD spike recoveries and RPD values were within laboratory control limits, indicating satisfactory analytical accuracy and precision were achieved for these samples.

6. FIELD DUPLICATE RESULTS - A field duplicate was taken and submitted "blind" to the laboratory in order to assess the aggregate analytical and sampling protocol precision. The field duplicate collected consisted of MW-12 and its field duplicate MW-13. The field duplicate results for VOCs showed adequate reproducibility, which indicated that satisfactory laboratory and sampling protocol precision was achieved for these parameters during this sampling event.

7. RINSATE BLANK RESULTS - In order to assess the efficiency of the sampling device cleansing protocols performed in the field, one rinsate blank (RB-61493) was collected and submitted to the laboratory for analysis. The results of the rinsate blank analysis showed non-detected quantities of all VOCs. This indicated that adequate sampling device decontamination procedures were adhered to for this sampling event.

8. TENTATIVELY IDENTIFIED COMPOUNDS (TICs) - TICs reported for sample MW-12 (undiluted analysis) included an unknown aromatic and an isomer of tetramethylbenzene. However, according to the laboratory's case narrative, these TICs were artifacts of a previous sample. Because the presence of these TICs were not confirmed in the field duplicate nor the MS/MSD samples from MW-12, it is assumed the laboratory's conclusion is correct and the TIC data for MW-12 should not be used. The laboratory should have reanalyzed MW-12 after the instrument was properly purged of any remaining compounds from previous samples.

9. CONCLUSION - Based on this QA/QC review, these data are judged acceptable without qualification. However, the TIC data for MW-12 should not be used as noted herein.

TABLE 1

SAMPLE SUMMARY KEY
VACAIR ALLOYS DIVISION
FREWSBURG, NEW YORK

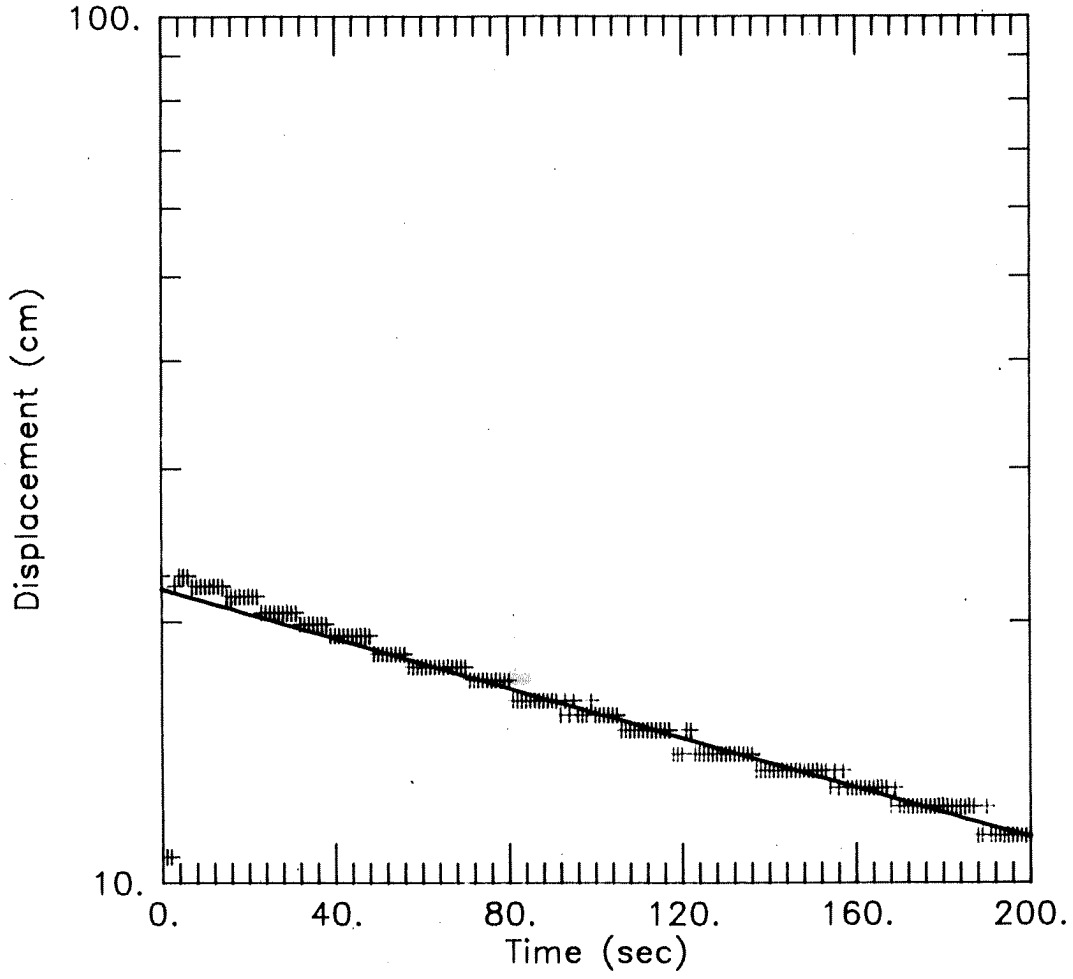
Collection Date	*Sample I.D.*	*Matrix*	*Parameter*	*Method*	*VTSR (1) Date*	*Analysis Date*
06/14/93	MW-12	Water	TCL VOCs	8240	06/16/93	06/17-18/93
06/14/93	MW-13 (Duplicate of MW-12)	Water	TCL VOCs	8240	06/16/93	06/17-18/93
06/14/93	RB-61493 (Rinsate Blank)	Water	TCL VOCs	8240	06/16/93	6/18/93

Note:
(1) VTSR - Verified Time of Sample Receipt

APPENDIX C

FIELD PERMEABILITY DATA

VACAIR SLUG TEST MW-12



DATA SET:
MW12.SLG
09/07/93

AQUIFER TYPE:
Unconfined

SOLUTION METHOD:
Bouwer-Rice

ESTIMATED PARAMETERS:
K = 0.0001493 cm/sec
y0 = 21.77 cm

TEST DATA:
H0 = 22.56 cm
rc = 2.54 cm
rw = 10.16 cm
L = 198.1 cm
b = 411.8 cm
H = 411.1 cm

<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<>>

A Q T E S O L V   R E S U L T S
Version 1.10

09/07/93 18:20:15

==

TEST DESCRIPTION

Data set........... MW12.SLG
Data set title..... VACAIR SLUG TEST MW-12

Knowns and Constants:
- No. of data points.................. 200
- Radius of well casing............... 2.54
- Radius of well...................... 10.16
- Aquifer saturated thickness......... 411.8
- Well screen length.................. 198.1
- Static height of water in well...... 411.1
- Log(Re/Rw).......................... 2.778
- A, B, C............................. 2.136, 0.334, 0.000

==

ANALYTICAL METHOD

Bouwer-Rice (Unconfined Aquifer Slug Test)

==

RESULTS FROM STATISTICAL CURVE MATCHING

STATISTICAL MATCH PARAMETER ESTIMATES

	Estimate		Std. Error
K =	1.4925E-004	+/-	4.2140E-006
y0 =	2.1766E+001	+/-	1.9536E-001

ANALYSIS OF MODEL RESIDUALS

residual = calculated - observed
weighted residual = residual * weight

Weighted Residual Statistics:
- Number of residuals............... 200
- Number of estimated parameters.... 2
- Degrees of freedom................ 198
- Residual mean..................... -0.001171
- Residual standard deviation....... 1.177
- Residual variance................. 1.385

Model Residuals:

Time	Observed	Calculated	Residual	Weight

1	10.668	21.695	-11.027		1
2	10.668	21.623	-10.955		1
3	21.946	21.552	0.3937		1
4	22.555	21.481	1.0743		1
5	22.555	21.41	1.1451		1
6	22.555	21.34	1.2156		1
7	21.946	21.269	0.67634		1
8	21.946	21.199	0.74642		1
9	21.946	21.129	0.81627		1
10	21.946	21.06	0.88589		1
11	21.946	20.99	0.95528		1
12	21.946	20.921	1.0244		1
13	21.946	20.852	1.0934		1
14	21.946	20.784	1.1621		1
15	21.336	20.715	0.62096		1
16	21.336	20.647	0.68921		1
17	21.336	20.579	0.75724		1
18	21.336	20.511	0.82504		1
19	21.336	20.443	0.89263		1
20	21.336	20.376	0.95998		1
21	21.336	20.309	1.0271		1
22	21.336	20.242	1.094		1
23	20.422	20.175	0.24633		1
24	20.422	20.109	0.31281		1
25	20.422	20.043	0.37906		1
26	20.422	19.976	0.4451		1
27	20.422	19.911	0.51092		1
28	20.422	19.845	0.57653		1
29	20.422	19.78	0.64191		1
30	20.422	19.715	0.70709		1
31	20.422	19.65	0.77204		1
32	19.812	19.585	0.22719		1
33	19.812	19.52	0.29172		1
34	19.812	19.456	0.35603		1
35	19.812	19.392	0.42014		1
36	19.812	19.328	0.48403		1
37	19.812	19.264	0.54772		1
38	19.812	19.201	0.61119		1
39	19.202	19.138	0.064855		1
40	19.202	19.074	0.12791		1
41	19.202	19.012	0.19076		1
42	19.202	18.949	0.2534		1
43	19.202	18.887	0.31584		1
44	19.202	18.824	0.37807		1
45	19.202	18.762	0.44009		1
46	19.202	18.7	0.50191		1
47	19.202	18.639	0.56353		1
48	19.202	18.577	0.62494		1
49	18.288	18.516	-0.22825		1
50	18.288	18.455	-0.16724		1
51	18.288	18.394	-0.10643		1
52	18.288	18.334	-0.045826		1
53	18.288	18.273	0.014582		1
54	18.288	18.213	0.074791		1
55	18.288	18.153	0.1348		1
56	18.288	18.093	0.19461		1
57	17.678	18.034	-0.35537		1
58	17.678	17.974	-0.29595		1
59	17.678	17.915	-0.23673		1

60	17.678	17.856	-0.1777	1
61	17.678	17.797	-0.11886	1
62	17.678	17.739	-0.060224	1
63	17.678	17.68	-0.0017768	1
64	17.678	17.622	0.056478	1
65	17.678	17.564	0.11454	1
66	17.678	17.506	0.17241	1
67	17.678	17.448	0.23009	1
68	17.678	17.391	0.28758	1
69	17.678	17.334	0.34488	1
70	17.678	17.276	0.40199	1
71	17.069	17.219	-0.15068	1
72	17.069	17.163	-0.093945	1
73	17.069	17.106	-0.037395	1
74	17.069	17.05	0.018968	1
75	17.069	16.994	0.075145	1
76	17.069	16.938	0.13114	1
77	17.069	16.882	0.18695	1
78	17.069	16.826	0.24257	1
79	17.069	16.771	0.29801	1
80	17.069	16.716	0.35327	1
81	16.154	16.66	-0.50606	1
82	16.154	16.606	-0.45116	1
83	16.154	16.551	-0.39645	1
84	16.154	16.496	-0.34191	1
85	16.154	16.442	-0.28756	1
86	16.154	16.388	-0.23339	1
87	16.154	16.334	-0.17939	1
88	16.154	16.28	-0.12557	1
89	16.154	16.226	-0.071932	1
90	16.154	16.173	-0.018467	1
91	16.154	16.12	0.03482	1
92	15.545	16.066	-0.52167	1
93	16.154	16.014	0.14087	1
94	15.545	15.961	-0.41597	1
95	16.154	15.908	0.24622	1
96	15.545	15.856	-0.31096	1
97	15.545	15.804	-0.25872	1
98	15.545	15.751	-0.20665	1
99	16.154	15.7	0.45485	1
100	15.545	15.648	-0.10302	1
101	15.545	15.596	-0.051462	1
102	15.545	15.545	-7.4347E-005	1
103	15.545	15.494	0.051144	1
104	15.545	15.443	0.10219	1
105	15.545	15.392	0.15308	1
106	14.935	15.341	-0.40581	1
107	14.935	15.29	-0.35526	1
108	14.935	15.24	-0.30488	1
109	14.935	15.19	-0.25467	1
110	14.935	15.14	-0.20462	1
111	14.935	15.09	-0.15473	1
112	14.935	15.04	-0.10501	1
113	14.935	14.991	-0.055459	1
114	14.935	14.941	-0.0060662	1
115	14.935	14.892	0.043164	1
116	14.935	14.843	0.092231	1
117	14.935	14.794	0.14114	1
118	14.021	14.745	-0.72452	1
119	14.021	14.697	-0.67593	1

120	14.021	14.648	-0.[illegible]751	1
121	14.935	14.6	0.33516	1
122	14.935	14.552	0.38326	1
123	14.021	14.504	-0.48319	1
124	14.021	14.456	-0.4354	1
125	14.021	14.409	-0.38777	1
126	14.021	14.361	-0.3403	1
127	14.021	14.314	-0.29298	1
128	14.021	14.267	-0.24582	1
129	14.021	14.22	-0.19881	1
130	14.021	14.173	-0.15196	1
131	14.021	14.126	-0.10526	1
132	14.021	14.08	-0.058715	1
133	14.021	14.033	-0.012324	1
134	14.021	13.987	0.033913	1
135	14.021	13.941	0.079999	1
136	14.021	13.895	0.12593	1
137	13.411	13.849	-0.43789	1
138	13.411	13.803	-0.39225	1
139	13.411	13.758	-0.34677	1
140	13.411	13.713	-0.30144	1
141	13.411	13.667	-0.25626	1
142	13.411	13.622	-0.21123	1
143	13.411	13.578	-0.16634	1
144	13.411	13.533	-0.12161	1
145	13.411	13.488	-0.077017	1
146	13.411	13.444	-0.032575	1
147	13.411	13.399	0.011721	1
148	13.411	13.355	0.055871	1
149	13.411	13.311	0.099875	1
150	13.411	13.267	0.14373	1
151	13.411	13.224	0.18745	1
152	13.411	13.18	0.23102	1
153	13.411	13.137	0.27445	1
154	12.802	13.093	-0.29187	1
155	13.411	13.05	0.36087	1
156	12.802	13.007	-0.20573	1
157	13.411	12.964	0.44673	1
158	12.802	12.922	-0.12015	1
159	12.802	12.879	-0.077577	1
160	12.802	12.837	-0.035141	1
161	12.802	12.794	0.0071543	1
162	12.802	12.752	0.049311	1
163	12.802	12.71	0.091328	1
164	12.802	12.668	0.13321	1
165	12.802	12.627	0.17495	1
166	12.802	12.585	0.21655	1
167	12.802	12.544	0.25802	1
168	12.192	12.502	-0.31025	1
169	12.802	12.461	0.34054	1
170	12.192	12.42	-0.228	1
171	12.192	12.379	-0.18708	1
172	12.192	12.338	-0.14629	1
173	12.192	12.298	-0.10564	1
174	12.192	12.257	-0.065117	1
175	12.192	12.217	-0.024732	1
176	12.192	12.176	0.015521	1
177	12.192	12.136	0.055642	1
178	12.192	12.096	0.09563	1
179	12.192	12.057	0.13549	1

180	12.192	12.017	0.17521	1
181	12.192	11.977	0.2148	1
182	12.192	11.938	0.25427	1
183	12.192	11.898	0.2936	1
184	12.192	11.859	0.33281	1
185	12.192	11.82	0.37188	1
186	12.192	11.781	0.41083	1
187	12.192	11.742	0.44964	1
188	11.278	11.704	-0.42607	1
189	11.278	11.665	-0.3875	1
190	12.192	11.627	0.56533	1
191	11.278	11.588	-0.31076	1
192	11.278	11.55	-0.27258	1
193	11.278	11.512	-0.23452	1
194	11.278	11.474	-0.19659	1
195	11.278	11.436	-0.15878	1
196	11.278	11.399	-0.1211	1
197	11.278	11.361	-0.083543	1
198	11.278	11.324	-0.04611	1
199	11.278	11.286	-0.0087992	1
200	11.278	11.249	0.028388	1

===

RESULTS FROM VISUAL CURVE MATCHING

VISUAL MATCH PARAMETER ESTIMATES

	Estimate
K =	1.4925E-004
y0 =	2.1766E+001

<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<>>

CO-17-1 (5/76)
Formerly GA-4

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

TRANSMITTAL SLIP

TO: Judy Ross Div. Fish & Wildlife - Albany

FROM: Greg Sutton, DMWR - Buffalo

DATE: June 23, 1993

RE: Vac Air Alloys Site

I received the attached Habitat Assessment from Vac Air consultant as part of thier quarterly report. This will be included in the RI report that is due mid July - Thought you may like to see the pre-view copy

Greg

FOR ACTION AS INDICATED:

- ☐ Please Handle
- ☐ Prepare Reply
- ☐ Prepare Reply for _____ Signature
- ☑ Information
- ☐ Approval
- ☐ Prepare final/draft in _____ copies
- ☐ Comments
- ☐ Signature
- ☐ File
- ☐ Return to me
- ☐ _____
- ☐ _____

6 P5

CRA

CONESTOGA-ROVERS & ASSOCIATES
7703 Niagara Falls Boulevard
Niagara Falls, New York 14304
(716) 283-6720 Fax: (716) 283-6724

June 7, 1993

Reference No. 2326

Mr. Greg Sutton
Environmental Engineer II
NEW YORK STATE DEPARTMENT
OF ENVIRONMENTAL CONSERVATION
270 Michigan Avenue
Buffalo, NY 14203-2999

Dear Mr. Sutton:

Re: Quarterly Progress Report
March 1993 through May 1993
Remedial Investigation/Feasibility Study
VacAir Alloys, Frewsburg Plant Site
Site I.D. #907016

Keywell Corporation (Keywell) and the New York State Department of Environmental Conservation (NYSDEC) entered into an Order on Consent (Order), Index No. B9-0333-90-05 to perform a Remedial Investigation/Feasibility Study (RI/FS) for Keywell's VacAir Alloys Division Plant Site (Site) located in Frewsburg, New York. Implementation of the RI/FS work activities began in October 1992, as identified in the NYSDEC approved RI/FS Work Plan dated August 24, 1992 and modified by letters dated September 21, 1992, October 6, 1992, October 9, 1992 and November 10, 1992. Pursuant to the Order, this progress report has been prepared to summarize RI/FS activities implemented during the period of March 1, 1993 through May 31, 1993.

The quarterly progress report for the period of November 30, 1992 through February 28, 1993 was submitted to the NYSDEC on March 3, 1993. The NYSDEC provided comments on this quarterly report by letter dated April 7, 1993 and requested the installation of three additional monitoring wells. CRA, on behalf of Keywell, responded to the NYSDEC comments by letter dated April 28, 1993 and indicated that additional monitoring wells were not required. By letter dated May 5, 1993, the NYSDEC agreed that two of the three additional wells were unnecessary. The NYSDEC maintained their position that an off-site well, located on the west side of Frewsburg-Falconer Road near the Conewango Creek was necessary. By letter dated May 20, 1993, it was agreed that one additional well would be installed at this off-site location.

1.0 ACTIONS WHICH HAVE BEEN TAKEN TOWARD ACHIEVING COMPLIANCE WITH THE ORDER DURING THE PERIOD FROM MARCH 1, 1993 AND ENDING MAY 31, 1993

1.1 RI TASK 1 - PROJECT SPECIFICATION PLANS

This task was completed during the previous reporting quarter.

1.2 RI TASK 2 - COMMUNITY RELATIONS

No formal community relations activities were required during this reporting quarter.

1.3 RI TASK 3 - CURRENT SITUATION

Activities involving a description of the current situation are substantially completed. The information obtained during implementation of this task is currently being compiled in the RI Report.

1.4 RI TASK 4 - CONTRACTOR PROCUREMENT

Work under this task is complete.

1.5 RI - TASK 5 - SITE INVESTIGATION

Field work for this task is complete. The information obtained from the implementation of this task is being compiled by presentation in the RI Report.

The Biota Inventory was completed during this reporting period. Field work for this task is complete. A draft copy of the Biota Inventory Report, as provided by Fine Line Technical Services, is included in Attachment 1 of this letter.

As stated above, one additional well will be installed off-Site on the west side of Frewsburg-Falconer Road across from MW-4. Work on obtaining an access agreement for the proposed well installation began in May 1993.

1.6 RI TASK 6 - SAMPLE ANALYSES

Work on this task is complete. The information obtained from implementation of this task will be presented in the RI Report.

1.7 RI TASK 7 - DATA EVALUATION

Data evaluation of all data collected on Site is substantially complete. The results of the data evaluation will be presented in the RI Report.

1.8 RI TASK 8 - ASSESSMENT OF RISKS

1.8.1 Public Health Evaluation (PHE)

Work on the PHE and the environmental assessment began during this reporting quarter and included a site visit on May 7, 1993.

1.9 RI TASK 9 -
IDENTIFICATION OF PRELIMINARY ACTION OBJECTIVES

Work to develop a preliminary Remedial Action Objective (RAO) document for submission to the NYSDEC has been completed and was submitted to the NYSDEC under separate cover on March 1, 1993.

Comments on the RAO document were received from NYSDEC by Keywell by letter dated March 12, 1993. Keywell responded to the NYSDEC comments by letter dated March 30, 1993. NYSDEC responded to Keywell's comments by letter dated April 12, 1993. Keywell is preparing a final response to the NYSDEC comments.

1.10 RI TASK 10 -
PRELIMINARY EVALUATION FOR TREATABILITY STUDIES

The preliminary evaluation for treatability studies was completed during this reporting quarter. A preliminary evaluation for treatability studies document was submitted to the NYSDEC on March 31, 1993.

Comments to the preliminary evaluation for treatability studies were received by Keywell from the NYSDEC via a letter dated May 18, 1993. The preliminary evaluation of treatability studies has not yet been approved by the NYSDEC.

1.11 RI TASK 11 - RI REPORT

Preparation of a draft RI report for submission to the NYSDEC is continuing. The draft RI report is scheduled to be submitted to the NYSDEC in early July 1993.

1.12 FS TASKS

Work on the Feasibility Study (FS) tasks (see RI Tasks 9 and 10) has begun.

1.13 PROPOSED PROJECT SCHEDULE

At this time, all of the tasks associated with the RI/FS being performed at the VacAir Site have been completed on schedule. No project delays have occurred and it is anticipated that all deliverables required under the Order will be submitted according to the project schedule.

2.0 ANALYTICAL RESULTS OF SAMPLING AND TESTING AND OTHER DATA RECEIVED IN THE QUARTER FROM MARCH 1, 1993 TO MAY 31, 1993

No new analytical data were received during this reporting quarter.

A report from the Biota Inventory was received from Fine-Line Technical Services. A draft copy of this report is presented in Attachment 1.

3.0 SUMMARY OF DELIVERABLES SUBMITTED FROM MARCH 1, 1993

Deliverables submitted during this second reporting quarter consist of the following documents:

i) the first quarterly progress report dated March 3, 1993;

ii) "Remedial Investigation/Feasibility Study, Preliminary Remedial Action Objectives, Technical Memorandum No. 1", dated February 19, 1993;

iii) "Remedial Investigation/Feasibility Study, Preliminary Evaluation of Remedial Technologies and Need for Treatability Studies, Technical Memorandum No. 2", dated March 31, 1993; and

iv) associated correspondence related to the above-mentioned reports.

4.0 RI/FS ACTIVITIES SCHEDULED FOR THE QUARTER FROM JUNE 1,1993 TO AUGUST 31, 1993

4.1 RI TASK 1 - PROJECT SPECIFIC PLANS

Work on this task is complete. No future work is scheduled.

4.2 RI TASK 2 - COMMUNITY RELATIONS

No work on this task is scheduled for the next quarter.

4.3 RI TASK 3 - DESCRIPTION OF THE CURRENT SITUATION

Work is substantially completed.

4.4 RI TASK 4 - CONTRACTOR PROCUREMENT

Keywell has agreed to install an additional well. Attempts will be made to utilize the same contractors as the RI/FS, if possible.

4.5 RI TASK 5 - SITE INVESTIGATION

Keywell has agreed to install one additional monitoring well into the Water Table Aquifer at an off-Site location on the west side of Frewsburg-Falconer Road

across from MW-4. An access agreement for the installation and sampling of the proposed well is being obtained from the property owner. Upon receipt of the access agreement, the monitoring well will be installed and sampled for the Target Compound List (TCL) Volatile Organic Compounds (VOCs). Water levels in all existing Water Table Aquifer wells will be recorded at the time of sample collection. A slug test will also be performed in the new monitoring well. Installation of this well is tentatively scheduled for the week of June 14, 1993. The NYSDEC will be notified of the final date for the well installation.

All other work under this RI task has been substantially completed.

4.6 RI TASK 6 - SAMPLE ANALYSES

One groundwater sample will be collected from the newly installed well and analyzed for the TCL VOCs in accordance with the approved RI/FS Work Plan and QAPP.

4.7 RI TASK 7 - DATA EVALUATION

Data evaluation and presentation will be presented in the final RI/FS Report.

4.8 RI TASK 8 - ASSESSMENT OF RISKS

Work on the assessment of risks is ongoing and will be summarized in the final RI/FS Report.

4.9 RI TASK 9 - IDENTIFICATION OF PRELIMINARY REMEDIAL ACTION OBJECTIVES

This task is substantially complete. Discussions between Keywell and NYSDEC on finalization of the document is ongoing.

4.10 RI TASK 10 - PRELIMINARY EVALUATION FOR TREATABILITY STUDIES

This task is substantially complete. A final response by Keywell to the NYSDEC comments is being prepared.

4.11 RI TASK 11 - RI REPORT

Preparation of the RI Report is ongoing.

4.12 FEASIBILITY STUDY

Work on the FS is ongoing.

5.0 PERCENTAGE OF COMPLETION, DELAYS AND EFFORTS MADE TO MITIGATE DELAYS

Estimated percentage of completion (task by task).

A. RI Task 1 - 100 percent complete.

B. RI Task 2 - Participation will be provided on an as-needed basis.

C. RI Task 3 - 100 percent complete.

D. RI Task 4 - 100 percent complete.

E. RI Task 5 - 100 percent complete.

F. RI Tasks 6 and 7

i) Sample Analyses and Validation - 100 percent complete.

ii) Data Evaluation and Presentation - 80 percent complete. Data assessment, interpretation and reporting is ongoing.

G. RI Task 8 - Assessment of Risks - 75 percent complete.

H. RI Task 9 - Identification of Preliminary Remedial Action Objectives - 95 percent complete.

I. RI Task 10 - Preliminary Evaluation for Treatability Studies - 90 percent complete.

J. Task 11 - RI Report - The RI report is 70 percent complete. Data assessment, interpretation and reporting is ongoing.

K. Feasibility Study - The FS is 25 percent complete. Preparation for the FS is ongoing.

L. Additional Well Installation - zero percent complete. Work on this task is currently underway. Data/information obtained during installation and sampling of this well will be provided to the NYSDEC under separate cover in a letter report so that this work will not interfere with the completion of the RI Report.

There are no anticipated delays at this time.

If you have any questions on this matter, please contact the undersigned at 716-283-6720.

Yours very truly,

CONESTOGA-ROVERS & ASSOCIATES

WaiChin Lachell

WCL:js
cc: K. Watson, Piper & Marbury
M. Lozier, Keywell
D. Trostle, Keywell
Assistant Counsel, Division of Environmental Enforcement, NYSDEC
Director, Bureau of Env. Exposure Investigation, NYSDOH
Section Chief, Division of Haz. Waste Remediation, NYSDEC

ATTACHMENT 1

BIOTA INVENTORY AS PROVIDED BY

FINE-LINE TECHNICAL SERVICES

FISH AND WILDLIFE IMPACT ASSESSMENT
PHASE I

KEYWELL CORPORATION,
VACAIR ALLOYS DIVISION
FREWSBURG, NEW YORK

MARCH 1993

TABLE OF CONTENTS

1.0 INTRODUCTION

A biotic survey of selected areas in the vicinity of the Keywell Corporation, VacAir Alloys Division (Site) was conducted during August and September 1992. The purpose of the survey was to provide a qualitative description of fish and wildlife resources that may be or may have been significantly affected by Site conditions, and to provide appropriate information to support a qualitative risk assessment to identified resources. This survey was performed in accordance with Step I of the New York State Department of Environmental Conservation (NYSDEC) guidance document titled "Fish and Wildlife Impact Analysis for Inactive Hazardous Waste Sites", dated June 18, 1991.

This report provides topographic and vegetation covertype maps and descriptions of fish and wildlife resources within selected areas in the vicinity of the Site.

2.0 SITE DESCRIPTION

For purposes of this survey, the Site was considered to be the fifteen acre parcel of developed land owned by Keywell Corporation, VacAir Alloys Division located near the Village of Frewsburg, New York. This 15 acre parcel of developed land is a portion of the 93 acres of land that Keywell Corporation owns at this location. The remaining 78 acres consist of undeveloped low lying land consisting of a variety of forested and more open community types.

2.1 TOPOGRAPHIC MAP

The Site Topographic Map (Figure 2.1) indicates the location of the Site and fish and wildlife resources documented by NYSDEC in the area within two miles of the perimeter of the Site. The map was prepared from New York State Freshwater Wetland maps titled "Jamestown, N.Y.", and "Ivory, N.Y.". Major documented natural features such as streams, open water, and freshwater wetlands within this area were identified

through consultation with NYSDEC Staff and review of other existing agency resource information.

2.1.1 Fish and Wildlife Resources Within Two Miles of the Site

A number New York State Freshwater Wetlands and mapped federal wetland areas occur in the area within two miles of the the Site. Boundaries of mapped New York State freshwater wetlands are shown on Figure 2.1. New York State Freshwater Wetlands occurring in this area are listed below:

NY STATE WETLAND	CLASSIFICATION
JA-1	Class I
JA-2	Class I
JA-4	Class I
JA-6	Class I
JA-7	Class II
JA-8	Class II
JA-9	Class 1
JA-10	Class II
JA-17	Class I

A number of mapped federal wetlands also occur in this area. These areas were identified from the United States Fish and Wildlife Service, National Wetland Inventory maps titled "Jamestown, NY", and "Ivory, N.Y." and are shown on Figure 2.2. Federal wetlands are classified according to ecological system, covertype, and water regime. Federal wetlands with the following classifications are identified within this area:

FEDERAL WETLAND CLASSIFICATION	DESCRIPTION
PFO1A	Palustrine, Forested, Broad leaf deciduous, Temporary
PFO1E	Palustrine, Forested, Broad leaf deciduous, Seasonally saturated
PFO1C	Palustrine, Forested, Broad leaf deciduous, Seasonal
PEM5F	Palustrine, Emergent, Narrow leaved persistent, Semipermanent
PSS1C	Palustrine,scrub/shrub, Broad leaf deciduous, Seasonal
POWZ	Palustrine, Open water, Unknown water regime
PSSIE	Palustrine, scrub/shrub, Broad leaf deciduous, Seasonally, saturated
PEM5C	Palustrine, emmergent, Broad leaved non-persistent, Seasonal
PSS1/ EM5E	Palustrine, scrub/shrub, Broad leaved deciduous, /emergent, Narrow leaved persistent, Seasonally saturated
POWZX	Palustrine, Open water, unknown water regime, Excavated

In addition to the main channel, a number of tributaries to Conewango Creek occur within a two mile radius of the Site Boundary. These tributaries are identified on Figure 2.1 and are listed below:

INDEX NO.	NAME	CLASS	STANDARD
PA 63-12	Cass Run	C	C
PA 63-11 11A, 11A-1	Tributaries to Conewango Cr.	C	C
PA 63-10	Boy Scout Cr.	C	C
PA 63-6,7, 8, and 9	All tributaries between Stillwater and Boy Scout Creeks	C	C
PA 63-5	Stillwater Creek	C	C
PA 63-4	Frews Run	B	B

2.1.2 Fish and Wildlife Resources More than Two Miles Downstream from the Site

Major natural resources more than two miles downstream from the perimeter of the Site include freshwater wetlands and tributaries to Conewango Creek. Mapped New York State Freshwater Wetlands in this area include JA-14, JA-15, and JA-16.

Tributaries to Conewango Creek occurring more than two miles downstream of the Site are identified below:

INDEX NO.	NAME	CLASS	STANDARD
PA 63-3B	Black Ash Creek	C	C(t)
PA 63-3A	Tributary of Conewango	C	C

INDEX NO.	NAME	CLASS	STANDARD
PA 63-3	Kiantone Creek	C	C
PA 63-2	Tributary of Conewango	C	C
PA 63-1 & Tributaries	Wiltsie Run (enters Conewango in PA)	C	C

2.2 VEGETATION COVERTYPE MAPPING

The Vegetation Covertype Map presented as Figure 2.3 indicates natural vegetative covertypes and locations of field survey observation points in the area within a one half mile radius of the Site perimeter. The map was prepared from interpretation of aerial photographs, review of agency resource information, and observations made during field reconnaissance. Detailed field data sheets and photographs corresponding to numbered locations on the Vegetation Covertype Map are presented in Appendix B.

Mapping units for the Vegetation Covertype Map are based on discrete community types and are identified in accordance with descriptions and classifications used by the New York Natural Heritage Program (NHP). It should be noted that covertype boundary locations are based on interpretation of recent aerial photographs and are approximate. No attempt was made to delineate jurisdictional wetland areas during the field survey.

3.0 FISH AND WILDLIFE RESOURCES

Fish and wildlife resources in the vicinity of the Site include components of riverine, lacustrine, palustrine, and terrestrial systems. These components are identified as distinct community types based

on descriptions of the New York Natural Heritage Program (Reschke, 1990). No unique covertypes, not described by the Natural Heritage Program, were identified through review of agency resource information or during the field survey. The following describes fish and wildlife resources of natural communities that occur on the Site and within a one half mile radius of the perimeter of the Site.

3.1 RIVERINE SYSTEMS

"Main Channel Stream"

A segment of Conewango Creek occurs in the proximity of the Site. The Creek flows from north to south and is tributary to the Allegheny River entering near Warren, Pennsylvania. Conewango Creek in the vicinity of the Site is classified by NYSDEC as a Class "C" Stream.

The portion of Conewango Creek in the vicinity of the Site exhibits typical "main channel stream" characteristics. The stream channel is approximately 75 feet wide and includes several clearly defined meanders. The course of the channel in the area is well defined within steeply sloping banks composed of silty clay. No exposed depositional bars were observed in the channel during field reconnaissance of the area approximately one half mile upstream of the Site to approximately two miles downstream. The streambed substrate was not examined during field reconnaissance. Information obtained from NYSDEC studies of similar areas within the watershed indicate mixed substrates composed of gravel, rubble, and mud.

Flow conditions and water depths in the Creek are seasonally variable with high water conditions occuring in spring and fall. Under base flow conditions the flow is sluggish with no distinct riffles. Evidence of periodic high water conditions including out of bank flow was observed during field reconnaissance as debris drift and sediment deposits on streamside vegetation.

Information obtained from NYSDEC regarding water quality of the Creek is limited to qualitative observations recorded during fish

collections conducted in similar upstream and downstream areas in the watershed. This information is most reflective of base flow conditions and indicates highly turbid conditions. Data sheets from NYSDEC Fish Collection or Small Stream Surveys are presented in Appendix A.

Seasonally variable water depths and highly turbid water conditions inhibit the growth of submergent aquatic vegetation in the area. None was observed during the field survey.

"Marsh Headwater Stream"

Tributaries "11A" and "11A-1" enter Conewango Creek at a common outlet approximately 1500 feet upstream of the Route 55 highway bridge located adjacent to the Site. These tributaries are classified by NYSDEC as Class "C" waters.

Characteristics observed in these creeks during the field survey were typical of "marsh headwater stream" conditions. Representative areas exhibit widths of approximately five feet and average (base flow) water depths of one foot or less. The stream bed is low gradient with well developed pools and riffles. The substrate is mixed consisting of silt, sand, and gravel. Observations of debris drift and high water marks indicate that the flow regime is variable and surrounding areas may be periodically inundated. Low flow and clear water conditions were observed during the field survey. No water quality information specific to these tributaries was found during review of NYSDEC file information.

Establishment of submergent aquatic vegetation in these tributaries is limited by variations in water levels and shading by overhanging vegetation cover. Water cress *(Nasturtium officinale)*, and duckweed *(Lemna minor)* were observed in areas having a more open canopy.

3.2 LACUSTRINE SYSTEMS

"Eutrophic Pond"

One perennial naturally occurring pond was identified approximately 2000 feet north of the Site boundary. The open water area of the pond is estimated to be approximately seven acres. It is likely that adjacent low areas and the pond site are inundated during high water events in Conewango Creek. No surface water inlets or outlets were observed during the field survey.

Little information regarding physical and chemical water quality characteristics of this water body are available. The pond appeared to exhibit characteristics consistent with eutrophic conditions during the field reconnaissance. Conditions observed include tannin stained water and a near shore substrate of soft muck. Characteristic aquatic vegetation of the area include, coontail (*Ceratophyllum demersum*), pond lily (*Nuphar advena*), and pondweed (*Potamogeton* spp.).

"Artificial Pond"

One "artificial pond" occurs within the boundaries of the Site. The pond covers an area of approximately three acres. No physical or chemical data are available for this pond system. Water clarity observed during the field survey was high. The near shore substrate consists of sand. Submergent aquatic vegetation is limited to the shallow near-shore area and is dominated by coontail and pondweed. The pond banks are steeply sloped and are vegetated with species typical of emergent marsh/wet meadow communities such as rushes, sedges, cattail, and other hydrophytic vegetation.

3.3 PALUSTRINE SYSTEMS

Major community types occurring in the palustrine system in the Site vicinity are open mineral soil wetlands and forested mineral soil wetlands. Communities characteristic of open wetlands are "shallow emergent marsh" and "shrub swamp". Forested wetlands in the Site area are dominated by "floodplain forest" with the exception of one small area that can be characterized as "hemlock-hardwood swamp". At many

locations the covertypes that characterize these wetland communities intergrade with each other and with more upland covertypes. No attempt was made to delineate wetland boundaries for jurisdictional purposes during the field survey. Descriptions of these community types are presented below:

"Shallow Emergent Marsh"

Communities in the vicinity of the Site described as "shallow emergent marsh" are dominated by hydrophytic vegetation, occur on nearly level hydric soils, and are saturated or inundated during a portion of the growing season. Shallow emergent marsh communities in the Site area commonly intergrade with shrub swamp and successional old field communities . Representative vegetation typical of shallow emmergent marsh communities identified during the field survey is presented below:

Common name	Scientific Name
	Shrubs
Black Willow	*Salix nigra*
Arrowwood	*Viburnum dentatum*
Red Osier Dogwood	*Cornus stolonifera*
Silky Dogwood	*Cornus amomum*
Meadowsweet	*Spirea alba*
	Herbs
Broadleaf Cattail	*Typha latifolia*
Rice Cutgrass	*Leersia oryzoides*
Reed Canary Grass	*Phalaris arundinacea*
Bluejoint	*Calamagrostis canadensis*
Burr Reed	*Sparganium americanum*
Wild Mint	*Mentha arvensis*
Purpleleaf Willow-herb	*Epilobium coloratum*
Pinkweed	*Polygonum pensylvanicum*
Common Smartweed	*Polygonum hydropiper*

Herbs (Cont.)

Arrow-leaved Tearthumb	*Polygonum sagittatum*
Tickseed Sunflower	*Bidens coronata*
Grass-leaved Goldenrod	*Euthanium graminifolia*
Swamp Goldenrod	*Solidago uliginosa*
Boneset	*Eupatorium perfoliatum*
Spotted Joe-pye Weed	*Eupatorium maculatum*
Jewelweed	*Impatiens capensis*
Blue vervain	*Verbena hastata*
Tall Nettle	*Urtica procera*
Sensitive Fern	*Onoclea sensibilis*
Water Plantain	*Alisma subcordatum*
Skunk Cabbage	*Symplocarpus foetidus*
Soft Rush	*Juncus effusus*
Lurid Sedge	*Carex lurida*
Spike Rush	*Eleocharis* spp.
Woolgrass	*Scirpus cyperinus*
Bladder Sedge	*Carex intumescens*

"Shrub Swamp"

Communities in the vicinity of the Site described as "shrub swamp" are dominated by hydrophytic woody shrub species, occur on nearly level hydric soils, and are saturated or inundated during a portion of the growing season. The shrub swamp communities identified in the Site area occur in similar areas and contain many of the same plant species as emergent marsh and wooded swamp communities. Representative vegetation typical of "shrub swamp" communities identified during the field survey is presented below:

Common Name	Scientific Name
Trees	
Silver Maple	*Acer saccharinum*
Red Maple	*Acer rubrum*
Black Willow	*Salix nigra*
Shrubs	
Black Willow	*Salix nigra*
Meadowsweet	*Spirea alba*
Tag Alder	*Alnus serrulata*
Silky Dogwood	*Cornus amomum*
Buttonbush	*Cephalanthus occidentalis*
Silver Maple	*Acer saccharinum*
Slippery elm	*Ulmus rubra*
Arrowwood	*Viburnum dentatum*
Herbs	
Common Smartweed	*Polygonum hydropiper*
Arrowleaved Tearthumb	*Polygonum sagittatum*
Grass-leaved Goldenrod	*Euthania graminifolia*
Tickseed Sunflower	*Bidens coronata*
Bladder Sedge	*Carex intumescens*
Reed Canary Grass	*Phalaris arundinacea*
Rice Cut Grass	*Leersia oryzoides*
Bluejoint	*Calamagrostis canadensis*
Boneset	*Eupatorium perfoliatum*
Purpleleaf Willow-herb	*Epilobium coloratum*
Wild Mint	*Mentha arvense*
Burreed	*Sparganium americanum*
Tall Nettle	*Urtica procera*
Sensitive Fern	*Onoclea sensibilis*
Northern Water Plantain	*Alisma subcordatum*

Herbs (Cont.)	
Broadleaf Cattail	*Typha latifolia*
Spotted Joe-pye Weed	*Eupatorium maculatum*
Soft Rush	*Juncus effusus*
Common Reed	*Phragmites australis*
Woolgrass	*Scirpus cyperinus*
Sedge species	*Carex* spp.

"Floodplain Forest"

Low lying wooded areas contiguous with the main channel of Conewango Creek and its tributaries contain forested mineral soil wetlands dominated by "floodplain forest" communities. Watermarks on trees, water stained leaves, and other indirect evidence of inundation observed during the field survey are indicative of seasonal flooding in these communities. Evidence of historical and ongoing logging was observed at a number of locations within this covertype.

The "floodplain forest" is a broadly defined community type. The vegetation of these communities in the vicinity of the Site is dominated by deciduous hardwood trees. The shrub and herbaceous understory layers are relatively open. Representative plant species of this community are presented below:

Common Name	Scientific Name
Trees	
Silver Maple	*Acer saccharinum*
Red Maple	*Acer rubrum*
Black Ash	*Fraxinus nigra*
Green Ash	*Fraxinus pennsylvanica*
Black Willow	*Salix nigra*
White Oak	*Quercus bicolor*

Trees (Con.)

Shagbark Hickory	*Carya ovata*
American Basswood	*Tilia americana*

Shrubs

Spicebush	*Lindera benzoin*
Arrowwood	*Viburnum dentatum*
Ironwood	*Ostrya virginiana*

Herbs

Jewell Weed	*Impatiens capensis*
Sensitive Fern	*Onoclea sensibilis*
Cinnamon Fern	*Osmunda cinnamomea*
Skunk Cabbage	*Symplocarpus foetidus*
Moneywort	*Lysimachia nummularia*
Clear Weed	*Pilea pumila*
Jumpseed	*Tovara virginiana*
Wood Aster	*Aster divaricatus*
White Avens	*Geum canadense*
Bladder Sedge	*Carex intumescens*
Cardinal Flower	*Lobelia cardinalis*

"Hemlock-hardwood Swamp"

One small area located to the east of the Site is identified on the covertype map as "Hemlock-hardwood swamp". Indirect evidence of seasonal flooding of the area included stained leaves and adventitious roots. Soils in the area were saturated to the surface during the field survey. Vegetation characteristics of this community type include a dense evergreen

canopy and relatively reduced shrub and herbaceous layers. Representative vegetation of this area includes:

Common Name	Scientific Name
Trees	
Eastern Hemlock	*Tsuga canadensis*
Yellow Birch	*Betula lutea*
Red Maple	*Acer rubrum*
White Pine	*Pinus strobus*
Shrubs	
Witch Hazel	*Hamamelis virginiana*
Herbs	
Cinnamon Fern	*Osmunda cinnamomea*
Skunk Cabbage	*Symplocarpus foetidus*

3.4 TERRESTRIAL SYSTEMS

Terrestrial communities in the vicinity of the Site are characterized by of a variety of naturally occurring and culturally influenced covertypes. Many terrestrial communities in the area have been modified to some degree by human activities. "Natural" areas contain successional communities composed of open covertypes, such as old field and shrubland, and wooded areas typified by successional northern hardwood forest and rich mesophytic forest. These areas have been altered to some degree by activities such as logging, and past agricultural and earth moving practices. Natural terrestrial communities identified in the vicinity of the Site are described below:

"Successional Old Field"

"Successional old field communities" occur in areas that may have been farmed, used as pasture land, and on filled land. The boundaries of old field communities may be marked by relic fence lines or hedgerows but more commonly occur in a transition zone with successional shrub and emergent marsh covertypes. Vegetation of these areas is dominated by grasses and forbs. Shrub species present comprise less than fifty percent of cover. Though portions of these communities may be seasonally flooded, they are not regularly inundated for prolonged periods during the growing season and are not dominated by hydrophytic vegetation. Plant species characteristic of "successional old field" communities in the vicinity of the Site are presented below:

Common Name	Scientific Name
	Shrubs
Meadowsweet	*Spirea alba*
Multiflora Rose	*Rosa multiflora*
Willow	*Salix* spp.
Quaking Aspen	*Populus tremuloides*
Silky Dogwood	*Cornus amomum*
	Herbs
Tall Goldenrod	*Solidago altissima*
Grass-leaved Goldenrod	*Euthania graminifolia*
Common Cinquefoil	*Potentila simplex*
Wild Strawberry	*Fragaria virginiana*
Birdfoot Trefoil	*Lotus corniculatus*
Queen Anns Lace	*Daucus carota*

Herbs (Cont.)	
Red Clover	*Trifolium pratense*
Black-eyed Susan	*Rudbeckia serotina*
Timothy	*Phleum pratense*
Heal-all	*Prunella vulgaris*

"Successional Shrubland"

"Successional shrubland" communities occur in locations and under conditions similar to successional old field communities. This community type is broadly defined and is a transitional stage between old field and wooded communities. Successional shrublands are typified by covertypes containing more than fifty percent shrub species and less than fifty percent trees. Plant species representative of "successional shrubland" in the vicinity of the Site are presented below:

Common Name	Scientific Name
Trees	
Quaking Aspen	*Populus tremuloides*
Eastern Cottonwood	*Populus deltoides*
Red Maple	*Acer rubrum*
Shrubs	
Meadowsweet	*Spirea alba*
Multiflora Rose	*Rosa multiflora*
Willow	*Salix* spp.
Silky Dogwood	*Cornus amomum*
Common Blackberry	*Rubus allegheniensis*
Herbs	
Tall Goldenrod	*Solidago altissima*
Grass-leaved Goldenrod	*Euthania graminifolia*

Herbs (Cont.)	
Common Cinquefoil	*Potentila simplex*
Queen Anns Lace	*Daucus carota*
Black-eyed Susan	*Rudbeckia hirta*
Timothy	*Phleum pratense*
Heal-all	*Prunella vulgaris*

"Successional Northern Hardwood Forest"

"Successional northern hardwood forest" conditions occur in areas that have been historically disturbed by clear cutting, farming, or other disturbances. This is a broadly defined community type composed of species adapted to establishment on disturbed soils. Dominant trees of the forest canopy are sun-tolerant species with wind dispersed seeds. The shrub and herb species present are characteristic of successional shrub and successional old field communities. Plant species characteristic of "successional northern hardwood forest" communities in the vicinity of the Site are presented below:

Common Name	Scientific Name
Trees	
Quaking Aspen	*Populus tremuloides*
Eastern Cottonwood	*Populus deltoides*
Red Maple	*Acer rubrum*
Black Cherry	Prunus serotina
White Pine	Pinus strobus
Shrubs	
Multiflora Rose	*Rosa multiflora*
Willow	*Salix* spp.
Silky Dogwood	*Cornus amomum*
Common Blackberry	*Rubus allegheniensis*

Shrubs (Cont.)

Arrowwood	*Viburnum dentatum*
Ironwood	*Ostrya virginiana*
Staghorn Sumac	*Rhus typhina*
Honeysuckle	*Lonicera* spp.

Herbs

Tall Goldenrod	*Solidago altissima*
Queen Anns Lace	*Daucus carota*
Timothy	*Phleum pratense*
Heal-all	*Prunella vulgaris*
White Avens	*Geum canadense*

"Rich Mesophytic Forest"

"Rich mesophytic forest" conditions occur in locations with moist well-drained soils. This is a rather broadly defined community typically containing a number of co-dominant tree species. Plant species found in this community type in the Site area are presented below:

Common Name	Scientific Name
Trees	
Quaking Aspen	*Populus tremuloides*
Eastern Cottonwood	*Populus deltoides*
Red Maple	*Acer rubrum*
Silver Maple	*Acer saccharinum*
Black Cherry	*Prunus serotina*
White Pine	*Pinus strobus*
Shagbark Hickory	*Carya ovata*
American Basswood	*Tilia americana*
Ironwood	*Ostrya virginiana*
American Elm	*Ulmus americana*
White Ash	*Fraxinus americana*

Shrubs	
Arrow Wood	*Viburnum dentatum*
Honeysuckle	*Lonicera canadensis*
Staghorn Sumac	*Rhus typhina*

Herbs	
White Avens	*Geum canadense*
Sensitive Fern	*Onoclea sensibilis*
Moneywort	*Lysimachia nummularia*
Jumpseed	*Tovara virginiana*

4.0 FAUNA EXPECTED WITHIN EACH COVERTYPE

The fish and wildlife species that may be associated with habitats within the vicinity of the Site were determined through review of NYSDEC file information, standard natural history references, and from observations during field reconnaissance. NYSDEC information sources included, Region 9 Bureau of Wildlife, Region 9 Division of Fisheries, and the New York Natural Heritage Program, Wildlife Resources Center. References used are presented in Appendix C.

It should be noted that information regarding the specific occurence of some wildlife species in the vicinity of the Site is not available. The species listed as expected to occur in association with covertypes found in the Site vicinity is not intended to be all-inclusive.

4.1 RIVERINE SYSTEMS

Species that utilize the main channel of Conewango Creek and its tributaries include fish and other water dependant wildlife. The fish species present in the Site area may be considered as characteristic of the Allegheny River drainage. Though little fisheries information is available for locations within the specific Site vicinity, the results of NYSDEC fishery collections in similar areas within the Conewango Creek water shed may be

representative of the Site area. Fish species that may occur in the vicinity of the Site are presented below:

Common Name	Scientific Name
Fish	
Allegheny Brook Lamprey	*Ichthyomyzon greeleyi*
American Brook Lamprey	*Lampetra lamottei*
Longnose Gar	*Lepisosteus osseus*
Cisco	*Coregonus artedii*
Rainbow Trout	*Salmo gardneri*
Brown Trout	*Salmo trutta*
Brook Trout	*Salvelinus fontinalis*
Northern Pike *	*Esox lucius*
Muskellunge *	*Esox masquinongy*
Grass Pickerel *	*Esox americanus*
Central Mudminnow *	*Umbra limi*
Carp*	*Cyprinus carpio*
Goldfish	*Carassius auratus*
Stoneroller *	*Campostoma anomalum*
Golden Shiner	*Notemigonus crysoleucas*
River Chub *	*Nocomis micropogon*
Bigeye Chub *	*Hybopsis amblops*
Streamline Chub	*Hybopsis dissimilis*
Tonguetied Minnow *	*Exoglossum laurea*
Redside Dace	*Clinostomus elongatus*
Sand Shiner *	*Notropis stramineus*
Emerald Shiner *	*Notropis atherinoides*
Blacknose Shiner	*Notropis heterolepis*
Spottail Shiner	*Notropis hudsonius*
Spotfin Shiner	*Notropis spilopterus*
Blackchin Shiner	*Notropis heterodon*
Mimic Shiner *	*Notropis volucellus*
Bigmouth Shiner	*Notropis dorsalis*

Fish (Cont.)

Common Shiner *	*Notropis cornutus*
Striped Shiner	*Notropis chrysocephalus*
Silver Shiner	*Notropis photogenis*
Rosyface Shiner *	*Notropis rubellus*
Steelcolor Shiner *	*Notropis whipplii*
Finescale Darter	*Phoxinus neogaeus*
Northern Redbelly Dace	*Phoxinus eos*
Bluntnose Minnow*	*Pimephales notatus*
	(Hyborhynchus notatus)
Fathead Minnow	*Pimephales promelas*
Blacknose Dace *	*Rhinichthys atratulus*
Longnose Dace	*Rhinichthys cataractae*
Creek Chub *	*Semotilus atromaculatus*
Pearl Dace	*Semotilus margarita*
Quillback *	*Carpiodes cyprinus*
White Sucker *	*Catostomus commersoni*
Northern Hog Sucker *	*Hypentelium nigricans*
Redhorse species *	*Moxostoma* spp.
River Redhorse *	*Moxostoma carinatum*
Silver Redhorse *	*Moxostoma anisurum*
Golden Redhorse *	*Moxostoma erythrurum*
Shorthead Redhorse	*Moxostoma macrolepidotum*
Black Redhorse	*Moxostoma duquesnei*
Yellow Bullhead *	*Ictalurus natalis*
Brown Bullhead *	*Ictalurus nebulosus*
	(Ameiurus nebulosus)
Stonecat	*Noturus flavus*
Brindled Madtom	*Noturus miurus*
Troutperch *	*Percopsis omiscomaycus*
Burbot	*Lota lota*
Banded Kilifish	*Fundulus diaphanus*
Brook Silversides	*Labidesthes sicculus*

Fish (Cont.)

Brook Stickleback	*Culaea inconstans*
Mottled Sculpin	*Cottus bairdi*
Slimy Sculpin	*Cottus cognatus*
Rock Bass	*Ambloplites rupestris*
Pumpinseed *	*Lepomis gibbosus*
Bluegill *	*Lepomis macrochirus*
Smallmouth Bass *	*Micropterus dolomieui*
Largemouth Bass *	*Micropterus salmoides*
	(Huro salmoides)
White Crappie *	*Pomoxis annularis*
Black Crappie*	*Pomoxis nigromaculatus*
	(Pomoxis sparoides)
Greenside Darter *	*Etheostoma blennioides*
Rainbow Darter	*Etheostoma caeruleum*
Iowa Darter	*Etheostoma exile*
Fantail Darter *	*Etheostoma flabellare*
	(Catonotus fabellaris)
Spotted Darter	*Etheostoma maculatum*
Johnny Darter*	*Etheostoma nigrum*
	Boleosoma nigrum
Variegated Darter	*Etheostoma variatum*
Banded Darter*	*Etheostoma zonale*
	(Poecilichthys zonalis)
Logperch *	*Percina caprodes*
Gilt Darter	*Percina evides*
Longhead Darter	*Percina macrocephalia*
Blackside Darter*	*Percina maculata*
	(Hadroperus maculatus)
Yellow Perch *	*Perca flavescens*
Walleye *	*Sitzostedion vitreum*

From: "Fishes of New York" (Werner, 1980) and/or reported from NYSDEC collections (*).

Water dependant wildlife that utilize resources of riverine systems for all or a portion of their life cycles include some mammals, birds, reptiles, and amphibians. The species known to be present (*) and other indigenous species that may occur in the Site vicinity are presented below:

Common Name	Scientific Name	NY State Protective Status
Amphibians		
Bullfrog	*Rana catesbeiana*	Game species
Green Frog	*Rana clamitans*	Game species
Wood Frog	*Rana sylvatica*	Game species
Pickerel Frog	*Rana palustris*	Game species
Reptiles		
Snapping Turtle	*Chelydra serpentina*	Unprotected
Northern Water Snake	*Nerodia sipedon*	Unprotected
Birds		
Woodduck *	*Aix sponsa*	Game species
Mallard *	*Anas platyrhynchos*	Game species
Great Blue Heron *	*Ardea herodias*	Protected
Green Backed Heron *	*Butorides striatus*	Protected
Hooded Merganser *	*Lophodytes cucullatus*	Game species
Osprey *	*Pandion haliaetus*	Threatened
Mammals		
Beaver *	*Castor canadensis*	Game species
Muskrat *	*Ondatra zibethicus*	Game species
Mink *	*Mustela vison*	Game species

From: NYSDEC Region 9 Bureau of Wildlife (*), and "Checklist of the Amphibians, Reptiles, Birds, and Mammals of New York State, Including Their Protective Status" (NYSDEC, 1987).

4.2 LACUSTRINE SYSTEMS

Wildlife species that can be expected to utilize covertypes found in lacustrine systems in the vicinity of the Site include fish and other water dependant wildlife. Covertypes that support these communities include a natural pond system located north of the Site and an artificial pond located on the Site.

"Eutrophic Pond"

The natural pond system may be flooded during high water conditions in Conewango Creek and is therefore likely to support a similar fish assemblage. No data specific to this pond system was found during review of agency resource information.

Other water dependant wildlife expected to utilize this resource would include amphibians, reptiles, birds, and mammals. As with fish, the amphibian and reptile species of this area may be similar to those found in the riverine systems in the vicinity of the Site.

Due to its relatively large open water surface, this area may provide attractive habitat for a number of migratory waterfowl species known to transit the area. Waterfowl species that may use this area include:

Common Name	Scientific Name	NY State Protective Status
Birds		
Woodduck	*Aix sponsa*	Game species
Mallard	*Anas platyrhynchos*	Game species
Black Duck	*Anas rubripes*	Game species
Great Blue Heron	*Ardea herodias*	Protected
Green Backed Heron	*Butorides striatus*	Protected
Hooded Merganser	*Lophodytes cucullatus*	Game species
Osprey	*Pandion haliaetus*	Threatened
Canada Goose	*Branta canadensis*	Game species

Birds (Cont.)

Tundra Swan	*Cygnus columbianus*	Protected
Woodcock	*Scolopax minor*	Game species
Common Snipe	*Capella gallainago*	Unlisted
Redwing Blackbird	*Agelaius phoeniceus*	Protected

Mammals that may utilize this pond system would include: muskrat (*Ondatra zibethicus*), beaver (*Castor canadensis*), and raccoon (*Procyon lotor*).

"Artificial Pond"

The artificial pond located on the Site can be considered to provide limited habitat for wildlife. Bass (*Micropterus* spp.) were observed in the pond during field reconnaissance. It is likely that these fish species were introduced. The pond may also attract migratory waterfowl. However due to the extensive availability of more suitable habitat in the Site vicinity the use of this area by waterfowl may not be significant.

4.3 PALUSTRINE SYSTEMS

Communities identified as components of the palustrine system in the Site vicinity include, shallow emergent marsh, shrub swamp, floodplain forest, and hemlock-hardwood swamp. These communities are transitional between upland and aquatic communities and exhibit a seasonally variable water regime. These communities may be flooded during spring and fall and may be relatively dry during other seasons. Therefore these areas may meet habitat requirements for aquatic and water dependant species during flooded periods and for more upland species during lower water periods.

"Shallow Emergent Marsh"

"Shallow emergent marsh" communities may be sufficiently inundated during spring high water conditions to provide spawning habitat for fish species known to occur in the area including

northern pike (*Esox lucius*), muskellunge, (*Esox masquinongy*), and grass pickerel (*Esox americanus*).

When flooded during spring and fall, this covertype may also provide nesting, resting, and feeding habitat for water dependant birds including migratory waterfowl. Species that may utilize emergent marsh during high water periods include:

Common Name	Scientific Name	NY State Protective Status
Birds		
Woodduck	*Aix sponsa*	Game species
Mallard	*Anas platyrhynchos*	Game species
Black Duck	*Anas rubripes*	Game species
Great Blue Heron	*Ardea herodias*	Protected
Green Backed Heron	*Butorides striatus*	Protected
Hooded Merganser	*Lophodytes cucullatus*	Game species
Osprey	*Pandion haliaetus*	Threatened
Canada Goose	*Branta canadensis*	Game species
Tundra Swan	*Cygnus columbianus*	Protected
Woodcock	*Scolopax minor*	Game species
Common Snipe	*Capella gallainago*	Unlisted
Redwing Blackbird	*Agelaius phoeniceus*	Protected

Other wildlife that can be expected to utilize emergent marsh areas for at least a portion of their life cycles include amphibian and reptile species. No site specific information regarding the occurence of these species was found during review of agency resource information. Species that can be expected to occur in the area would include species typical of the region. These would include the following species:

Common Name	Scientific Name	NY State Protective Status
	Amphibians	
Bullfrog	*Rana catesbeiana*	Game species
Green Frog	*Rana clamitans*	Game species
Wood Frog	*Rana sylvatica*	Game species
Pickerel Frog	*Rana palustris*	Game species
	Reptiles	
Snapping Turtle	*Chelydra serpentina*	Unprotected
Northern Water Snake	*Nerodia sipedon*	Unprotected

Mammals that may occur in emergent marsh communities in the Site vicinity include, muskrat (*Ondatra zibethicus*), white-tailed deer (*Odocoileus virginianus*), and raccoon (*Procyon lotor*).

"Shrub Swamp"

As is the case with emergent marsh areas, shrub swamp communities in the vicinity of the Site may also be periodically inundated and may provide spawning habitat for Esocid species. Though the dominance of shrub vegetation would limit utilization by waterfowl, conditions in these areas are attractive to a diverse population of passerine bird species. It is likely that the bird population would include resident and migratory species representative of the region. Among species likely to be present would include approximately thirty warbler species, more than ten sparrow species and a number of vireos.

"Floodplain Forest"

Wildlife that can be expected to occur in "floodplain forest" communities in the vicinity of the Site include amphibians, reptiles, birds, and mammals. Floodplain forest areas are inundated during the spring

and fall. This covertype is not the preferred spawning habitat of pike and pickerel though these species may migrate through to and from spawning areas in emergent marsh and flooded meadow areas.

Characteristic wildlife species of "floodplain forest" communities in the vicinity of the Site include:

Common Name	Scientific Name	NY State Protective Status
Birds		
Yellow Warbler	*Dendroica petechia*	Protected
Louisiana Waterthrush	*Seiurus motacilla*	Protected
Alder Flycatcher	*Empidonax alnorum*	Protected
Blue-gray Gnatcatcher	*Polioptila caerulea*	Protected
Wood Duck	*Aix sponsa*	Game species
Green-backed Heron	*Butorides striatus*	Protected
Barred Owl	*Strix varia*	Protected
Mammals		
Beaver	*Castor canadensis*	Game species
Mink	*Mustela vison*	Game species

"Hemlock-Hardwood Swamp"

A small area located east of the Site is characterized as "Hemlock-hardwood swamp" covertype. Characteristic bird species of this community type include the golden-crowned kinglet (*Regulus satrapa*) and American woodcock (*Scolopax minor*).

4.4 TERRESTRIAL SYSTEMS

Terrestrial covertypes occurring in the vicinity of the Site include: successional old field, successional shrub, successional northern

hardwood forest and rich mesophytic forest. These areas are dominated by upland community types though lower lying areas may be temporarily inundated during the highest flood conditions. Wildlife species that can be expected to occur in these covertypes are presented below:

"Successional Old Field"

Wildlife species that can be expected to occur in old field communities include, amphibians, reptiles, birds, and mammals. No site specific information regarding the occurence of reptiles in the Site vicinity was found during review of agency resource information. Amphibian and reptile species that can be expected to occur in these covertypes would consist of indigenous species including, American toad (*Bufo americanus*), and snakes including the common garter snake (*Thamnophis sirtalis*).

Characteristic bird species likely to occur in old field areas in the vicinity of the Site include hawks and owls including, northern harrier (*Circus cyaneus*), sharp-shinned hawk (*Accipiter striatus*), Red-tailed hawk (*Buteo jamaicensis*), rough-legged hawk (*B. lagopus*) American kestrel (*Falco sparverius*), great horned owl (*Bubo virginianus*), and northern saw-whet owl (*Aegolius acadicus*). Other bird species that can be expected to occur in this habitat include a large variety of passerine species also found in nearby shrub habitats.

Mammal species that can be expected to occur in old field habitats in the Site vicinity include small resident mammals with limited territorial ranges such as mice and voles, and larger more freely ranging mammals that exploit a variety of covertypes such as white-tailed deer. Mammal species expected to occur in this habitat are presented below:

Common Name	Scientific Name	NY State Protective Status
Deer Mouse	*Peromyscus maniculatus*	Unprotected
Meadow Vole	*Microtus pennsylvanicus*	Unprotected
House Mouse	*Mus musculus*	Unprotected

Mammals (Cont.)

Eastern Cottontail	*Sylvilagus floridanus*	Game species
Red Fox	*Vulpes vulpes*	Game species
Raccoon	*Procyon lotor*	Game species
Striped Skunk	*Mephitis mephitis*	Game species
Woodchuck	*Marmota monax*	Unprotected
White-tailed Deer	*Odocoileus virginianus*	Game species

"Successional Shrub"

Successional shrub communities occur adjacent to and intergrade with old field communities in the Site vicinity. Wildlife species expected to occur in this habitat would be similar to those found in old field areas. Due to the dominance of shrub cover hawks and owls would be less likely to exploit the shrub community.

"Successional Northern Hardwood Forest"

Wildlife species expected to occur in this community type include birds and mammals. Characteristic species would include:

Common Name	Scientific Name	NY State Protective Status
Birds		
Yellow-bellied Sapsucker	*Sphyrapicus varius*	Protected
Downy Woodpecker	*Picoides pubescens*	Protected
Hairy Woodpecker	*P. villosus*	Protected
Northern Flicker	*Colaptes auratus*	Protected
Eastern Phoebe	*Sayornis phoebe*	Protected
Blue Jay	*Cyanocitta cristata*	Protected
American Crow	*Corvus brachyrhynchos*	Game species

Birds (Cont.)

Black-capped Chickadee	*Parus atricapillus*	Protected
Tufted Titmouse	*Parus bicolor*	Protected
Red-breasted Nuthatch	*Sitta canadensis*	Protected
White-breasted Nuthatch	*Sitta corolinensis*	Protected
Brown Creeper	*Certhia americana*	Protected
Gray catbird	*Dumetella carolinensis*	Protected

Mammals

White-tailed Deer	*Odocoileus virginianus*	Game species
Eastern Chipmunk	*Tamias striatus*	Unprotected
Gray Squirrel	*Sciurus carolinensis*	Game species

"Rich Mesophytic Forest"

Wildlife species expected to occur in this community type include birds and mammals. Characteristic species would include:

Common Name	Scientific Name	NY State Protective Status
Birds		
Wild Turkey	*Meleagris gallopavo*	Game species
Ruffed Grouse	*Bonasa umbellus*	Game species
American Woodcock	*Scolopax minor*	Game species
Downy Woodpecker	*Picoides pubescens*	Protected
Hairy Woodpecker	*P. villosus*	Protected
Northern Flicker	*Colaptes auratus*	Protected
Eastern Phoebe	*Sayornis phoebe*	Protected

Birds (Cont.)

Blue Jay	*Cyanocitta cristata*	Protected
American Crow	*Corvus brachyrhynchos*	Game species
Black-capped Chickadee	*Parus atricapillus*	Protected
Tufted Titmouse	*Parus bicolor*	Protected
Red-breasted Nuthatch	*Sitta canadensis*	Protected
White-breasted Nuthatch	*Sitta corolinensis*	Protected
Brown Creeper	*Certhia americana*	Protected
Gray Catbird	*Dumetella carolinensis*	Protected

Mammals

White-tailed Deer	*Odocoileus virginianus*	Game species
Eastern Chipmunk	*Tamias striatus*	Unprotected
Gray Squirrel	*Sciurus carolinensis*	Game species

5.0 OBSERVATIONS OF STRESS POTENTIALLY RELATED TO SITE CONTAMINANTS

Conditions resulting in stressed vegetation were observed at two locations in the vicinity of the Site during field reconnaissance. It is not known whether these effects were contaminant related and no evidence of obvious contamination such as stained soil or leachate seepage were observed. Conditions in these areas were consistent with effects that may be caused by physical disturbances. Stressed vegetation was observed in the vicinity of Observation Points 26 and 27. Conditions at these locations are described below.

Observation Point 26 was located approximately 200 feet off-site between an abandoned railway right-of-way and crushed stone stockpiles adjacent to County Road 55 (Frewsburg-Falconer Road). This area included an artificial road side drainage swale leading to Conewango Creek. The swale appeared to be heavily silted and was not flowing during the

observation period. Vegetation in the swale and adjacent areas consisted of successional upland herb, shrub, and tree species typical of previously disturbed areas. Stressed vegetation consisting of dead trees was observed in the swale. Adjacent vegetation appeared normal. No evidence of stressed wildlife was observed in this area during field reconnaissance.

Observation Point 27 was located at the Site boundary near Monitoring Well Number 4 (MW-4). Vegetation in the area was dominated by successional herb species typical of disturbed soils. Observations of disturbance included bare and sparsely vegetated soil in an area approximately fifteen feet wide extending approximately 40 feet from the site boundary. Adjacent vegetation appeared normal and no evidence of stressed wildlife was observed.

Records of fish and wildlife mortality associated with past Site activities were obtained from NYSDEC Region 9 Staff. This information consists of a report regarding the discharge of a synthetic wax emulsion to Conewango Creek. The discharge occurred in the fall of 1966 during operations conducted by a previous owner, Flakeboard Corporation. The discharge may have resulted in a fish kill in Conewango Creek. Information received from NYSDEC regarding this discharge is presented in Appendix A.

6.0 FISH AND WILDLIFE RESOURCE VALUES

6.1 VALUE OF HABITATS TO WILDLIFE

The wildlife resources in the vicinity of the Site can be best described as a complex mosaic of interacting community systems. Natural community systems of the area consist of a variety of aquatic, wetland, and upland covertypes that support a diverse population of wildlife species. The Site is located within the floodplain of Conewango Creek and utilization of area resources by wildlife is strongly influenced by the seasonal water regime.

In addition to natural covertypes, the area also contains farmed land. Though description of "cultural covertypes" may be beyond the scope of this report, these areas can be considered to provide a significant

attractant to some wildlife species as feeding areas for migratory waterfowl and some mammals.

Though not unique to the region, the resources of these communities are valuable to wildlife due to their diversity, their interaction through transitional areas, or ecotones, and due to seasonal variations in water level. Site resident and migratory wildlife that utilize these resources include fish, water dependant, and terrestrial species.

Aquatic Systems

Communities present in the aquatic system of the Site area include the main channel of Conewango Creek, its local tributaries, perennially ponded areas, and seasonally inundated wetlands. Though little site specific information regarding wildlife populations is available from file information, the covertype characteristics of these areas meet the habitat requirements for a variety of fish, migratory waterfowl, and other water dependant wildlife species.

Conditions found in the main channel of Conewango Creek and seasonally inundated wetland areas meet the full life cycle requirements for indigenous fish species such as northern pike. This and other Esocid species utilize all components of the aquatic system during different life cycle stages. These species may utilize the main creek channel for migration, feeding, and cover requirements and may utilize inundated wetland areas on a seasonal basis for spawning and nursery habitat.

Migratory waterfowl species expected to utilize aquatic habitats in the Site vicinity would include a variety of ducks, geese, and wading birds. The main channel of Conewango Creek includes wood duck nesting habitat. Due to relatively deep water conditions and the lack of aquatic vegetation, the main channel does not represent significant feeding habitat for dabbling ducks. However, this area may be used for resting during migration. Seasonally inundated wetland areas may be used by these species for resting/roosting, feeding, nesting and nursery areas.

Other water dependant wildlife that can be expected to utilize aquatic communities in the vicinity of the Site would include

amphibians and some mammals. No information regarding the amphibian population of the Site area was available from review of file information. Amphibians that are likely to be present include a variety of species indigenous to New York. In general, amphibians require moist habitat conditions for survival and are dependant on aquatic habitats for breeding and egg development.

Water dependant mammals that can be expected utilize aquatic resources in the vicinity of the Site would include beaver, mink, and muskrat. These wildlife species are considered to be resident game species. Habitat conditions in the Site area are suitable to support the full life cycle requirements for these species.

Terrestrial Systems

Communities present in the terrestrial system of the Site area include successional old field, shrubland, and deciduous forest. Though little site specific information regarding the wildlife that may utilize these habitats is available from file information, the covertype characteristics of these areas meet the habitat requirements for a variety of resident and migratory species including reptiles, birds, and mammals.

Reptiles that are likely to be present include a variety of snake species indigenous to New York. These species can be considered to be resident species. Habitat conditions in the Site area are suitable to support the full life cycle requirements for these species.

Birds that are likely to utilize terrestrial communities in the vicinity of the Site include a large variety of birds of prey, passerine, and other bird species. In general, habit conditions in the area are diverse and can be considered to be very attractive to birds. Resources of the area are well suited for providing feeding, nesting, roosting, and other requirements for these species.

Mammals that can be expected to utilize resources of the area include resident and more transient species. Resident species would include small mammals with limited territorial requirements such as mice, voles, and squirrels. These species can be considered to be "site resident" in

that habitat conditions found in the Site area support their full life cycle requirements.

Though covertype conditions found in the Site vicinity meet the habitat requirements for a number of larger mammal species such as deer and fox, these species are free ranging and may not depend on Site resources alone for their habitat requirements. Covertypes found in the Site vicinity would meet the requirements for feeding, bedding, breeding, denning, and seasonal cover for these species.

6.2 VALUE OF RESOURCES TO HUMANS

Resources in the Site vicinity have recreational and economic values to humans. The extent to which these resources are utilized is largely undocumented. Recreational opportunities include boating, fishing, hunting, observation of wildlife, and scientific study. Current and potential economic activities that are dependant on Site area resources include agriculture, forestry, and trapping of furbearers.

The resources of Conewango Creek offer opportunities for water related recreational activities. The segment of Conewango Creek in Chautauqua County is included in the "Cassadaga/Conewango Waterway" system maintained by the County Parks Commission. Public access to the Creek in the vicinity of the Site is provided by a launch point off the Frewsburg-Falconer Road. Other County owned recreational land including public camping facilities on Conewango Creek are located further than two miles downstream of the Site.

The majority of the land in the vicinity of the Site is privately owned. Most of this land is undeveloped though some higher floodplain terraces are farmed and some wooded areas support selective logging. Active farm fields in the area were planted with corn during the field reconnaissance period. Though no areas in the Site vicinity appeared to have been planted with trees, logging operations were observed during field reconnaissance and evidence of past logging was common in wooded areas. The majority of the standing timber found in the vicinity of the Site is located in floodplain forest communities.

Though resources of the Site area itself are probably not sufficient to support a commercially economic furbearer harvest, resources of the Site and surrounding areas could potentially support commercial trapping. This activity is largely driven by market factors and the extent to which these resources are currently utilized is not known.

GPS

CRA

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April 28, 1993

Reference No. 2326

Gregory Sutton, P.E.
Environmental Engineer II
NEW YORK STATE DEPARTMENT
OF ENVIRONMENTAL CONSERVATION
270 Michigan Avenue
Buffalo, NY 14203

Dear Mr. Sutton:

Re: Response to NYSDEC Comments to
Quarterly Progress Report, October 1992 -
February 1993
VacAir Alloys, Site No. 907016

Keywell Corporation (Keywell) and Conestoga-Rovers & Associates (CRA) are in receipt of the New York State Department of Environmental Conservation (NYSDEC) comments on the above referenced report dated February 1993. On behalf of Keywell, CRA has reviewed these comments and has prepared the following responses for NYSDEC review.

Comment #1 - **The extent of the contamination in the area directly west of monitoring well MW-4 has not been adequately established. Monitoring well MW-4 continues to show high levels of volatile compound contamination while the two soil boring that were installed west of MW-4 have also showed elevated levels of contamination. This would seem to indicate that the contamination has moved west of MW-4 and may be impacting off-site locations. An additional monitoring well west of MW-4 is necessary to augment the information collected from MW-7 and accurately determine the extent of contamination in relation to the municipal well fields location and the surface water receptor.**

Response #1 - CRA believes the extent of the contamination in the area directly west of monitoring well MW-4 has, in fact, been adequately established. Therefore, an additional monitoring well is not required for the Remedial Investigation (RI). Four soil borings west of MW-4 were installed and sampled. The locations and their associated total volatile organic contaminant (VOC) concentrations are as follows:

Location	*Total VOCs (µg/kg)*	*Depth of Sample (Ft. BGS)*
BH-C	4,930	12 to 14
BH-D	11,184	18 to 20
BH-G	111	12 to 14
BH-H	12J	10 to 12

In addition, there is a monitoring well, MW-7, which is located at the northeast corner of the municipal well field (for wells #1 and #2A). As you are aware, MW-7 has been sampled three times (September 1991, November 1991, and December 1992) and has never exhibited VOC contamination.

BH-C was located nearly due west of MW-4 and on the east side of Falconer Street. The sample from BH-C (12 to 14 feet below ground surface (BGS) contained 4,930 µg/kg of total VOCs.

BH-D was located northwest of MW-4 on the east side of Falconer Street and near Conewango Creek. The sample from BH-D (18 to 20 feet BGS) contained 11,184 µg/kg of total VOCs.

BH-G, which was located on the west side of Falconer Street at the extreme north end of the parking area for stream access to Conewango Creek, contained a total of 111 µg/kg total VOCs in the 12 to 14 feet BGS zone which corresponds to the top of clay contact in this borehole.

BH-H was located approximately midway between BH-G and MW-7. The sample submitted for chemical analysis was from 10 to 12 feet BGS. This sample depth corresponds to the sand and silt material immediately above the top of clay contact. Sample BHH-1 contained only 12 µg/kg of trichloroethene (TCE) which is somewhat lower than BH-G. This is to be expected, since BH-H is upgradient of BH-G.

If we were to install a monitoring well anywhere downgradient of the location of BH-H, it would be reasonable to expect that contamination would be present. Since BH-H had low level TCE contamination and MW-7 was non-detect for VOCs, it is reasonable to expect that the plume passes somewhere between MW-7 and BH-H. Since the distance

between MW-7 and BH-H is approximately 125 feet, the extent of contamination in the area west of MW-4 does appear to be reasonably well defined.

Before addressing comments #2 and #3 it is important to note that the goal for remediation of groundwater contamination will be to attain hydraulic containment downgradient of the areas of known groundwater contamination . At this time, the hydraulic containment system is conceptualized to extend from a point between and downgradient of MW-5 and MW-4 to the northwest corner of the Site near the Conewango Creek and then east along the northern perimeter of the Site to a point east of MW-2. In addition to a perimeter containment system, source control may be employed to treat suspected source areas.

Comment #2 - An additional well is necessary in the north end of the manufacturing plant building to determine if monitoring well MW-11 (and the contamination source associated with it) is the source of the contamination at MW-4.

Response #2 - CRA believes that an additional well is not required. Based upon the results of the Site Investigation (SI) program CRA considers the source area for TCE to extend from a point upgradient of MW-4 to a point east of MW-2. During the RI program an additional source area was found in the vicinity of MW-11. The source of the TCE at MW-11 is unknown but based upon the underground utility survey, also performed during the RI, it appears as though two buried pipes in the area around MW-11 might be the source of or preferential migratory pathway for TCE. As you were informed on April 8, 1993 by a telephone conversation (D. Oscar, CRA to G. Sutton, NYSDEC), CRA has undertaken additional work to gather data which we anticipate will resolve if these pipes are the source of the TCE detected at MW-11.

Based upon the storage tank investigation, CRA further believes that the source of TCE contamination at MW-4 is likely the result of historical usage of TCE for the degreasing operations performed at the plant. The current (recently installed TCE tank) has its own secondary containment and this tank operation and usage is not in question. The former tank was located within the same area. However, the tank sat on a slab surrounded by a cinder block wall which was not watertight. In addition, the chemical transfer pump was also located within the enclosure.

Prior to this, the TCE tank was located further south, near the southwest corner of the Main Building, at the location which is now a small grassy area.

More importantly, when the second degreaser operation was in use, a second TCE tank was in use. The tank sat at the southwest corner of the stainless steel turnings pad located immediately north of the Main Building. This tank had no secondary confinement. Since the low temperature turnings come into the plant with significantly more oil and dirt on them, significantly more TCE had to be used to degrease these turnings. Ultimately, the low temperature degreasing operation proved to be too costly and the process was shut down. However, Plant personnel have informed CRA that large quantities of TCE were used during this period. MW-4 is located less than 100 feet west of the location of this former TCE storage tank.

The installation of a monitoring well inside the Main Building may essentially provide one piece of data; is the plume continuous under the building or is the source of contamination at MW-11 different from MW-4. For the purposes of the RI Program, it is reasonable to assume that the plume exists under the building.

One other piece of information exists that is useful in addressing Comment #2. MW-9 was installed through the stainless steel turnings pad, approximately 120 feet north of the Main Building. MW-9 was sampled in December 1992 and found to contain 19,172 µg/L of total VOCs. This indicates that the plume exists south of MW-9 and further substantiates the assumption that the plume is continuous under the Main Building.

Comment #3 - An additional well needs to be installed upgradient of MW-11 to determine the flow of groundwater in this specific area and to also evaluate the upgradient extent of the contamination from this specific source area. Monitoring well MW-1 is to far away to accurately describe the conditions pertaining to MW-11.

Response #3 - Several pieces of information exist which make an additional monitoring well upgradient of MW-11 unnecessary.

CRA disagrees with NYSDEC's conclusions that MW-10 is not upgradient of MW-11. In the telephone conversation of April 8, 1993 (Oscar-Sutton) NYSDEC stated that their interpretation is that MW-10 is cross-gradient to MW-11. During the RI, three rounds of water levels were taken beginning in December 1992 and ending in February 1993. In each of these water level rounds, the water level in MW-10 was consistently one foot

higher than MW-11. A comparison of the water levels measured during this period is as follows:

Date	*Elev. MW-10 (AMSL)*	*Elev. MW-11 (AMSL)*
12/22/92	1248.66	1247.64
01/21/93	1248.29	1247.25
02/19/93	1248.08	1247.11

This clearly indicates that MW-10 is upgradient of MW-11. Copies of the draft groundwater contours are attached to this letter.

Chemical data obtained from the RI sampling performed in December 1992 is also useful in evaluating the conditions upgradient from MW-11. The results of the analyses indicate that MW-10 contained relatively low total VOCs (6 µg/L) compared to 170,496 µg/L at MW-11. In addition, the VOC contamination at MW-10 consisted solely of toluene at 2J µg/L and xylenes at 4J µg/L. However, the chemical contamination at MW-11 was predominately TCE (and its degradation products) with a secondary component of BTEX compounds including toluene (4J µg/L), ethylbenzene (6J µg/L), and xylene (24 µg/L).

The important comparison is that MW-10 was installed in the vicinity of an existing abandoned underground fuel tank. A BTEX plume was anticipated in this area. MW-11 was installed based upon the results of the soil gas which indicated a potential hot spot in this area. Groundwater samples collected from MW-10 contained low levels of BTEX and no TCE. Samples from MW-11 contained both BTEX and TCE and in fact, the BTEX concentrations were actually higher in MW-11 than in MW-10. If the assumption is made that MW-11 is close to a source and that MW-10 is side-gradient to MW-11, then it would also be reasonable to assume that MW-10 should contain detectable levels of TCE as well.

Additional data points exist which can be used to estimate the limits of the TCE detected at MW-11. BH-F was installed approximately 220 feet southeast (and upgradient) of MW-11. Organic vapor readings were measured and recorded during the drilling of BH-F. Organic vapor readings indicated organic vapors at concentrations of less than 1 part per million (ppm). For comparison purposes, organic vapor readings

taken during the installation of MW-11 exceeded 10 ppm in several of the soil cores. This indicates that high concentrations of VOCs would not be anticipated in the vicinity of BH-F.

Boreholes BH5B-1, BH5B-2 and BH5B-3 were installed during the SI along and on the east side of the culvert. Although these samples were taken from a shallow depth of 7 to 9 feet BGS at BH5B-1 and BH5B-3 and 9 to 11 feet BGS at BH5B-2 all three of the samples contained TCE at concentrations ranging from 13 µg/kg at BH5B-2 to 4,900 µg/kg at BH5B-3.

Based upon this information, the extent of the TCE contamination upgradient of MW-11 can be presumed to be between MW-10 and MW-11 and between BH-F and BH5B-1. For the purposes of the RI, this sufficiently delineates the extent of TCE contamination upgradient of MW-11.

Comment #4 - **In a preliminary review of the analytical data provided, there are several sampling points that no VOC data has been provided. These locations are: Soil: BH-9D, BH-8D, BH-10D, BH-K, BH-N, BH-R, BH-Q, BH-S, BH-T, BH-U, BH-V and BH-W; Groundwater: MW-1, MW-6 MW-7 & MW-8; Surfacewater: SW-A, SW-B, SW-C, SW-D, SW-L & SW-M and Sediments: SED-A, SED-B, & SED-L. Since several of these sampling location were specifically chosen to evaluate upgradient sources of contamination, analytical data must be provided. If no analytical information exists, they must be resampled.**

Response #4 - As a general response to Comment #4, it is necessary to clarify the nature of the chemical data which was included with the Quarterly Report for October 1992 - February 1993. The data tables that were submitted were data summary tables for detected compounds only. Therefore, samples that were non-detect for all compounds would have been deleted from these tables. Copies of complete analytical results for samples collected during the RI will be attached to this response.

Boreholes BH-8D and BH-9D were installed during the Interim Remedial Activities (IRA) Program. No soil samples for VOC analyses were collected during the IRA program. BH-10D was installed during the RI program. No soil samples from BH-10D were collected. However, soil samples were collected from BH-P which is in the same location. No soil samples for VOC analysis were collected from boreholes BH-K, BH-N,

BH-Q, BH-R, BH-S and BH-T. Soil samples were collected and analyzed from BH-U, BH-V and BH-W and were non-detect for all compounds.

Groundwater samples were collected from wells MW-1, MW-6, MW-7 and MW-8. Analytical results for all the VOCs in these wells were non-detect.

Surface water samples were collected and analyzed at locations SW-A, SW-B, SW-C, SW-D, SW-L and SW-M. All VOCs were non-detect in these samples except SW-D which had 2J µg/L of styrene.

Sediment samples were collected from locations SED-A, SED-B and SED-L. Analytical results for these samples were non-detect for all VOCs.

The submission of the complete data tables for the samples collected during the RI should clarify the confusion regarding analytical results.

If you have any questions concerning these responses please do not hesitate to contact us.

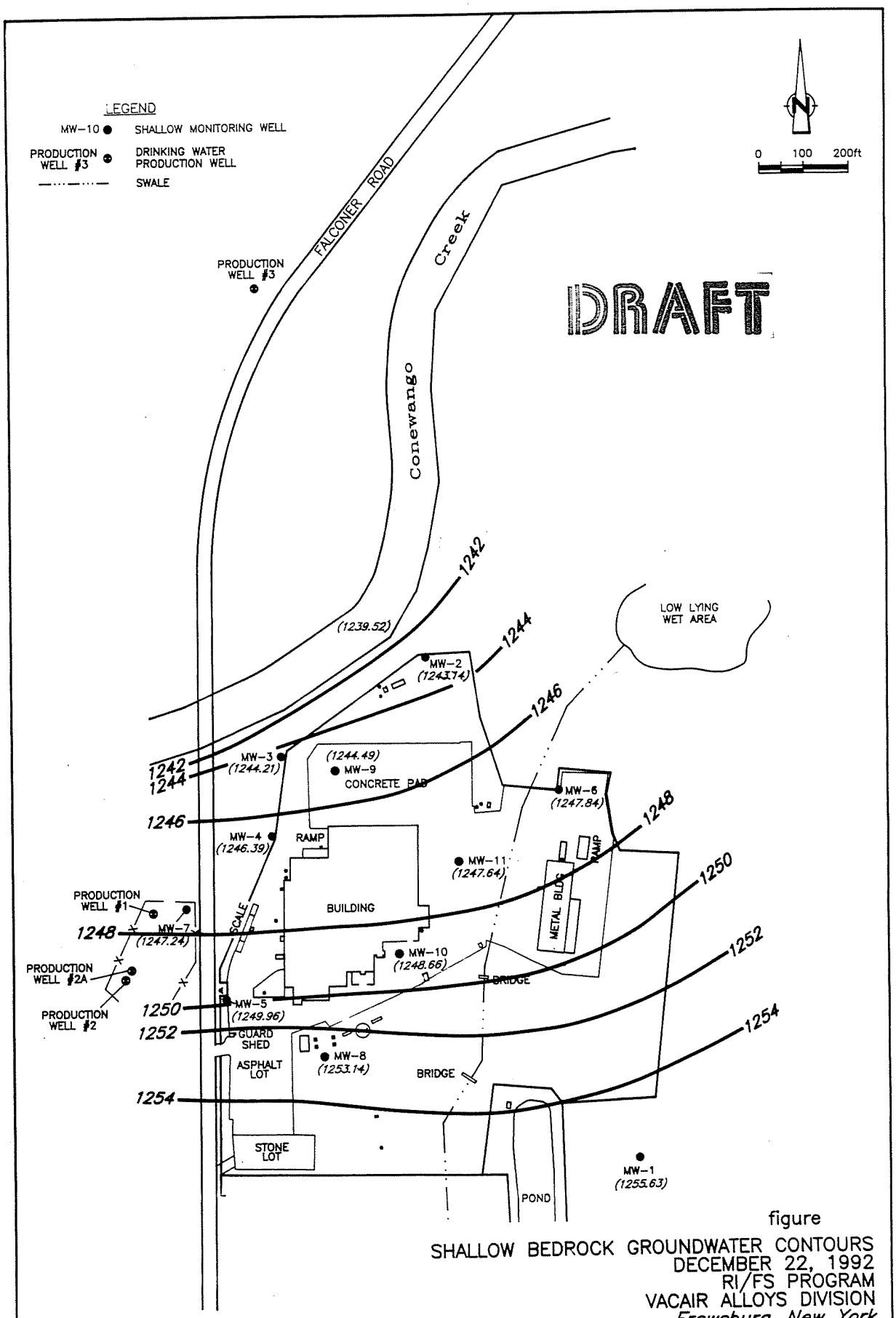
Yours very truly,

CONESTOGA-ROVERS & ASSOCIATES

Wai Chin Lachell /per dh

Wai Chin Lachell

WCL:js
Attachments
cc: J.M. Lozier (1 Copy)
K. Watson (1 Copy)
C. Peterson, (NYSDEC-Buffalo) (1 Copy)
Assist. Counsel, Div. Envr. Enfor. (NYSDEC-Buffalo) (1 Copy)
Dir., Bur. of Envr. Exps. (NYSDOH-Albany) (2 Copies)
Sect. Chief, Div. of Haz. Waste Rem. (NYSDEC-Albany) (1 Copy)
M. Mateyk (1 Copy)
D. Oscar (1 Copy)

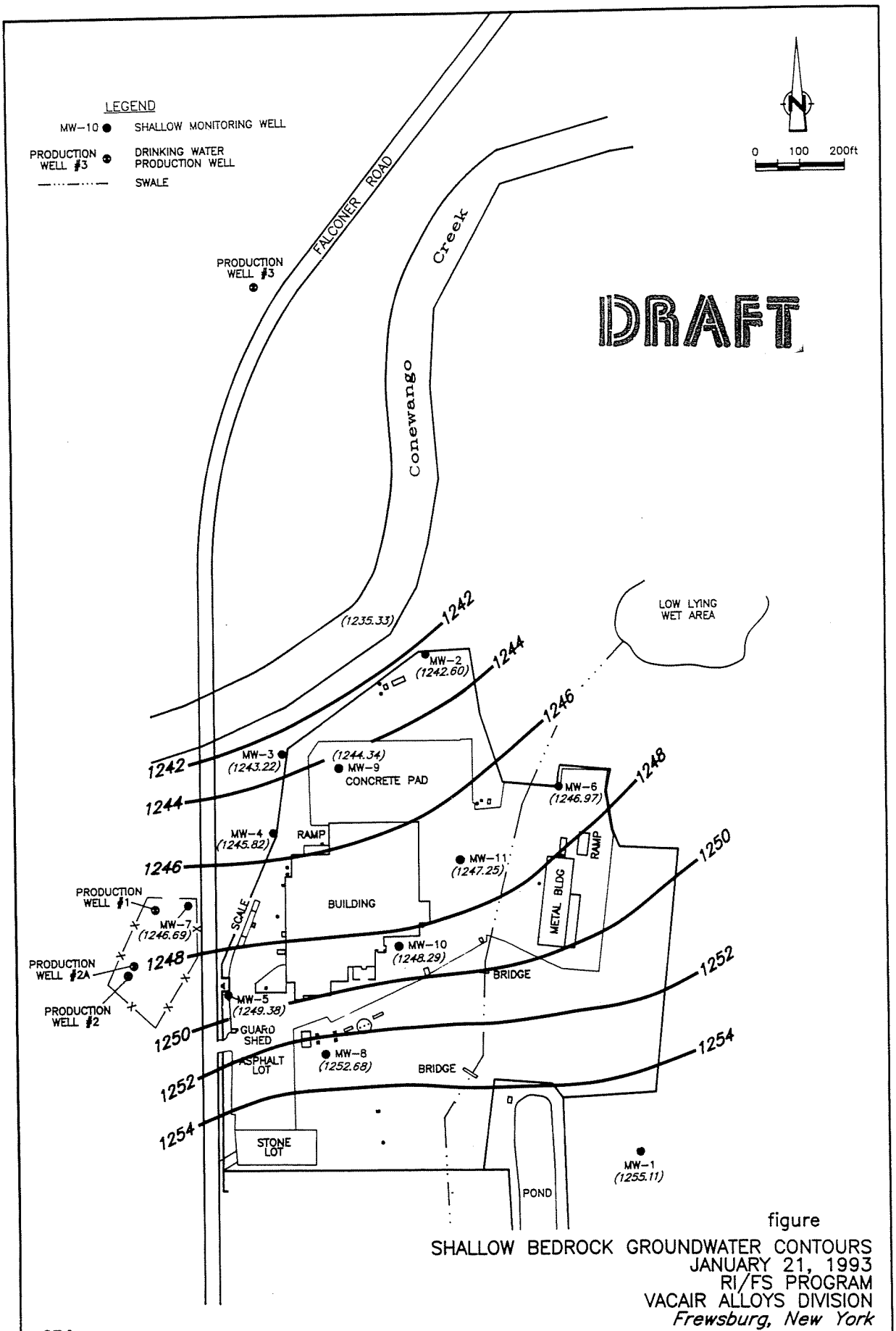


figure

SHALLOW BEDROCK GROUNDWATER CONTOURS
DECEMBER 22, 1992
RI/FS PROGRAM
VACAIR ALLOYS DIVISION
Frewsburg, New York

CRA

2326(19)-10APR/93-REV.0 (NF)



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SHALLOW BEDROCK GROUNDWATER CONTOURS
JANUARY 21, 1993
RI/FS PROGRAM
VACAIR ALLOYS DIVISION
Frewsburg, New York

CRA

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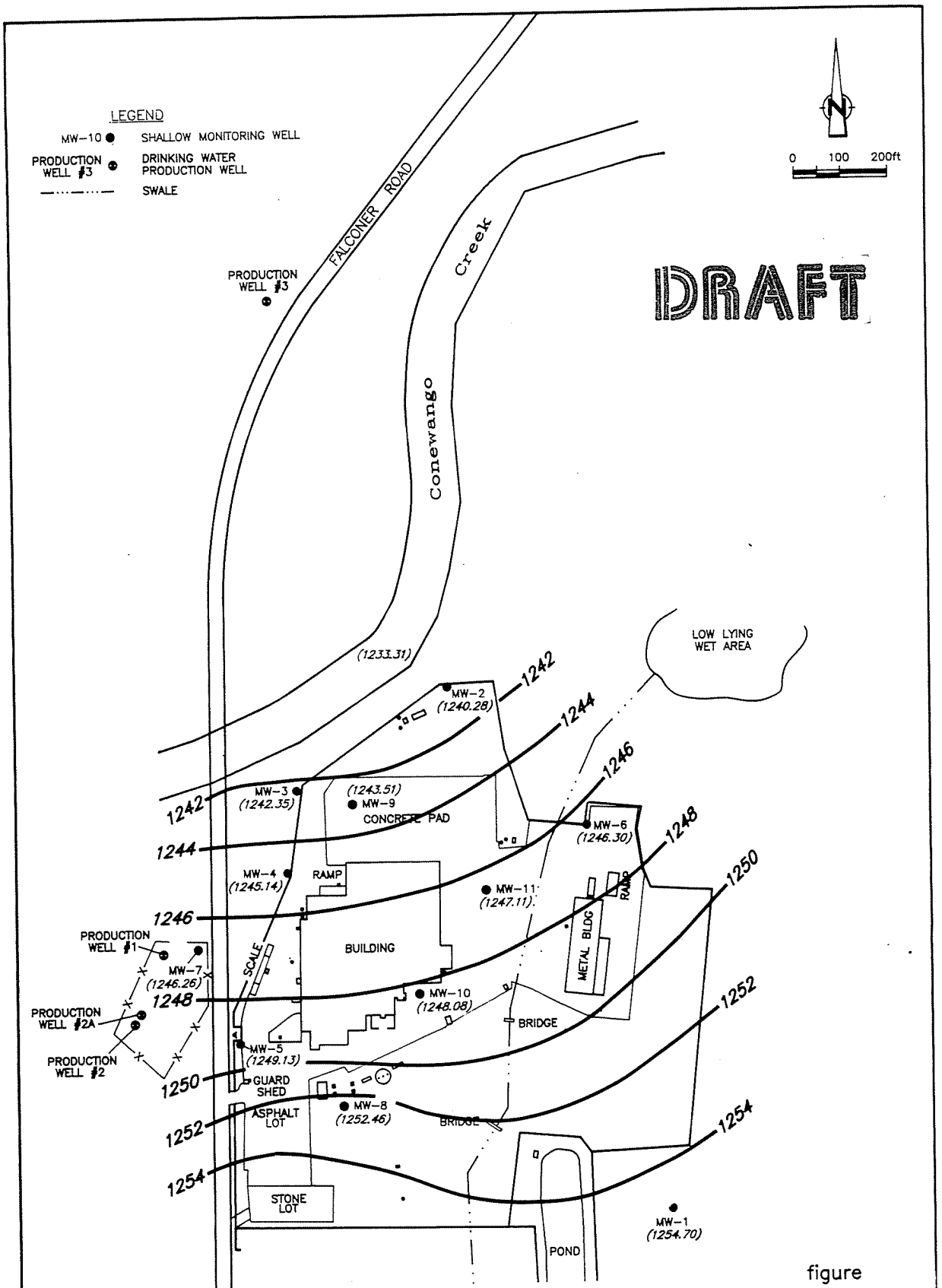

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SHALLOW BEDROCK GROUNDWATER CONTOURS
FEBRUARY 19, 1993
RI/FS PROGRAM
VACAIR ALLOYS DIVISION
Frewsburg, New York

CRA

2326(19)-10APR/93-REV.0 (NF)

DRAFT

GROUNDWATER SAMPLE DATA
VACAIR ALLOYS
REMEDIAL INVESTIGATION
FREWSBURG, NEW YORK

VOLATILE ORGANIC COMPOUNDS	*MW1* (µg/L)	*MW2* (µg/L)	*MW3* (µg/L)	*MW4* (µg/L)	*MW4D (12/18/92)* (µg/L)	*MW4D (1/14/93)* (µg/L)	*MW12 (1/14/93) DUP OF MW4D* (µg/L)	*MW13 (12/18/92) DUP OF MW4D* (µg/L)	*MW5* (µg/L)	*MW5D* (µg/L)	*MW6* (µg/L)
Chloromethane	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
Bromomethane	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
Vinyl Chloride	ND(10)	1200	50	6 J	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
Chloroethane	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
Methylene Chloride	ND(10)	ND(10)	ND(10)J	ND(10)J	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
Acetone	ND(10)J	ND(10)J	ND(10)J	ND(10)J	ND(10)J	7J	6J	ND(10)J	ND(10)J	ND(10)J	ND(10)J
Carbon Disulfide	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
1,1-Dichloroethene	ND(10)	170	6J	4 J	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
1,1-Dichloroethane	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
1,2-Dichloroethene (Total)	ND(10)	62000	800 J	2300 J	ND(10)	ND(10)	ND(10)	10	ND(10)	ND(10)	ND(10)
Chloroform	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
1,2-Dichloroethane	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
2-Butanone	ND(10)J	ND(10)J	ND(10)J	ND(10)J	ND(10)J	ND(10)	ND(10)	ND(10)J	ND(10)J	ND(10)J	ND(10)J
1,1,1-Trichloroethane	ND(10)	ND(10)	ND(10)	3 J	ND(10)	1J	1J	ND(10)	ND(10)	ND(10)	ND(10)
Carbon Tetrachloride	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
Bromodichloromethane	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
1,2-Dichloropropane	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
cis-1,3-Dichloropropene	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
Trichloroethene	ND(10)	ND(2000)	26000	74000	ND(10)	ND(10)	ND(10)	4 J	ND(10)	ND(10)	ND(10)
Dibromochloromethane	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
1,1,2-Trichloroethane	ND(10)	ND(10)	16	29	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
Benzene	ND(10)	11	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
trans-1,3-Dichloropropene	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
Bromoform	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
4-Methyl-2-Pentanone	ND(10)J	ND(10)J	ND(10)J	ND(10)J	ND(10)J	ND(10)	ND(10)	ND(10)J	ND(10)J	ND(10)J	ND(10)J
2-Hexanone	ND(10)J	ND(10)J	ND(10)J	ND(10)J	ND(10)J	ND(10)	ND(10)	ND(10)J	ND(10)J	ND(10)J	ND(10)J
Tetrachloroethene	ND(10)	ND(10)	5 J	4 J	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
1,1,2,2-Tetrachloroethane	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
Toluene	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
Chlorobenzene	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
Ethylbenzene	ND(10)	6 J	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
Styrene	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
Xylene (Total)	ND(10)	17	ND(10)	ND(10)	ND(10)	ND(10)	2J	ND(10)	ND(10)	ND(10)	ND(10)

DRAFT

GROUNDWATER SAMPLE DATA
VACAIR ALLOYS
REMEDIAL INVESTIGATION
FREWSBURG, NEW YORK

VOLATILE ORGANIC COMPOUNDS	*MW7* *(µg/L)*	*MW8* *(µg/L)*	*MW9* *(µg/L)*	*MW14 DUP OF MW9* *(µg/L)*	*MW10* *(µg/L)*	*MW11* *(µg/L)*	*RINSE BLANK RB1218* *(µg/L)*	*RINSE BLANK RB1221* *(µg/L)*	*TRIP BLANK 12/16/92* *(µg/L)*
Chloromethane	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)J	ND(10)	ND(10)	ND(10)J	ND(10)
Bromomethane	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
Vinyl Chloride	ND(10)	ND(10)	53	61	ND(10)	9 J	ND(10)	ND(10)	ND(10)
Chloroethane	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
Methylene Chloride	ND(10)	ND(10)	ND(10)J	ND(10)J	ND(10)	ND(10)J	ND(10)	ND(10)J	ND(10)
Acetone	ND(10)J	ND(10)J	ND(10)J	ND(10)J	ND(10)J	ND(10)J	ND(10)J	ND(10)	ND(10)J
Carbon Disulfide	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
1,1-Dichloroethene	ND(10)	ND(10)	11	12	ND(10)	5 J	ND(10)	ND(10)	ND(10)
1,1-Dichloroethane	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	4 J	ND(10)	ND(10)	ND(10)
1,2-Dichloroethene (Total)	ND(10)	ND(10)	1100 J	670 J	ND(10)	380	ND(10)	ND(10)	ND(10)
Chloroform	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
1,2-Dichloroethane	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	7 J	ND(10)	ND(10)	ND(10)
2-Butanone	ND(10)J	ND(10)J	ND(10)J	ND(10)J	ND(10)J	ND(10)J	ND(10)J	ND(10)	ND(10)J
1,1,1-Trichloroethane	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
Carbon Tetrachloride	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)J	ND(10)
Bromodichloromethane	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
1,2-Dichloropropane	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
cis-1,3-Dichloropropene	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
Trichloroethene	ND(10)	ND(10)	18000	24000	ND(10)	170000	ND(10)	ND(10)	ND(10)
Dibromochloromethane	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
1,1,2-Trichloroethane	ND(10)	ND(10)	4 J	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
Benzene	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
trans-1,3-Dichloropropene	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
Bromoform	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)J	ND(10)
4-Methyl-2-Pentanone	ND(10)J	ND(10)J	ND(10)J	ND(10)J	ND(10)J	ND(10)J	ND(10)J	ND(10)J	ND(10)J
2-Hexanone	ND(10)J	ND(10)J	ND(10)J	ND(10)J	ND(10)J	ND(10)J	ND(10)J	ND(10)J	ND(10)J
Tetrachloroethene	ND(10)	ND(10)	4 J	4 J	ND(10)	57	ND(10)	ND(10)	ND(10)
1,1,2,2-Tetrachloroethane	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
Toluene	ND(10)	ND(10)	ND(10)	ND(10)	2 J	4J	ND(10)	ND(10)	ND(10)
Chlorobenzene	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
Ethylbenzene	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	6 J	ND(10)	ND(10)	ND(10)
Styrene	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
Xylene (Total)	ND(10)	ND(10)	ND(10)	ND(10)	4 J	24	1 J	ND(10)	ND(10)

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GROUNDWATER SAMPLE DATA
VACAIR ALLOYS
REMEDIAL INVESTIGATION
FREWSBURG, NEW YORK

VOLATILE ORGANIC COMPOUNDS	*TRIP BLANK 12/16/92 (µg/L)*	*TRIP BLANK 12/17/92 (µg/L)*	*TRIP BLANK 12/18/92 (µg/L)*	*TRIP BLANK 12/21/92 (µg/L)*
Chloromethane	ND(10)	ND(10)	ND(10)	ND(10)J
Bromomethane	ND(10)	ND(10)	ND(10)	ND(10)
Vinyl Chloride	ND(10)	ND(10)	ND(10)	ND(10)
Chloroethane	ND(10)	ND(10)	ND(10)	ND(10)
Methylene Chloride	ND(10)	ND(10)	ND(10)	10 J
Acetone	ND(10)J	ND(10)J	ND(10)J	ND(10)
Carbon Disulfide	ND(10)	ND(10)	ND(10)	ND(10)
1,1-Dichloroethene	ND(10)	ND(10)	ND(10)	ND(10)
1,1-Dichloroethane	ND(10)	ND(10)	ND(10)	ND(10)
1,2-Dichloroethene (Total)	ND(10)	ND(10)	ND(10)	ND(10)
Chloroform	ND(10)	ND(10)	ND(10)	ND(10)
1,2-Dichloroethane	ND(10)	ND(10)	ND(10)	ND(10)
2-Butanone	ND(10)J	ND(10)J	ND(10)J	ND(10)
1,1,1-Trichloroethane	ND(10)	ND(10)	ND(10)	ND(10)
Carbon Tetrachloride	ND(10)	ND(10)	ND(10)	ND(10)J
Bromodichloromethane	ND(10)	ND(10)	ND(10)	ND(10)
1,2-Dichloropropane	ND(10)	ND(10)	ND(10)	ND(10)
cis-1,3-Dichloropropene	ND(10)	ND(10)	ND(10)	ND(10)
Trichloroethene	ND(10)	ND(10)	ND(10)	7 J
Dibromochloromethane	ND(10)	ND(10)	ND(10)	ND(10)
1,1,2-Trichloroethane	ND(10)	ND(10)	ND(10)	ND(10)
Benzene	ND(10)	ND(10)	ND(10)	ND(10)
trans-1,3-Dichloropropene	ND(10)	ND(10)	ND(10)	ND(10)
Bromoform	ND(10)	ND(10)	ND(10)	ND(10)J
4-Methyl-2-Pentanone	ND(10)J	ND(10)J	ND(10)J	ND(10)J
2-Hexanone	ND(10)J	ND(10)J	ND(10)J	ND(10)J
Tetrachloroethene	ND(10)	ND(10)	ND(10)	ND(10)
1,1,2,2-Tetrachloroethane	ND(10)	ND(10)	ND(10)	ND(10)
Toluene	ND(10)	ND(10)	ND(10)	ND(10)
Chlorobenzene	ND(10)	ND(10)	ND(10)	ND(10)
Ethylbenzene	ND(10)	ND(10)	ND(10)	ND(10)
Styrene	ND(10)	ND(10)	ND(10)	ND(10)
Xylene (Total)	ND(10)	ND(10)	ND(10)	ND(10)

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GROUNDWATER SAMPLE DATA
VACAIR ALLOYS
REMEDIAL INVESTIGATION
FREWSBURG, NEW YORK

TOTAL METALS	*MW1* (µg/L)	*MW2* (µg/L)	*MW3* (µg/L)	*MW4* (µg/L)	*MW4D* (µg/L)	*MW13 DUP OF MW4D* (µg/L)	*MW5* (ug/L)	*MW5D* (µg/L)	*MW6* (µg/L)	*MW7* (µg/L)
Aluminum	360	6830	30000	11700	5270	4640	17600	54.2	90500	56800
Antimony	ND(25.9)	ND(25.9)	ND(25.9)	ND(25.9)	ND(25.9)	ND(25.9)	ND(25.9)	ND(25.9)	52.4	33.0
Barium	117	561	804	349	267	257	613	225	1410	374
Beryllium	0.70	2.3	3.0	1.8	1.1	1.2	1.9	0.97	8.4	5.2
Cadmium	ND(2.7)	11.7	12.4	3.6	ND(2.7)	ND(2.7)	7.7	ND(2.7)	41.5	25.0
Calcium	59400	146000	127000	105000	78300	76500	94100	82300	257000	172000
Chromium	ND(8.4)	22.0	123	51.1	13.8	14.2	68.4	ND(8.4)	133	150
Cobalt	ND(5.1)	ND(5.1)	30.0	11.7J	5.4	5.1	18.7	ND(5.1)	99.5	63.3
Copper	5.8	32.8	124	48.3	26.1J	16.9J	145	8.2	240	157
Iron	556	58300	55700	21400	8670	8340	33500	1930	190000	112000
Lead	ND(1.9)	5.3	57.4	17.9	4.7J	1.9J	28.0	ND(1.9)	222	159
Magnesium	9840	33500	35700	21800	13800	13500	21400	12400	99900	53300
Manganese	24.0	20400	2110	1560	161	160	3720	30.7	6230	3720
Mercury	ND(0.10)	0.11	0.13	ND(0.10)	ND(0.10)	ND(0.10)	ND(0.10)	ND(0.10)	ND(0.10)	ND(0.10)
Nickel	ND(6.9)	72.3	124	43.9	14.2	10.4	62.4	14.2	212	254
Potassium	992	6560	8230	7670	3280	2940	8010	2070	16000	12500
Silver	ND(2.2)	ND(2.2)	ND(2.2)	ND(2.2)	ND(2.2)	ND(2.2)	ND(2.2)	ND(2.2)	ND(2.2)	ND(2.2)
Sodium	3400	10400	18500	22900	10400	10200	14300	11300	6380	17600
Vanadium	ND(2.9)	13.2	57.2	20.0	8.3	7.4	31.2	ND(2.9)	174	110
Zinc	ND(4.9)	54.2	176	74.1	69.3	79.3	108	27.6	525	316

GROUNDWATER SAMPLE DATA
VAC AIR ALLOYS
REMEDIAL INVESTIGATION
FREWSBURG, NEW YORK

TOTAL METALS	*MW8* (µg/L)	*MW9* (µg/L)	*MW10* (µg/L)	*MW11* (µg/L)	*MW14 DUP OF MW9* (µg/L)	*RINSE BLANK RB1218* (µg/L)
Aluminum	12400	48900J	24500	940	388J	17.4
Antimony	ND(25.9)	34.1	ND(25.9)	ND(25.9)	ND(25.9)	ND(25.9)
Barium	365	366	482	174	348	ND(1.5)
Beryllium	2.1	5.0J	2.2	1.4	1.1J	ND(0.40)
Cadmium	5.6	22.3J	9.3	ND(2.7)	ND(2.7)J	ND(2.7)
Calcium	112000	181000J	82500	112000	82100J	117
Chromium	23.5	113J	54.2	ND(8.4)	12.0J	ND(8.4)
Cobalt	9.1	55.4J	21.5	ND(5.1)	ND(5.1)J	ND(5.1)
Copper	153	156J	70.3	72.3	16.2J	1.2
Iron	21100	99400J	48100	1650	866J	ND(37.6)
Lead	33.8	132J	54.2	ND(1.9)	ND(1.9)J	ND(1.9)
Magnesium	20200	53800J	25700	20800	13500J	26.0
Manganese	501	3860J	1370	10500	57.2J	ND(1.3)
Mercury	ND(0.10)	0.11	ND(0.10)	0.22	ND(0.10)	ND(0.10)
Nickel	31.7	205J	58.6	30.0	67.0J	ND(6.9)
Potassium	4760	10400J	10100	1420	4190J	ND(28.0)
Silver	ND(2.2)	ND(2.2)	ND(2.2)	ND(2.2)	ND(2.2)	ND(2.2)
Sodium	22000	17200J	12100	19700	10600J	153
Vanadium	20.3	95.4J	47.0	ND(2.9)	ND(2.9)J	ND(2.9)
Zinc	80.1	297J	147	33.9	22.7J	ND(4.9)

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GROUNDWATER SAMPLE DATA
VACAIR ALLOYS
REMEDIAL INVESTIGATION
FREWSBURG, NEW YORK

DISSOLVED METALS	*MW1* *(ug/L)*	*MW2* *(µg/L)*	*MW3* *(µg/L)*	*MW4* *(µg/L)*	*MW4D* *(µg/L)*	*MW13* *DUP OF MW4D* *(µg/L)*	*MW5* *(ug/L)*	*MW5D* *(ug/L)*	*MW6* *(µg/L)*
Aluminum	ND(16.7)	424	ND(16.7)	ND(15.1)	229J	ND(12.5)J	ND(16.2)	ND(25.1)	ND(19.3)
Antimony	ND(25.9)	ND(25.9)	ND(25.9)	ND(25.9)	ND(25.9)	ND(25.9)	ND(25.9)	ND(25.9)	ND(25.9)
Barium	109	554	460	216	274	263	386	202	167
Beryllium	ND(1.4)	2.6	ND(1.4)	ND(1.5)	ND(1.3)	1.1	ND(1.3)	ND(1.1)	ND(1.5)
Cadmium	ND(2.7)	7.5	ND(2.7)	ND(2.7)	ND(2.7)	ND(2.7)	ND(2.7)	ND(2.7)	ND(2.7)
Calcium	56900	141000	80700	88600	69800	68200	70500	71800	106000
Chromium	ND(8.4)	ND(8.4)	ND(8.4)	ND(8.4)	ND(8.4)	ND(8.4)	ND(8.4)	ND(8.4)	ND(8.4)
Cobalt	ND(5.1)	ND(5.1)	ND(5.1)	ND(5.1)	ND(5.1)	ND(5.1)	ND(5.1)	ND(5.1)	ND(5.1)
Copper	4.7	7.9	5.8	5.2	5.8	4.2	4.4	5.9	8.0
Iron	ND(8.7)	48500	ND(8.7)	ND(8.7)	ND(8.7)J	62.3J	ND(8.7)	ND(8.7)	ND(8.7)
Lead	ND(1.9)	ND(1.9)	ND(1.9)	ND(1.9)	ND(1.9)	ND(1.9)	ND(1.9)	ND(1.9)	ND(1.9)
Magnesium	9400	31400	15000	15600	11300	11200	11300	11400	20000
Manganese	25.9	20000	33.4	46.5	14.7	9.7	5.0	14.8	10200
Mercury	ND(0.10)	ND(0.10)	ND(0.10)	ND(0.10)	ND(0.10)	ND(0.10)	ND(0.10)	ND(0.10)	ND(0.10)
Nickel	9.4	60.4	ND(6.9)	ND(6.9)	ND(6.9)	ND(6.9)	ND(6.9)	ND(6.9)	30.4
Potassium	818	5310	2810	4820	1720	1730	3840	1880	1180
Silver	ND(2.2)J	ND(3.6)J	ND(2.2)J	ND(3.1)J	ND(2.2)J	ND(2.2)J	ND(2.2)J	ND(3.9)J	ND(4.3)J
Sodium	3250	10200	17400	22300	10400	10300	13800	10400	19200
Vanadium	ND(2.9)	ND(2.9)	ND(2.9)	ND(2.9)	ND(2.9)	ND(2.9)	ND(2.9)	ND(2.9)	ND(2.9)
Zinc	32.8	48.9	44.2	32.1	32.4	38.3	39.7	11.0	8.1

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GROUNDWATER SAMPLE DATA
VAC AIR ALLOYS
REMEDIAL INVESTIGATION
FREWSBURG, NEW YORK

DISSOLVED METALS	*MW7* (µg/L)	*MW8* (µg/L)	*MW9* (µg/L)	*MW14 DUP OF MW9* (µg/L)	*MW10* (µg/L)	*MW11* (µg/L)	*RINSE BLANK RB1218* (µg/L)
Aluminum	ND(14.6)	ND(51.3)	ND(11.4)	ND(14.0)	ND(129)	ND(17.7)	ND(12.5)
Antimony	ND(25.9)	ND(25.9)	ND(25.9)	ND(25.9)	ND(25.9)	ND(25.9)	ND(25.9)
Barium	333	355	217	212	350	641	ND(1.5)
Beryllium	ND(1.1)	ND(1.5)	1.7	1.6	0.83	1.2	ND(0.40)
Cadmium	ND(2.7)	ND(2.7)	ND(2.7)	ND(2.7)	ND(2.7)	ND(2.7)	ND(2.7)
Calcium	78800	91300	101000	102000	49600	66600	172
Chromium	ND(8.4)	ND(8.4)	ND(8.4)	ND(8.4)	ND(8.4)	ND(8.4)	ND(8.4)
Cobalt	ND(5.1)	ND(5.1)	ND(5.1)	ND(5.1)	ND(5.1)	ND(5.1)	ND(5.1)
Copper	5.3	5.1	7.4	9.1	4.8	4.0	ND(1.0)
Iron	ND(8.7)	45.1	ND(8.7)	ND(8.7)	ND(8.7)	ND(8.7)	ND(8.7)
Lead	ND(1.9)	ND(1.9)	ND(1.9)	ND(1.9)	ND(1.9)	ND(1.9)	ND(1.9)
Magnesium	13500	12300	18400	18600	8820	11400	ND(14.6)
Manganese	12.2	74.0	604	596	86.7	139	7.5
Mercury	ND(0.10)	ND(0.10)	ND(0.10)	ND(0.10)	ND(0.10)	ND(0.10)	ND(0.10)
Nickel	ND(6.9)	ND(6.9)	10.8	9.8	ND(6.9)	ND(6.9)	ND(6.9)
Potassium	4170	1510	1970	2230	5110	1240	ND(28.0)
Silver	ND(2.2)J	ND(2.2)J	ND(2.2)J	ND(2.2)J	ND(2.2)J	ND(2.2)J	ND(2.2)
Sodium	11000	22200	15800	16600	11700	5890	103
Vanadium	ND(2.9)	ND(2.9)	ND(2.9)	ND(2.9)	ND(2.9)	ND(2.9)	ND(2.9)
Zinc	5.4	37.0	45.7	41.8	6.1	47.8	ND(4.9)

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GROUNDWATER SAMPLE DATA
VACAIR ALLOYS
REMEDIAL INVESTIGATION
FREWSBURG, NEW YORK

INORGANICS	*MW1* *(mg/L)*	*MW2* *(mg/L)*	*MW3* *(mg/L)*	*MW4* *(mg/L)*	*MW4D* *(mg/L)*	*MW13* *DUP OF MW4D* *(mg/L)*	*MW5* *(mg/L)*	*MW5D* *(mg/L)*	*MW6* *(mg/L)*
BOD5	ND(4)	22	ND(4)	ND(4)	ND(4)	ND(4)	ND(4)	ND(4)	ND(4)
Chloride	8.0	154	37	43	31	32	26	30	59
COD	50	180	110	50	ND(15)	ND(15)	45	ND(15)	70
Hardness (Total)	189	502	464	352	252	247	323	257	1050
Bicarbonate	150	381	312	252	164	161	190	159	303
Ammonia	ND(0.02)	8.4	2.7	0.89	0.02	0.02	0.02	ND(0.02)	0.10
Nitrite	ND(0.1)	ND(0.1)	ND(0.1)	ND(0.1)	ND(0.1)	ND(0.1)	ND(0.1)	ND(0.1)	ND(0.1)
Nitrate	1.8	ND(0.1)	0.8	0.3	7.7	7.7	4.9	8.4	ND(0.1)
Phosphorus (Total)	ND(0.05)	ND(0.05)	0.07	ND(0.05)	0.07	ND(0.05)	0.12	ND(0.05)	0.09
Sulfide	ND(0.1)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.1)	ND(0.1)	ND(0.1)
Sulfate	18.3	18.1	34.0	52.2	23.6	27.2	30.6	26.1	74.4
Total Suspended Solids	ND(5)	68	1500	401	160	169	23	ND(5)	ND(5)
Alkalinity (Total)	151	381	313	253	166	162	191	161	303
Total Dissolved Solids	219	848	365	393	295	288	308	297	530
Total Organic Carbon	4.9	43.0	9.1	11.3	1.3	1.4	2.1	1.2	17.0

GROUNDWATER SAMPLE DATA
VACAIR ALLOYS
REMEDIAL INVESTIGATION
FREWSBURG, NEW YORK

INORGANICS	*MW7* *(mg/L)*	*MW8* *(mg/L)*	*MW9* *(mg/L)*	*MW14* *DUP OF MW9* *(mg/L)*	*MW10* *(mg/L)*	*MW11* *(mg/L)*	*RINSE BLANK* *RB1218* *(mg/L)*
BOD5	ND(4)	ND(4)	ND(4)	4	ND(4)	ND(4)	ND(4)
Chloride	33	31	43	46	5	12	ND(2)
COD	20	65	220J	150J	40	210	ND(15)
Hardness (Total)	649	363	673J	261J	312	365	ND(1.0)
Bicarbonate	211	241	323	307	130	225	2.3
Ammonia	ND(0.02)	0.08	0.09	0.09	0.18	0.12	ND(0.02)
Nitrite	ND(0.1)	ND(0.1)	ND(0.1)	ND(0.1)	ND(0.1)	ND(0.1)	ND(0.1)
Nitrate	1.8	8.9	0.1	ND(0.1)	ND(0.1)	ND(0.1)	ND(0.1)
Phosphorus (Total)	ND(0.05)	0.12	ND(0.05)	0.10	0.12	0.05	ND(0.05)
Sulfide	ND(0.1)	ND(0.1)	ND(0.5)	ND(0.5)	ND(0.1)	ND(0.5)	ND(0.5)
Sulfate	36.4	35.0	44.2	50.4	60.4	30.6	ND(5)
Total Suspended Solids	7	14	2230	1990	50	1880	ND(5)
Alkalinity (Total)	212	241	324	308	138	226	ND(2.3)
Total Dissolved Solids	316	367	450	452	232	291	7
Total Organic Carbon	6.5	5.9	18.1J	10.1J	1.9	23.1	ND(1.0)

Notes:
ND Not detected at the detection limit within the paranthesis
J Associated value is estimated.

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SOIL SAMPLE DATA
VACAIR ALLOYS
REMEDIAL INVESTIGATION
FREWSBURG, NEW YORK

VOLATILE ORGANIC COMPOUNDS	*BHA-1 (2-4')BGS*	*BHB-1 (20-22')*	*BHC-1 (12-14')*	*BHD-1 (6-8')*	*BHD-2 (18-20')*	*BHE-1 (8-10')*	*BHE-2 (22-24')*	*BHF-1 (16-18')*	*BHG-1 (12-14')*	*BHH-2 (10-12')*
	(µg/kg)	*(µg/kg)*	*(µg/kg)*	*(µg/kg)*	*(µg/kg)*	*(µg/kg)*	*(µg/kg)*	*(µg/kg)*	*(µg/kg)*	*(µg/kg)*
Chloromethane	ND(11)	ND(12)	ND(13)	ND(12)	ND(13)	ND(14)	ND(13)	ND(13)	ND(13)	ND(13)
Bromomethane	ND(11)	ND(12)	ND(13)	ND(12)	ND(13)	ND(14)	ND(13)	ND(13)	ND(13)	ND(13)
Vinyl Chloride	ND(11)	ND(12)	ND(13)	ND(12)	ND(13)	ND(14)	ND(13)	ND(13)	ND(13)	ND(13)
Chloroethane	ND(11)	ND(12)	ND(13)	ND(12)	ND(13)	ND(14)	ND(13)	ND(13)	ND(13)	ND(13)
Methylene Chloride	ND(11)	ND(12)	ND(13)	ND(12)	ND(13)	ND(14)	ND(13)	ND(13)	ND(13)	ND(13)
Acetone	4J	ND(12)J	ND(13)	ND(12)J	14J	ND(14)J	19J	20J	17J	ND(13)J
Carbon Disulfide	ND(11)	ND(12)	ND(13)	ND(12)	ND(13)	ND(14)	ND(13)	ND(13)	ND(13)	ND(13)
1,1-Dichloroethene	ND(11)	ND(12)	ND(13)	ND(12)	ND(13)	ND(14)	ND(13)	ND(13)	ND(13)	ND(13)
1,1-Dichloroethane	ND(11)	ND(12)	ND(13)	ND(12)	ND(13)	ND(14)	ND(13)	ND(13)	ND(13)	ND(13)
1,2-Dichloroethene (Total)	ND(11)	ND(12)	130	ND(12)	170	ND(14)	ND(13)	ND(13)	ND(13)	ND(13)
Chloroform	ND(11)	ND(12)	ND(13)	ND(12)	ND(13)	ND(14)	ND(13)	ND(13)	ND(13)	ND(13)
1,2-Dichloroethane	ND(11)	ND(12)	ND(13)	ND(12)	ND(13)	ND(14)	ND(13)	ND(13)	ND(13)	ND(13)
2-Butanone	ND(11)	ND(12)	ND(13)	ND(12)	ND(13)	ND(14)	ND(13)	ND(13)	ND(13)J	ND(13)J
1,1,1-Trichloroethane	ND(11)	ND(12)	ND(13)	ND(12)	ND(13)	ND(14)	ND(13)	ND(13)	ND(13)	ND(13)
Carbon Tetrachloride	ND(11)	ND(12)	ND(13)	ND(12)	ND(13)	ND(14)	ND(13)	ND(13)	ND(13)	ND(13)
Bromodichloromethane	ND(11)	ND(12)	ND(13)	ND(12)	ND(13)	ND(14)	ND(13)	ND(13)	ND(13)	ND(13)
1,2-Dichloropropane	ND(11)	ND(12)	ND(13)	ND(12)	ND(13)	ND(14)	ND(13)	ND(13)	ND(13)	ND(13)
cis-1,3-Dichloropropane	ND(11)	ND(12)	ND(13)	ND(12)	ND(13)	ND(14)	ND(13)	ND(13)	ND(13)	ND(13)
Trichloroethene	ND(11)	ND(12)	4800	18	11000	ND(14)	ND(13)	ND(13)	94	12 J
Dibromochloromethane	ND(11)	ND(12)	ND(13)	ND(12)	ND(13)	ND(14)	ND(13)	ND(13)	ND(13)	ND(13)
1,1,2-Trichloroethane	ND(11)	ND(12)	ND(13)	ND(12)	ND(13)	ND(14)	ND(13)	ND(13)	ND(13)	ND(13)
Benzene	ND(11)	ND(12)	ND(13)	ND(12)	ND(13)	ND(14)	ND(13)	ND(13)	ND(13)	ND(13)
trans-1,3-Dichloropropene	ND(11)	ND(12)	ND(13)	ND(12)	ND(13)	ND(14)	ND(13)	ND(13)	ND(13)	ND(13)
Bromoform	ND(11)	ND(12)	ND(13)	ND(12)	ND(13)	ND(14)	ND(13)	ND(13)	ND(13)	ND(13)
4-Methyl-2-Pentanone	ND(11)	ND(12)J	ND(13)	ND(12)J	ND(13)J	ND(14)J	ND(13)J	ND(13)J	ND(13)J	ND(13)J
2-Hexanone	ND(11)	ND(12)J	ND(13)	ND(12)J	ND(13)J	ND(14)J	ND(13)J	ND(13)J	ND(13)J	ND(13)J
Tetrachloroethene	ND(11)	ND(12)	ND(13)	ND(12)	ND(13)	ND(14)	ND(13)	ND(13)	ND(13)	ND(13)
1,1,2,2-Tetrachloroethane	ND(11)	ND(12)	ND(13)	ND(12)	ND(13)	ND(14)	ND(13)	ND(13)	ND(13)	ND(13)
Toluene	ND(11)	ND(12)	ND(13)	ND(12)	ND(13)	ND(14)	ND(13)	ND(13)	ND(13)	ND(13)
Chlorobenzene	ND(11)	ND(12)	ND(13)	ND(12)	ND(13)	ND(14)	ND(13)	ND(13)	ND(13)	ND(13)
Ethylbenzene	ND(11)	ND(12)	ND(13)	ND(12)	ND(13)	ND(14)	ND(13)	ND(13)	ND(13)	ND(13)
Styrene	ND(11)	ND(12)	ND(13)	ND(12)	ND(13)	ND(14)	ND(13)	ND(13)	ND(13)	ND(13)
Xylene (Total)	ND(11)	ND(12)	ND(13)	ND(12)	ND(13)	ND(14)	ND(13)	ND(13)	ND(13)	ND(13)
Percent Solids (%)	91.0	80.0	78.0	83.0	78.0	77.0	78.0	77.0	77.0	80.0

SOIL SAMPLE DATA
VACAIR ALLOYS
REMEDIAL INVESTIGATION
FREWSBURG, NEW YORK

VOLATILE ORGANIC COMPOUNDS	*BHI-1 (2-4')* (µg/kg)	*BHAB-1* *Dup of BHI-1* (µg/kg)	*BHI-2 (4-6')* (µg/kg)	*BHJ-1 (14-16')* (µg/kg)	*BHJ-2 (20-22')* (µg/kg)	*BHL-1 (4-6')* (µg/kg)	*BHL-2 (20-22')* (µg/kg)	*BHM-I (0-2')* (µg/kg)	*BHBC-1* *Dup of BHM-1* (µg/kg)
Chloromethane	ND(12)	ND(12)	ND(13)	ND(12)	ND(13)	ND(11)	ND(13)	ND(21)	ND(12)J
Bromomethane	ND(12)	ND(12)	ND(13)	ND(12)	ND(13)	ND(11)	ND(13)	ND(21)	ND(12)J
Vinyl Chloride	ND(12)	ND(12)	ND(13)	ND(12)	ND(13)	ND(11)	ND(13)	ND(21)	ND(12)J
Chloroethane	ND(12)	ND(12)	ND(13)	ND(12)	ND(13)	ND(11)	ND(13)	ND(21)	ND(12)J
Methylene Chloride	ND(12)	ND(12)	ND(13)	ND(12)	ND(13)	ND(11)	ND(13)	ND(21)	ND(12)J
Acetone	58J	50J	ND(13)J	ND(12)J	16J	54J	ND(13)J	160J	380J
Carbon Disulfide	ND(12)	ND(12)	ND(13)	ND(12)	ND(13)	ND(11)	ND(13)	ND(21)	ND(12)J
1,1-Dichloroethene	ND(12)	ND(12)	ND(13)	ND(12)	ND(13)	ND(11)	ND(13)	ND(21)	ND(12)J
1,1-Dichloroethane	ND(12)	ND(12)	ND(13)	ND(12)	ND(13)	ND(11)	ND(13)	ND(21)	ND(12)J
1,2-Dichloroethene (Total)	ND(12)	ND(12)	ND(13)	ND(12)	ND(13)	ND(11)	24	ND(21)	11J
Chloroform	ND(12)	ND(12)	ND(13)	ND(12)	ND(13)	ND(11)	ND(13)	ND(21)	ND(12)J
1,2-Dichloroethane	ND(12)	ND(12)	ND(13)	ND(12)	ND(13)	ND(11)	ND(13)	ND(21)	ND(12)J
2-Butanone	ND(12)	ND(12)	ND(13)	ND(12)	ND(13)	9J	ND(13)J	ND(21)J	100J
1,1,1-Trichloroethane	ND(12)	ND(12)	ND(13)	ND(12)	ND(13)	ND(11)	ND(13)	16J	ND(12)J
Carbon Tetrachloride	ND(12)	ND(12)	ND(13)	ND(12)	ND(13)	ND(11)	ND(13)	ND(21)	ND(12)J
Bromodichloromethane	ND(12)	ND(12)	ND(13)	ND(12)	ND(13)	ND(11)	ND(13)	ND(21)	ND(12)J
1,2-Dichloropropane	ND(12)	ND(12)	ND(13)	ND(12)	ND(13)	ND(11)	ND(13)	ND(21)	ND(12)J
cis-1,3-Dichloropropane	ND(12)	ND(12)	ND(13)	ND(12)	ND(13)	ND(11)	ND(13)	ND(21)	ND(12)J
Trichloroethene	ND(12)	ND(12)	ND(13)	ND(12)	ND(13)	ND(11)	610	11J	36J
Dibromochloromethane	ND(12)	ND(12)	ND(13)	ND(12)	ND(13)	ND(11)	ND(13)	ND(21)	ND(12)J
1,1,2-Trichloroethane	ND(12)	ND(12)	ND(13)	ND(12)	ND(13)	ND(11)	ND(13)	ND(21)	ND(12)J
Benzene	ND(12)	ND(12)	ND(13)	ND(12)	ND(13)	ND(11)	ND(13)	ND(21)	ND(12)J
trans-1,3-Dichloropropene	ND(12)	ND(12)	ND(13)	ND(12)	ND(13)	ND(11)	ND(13)	ND(21)	ND(12)J
Bromoform	ND(12)	ND(12)	ND(13)	ND(12)	ND(13)	ND(11)	ND(13)	ND(21)	ND(12)J
4-Methyl-2-Pentanone	ND(12)J	ND(12)J	ND(13)J	ND(12)J	ND(13)J	ND(11)J	ND(13)J	ND(21)J	ND(12)J
2-Hexanone	ND(12)J	ND(12)J	ND(13)J	ND(12)J	ND(13)J	ND(11)J	ND(13)J	ND(21)J	ND(12)J
Tetrachloroethene	ND(12)	ND(12)	ND(13)	ND(12)	ND(13)	ND(11)	ND(13)	ND(21)	ND(12)J
1,1,2,2-Tetrachloroethane	ND(12)	ND(12)	ND(13)	ND(12)	ND(13)	ND(11)	ND(13)	ND(21)	ND(12)J
Toluene	ND(12)	ND(12)	ND(13)	ND(12)	ND(13)	ND(11)	ND(13)	5J	12J
Chlorobenzene	ND(12)	ND(12)	ND(13)	ND(12)	ND(13)	ND(11)	ND(13)	ND(21)	ND(12)J
Ethylbenzene	ND(12)	ND(12)	ND(13)	ND(12)	ND(13)	ND(11)	ND(13)	ND(21)	ND(12)J
Styrene	ND(12)	ND(12)	ND(13)	ND(12)	ND(13)	ND(11)	ND(13)	ND(21)	ND(12)J
Xylene (Total)	ND(12)	ND(12)	ND(13)	ND(12)	ND(13)	ND(11)	ND(13)	ND(21)	ND(12)J
Percent Solids (%)	88.0	86.0	77.0	87.0	77.0	90.0	77.0	89.0	91.0

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SOIL SAMPLE DATA
VACAIR ALLOYS
REMEDIAL INVESTIGATION
FREWSBURG, NEW YORK

VOLATILE ORGANIC COMPOUNDS	*BHM-2* (22-24')	*BHO-1* (22-24')	*BHP-1* (4-6')	*BHP-2* (18-20')	*BHU-1* (6-8')	*BHV-1* (24-26')	*BHW-2* (24-26')	*MW5D-1* (20-22')	*MW8-1* (2-4')
	(µg/kg)	*(µg/kg)*	*(µg/kg)*	*(µg/kg)*	*(µg/kg)*	*(µg/kg)*	*(µg/kg)*	*(µg/kg)*	*(µg/kg)*
Chloromethane	ND(13)	ND(13)	ND(21)	ND(13)	ND(13)J	ND(13)J	ND(12)J	ND(12)	ND(12)J
Bromomethane	ND(13)	ND(13)	ND(21)	ND(13)	ND(13)	ND(13)	ND(12)	ND(12)	ND(12)
Vinyl Chloride	ND(13)	ND(13)	ND(21)	ND(13)	ND(13)	ND(13)	ND(12)	ND(12)	ND(12)
Chloroethane	ND(13)	ND(13)	ND(21)	ND(13)	ND(13)	ND(13)	ND(12)	ND(12)J	ND(12)
Methylene Chloride	ND(13)	ND(13)	ND(21)	ND(13)	ND(13)J	ND(13)J	ND(12)J	ND(12)	ND(12)J
Acetone	ND(13)J	66J	ND(21)J	ND(13)J	ND(13)J	ND(13)J	ND(12)J	6J	16J
Carbon Disulfide	ND(13)	ND(13)	ND(21)	ND(13)	ND(13)	ND(13)	ND(12)	ND(12)	ND(12)
1,1-Dichloroethene	ND(13)	ND(13)	ND(21)	ND(13)	ND(13)	ND(13)	ND(12)	ND(12)	ND(12)
1,1-Dichloroethane	ND(13)	ND(13)	ND(21)	ND(13)	ND(13)	ND(13)	ND(12)	ND(12)	ND(12)
1,2-Dichloroethene (Total)	ND(13)	ND(13)	ND(21)	ND(13)	ND(13)J	ND(13)J	ND(12)J	ND(12)	ND(12)
Chloroform	ND(13)	ND(13)	ND(21)	ND(13)	ND(13)J	ND(13)J	ND(12)J	ND(12)	ND(12)J
1,2-Dichloroethane	ND(13)	ND(13)	ND(21)	ND(13)	ND(13)	ND(13)	ND(12)	ND(12)	ND(12)J
2-Butanone	ND(13)J	ND(13)J	ND(21)J	ND(13)J	ND(13)	ND(13)	ND(12)	ND(12)J	ND(12)
1,1,1-Trichloroethane	9J	ND(13)	ND(21)	ND(13)	ND(13)	ND(13)	ND(12)	ND(12)	ND(12)
Carbon Tetrachloride	ND(13)	ND(13)	ND(21)	ND(13)	ND(13)	ND(13)	ND(12)	ND(12)	ND(12)
Bromodichloromethane	ND(13)	ND(13)	ND(21)	ND(13)	ND(13)	ND(13)	ND(12)	ND(12)	ND(12)
1,2-Dichloropropane	ND(13)	ND(13)	ND(21)	ND(13)	ND(13)	ND(13)	ND(12)	ND(12)	ND(12)
cis-1,3-Dichloropropane	ND(13)	ND(13)	ND(21)	ND(13)	ND(13)	ND(13)	ND(12)	ND(12)	ND(12)
Trichloroethene	12J	ND(13)	ND(21)	ND(13)	ND(13)	ND(13)	ND(12)	12	ND(12)
Dibromochloromethane	ND(13)	ND(13)	ND(21)	ND(13)	ND(13)	ND(13)	ND(12)	ND(12)	ND(12)
1,1,2-Trichloroethane	ND(13)	ND(13)	ND(21)	ND(13)	ND(13)	ND(13)	ND(12)	ND(12)	ND(12)
Benzene	ND(13)	ND(13)	470J	ND(13)	ND(13)	ND(13)	ND(12)	ND(12)	ND(12)
trans-1,3-Dichloropropene	ND(13)	ND(13)	ND(21)	ND(13)	ND(13)	ND(13)	ND(12)	ND(12)	ND(12)
Bromoform	ND(13)	ND(13)	ND(21)	ND(13)	ND(13)	ND(13)	ND(12)	ND(12)	ND(12)
4-Methyl-2-Pentanone	ND(13)J	ND(13)J	ND(21)J	ND(13)J	ND(13)J	ND(13)J	ND(12)J	ND(12)	ND(12)J
2-Hexanone	ND(13)J	ND(13)J	ND(21)J	ND(13)J	ND(13)J	ND(13)J	ND(12)J	ND(12)	ND(12)J
Tetrachloroethene	ND(13)	ND(13)	ND(21)	ND(13)	ND(13)	ND(13)	ND(12)	4J	ND(12)
1,1,2,2-Tetrachloroethane	ND(13)	ND(13)	ND(21)	ND(13)	ND(13)	ND(13)	ND(12)	ND(12)	ND(12)
Toluene	ND(13)	ND(13)	5900J	ND(13)	ND(13)	ND(13)	ND(12)	ND(12)	ND(12)
Chlorobenzene	ND(13)	ND(13)	ND(21)	ND(13)	ND(13)	ND(13)	ND(12)	ND(12)	ND(12)
Ethylbenzene	ND(13)	ND(13)	6000J	ND(13)	ND(13)	ND(13)	ND(12)	ND(12)	ND(12)
Styrene	ND(13)	ND(13)	ND(21)	ND(13)	ND(13)	ND(13)	ND(12)	ND(12)	ND(12)
Xylene (Total)	ND(13)	ND(13)	39000J	ND(13)	ND(13)	ND(13)	ND(12)	ND(12)	ND(12)
Percent Solids (%)	80.0	81.0	89.0	78.0	77.0	78.0	80.0	78.0	83.0

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SOIL SAMPLE DATA
VACAIR ALLOYS
REMEDIAL INVESTIGATION
FREWSBURG, NEW YORK

VOLATILE ORGANIC COMPOUNDS	*MW8-2 (16-18')*	*MW9-2 (22-24')*	*MW11-1 (10-12')*	*MW11-2 (14-16')*	*RB1124*
	(µg/kg)	*(µg/kg)*	*(µg/kg)*	*(µg/kg)*	*RINSE BLANK (µg/L)*
Chloromethane	ND(14)J	ND(13)J	ND(65)J	ND(13)J	ND(10)
Bromomethane	ND(14)	ND(13)	ND(65)	ND(13)	ND(10)
Vinyl Chloride	ND(14)	ND(13)	ND(65)	ND(13)	ND(10)
Chloroethane	ND(14)	ND(13)	ND(65)	ND(13)	ND(10)
Methylene Chloride	ND(14)J	ND(13)J	ND(65)J	ND(13)J	ND(10)J
Acetone	ND(14)J	ND(13)J	ND(65)J	ND(13)J	ND(10)
Carbon Disulfide	ND(14)	ND(13)	ND(65)	ND(13)	ND(10)
1,1-Dichloroethene	ND(14)	ND(13)	ND(65)	ND(13)	ND(10)
1,1-Dichloroethane	ND(14)	ND(13)	ND(65)	ND(13)	ND(10)
1,2-Dichloroethene (Total)	ND(14)	ND(13)	130J	ND(13)J	ND(10)
Chloroform	ND(14)J	ND(13)J	ND(65)J	ND(13)J	ND(10)
1,2-Dichloroethane	ND(14)J	ND(13)J	ND(65)	ND(13)	ND(10)
2-Butanone	ND(14)	ND(13)	ND(65)	ND(13)	ND(10)
1,1,1-Trichloroethane	ND(14)	ND(13)	ND(65)	ND(13)	ND(10)
Carbon Tetrachloride	ND(14)	ND(13)	ND(65)	ND(13)	ND(10)
Bromodichloromethane	ND(14)	ND(13)	ND(65)	ND(13)	ND(10)
1,2-Dichloropropane	ND(14)	ND(13)	ND(65)	ND(13)	ND(10)
cis-1,3-Dichloropropane	ND(14)	ND(13)	ND(65)	ND(13)	ND(10)
Trichloroethene	ND(14)	ND(13)	85000	ND(1600)	ND(10)
Dibromochloromethane	ND(14)	ND(13)	ND(65)	ND(13)	ND(10)
1,1,2-Trichloroethane	ND(14)	ND(13)	ND(65)	ND(13)	ND(10)
Benzene	ND(14)	ND(13)	ND(65)	ND(13)	ND(10)
trans-1,3-Dichloropropene	ND(14)	ND(13)	ND(65)	ND(13)	ND(10)
Bromoform	ND(14)	ND(13)	ND(65)	ND(13)	ND(10)
4-Methyl-2-Pentanone	ND(14)J	ND(13)J	ND(65)J	ND(13)J	ND(10)
2-Hexanone	ND(14)J	ND(13)J	ND(65)J	ND(13)J	ND(10)
Tetrachloroethene	ND(14)	ND(13)	93	ND(13)	ND(10)
1,1,2,2-Tetrachloroethane	ND(14)	ND(13)	ND(65)	ND(13)	ND(10)
Toluene	ND(14)	ND(13)	ND(65)	ND(13)	ND(10)
Chlorobenzene	ND(14)	ND(13)	ND(65)	ND(13)	ND(10)
Ethylbenzene	ND(14)	ND(13)	ND(65)	ND(13)	ND(10)
Styrene	ND(14)	ND(13)	ND(65)	ND(13)	ND(10)
Xylene (Total)	ND(14)	ND(13)	28J	ND(13)	ND(10)
Percent Solids (%)	75.0	77.0	77.0	77.0	NA

TABLE 15
SOIL SAMPLE DATA
VACAIR ALLOYS
REMEDIAL INVESTIGATION
FREWSBURG, NEW YORK

ORGANIC PESTICIDES Depth Units	BHLS-1 (4-6') (µg/kg)	BHLS-2 (20-22') (µg/kg)	BHPS-1 (4-6') (µg/kg)	MW11 S-1 (10-12') (µg/kg)	RB-1124 Rinse Blank (µg/L)
Aroclor 1016	ND(37)	ND(43)	ND(37)	ND(43)	ND(1.0)
Aroclor 1221	ND(74)	ND(87)	ND(75)	ND(87)	ND(2.0)
Aroclor 1232	ND(37)	ND(43)	ND(37)	ND(43)	ND(1.0)
Aroclor 1242	ND(37)	ND(43)	ND(37)	ND(43)	ND(1.0)
Aroclor 1248	ND(37)	ND(43)	ND(37)	ND(43)	ND(1.0)
Aroclor 1254	ND(37)	ND(43)	ND(37)	ND(43)	ND(1.0)
Aroclor 1260	ND(37)	ND(43)	ND(37)	ND(43)	ND(1.0)

TABLE 15
SOIL SAMPLE DATA
VACAIR ALLOYS
REMEDIAL INVESTIGATION
FREWSBURG, NEW YORK

TOTAL ORGANIC CARBON (TOC)	MW-10 Composite (6-22') (mg/kg)	MW-4 Composite (4-17') (mg/kg)
TOC	4260	1790
Percent Solids (%)	81.1	83.1

Notes:
ND Not detected at the detection limit within the paranthesis.
J Associated value is estimated.

SURFACE WATER SAMPLE DATA
VACAIR ALLOYS
REMEDIAL INVESTIGATION
FREWSBURG, NEW YORK

VOLATILE ORGANIC COMPOUNDS	*SW-A* (µg/L)	*SW-B* (µg/L)	*SW-C* (µg/L)	*SW-D* (µg/L)	*SW-E* (µg/L)	*SW-F* (µg/L)	*SW-G* (µg/L)	*SW-H* (µg/L)	*SW-I Dup of SW-H* (µg/L)	*SW-J* (µg/L)
Chloromethane	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
Bromomethane	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
Vinyl Chloride	ND(10)	ND(10)	ND(10)	ND(10)	140	ND(10)	48	130	130	ND(10)
Chloroethane	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
Methylene Chloride	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
Acetone	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
Carbon Disulfide	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
1,1-Dichloroethene	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
1,1-Dichloroethane	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
1,2-Dichloroethene (Total)	ND(10)	ND(10)	ND(10)	ND(10)	9 J	170	540	720	510	11
Chloroform	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
1,2-Dichloroethane	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
2-Butanone	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
1,1,1-Trichloroethane	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
Carbon Tetrachloride	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
Bromodichloromethane	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
1,2-Dichloropropane	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
cis-1,3-Dichloropropene	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
Trichloroethene	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	160	600	770J	540J	ND(10)
Dibromochloromethane	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
1,1,2-Trichloroethane	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
Benzene	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
trans-1,3-Dichloropropene	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
Bromoform	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
4-Methyl-2-Pentanone	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
2-Hexanone	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
Tetrachloroethene	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
1,1,2,2-Tetrachloroethane	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
Toluene	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
Chlorobenzene	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
Ethylbenzene	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
Styrene	ND(10)	ND(10)	ND(10)	2 J	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
Xylene (Total)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)

TABLE 13

SURFACE WATER SAMPLE DATA
VACAIR ALLOYS
REMEDIAL INVESTIGATION
FREWSBURG, NEW YORK

VOLATILE ORGANIC COMPOUNDS	*SW-K* (µg/L)	*SW-L* (µg/L)	*SW-M* (µg/L)	*SW-N Dup of SW-M* (µg/L)	*Trip Blank* (µg/L)
Chloromethane	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
Bromomethane	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
Vinyl Chloride	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
Chloroethane	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
Methylene Chloride	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
Acetone	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
Carbon Disulfide	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
1,1-Dichloroethene	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
1,1-Dichloroethane	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
1,2-Dichloroethene (Total)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
Chloroform	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
1,2-Dichloroethane	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
2-Butanone	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
1,1,1-Trichloroethane	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
Carbon Tetrachloride	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
Bromodichloromethane	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
1,2-Dichloropropane	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
cis-1,3-Dichloropropene	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
Trichloroethene	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
Dibromochloromethane	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
1,1,2-Trichloroethane	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
Benzene	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
trans-1,3-Dichloropropene	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
Bromoform	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
4-Methyl-2-Pentanone	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
2-Hexanone	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
Tetrachloroethene	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
1,1,2,2-Tetrachloroethane	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
Toluene	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
Chlorobenzene	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
Ethylbenzene	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
Styrene	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
Xylene (Total)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)

~~TABLE 15~~

SURFACE WATER SAMPLE DATA
VACAIR ALLOYS
REMEDIAL INVESTIGATION
FREWSBURG, NEW YORK

PCB	*SW-F* (µg/L)	*SW-G* (µg/L)	*SW-H* (µg/L)	*SW-I Dup of SW-H* (µg/L)	*SW-J* (µg/L)	*SW-K* (µg/L)	*SW-L* (µg/L)	*SW-M* (µg/L)	*SW-N Dup of SW-M* (µg/L)
Aroclor 1016	ND(0.99)	ND(1.0)	ND(1.0)	ND(1.0)	ND(0.98)	ND(1.0)	ND(0.99)	ND(.95)	ND(1.9)
Aroclor 1221	ND(2.0)	ND(2.1)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(1.9)	ND(3.8)
Aroclor 1232	ND(0.99)	ND(1.0)	ND(1.0)	ND(1.0)	ND(0.98)	ND(1.0)	ND(0.99)	ND(.95)	ND(1.9)
Aroclor 1242	ND(0.99)	ND(1.0)	ND(1.0)	ND(1.0)	ND(0.98)	ND(1.0)	ND(0.99)	ND(.95)	ND(1.9)
Aroclor 1248	ND(0.99)	ND(1.0)	ND(1.0)	ND(1.0)	ND(0.98)	ND(1.0)	ND(0.99)	ND(.95)	ND(1.9)
Aroclor 1254	ND(0.99)	ND(1.0)	ND(1.0)	ND(1.0)	ND(0.98)	ND(1.0)	ND(0.99)	ND(.95)	ND(1.9)
Aroclor 1260	ND(0.99)	ND(1.0)	ND(1.0)	ND(1.0)	ND(0.98)	ND(1.0)	ND(0.99)	ND(.95)	ND(1.9)

TABLE 15

SURFACE WATER SAMPLE DATA
VACAIR ALLOYS
REMEDIAL INVESTIGATION
FREWSBURG, NEW YORK

METALS	*SW-A* (µg/L)	*SW-B* (µg/L)	*SW-C* (µg/L)	*SW-D* (µg/L)	*SW-E* (µg/L)	*SW-F* (µg/L)	*SW-G* (µg/L)	*SW-H* (µg/L)	*SW-I Dup of SW-H* (µg/L)	*SW-J* (µg/L)	*SW-K* (µg/L)
Cadmium	ND(2.7)	ND(2.7)	ND(2.7)	24.7	166	ND(2.7)	ND(2.7)	ND(2.7)	ND(2.7)	5.1	ND(2.7)
Calcium	34000	80100	84800	150000	261000	64400	75000	68100	68700	50300	32700
Chromium	ND(8.4)	ND(8.4)	ND(8.4)	272	2900	ND(8.4)	9.4	15.3	17.8	10.7	ND(8.4)
Copper	5.4	2.8	3.5	318	1850	6.9	6.2	45.8J	22.0J	19.6	3.5
Iron	ND(38.8)	ND(65.4)	ND(46.3)	53200	172000	1280	426	2220	1960	15000	649
Lead	ND(1.9)	ND(1.9)	ND(1.9)	289	1390	ND(1.9)	ND(1.9)	11.3	14.8	6.7	ND(1.9)
Magnesium	7700	10100	10800	42000	55600	9860	11400	10700	10600	9130	6000
Manganese	4.1	24.4	17.9	11000	6770	356	140	270	264	713	90.9
Mercury	ND(0.10)	ND(0.10)	ND(0.10)	3.0	10.7	ND(0.10)	ND(0.10)	ND(0.10)	ND(0.10)	0.14	ND(0.10)
Nickel	ND(6.9)	ND(6.9)	ND(6.9)	892	5670	13.4	17.9	74.8	69.0	49.8	ND(6.9)
Sodium	5730	11500	11600	17400	35000	9560	11700	11400	11000	8900	8370

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SURFACE WATER SAMPLE DATA
VACAIR ALLOYS
REMEDIAL INVESTIGATION
FREWSBURG, NEW YORK

METALS	*SW-L* (µg/L)	*SW-M* (µg/L)	*SW-N Dup of SW-M* (µg/L)
Cadmium	ND(2.7)	ND(2.7)	ND(2.7)
Calcium	30000	31600	28700
Chromium	ND(8.4)	ND(8.4)	ND(8.4)
Copper	5.5	4.0	4.2
Iron	1100	504J	849J
Lead	ND(1.9)	ND(1.9)	2.2
Magnesium	5670	5960	5450
Manganese	152	85.2J	165J
Mercury	ND(0.10)	ND(0.10)	ND(0.10)
Nickel	ND(6.9)	ND(8.0)	ND(6.9)
Sodium	7940	8220	7610

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~~TABLE 10~~

SURFACE WATER SAMPLE DATA
VACAIR ALLOYS
REMEDIAL INVESTIGATION
FREWSBURG, NEW YORK

TOTAL HARDNESS	*SW-A* (µg/L)	*SW-B* (µg/L)	*SW-C* (µg/L)	*SW-D* (µg/L)	*SW-E* (µg/L)	*SW-F* (µg/L)	*SW-G* (µg/L)	*SW-H* (µg/L)	*SW-I Dup of SW-H* (µg/L)	*SW-J* (µg/L)	*SW-K* (µg/L)	*SW-L* (µg/L)	*SW-M* (µg/L)	*SW-N Dup of SW-M* (µg/L)
Total Hardness	116000	241000	256000	547000	881000	202000	234000	214000	215000	163000	106000	98300	103000	94100

Notes:
ND Not detected at the detection limit within the paranthesis.
J Associated value is estimated.

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TABLE 14

SEDIMENT SAMPLE DATA
VACAIR ALLOYS
REMEDIAL INVESTIGATION
FREWSBURG, NEW YORK

VOLATILE ORGANIC COMPOUNDS	*SED-A* (µg/kg)	*SED-B* (µg/kg)	*SED-C* (µg/kg)	*SED-D* (µg/kg)	*SED-E* (µg/kg)	*SED-F* (µg/kg)	*SED-G* (µg/kg)	*SED-H* (µg/kg)	*SED-I* (µg/kg) *Dup of SED-H*	*SED-J* (µg/kg)
Chloromethane	ND(61)	ND(22)	ND(51)	ND(33)	ND(28)	ND(35)	ND(54)	ND(39)J	ND(59)J	ND(61)
Bromomethane	ND(61)	ND(22)	ND(51)	ND(33)	ND(28)	ND(35)	ND(54)	ND(39)J	ND(59)J	ND(61)
Vinyl Chloride	ND(61)J	ND(22)J	ND(51)J	ND(33)J	ND(28)J	300J	310J	1100J	ND(7600) J	ND(61)J
Chloroethane	ND(61)	ND(22)	ND(51)	ND(33)	ND(28)	ND(35)	ND(54)	ND(39)J	ND(59)J	ND(61)
Methylene Chloride	ND(61)	ND(22)	ND(51)	ND(33)	ND(28)	ND(35)	ND(54)	ND(39)J	ND(59)J	ND(61)
Acetone	ND(61)J	ND(22)J	530J	390J	270J	110J	230J	120J	ND(59)J	200J
Carbon Disulfide	ND(61)	ND(22)	ND(51)	ND(33)	ND(28)	ND(35)	ND(54)	ND(39)J	ND(59)J	ND(61)
1,1-Dichloroethene	ND(61)	ND(22)	ND(51)	ND(33)	ND(28)	ND(35)	ND(54)	39 J	53 J	ND(61)
1,1-Dichloroethane	ND(61)	ND(22)	ND(51)	ND(33)	ND(28)	ND(35)	ND(54)	ND(39)J	ND(59)J	ND(61)
1,2-Dichloroethene (Total)	ND(61)	ND(22)	ND(51)	ND(33)	ND(28)	270	470	3400	9900	ND(61)
Chloroform	ND(61)	ND(22)	ND(51)	ND(33)	ND(28)	ND(35)	ND(54)	ND(39)J	ND(59)J	ND(61)
1,2-Dichloroethane	ND(61)	ND(22)	ND(51)	ND(33)	ND(28)	ND(35)	ND(54)	ND(39)J	ND(59)J	ND(61)
2-Butanone	ND(61)	ND(22)	180	79	100	ND(35)	ND(54)	ND(39)J	ND(59)J	ND(61)
1,1,1-Trichloroethane	ND(61)	ND(22)	ND(51)	ND(33)	ND(28)	ND(35)	ND(54)	ND(39)J	ND(59)J	ND(61)
Carbon Tetrachloride	ND(61)	ND(22)	ND(51)	ND(33)	ND(28)	ND(35)	ND(54)	ND(39)J	ND(59)J	ND(61)
Bromodichloromethane	ND(61)	ND(22)	ND(51)	ND(33)	ND(28)	ND(35)	ND(54)	ND(39)J	ND(59)J	ND(61)
1,2-Dichloropropane	ND(61)	ND(22)	ND(51)	ND(33)	ND(28)	ND(35)	ND(54)	ND(39)J	ND(59)J	ND(61)
cis-1,3-Dichloropropene	ND(61)	ND(22)	ND(51)	ND(33)	ND(28)	ND(35)	ND(54)	ND(39)J	ND(59)J	ND(61)
Trichloroethene	ND(61)	ND(22)	ND(51)	ND(33)	ND(28)	26 J	66	290J	380J	ND(61)
Dibromochloromethane	ND(61)	ND(22)	ND(51)	ND(33)	ND(28)	ND(35)	ND(54)	ND(39)J	ND(59)J	ND(61)
1,1,2-Trichloroethane	ND(61)	ND(22)	ND(51)	ND(33)	ND(28)	ND(35)	ND(54)	ND(39)J	ND(59)J	ND(61)
Benzene	ND(61)	ND(22)	ND(51)	ND(33)	ND(28)	ND(35)	ND(54)	ND(39)J	ND(59)J	ND(61)
trans-1,3-Dichloropropene	ND(61)	ND(22)	ND(51)	ND(33)	ND(28)	ND(35)	ND(54)	ND(39)J	ND(59)J	ND(61)
Bromoform	ND(61)	ND(22)	ND(51)	ND(33)	ND(28)	ND(35)	ND(54)	ND(39)J	ND(59)J	ND(61)
4-Methyl-2-Pentanone	ND(61)	ND(22)	ND(51)	ND(33)J	ND(28)	ND(35)J	ND(54)J	ND(39)J	ND(59)J	ND(61)
2-Hexanone	ND(61)	ND(22)	ND(51)	ND(33)J	ND(28)	ND(35)J	ND(54)J	ND(39)J	ND(59)J	ND(61)
Tetrachloroethene	ND(61)	ND(22)	ND(51)	ND(33)J	ND(28)	ND(35)J	ND(54)J	ND(39)J	ND(59)J	ND(61)
1,1,2,2-Tetrachloroethane	ND(61)	ND(22)	ND(51)	ND(33)J	ND(28)	ND(35)J	ND(54)J	ND(39)J	ND(59)J	ND(61)
Toluene	ND(61)	ND(22)	ND(51)	14 J	ND(28)	ND(35)J	ND(54)J	ND(39)J	ND(59)J	ND(61)
Chlorobenzene	ND(61)	ND(22)	ND(51)	ND(33)J	ND(28)	ND(35)J	ND(54)J	ND(39)J	ND(59)J	ND(61)
Ethylbenzene	ND(61)	ND(22)	ND(51)	ND(33)J	ND(28)	ND(35)J	ND(54)J	ND(39)J	ND(59)J	ND(61)
Styrene	ND(61)	ND(22)	ND(51)	ND(33)J	ND(28)	ND(35)J	ND(54)J	ND(39)J	ND(59)J	ND(61)
Xylene (Total)	ND(61)	ND(22)	ND(51)	ND(33)J	ND(28)	ND(35)J	ND(54)J	ND(39)J	ND(59)J	ND(61)

~~TABLE 14~~

SEDIMENT SAMPLE DATA
VACAIR ALLOYS
REMEDIAL INVESTIGATION
FREWSBURG, NEW YORK

VOLATILE ORGANIC COMPOUNDS	*SED-K* (µg/kg)	*SED-L* (µg/kg)	*SED-M* (µg/kg)	*SED-N* (µg/kg) *Dup of SED-M*	*SED-1030* (µg/L) *Rinse Blank*
Chloromethane	ND(17)	ND(15)	ND(20)	ND(20)	ND(10)
Bromomethane	ND(17)	ND(15)	ND(20)	ND(20)	ND(10)
Vinyl Chloride	ND(17)	ND(15)	ND(20)	ND(20)	ND(10)
Chloroethane	ND(17)	ND(15)	ND(20)	ND(20)	ND(10)
Methylene Chloride	ND(17)	ND(15)	ND(20)	ND(20)	ND(10)
Acetone	ND(17)J	ND(15)J	19 J	ND(20)J	ND(10)
Carbon Disulfide	ND(17)	ND(15)	ND(20)	ND(20)	ND(10)
1,1-Dichloroethene	ND(17)	ND(15)	ND(20)	ND(20)	ND(10)
1,1-Dichloroethane	ND(17)	ND(15)	ND(20)	ND(20)	ND(10)
1,2-Dichloroethene (Total)	ND(17)	ND(15)	ND(20)	ND(20)	ND(10)
Chloroform	ND(17)	ND(15)	ND(20)	ND(20)	ND(10)
1,2-Dichloroethane	ND(17)	ND(15)	ND(20)	ND(20)	ND(10)
2-Butanone	ND(17)J	ND(15)J	ND(20)J	ND(20)J	ND(10)
1,1,1-Trichloroethane	ND(17)	ND(15)	ND(20)	ND(20)	ND(10)
Carbon Tetrachloride	ND(17)	ND(15)	ND(20)	ND(20)	ND(10)
Bromodichloromethane	ND(17)	ND(15)	ND(20)	ND(20)	ND(10)
1,2-Dichloropropane	ND(17)	ND(15)	ND(20)	ND(20)	ND(10)
cis-1,3-Dichloropropene	ND(17)	ND(15)	ND(20)	ND(20)	ND(10)
Trichloroethene	ND(17)	ND(15)	ND(20)	ND(20)	7 J
Dibromochloromethane	ND(17)	ND(15)	ND(20)	ND(20)	ND(10)
1,1,2-Trichloroethane	ND(17)	ND(15)	ND(20)	ND(20)	ND(10)J
Benzene	ND(17)	ND(15)	ND(20)	ND(20)	ND(10)
trans-1,3-Dichloropropene	ND(17)	ND(15)	ND(20)	ND(20)	ND(10)
Bromoform	ND(17)	ND(15)	ND(20)	ND(20)	ND(10)
4-Methyl-2-Pentanone	ND(17)J	ND(15)J	ND(20)J	ND(20)J	ND(10)
2-Hexanone	ND(17)	ND(15)	ND(20)	ND(20)	ND(10)
Tetrachloroethene	ND(17)	ND(15)	ND(20)	ND(20)	ND(10)
1,1,2,2-Tetrachloroethane	ND(17)	ND(15)	ND(20)	ND(20)	ND(10)
Toluene	ND(17)	ND(15)	ND(20)	ND(20)	ND(10)
Chlorobenzene	ND(17)	ND(15)	ND(20)	ND(20)	ND(10)
Ethylbenzene	ND(17)	ND(15)	ND(20)	ND(20)	ND(10)
Styrene	ND(17)	ND(15)	ND(20)	ND(20)	ND(10)
Xylene (Total)	ND(17)	ND(15)	ND(20)	ND(20)	ND(10)

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TABLE 14

SEDIMENT SAMPLE DATA
VACAIR ALLOYS
REMEDIAL INVESTIGATION
FREWSBURG, NEW YORK

PCB	*SED-F* (µg/kg)	*SED-G* (µg/kg)	*SED-H* (µg/kg)	*SED-I Dup of SED-H* (µg/kg)	*SED-J* (µg/kg)	*SED-K* (µg/kg)	*SED-L* (µg/kg)	*SED-M* (µg/kg)	*SED-N Dup of SED-M* (µg/kg)	*SED-1030 Rinse Blank* (µg/L)
Aroclor 1016	ND(100)	ND(120)	ND(130)	ND(170)	ND(240)	ND(55)	ND(49)	ND(59)	ND(57)	ND(1.0)
Aroclor 1221	ND(200)	ND(250)	ND(260)	ND(350)	ND(480)	ND(110)	ND(99)	ND(120)	ND(120)	ND(2.0)
Aroclor 1232	ND(100)	ND(120)	ND(130)	ND(170)	ND(240)	ND(55)	ND(49)	ND(59)	ND(57)	ND(1.0)
Aroclor 1242	ND(100)	ND(120)	ND(130)	ND(170)	ND(240)	ND(55)	ND(49)	ND(59)	ND(57)	ND(1.0)
Aroclor 1248	ND(100)	ND(120)	ND(130)	ND(170)	ND(240)	ND(55)	ND(49)	ND(59)	ND(57)	ND(1.0)
Aroclor 1254	ND(100)	ND(120)	ND(130)	ND(170)	ND(240)	ND(55)	ND(49)	ND(59)	ND(57)	ND(1.0)
Aroclor 1260	ND(100)	ND(120)	ND(130)	ND(170)	ND(240)	ND(55)	ND(49)	ND(59)	ND(57)	ND(1.0)

NOTE: Elevated DL due to high percent moisture content.

TABLE 14

SEDIMENT SAMPLE DATA
VACAIR ALLOYS
REMEDIAL INVESTIGATION
FREWSBURG, NEW YORK

METALS	*SED-A (mg/kg)*	*SED-B (mg/kg)*	*SED-C (mg/kg)*	*SED-D (mg/kg)*	*SED-E (mg/kg)*	*SED-F (mg/kg)*	*SED-G (mg/kg)*	*SED-H (mg/kg)*	*SED-I Dup of SED-H (mg/kg)*	*SED-J (mg/kg)*	*SED-K (mg/kg)*	*SED-L (mg/kg)*
Cadmium	4.9	1.8	4.7	49.3	43.1	15.2	13.3	22.3	31.6	19.9	3.6	3.2
Calcium	34400	6300	18200	55800	33500	17700	13900	22600	29300	6480	3940	4110
Chromium	47.1	10.1	21.7	1130	772	427	340	523	710	228	20.3	16.0
Copper	796	8.8	27.7	774	492	310	282	426	549	489	25.7	22.3
Iron	15700	8900	19200	73400	46200	30900	23200	40800J	52200J	26900	18700	15200
Lead	47.5	15.2	28.6	800	433J	64.0	80.0	166	201	106	35.5	15.2
Magnesium	5990	1460	2210	12700	7300	3720	3850	4660	6390	3230	3160	3450
Manganese	211	569	267	2060	1100	2540	1020	3250	3960	297	580	426
Mercury	ND(0.35)	ND(0.11)	ND(0.27)	6.4	8.0	1.4	2.8	1.9J	5.0J	2.8	ND(0.60)	ND(0.05)
Nickel	90.4	11.5	30.1	1660	1720	958	349	1240	1490	259	48.4	19.8
Sodium	407J	122J	276J	375J	278J	198J	251J	249J	353J	349J	117J	117J

~~TABLE 14~~

SEDIMENT SAMPLE DATA
VACAIR ALLOYS
REMEDIAL INVESTIGATION
FREWSBURG, NEW YORK

METALS	*SED-M* *(mg/kg)*	*SED-N* *Dup of SED-M* *(mg/kg)*	*RINSE BLANK* *SED1030* *(µg/L)*
Cadmium	3.2	4.3	ND(2.7)
Calcium	3580	4100	14.6
Chromium	23.2	25.9	ND(8.4)
Copper	39.7	40.6	ND(2.2)
Iron	19700	22400	ND(15.7)
Lead	24.5	24.5	ND(1.9)
Magnesium	3840	4390	ND(14.6)
Manganese	509	599	ND(1.8)
Mercury	ND(0.10)	ND(0.09)	ND(0.10)
Nickel	24.3	27.1	ND(6.9)
Sodium	155J	138J	18.8

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TABLE 4

SEDIMENT SAMPLE DATA
VACAIR ALLOYS
REMEDIAL INVESTIGATION
FREWSBURG, NEW YORK

TOTAL ORGANIC CARBON (TOC)	*SED-A (mg/kg)*	*SED-B (mg/kg)*	*SED-C (mg/kg)*	*SED-D (mg/kg)*	*SED-E (mg/kg)*	*SED-F (mg/kg)*	*SED-G (mg/kg)*	*SED-H (mg/kg)*	*SED-I Dup of SED-H (mg/kg)*	*SED-J (mg/kg)*	*SED-K (mg/kg)*	*SED-L (mg/kg)*	*SED-M (mg/kg)*	*SED-N Dup of SED-H (mg/kg)*	*RINSE BLANK SED-1030 (mg/L)*
TOC	53600	38600	67700	94600	72900	71700	102000	94100	117000	77700	17600	4180	18600	13000	<1.0
PERCENT SOLIDS (%)	16.3	44.2	20.2	29.9	37.1	28.3	19.0	25.6	16.5	14.4	59.5	67.5	49.5	49.2	NA

Notes:
ND Not detected at the detection limit within the parenthesis.
J Associated value is estimated.
NA Not analyzed

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SURFACE SOIL SAMPLE DATA
VACAIR ALLOYS
REMEDIAL INVESTIGATION
FREWSBURG, NEW YORK

VOLATILE ORGANIC COMPOUNDS	*SSOIL-A* (µg/kg)	*SSOIL-J* (µg/kg)	*SSOIL-M* (µg/kg)	*SSOIL-N* (µg/kg)	*SSOIL-CD DUP OF SSOIL-N* (µg/kg)	*SSOIL-O* (µg/kg)	*RINSE BLANK RB1222* (µg/L)
Chloromethane	ND(22)	ND(98)	ND(13)	ND(12)	ND(12)	ND(11)	ND(10)
Bromomethane	ND(22)	ND(98)	ND(13)	ND(12)	ND(12)	ND(11)	ND(10)
Vinyl Chloride	ND(22)	ND(98)	ND(13)	ND(12)	ND(12)	ND(11)	ND(10)
Chloroethane	ND(22)	ND(98)	ND(13)	ND(12)	ND(12)	ND(11)	ND(10)
Methylene Chloride	ND(22)	17 J	ND(13)	ND(12)	ND(12)	ND(11)	20
Acetone	86	48 J	11 J	4 J	ND(12)	ND(11)	ND(10)
Carbon Disulfide	ND(22)	ND(98)	4 J	1 J	3 J	ND(11)	ND(10)
1,1-Dichloroethene	ND(22)	ND(98)	ND(13)	ND(12)	ND(12)	ND(11)	ND(10)
1,1-Dichloroethane	ND(22)	ND(98)	ND(13)	ND(12)	ND(12)	ND(11)	ND(10)
1,2-Dichloroethene (Total)	ND(22)	ND(98)	5 J	ND(12)	2 J	ND(11)	ND(10)
Chloroform	ND(22)	ND(98)	ND(13)	ND(12)	ND(12)	ND(11)	ND(10)
1,2-Dichloroethane	ND(22)	ND(98)	ND(13)	ND(12)	ND(12)	ND(11)	ND(10)
2-Butanone	8 J	ND(98)	ND(13)	ND(12)	ND(12)	ND(11)	ND(10)
1,1,1-Trichloroethane	ND(22)	ND(98)	ND(13)	ND(12)	ND(12)	ND(11)	ND(10)
Carbon Tetrachloride	ND(22)	ND(98)	ND(13)	ND(12)	ND(12)	ND(11)	ND(10)
Bromodichloromethane	ND(22)	ND(98)	ND(13)	ND(12)	ND(12)	ND(11)	ND(10)
1,2-Dichloropropane	ND(22)	ND(98)	ND(13)	ND(12)	ND(12)	ND(11)	ND(10)
cis-1,3-Dichloropropene	ND(22)	ND(98)	ND(13)	ND(12)	ND(12)	ND(11)	ND(10)
Trichloroethene	ND(22)	ND(98)	8 J	3 J	5 J	ND(11)	9 J
Dibromochloromethane	ND(22)	ND(98)	ND(13)	ND(12)	ND(12)	ND(11)	ND(10)
1,1,2-Trichloroethane	ND(22)	ND(98)	ND(13)	ND(12)	ND(12)	ND(11)	ND(10)
Benzene	ND(22)	ND(98)	ND(13)	ND(12)	ND(12)	ND(11)	ND(10)
trans-1,3-Dichloropropene	ND(22)	ND(98)	ND(13)	ND(12)	ND(12)	ND(11)	ND(10)
Bromoform	ND(22)	ND(98)	ND(13)	ND(12)	ND(12)	ND(11)	ND(10)
4-Methyl-2-Pentanone	ND(22)	ND(98)	4 J	2 J	2 J	ND(11)	ND(10)
2-Hexanone	ND(22)	ND(98)	ND(13)	ND(12)	ND(12)	ND(11)	ND(10)
Tetrachloroethene	ND(22)	ND(98)	ND(13)	ND(12)	ND(12)	ND(11)	ND(10)
1,1,2,2-Tetrachloroethane	ND(22)	ND(98)	ND(13)	ND(12)	ND(12)	ND(11)	ND(10)
Toluene	ND(22)	ND(98)	ND(13)	ND(12)	ND(12)	ND(11)	ND(10)
Chlorobenzene	ND(22)	ND(98)	ND(13)	ND(12)	ND(12)	ND(11)	ND(10)
Ethylbenzene	ND(22)	ND(98)	3 J	ND(12)	ND(12)	ND(11)	ND(10)
Styrene	ND(22)	ND(98)	ND(13)	ND(12)	ND(12)	ND(11)	ND(10)
Xylene (Total)	ND(22)	ND(98)	3 J	3 J	4J	ND(11)	ND(10)
Percent Solids (%)	46.0	51.0	80.0	87.0	80.0	89.0	NA

SURFACE SOIL SAMPLE DATA
VACAIR ALLOYS
REMEDIAL INVESTIGATION
FREWSBURG, NEW YORK

PCB	*SSOIL-M* (µg/kg)	*SSOIL-N* (µg/kg)	*SSOIL-CD DUP OF SSOIL-N* (µg/kg)	*SSOIL-O* (µg/kg)
Aroclor 1016	ND(41)J	ND(38)	ND(41)J	ND(37)J
Aroclor 1221	ND(84)J	ND(77)	ND(84)J	ND(75)J
Aroclor 1232	ND(41)J	ND(38)	ND(41)J	ND(37)J
Aroclor 1242	ND(41)J	ND(38)	ND(41)J	ND(37)J
Aroclor 1248	ND(41)J	ND(38)	ND(41)J	ND(37)J
Aroclor 1254	ND(41)J	ND(38)	ND(41)J	ND(37)J
Aroclor 1260	37 J	36 J	29 J	ND(37)J

Notes:
ND Not detected at the detection limit within the paranthesis.
J Associated value is estimated.
NA Not analyzed

CRA

CONE. GA-ROVERS & ASSOCIATES
7703 Niagara Falls Boulevard
Niagara Falls, New York 14304
(716) 283-6720

DATE: September 13, 1993

REFERENCE NO: 2326

TO: Greg Sutton

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September 3, 1993

Reference No. 2326

Mr. Greg Sutton
Environmental Engineer II
NEW YORK STATE DEPARTMENT
OF ENVIRONMENTAL CONSERVATION
270 Michigan Avenue
Buffalo, NY 14203-2999

Dear Mr. Sutton:

Re: Quarterly Progress Report
June 1993 through August 1993
Remedial Investigation/Feasibility Study
VacAir Alloys, Frewsburg Plant Site
Site I.D. #907016

Keywell Corporation (Keywell) and the New York State Department of Environmental Conservation (NYSDEC) entered into an Order on Consent (Order), Index No. B9-0333-90-05 to perform a Remedial Investigation/Feasibility Study (RI/FS) for Keywell's VacAir Alloys Division Plant Site (Site) located in Frewsburg, New York. Implementation of the RI/FS work activities began in October 1992, as identified in the NYSDEC approved RI/FS Work Plan dated August 24, 1992 and modified by letters dated September 21, 1992, October 6, 1992, October 9, 1992 and November 10, 1992. Pursuant to the Order, this progress report has been prepared to summarize RI/FS activities implemented during the period of June 1, 1993 through August 31, 1993.

1.0 ACTIONS WHICH HAVE BEEN TAKEN TOWARD ACHIEVING COMPLIANCE WITH THE ORDER DURING THE PERIOD FROM JUNE 1, 1993 AND ENDING AUGUST 31, 1993

1.1 RI TASK 1 - PROJECT SPECIFICATION PLANS

This task is completed.

1.2 RI TASK 2 - COMMUNITY RELATIONS

No formal community relations activities were required during this reporting quarter.

1.3 RI TASK 3 - CURRENT SITUATION

This task is complete.

1.4 RI TASK 4 - CONTRACTOR PROCUREMENT

This task is complete.

1.5 RI - TASK 5 - SITE INVESTIGATION

One additional well (well MW-12) was installed off-Site on the west side of Frewsburg-Falconer Road across from MW-4. Well installation was completed on June 11, 1993. Attachment 1 to this progress report presents a report of the well installation and sampling results.

1.6 RI TASK 6 - SAMPLE ANALYSES

This task is complete.

1.7 RI TASK 7 - DATA EVALUATION

This task is complete.

1.8 RI TASK 8 - ASSESSMENT OF RISKS

1.8.1 Public Health Evaluation (PHE)

The PHE and the environmental assessment are complete.

1.9 RI TASK 9 -
IDENTIFICATION OF PRELIMINARY ACTION OBJECTIVES

By letter dated March 1, 1993, the RI/FS Preliminary Remedial Action Objectives, Technical Memorandum No. 1, were submitted to NYSDEC. NYSDEC commented on the document by letter dated March 12, 1993. After a series of exchanges by telephone conversations and correspondence concerning the

NYSDEC comments and concerns, the document was revised and resubmitted to the NYSDEC by cover letter dated June 25, 1993.

1.10 RI TASK 10 -
PRELIMINARY EVALUATION FOR TREATABILITY STUDIES

By letter dated May 18, 1993, the NYSDEC provided comments on the "Preliminary Evaluation of Remedial Technologies and Need for Treatability Studies Report, Technical Memorandum No. 2", dated March 31, 1993. Responses to the NYSDEC comments and revised tables to the document were submitted to NYSDEC by letter dated June 8, 1993.

NYSDEC approved the responses and the document by letter dated June 28, 1993.

1.11 RI TASK 11 - RI REPORT

Preparation of the RI report is complete. The draft RI report was submitted to the NYSDEC on July 12, 1993.

1.12 FS TASKS

Work on the Feasibility Study (FS) tasks is on-going.

1.13 PROPOSED PROJECT SCHEDULE

At this time, all of the tasks associated with the RI/FS being performed at the VacAir Site have been completed on schedule. No project delays have occurred and it is anticipated that all deliverables required under the Order will be submitted according to the project schedule.

Telecon WaiChin Lachell CRA 9/15/93
Correction - CRA resubmitted on June 23. 1993
NYSDEC Accepted w/ revised wording on June 25, 1993.

2.0 ANALYTICAL RESULTS OF SAMPLING AND TESTING AND OTHER DATA RECEIVED IN THE QUARTER FROM JUNE 1, 1993 TO AUGUST 31, 1993

Analytical data for samples collected from the newly installed MW-12 monitoring well have been received. Attachment 1 summarizes the results obtained from groundwater samples collected from MW-12.

3.0 SUMMARY OF DELIVERABLES SUBMITTED FROM JUNE 1, 1993

Deliverables submitted during this third reporting quarter consist of the following documents:

i) the quarterly progress report for the period of March 1, 1992 through May 31, 1991, dated June 7, 1993;

ii) a revised "Remedial Investigation/Feasibility Study, Preliminary Remedial Action Objectives, Technical Memorandum No. 1", dated June 25, 1993;

iii) "Remedial Investigation/Feasibility Study, Preliminary Evaluation of Remedial Technologies and Need for Treatability Studies, Technical Memorandum No. 2", dated March 31, 1993;

iv) "Remedial Investigation/Feasibility Study, Remedial Investigation (RI) Report", dated July 12, 1993; and

v) associated correspondence related to the above-mentioned reports.

4.0 RI/FS ACTIVITIES SCHEDULED FOR THE QUARTER FROM SEPTEMBER 1,1993 TO NOVEMBER 30, 1993

4.1 RI TASK 1 - PROJECT SPECIFIC PLANS

Work on this task is complete.

4.2 RI TASK 2 - COMMUNITY RELATIONS

No work on this task is scheduled for the next quarter.

4.3 RI TASK 3 - DESCRIPTION OF THE CURRENT SITUATION

Work on this task is complete.

4.4 RI TASK 4 - CONTRACTOR PROCUREMENT

Work on this task is complete.

4.5 RI TASK 5 - SITE INVESTIGATION

All work under this RI task has been completed.

4.6 RI TASK 6 - SAMPLE ANALYSES

Work on this task is complete.

4.7 RI TASK 7 - DATA EVALUATION

Work on this task is complete.

4.8 RI TASK 8 - ASSESSMENT OF RISKS

Work on this task is complete.

4.9 RI TASK 9 - IDENTIFICATION OF PRELIMINARY REMEDIAL ACTION OBJECTIVES

This task is complete.

4.10 RI TASK 10 - PRELIMINARY EVALUATION FOR TREATABILITY STUDIES

This task is complete.

4.11 RI TASK 11 - RI REPORT

Preparation of the RI Report is complete.

4.12 FEASIBILITY STUDY

Work on the FS is ongoing.

5.0 PERCENTAGE OF COMPLETION, DELAYS AND EFFORTS MADE TO MITIGATE DELAYS

Estimated percentage of completion (task by task).

A. RI Task 1 - 100 percent complete.

B. RI Task 2 - Participation will be provided on an as-needed basis.

C. RI Task 3 - 100 percent complete.

D. RI Task 4 - 100 percent complete.

E. RI Task 5 - 100 percent complete.

F. RI Tasks 6 and 7

i) Sample Analyses and Validation - 100 percent complete.

ii) Data Evaluation and Presentation - 100 percent complete.

G. RI Task 8 - Assessment of Risks - 100 percent complete.

H. RI Task 9 - Identification of Preliminary Remedial Action Objectives - 100 percent complete.

I. RI Task 10 - Preliminary Evaluation for Treatability Studies - 100 percent complete.

J. Task 11 - RI Report - The RI report is 100 percent complete.

K. Feasibility Study - The FS is 50 percent complete. Preparation for the FS is ongoing.

L. Additional Well Installation - 100 percent complete. Work on this task is currently underway. Data/information obtained during installation and sampling of this well is included in this report as Attachment 1.

There are no anticipated delays at this time.

If you have any questions on this matter, please contact the undersigned at 716-283-6720.

Yours very truly,

CONESTOGA-ROVERS & ASSOCIATES

Wai Chin Lachell

Wai Chin Lachell

WCL/ms/1
cc: K. Watson, Piper & Marbury
M. Lozier, Keywell
D. Trostle, Keywell
Assistant Counsel, Division of Environmental Enforcement, NYSDEC
Director, Bureau of Env. Exposure Investigation, NYSDOH
Section Chief, Division of Haz. Waste Remediation, NYSDEC

ATTACHMENT 1
SUPPLEMENTAL REPORT
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
VACAIR ALLOYS DIVISION
FREWSBURG, NEW YORK

1.0 INTRODUCTION

Keywell Corporation (Keywell) and the New York State Department of Environmental Conservation (NYSDEC) entered into an Order on Consent (Index No. B9-0333-90-05) to perform a Remedial Investigation/Feasibility Study (RI/FS) for Keywell's VacAir Alloys Division Plant Site (Site) located in Frewsburg, New York. Implementation of the RI/FS work activities began in October 1992, as specified in the approved RI/FS Work Plan. By letter dated April 7, 1993, the NYSDEC requested the installation of additional monitoring wells.

It was agreed by letters dated May 5, 1993 and May 20, 1993 that one additional monitoring well (MW-12) would be installed off-Site, west of Frewsburg-Falconer Road, across from well MW-4. It was further agreed that data/information obtained during installation and sampling of this well would be provided to the NYSDEC in a letter report so as not to interfere with the completion of the RI Report.

This report summarizes the information/data obtained as part of this well installation and sampling program and includes:

i) a description of well installation activities;

ii) the well instrumentation and stratigraphic log for MW-12;

iii) one round of groundwater level data from all Water Table Aquifer wells and groundwater contours drawing; and

iv) analytical results from the groundwater samples collected and a data validation report.

2.0 FIELD ACTIVITIES

2.1 WELL INSTALLATION

The additional monitoring well, designated as MW-12, was installed on the west side of Falconer-Frewsburg Road, at the north end of the parking area used for access to the Conewango River. MW-12 was installed approximately three feet

west of BH-G which was installed as part of the RI/FS program in November 1993. Figure 1 shows the location of the MW-12. MW-12 was installed on June 11, 1993 according to the procedures and protocols established for the approved RI/FS Work Plan and associated project-specific documents. Empire Soils Investigations performed the drilling activities.

Since the well was being installed adjacent to BH-G, which was continuously split-spoon sampled and screened for organic vapors, the borehole for MW-12 was advanced to 14 feet below ground surface (BGS) without continuous sampling. A split-spoon sample was collected from 14 to 16 feet BGS to confirm the presence of the clayey confining layer. At the completion of drilling activities, a monitoring well was installed consisting of a 5 foot long, 2-inch diameter number 10 slotted stainless steel well screen coupled to an appropriate length of 2-inch diameter stainless steel riser pipe. The bottom of the well screen was set at 13.8 feet BGS. A sandpack consisting of number 4 quartzite sand was installed around the well screen and extended to a depth of 7.5 feet BGS. A 2-foot thick bentonite pellet seal was placed above the sandpack. After hydrating the bentonite pellets the remaining 3.5 feet of the open annulus of the borehole was backfilled with cement/bentonite grout. The well was finished as an above-grade well. A locking protective casing was installed over the well casing. A 2-foot square concrete pad was placed around the base of the protective casing. A copy of the stratigraphic and instrumentation log for MW-12 is included as Appendix A to this report. Following installation, the well was allowed to set for two hours prior to development.

Development was performed in the afternoon of June 11, 1993. Development consisted of the removal of 10 well volumes of groundwater from the well. Development was performed using a precleaned bailer. As each well volume was removed pH, conductivity, temperature and turbidity were measured and recorded. Stabilization according to pH, conductivity and temperature was reached after the fourth well volume. However, turbidity remained high throughout the well development. Development was completed after removing the maximum ten well volumes of groundwater from the well. Table 1 provides a summary of data from the development of MW-12.

The top of casing elevation (TOC) was surveyed to establish this reference point to be used to calculate groundwater table elevations. The survey used the TOC elevation of existing monitoring well MW-7 as a bench mark. Since MW-12 is located immediately adjacent to BH-G, the horizontal coordinates and ground surface elevation were assumed to be the same for MW-12. The TOC elevation for MW-12 was determined to be 1243.08 feet above mean sea level (AMSL).

2.2 SAMPLE COLLECTION

MW-12 was purged and sampled on June 14, 1993 using a clean disposable teflon bailer. Prior to beginning to purge the well, a field blank was collected by pouring laboratory supplied organic free water into the bailer and then from the bailer directly into the sample bottles. Purging consisted of the removal of five well volumes of groundwater from the well. As each well volume was removed the pH, conductivity, temperature and turbidity of the groundwater was measured. Data collected while purging MW-12 is included on Table 1.

Immediately following purging, MW-12 was sampled. Samples were collected in sample bottles supplied by the laboratory. Samples were collected with the bailer used during purging. Samples collected from the well included a blind field duplicate sample labeled MW-13 and a Matrix Spike/Matrix Spike Duplicate (MS/MSD) sample. Following sampling the sample bottles were labeled placed in a cooler with ice and shipped via overnight courier to H2M Laboratories in Melville, New York following chain of custody procedures. The samples were analyzed for the Target Compound List (TCL) Volatile Organic Contaminants (VOCs) only.

The results of the samples collected from MW-12 indicate that trichloroethene (TCE) and total 1,2-dichloroethene (1,2-DCE) are present in the groundwater at MW-12. TCE was detected in the sample and duplicate at concentrations of 3400 µg/L and 3500 µg/L respectively. 1,2-DCE was detected in the sample and duplicate sample at concentrations of 41 µg/L and 37 µg/L respectively. All other VOCs were non-detect at a detection limit of 10 µg/L. The rinse blank from the bailer used at MW-12 was non-detect for all VOCs at the 10 µg/L detection limit. A summary of detected compounds is found on Table 2. Appendix B presents results of the data validation and assessment.

2.3 HYDRAULIC MONITORING

Following sampling, a complete round of water levels was collected from all of the existing monitoring wells located at the Site. Sufficient time was allowed for MW-12 to recover fully prior to measuring the static water level. The static water level in MW-12 has been observed to be at or near the elevation of the ground surface. Based upon the water level round performed on June 14, 1993, groundwater contours in the shallow water table have been interpolated. These contours are presented on Figure 2. The water level data collected on June 14, 1993 is shown on Table 3.

2.4 FIELD PERMEABILITY TESTING

A slug test was performed at MW-12 on August 11, 1993. First a recording pressure transducer was installed in the well. After the water level returned to static, a PVC slug was quickly lowered into the water column, "instantaneously" raising the water level by a known volume of displacement. The water level recorder monitored the subsequent decrease in the water level (falling head test) as the well level returned to static. Once the water level returned to static, the slug was quickly removed from the well, instantaneously lowering the water level by a known volume of displacement. The water level recorder monitored the increasing water level (rising head test) until the well level returned to static. This process was then repeated to ensure that a good data set had been collected. The data from the water level recorder was downloaded onto a computer disc and was imported into a computer software program which calculated an estimated hydraulic conductivity for MW-12 for a rising head test based upon the method developed by Bower and Rice (1979). The estimated hydraulic conductivity of MW-12 was 1.5×10^{-4} cm/sec. Appendix C presents the data used in estimating the hydraulic conductivity.

3.0 CONCLUSIONS

Based on the information obtained, the conclusions of the RI Report, dated July 1993, have not changed.

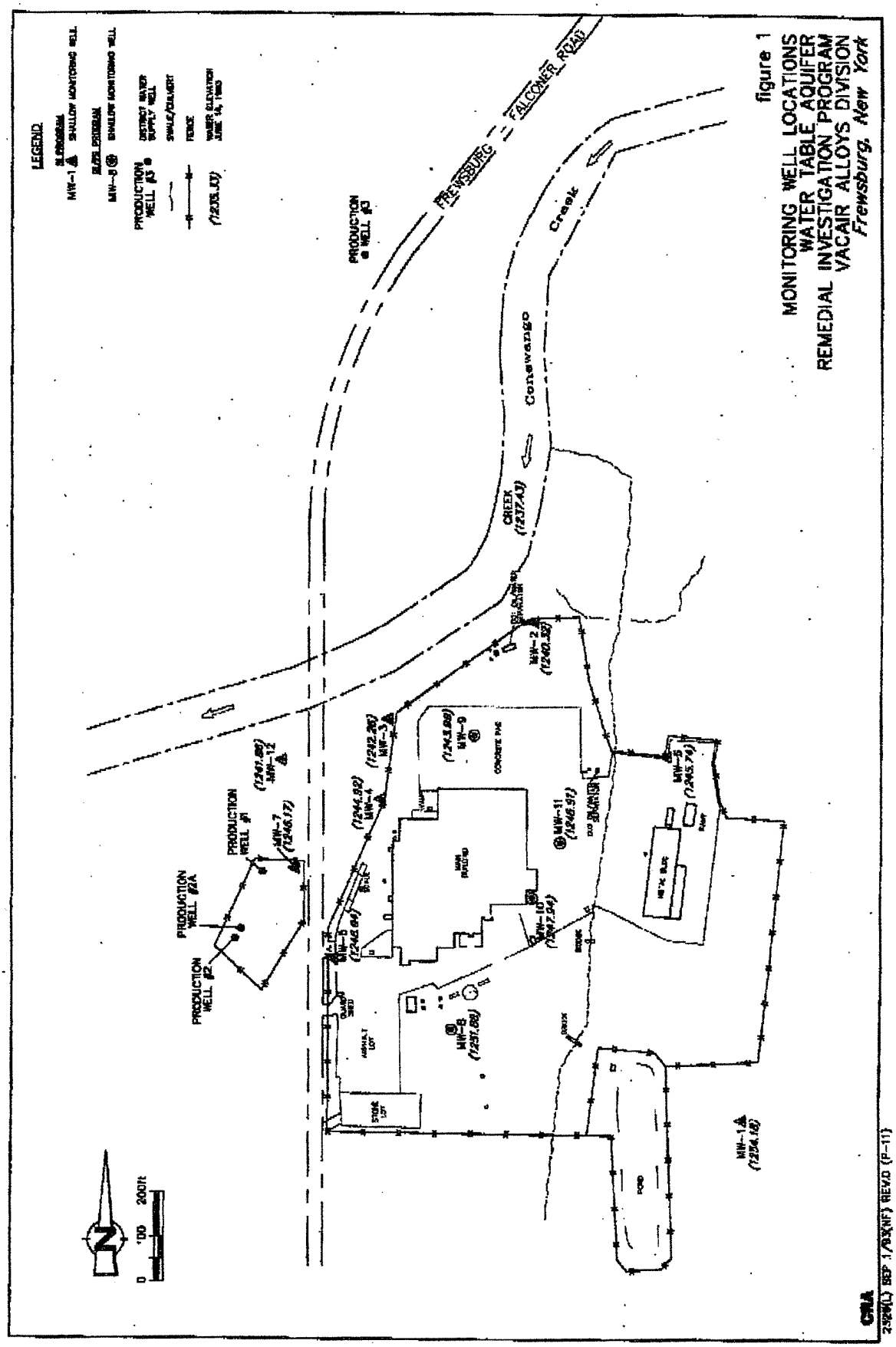


figure 1
MONITORING WELL LOCATIONS
WATER TABLE AQUIFER
REMEDIAL INVESTIGATION PROGRAM
VACAIR ALLOYS DIVISION
Frewsburg, New York

CRA
2329W(L) SEP 1/99(NF) REV.0 (F-11)

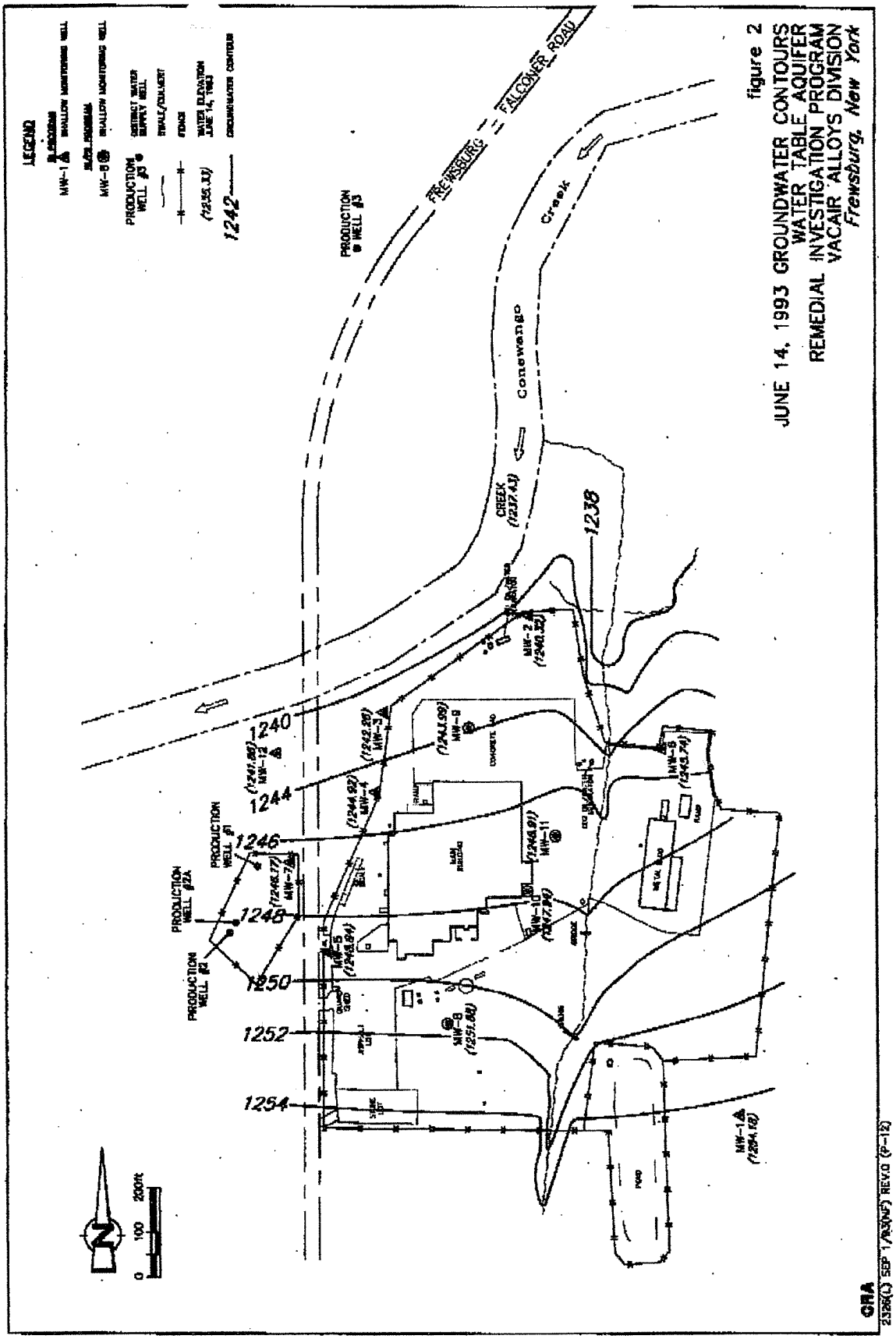

LEGEND
PRODUCTION WELL #3
DISTRICT WATER SUPPLY WELL
FENCE
1242
PRODUCTION WELL #3
FALCONER ROAD
FREWSBURG
Conewango Creek
CREEK (1232.43)
1238
1240
1244
1246
1248
1250
1252
1254
PRODUCTION WELL #1
PRODUCTION WELL #2A
PRODUCTION WELL #2
MW-1A (1294.16)
0 100 200ft
figure 2
JUNE 14, 1993 GROUNDWATER CONTOURS
WATER TABLE AQUIFER
REMEDIAL INVESTIGATION PROGRAM
VACAIR ALLOYS DIVISION
Frewsburg, New York
CRA
2336(L) SEP 1/93(NF) REV0 (P-12)

TABLE 1

MW-12 WELL DEVELOPMENT AND PURGING RECORD
VACAIR ALLOYS, FREWSBURG, NEW YORK
JUNE 1993

Date	*Time*	*Well Volume Number*	*Total Gallons*	*Temperature (°C)*	*pH (Units)*	*Conductivity (µmohs)*	*Turbidity (NTU's)*
			Well Development Data				
06/11/93	1353	1	2.3	14.6	6.65	419	>200
06/11/93	1400	2	4.6	12.3	6.62	396	>200
06/11/93	1407	3	6.9	12.1	6.54	380	>200
06/11/93	1415	4	9.2	12.3	6.56	378	>200
06/11/93	1424	5	11.5	12.5	6.51	377	>200
06/11/93	1432	6	13.8	11.7	6.45	374	>200
06/11/93	1438	7	16.1	11.9	6.47	377	>200
06/11/93	1447	8	18.4	11.7	6.59	384	>200
06/11/93	1453	9	20.7	11.6	6.48	385	>200
06/11/93	1500	10	23.0	11.8	6.55	393	>200
			Well Purging Data				
06/14/93	1324	1	2.3	-	6.66	418	89
06/14/93	1330	2	4.6	11.7	6.46	411	125
06/14/93	1338	3	6.9	11.6	6.54	403	142
06/14/93	1345	4	9.2	12.0	6.56	408	100
06/14/93	1355	5	11.5	11.5	6.58	428	45

TABLE 2

SUMMARY OF DETECTED COMPOUNDS
VACAIR ALLOYS, FREWSBURG, NEW YORK

Compounds	*Units*	*MW-12*	*MW-12 Dup.*
Trichloroethene	µg/L	3400	3500
Total 1,2-Dichloroethene	µg/L	41	37

TABLE 3

GROUNDWATER ELEVATIONS ON JUNE 14, 1993
VACAIR ALLOYS, FREWSBURG, NEW YORK

Location	*Reference Elevation ((TOC) Ft. AMSL)*	*Groundwater Elevation (Ft. AMSL)*
MW-1	1260.6	1254.18
MW-2	1251.6	1240.32
MW-3	1252.3	1242.26
MW-4	1250.1	1244.92
MW-4D	1249.37	1240.35
MW-5	1256.5	1248.94
MW-5D	1255.14	1244.16
MW-6	1253.7	1245.74
MW-7	1253.76	1246.17
MW-8	1256.65	1251.88
MW-9	1249.20	1243.99
MW-10	1253.50	1247.94
MW-11	1251.02	1246.91
MW-12	1243.08	1241.86
Conewango River	1248.7	1237.43

APPENDIX A

WELL LOG

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

(L-54)

PROJECT NAME: VAC-AIR
PROJECT NO.: 2326
CLIENT: S.G. KEYWELL
LOCATION: ADJACENT TO BH-G

HOLE DESIGNATION: MW-12
DATE COMPLETED: JUNE 11, 1993
DRILLING METHOD: 4 1/4" ID HSA
CRA SUPERVISOR: D. OSCAR

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE STATE	SAMPLE N VALUE	SAMPLE PID / OVA (ppm)
	REFERENCE POINT (Top of Riser)	1243.08					
	GROUND SURFACE	1241.9					
	For stratigraphy from 0.0 to 14.0 ft BGS see BH-G						
2.5			CEMENT/ BENTONITE GROUT				
5.0			8"ø BOREHOLE				
7.5			BENTONITE PELLET SEAL				
10.0			2"ø STEEL CASING				
12.5			SAND PACK WELL SCREEN				
15.0	Gray to brown CLAY, some silt, little fine sand, moist, NATIVE	1227.9	2"ø BOREHOLE	1SS	X	9	
	END OF HOLE @ 16.0 FT. BGS	1225.9					
17.5			SCREEN DETAILS: Screened interval: 8.8 to 13.8' BGS Length -5.0' Diameter -2.0" Slot # 10 Material -Stainless steel Sand pack interval: 7.5 to 14.0' BGS Material -# 4 QROK				
20.0							
22.5							
25.0							
27.5							
30.0							
32.5							

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS ⬭ WATER FOUND ▽ STATIC WATER LEVEL ▼

APPENDIX B

DATA ASSESSMENT AND VALIDATION
MW-12 GROUNDWATER SAMPLING

APPENDIX B
DATA ASSESSMENT AND VALIDATION
MW-12 GROUNDWATER SAMPLING
VACAIR ALLOYS DIVISION
FREWSBURG, NEW YORK
AUGUST 11, 1993

The following memo details the analytical data assessment and validation for results obtained by H2M Labs, Inc. on samples collected during June 1993 at the VacAir Alloys Site. The samples submitted for analysis consisted of the following:

Matrix	*Investigative Samples*	*Rinsate Blanks*	*Field Duplicate*	*Total*
Water	1	1	1	3

A summary of the analytical methods and parameters for which the samples were submitted is presented in Table 1. Trip blanks were not submitted with the investigative samples, however, a rinsate blank was submitted and confirmed that there was no cross-contamination during sample transport.

Evaluation of the data was based on information derived from the finished data sheets, chain of custody forms, blank data, and recovery data for matrix and surrogate spikes. The assessment of analytical and in-house data included checks for: adherence to accuracy and precision criteria; transmittal errors; and anomalously high and low parameters values.

The QA/QC criteria by which these data have been assessed are outlined in the methods referenced in Table 1 and the documents entitled:

i) "Laboratory Data Validation Functional Guidelines for Evaluating Organic Analyses" (February 1, 1988), Prepared by the USEPA Data Validation Work Group.

ii) "National Functional Guidelines for Organic Data Review", 12/90 (Rev. 6/91).

Items i) and ii) will hereinafter be referred to as the "Guidelines".

1. SAMPLE HOLDING TIMES - Based on the criteria outlined in the relevant methods and NYSDEC sample holding time protocols, the following sample holding time requirements have been established for groundwater matrices.

Volatile Organic Compounds (VOCs)	7 days from VTSR[1] to analyses

1 VTSR - Verified Time of Sample Receipt.

By comparing the VTSR of all samples (from the notation appearing on the chain of custody documents) with the reported dates of extraction and/or analysis, it is noted that all samples submitted for VOC determinations were analyzed prior to expiration of their prescribed holding times.

2. GC/MS TUNING, CALIBRATIONS, INTERNAL STANDARDS AND CHECK STANDARDS (VOCs) - To ensure that the data produced by the instrument may be correctly interpreted and quantitated, the tuning and performance criteria presented in the method and "Guidelines" have been assessed herein. These criteria have been established to assure mass resolution, identification, quantitation, and to some degree sensitivity.

   A review of the GC/MS tuning, calibration, internal standards, and check standard data accompanying the H2M work orders, indicated that all tuning, calibration, internal standard and check standard criteria were met during the VOC analysis. Acetone, 2-butanone and xylene check standard recoveries yielded outlying recoveries, bias high. Due to the non-detect results of acetone, 2-butanone and xylene in the samples, no qualification was necessary.

3. SURROGATE SPIKE RECOVERIES - Laboratory performance on individual samples is assessed on the basis of surrogate spike recoveries. When properly employed in conjunction with sample preparation, surrogates can be used to determine the effectiveness of sample cleanup or matrix modifying techniques. In addition, fortifying the sample with a known amount of the surrogate compound prior to sample preparation serves as an indicator of the efficiency of analyte extraction, dissolution, or other analyte-matrix separation technique.

   All samples submitted for VOC determinations were spiked with the surrogate compounds bromofluorobenzene, toulene-d8, and 1,2-dichloroethane-d4. Sample MW-12 yielded outlying toluene-d8 recovery by one percent. Due to the negligible effects of one percent, sample results were not qualified. All remaining surrogate recoveries were within method control limits, indicating acceptable laboratory performance.

4. METHOD BLANK ANALYSES - Method blank analyses were assessed to determine the existence and magnitude of sample contamination due to laboratory conditions or procedures. All method blanks were prepared from deionized water, and analyzed at a minimum frequency of one per 20 investigative samples per day of analysis.

   All VOC method blank results showed non-detect quantities of the compounds of interest. This indicated that the potential for sample contamination attributable to laboratory conditions or procedures was minimal during VOC analysis.

5. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD) - The recoveries of MS/MSD analyses are used to assess the analytical accuracy on an individual sample basis, while the percent reproducibility (RPD) between the MS and MSD indicates the analytical precision achieved for that sample. MS/MSD samples were performed at a frequency of one per 20 determinations.

   MW-12 was analyzed as an MS/MSD sample for VOCs. Trichloroethene yielded outlying MS and MSD recoveries due to high sample concentrations exceeding the calibration range. As a result, the spiking concentration of trichloroethene was masked in the undiluted sample, therefore not evaluated herein. The RPD result for benzene MS/MSD recoveries was outside of laboratory control limits by one percent. However, due to acceptable MS/MSD recoveries, and the negligible effects of one percent, sample results were not qualified. All remaining MS/MSD spike recoveries and RPD values were within laboratory control limits, indicating satisfactory analytical accuracy and precision were achieved for these samples.

6. FIELD DUPLICATE RESULTS - A field duplicate was taken and submitted "blind" to the laboratory in order to assess the aggregate analytical and sampling protocol precision. The field duplicate collected consisted of MW-12 and its field duplicate MW-13. The field duplicate results for VOCs showed adequate reproducibility, which indicated that satisfactory laboratory and sampling protocol precision was achieved for these parameters during this sampling event.

7. RINSATE BLANK RESULTS - In order to assess the efficiency of the sampling device cleansing protocols performed in the field, one rinsate blank (RB-61493) was collected and submitted to the laboratory for analysis. The results of the rinsate blank analysis showed non-detected quantities of all VOCs. This indicated that adequate sampling device decontamination procedures were adhered to for this sampling event.

8. TENTATIVELY IDENTIFIED COMPOUNDS (TICs) - TICs reported for sample MW-12 (undiluted analysis) included an unknown aromatic and an isomer of tetramethylbenzene. However, according to the laboratory's case narrative, these TICs were artifacts of a previous sample. Because the presence of these TICs were not confirmed in the field duplicate nor the MS/MSD samples from MW-12, it is assumed the laboratory's conclusion is correct and the TIC data for MW-12 should not be used. The laboratory should have reanalyzed MW-12 after the instrument was properly purged of any remaining compounds from previous samples.

9. CONCLUSION - Based on this QA/QC review, these data are judged acceptable without qualification. However, the TIC data for MW-12 should not be used as noted herein.

TABLE 1

SAMPLE SUMMARY KEY
VACAIR ALLOYS DIVISION
FREWSBURG, NEW YORK

Collection Date	*Sample I.D.*	*Matrix*	*Parameter*	*Method*	*VTSR (1) Date*	*Analysis Date*
06/14/93	MW-12	Water	TCL VOCs	8240	06/16/93	06/17-18/93
06/14/93	MW-13 (Duplicate of MW-12)	Water	TCL VOCs	8240	06/16/93	06/17-18/93
06/14/93	RB-61493 (Rinsate Blank)	Water	TCL VOCs	8240	06/16/93	6/18/93

Note:
(1) VTSR - Verified Time of Sample Receipt

APPENDIX C

FIELD PERMEABILITY DATA

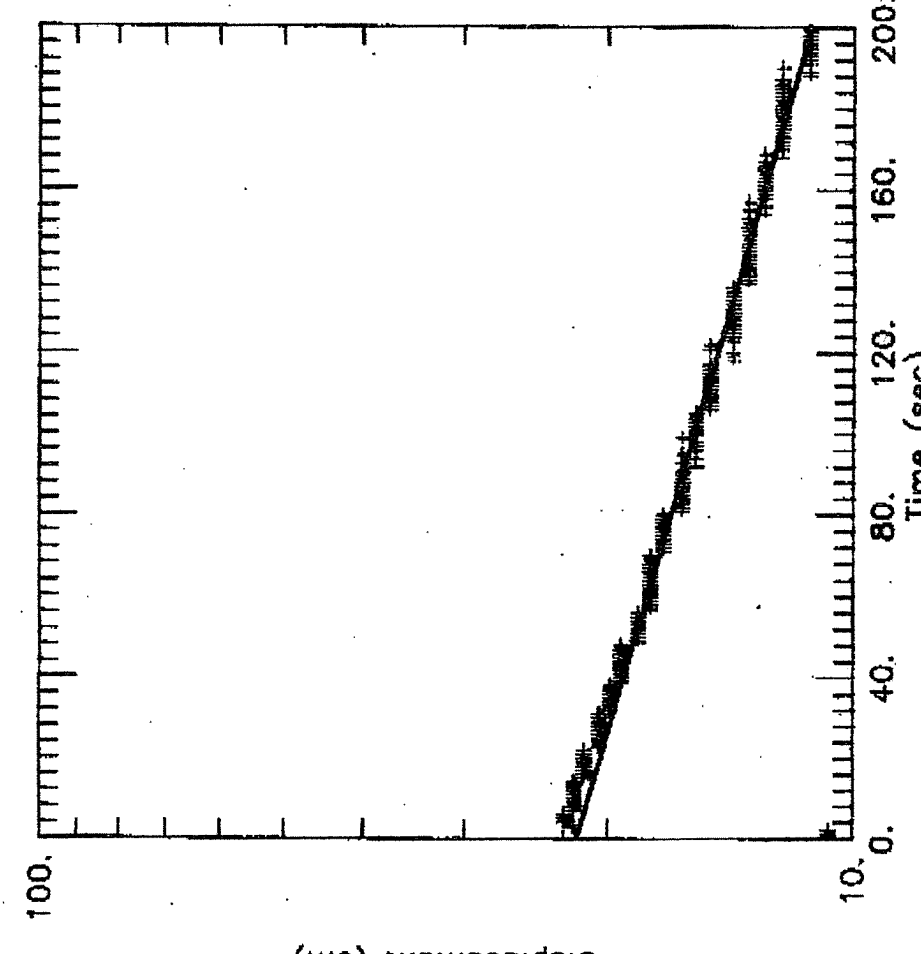
VACAIR SLUG TEST MW-12

DATA SET:
MW12.SLG
09/07/93

AQUIFER TYPE:
Unconfined
SOLUTION METHOD:
Bouwer-Rice

ESTIMATED PARAMETERS:
K = 0.0001493 cm/sec
yo = 21.77 cm

TEST DATA:
H0 = 22.56 cm
rc = 2.54 cm
rw = 10.16 cm
L = 198.1 cm
b = 411.8 cm
H = 411.1 cm



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A Q T E S O L V   R E S U L T S
Version 1.10

09/07/93 18:20:15

TEST DESCRIPTION

Data set........... MW12.SLG
Data set title..... VACAIR SLUG TEST MW-12

Knowns and Constants:
No. of data points................. 200
Radius of well casing.............. 2.54
Radius of well..................... 10.16
Aquifer saturated thickness........ 411.8
Well screen length................. 198.1
Static height of water in well..... 411.1
Log(Re/Rw)......................... 2.778
A, B, C............................ 2.136, 0.334, 0.000

ANALYTICAL METHOD

Bouwer-Rice (Unconfined Aquifer Slug Test)

RESULTS FROM STATISTICAL CURVE MATCHING

STATISTICAL MATCH PARAMETER ESTIMATES

	Estimate		Std. Error
K =	1.4925E-004	+/-	4.2140E-006
y0 =	2.1766E+001	+/-	1.9536E-001

ANALYSIS OF MODEL RESIDUALS

residual = calculated - observed
weighted residual = residual * weight

Weighted Residual Statistics:
Number of residuals............... 200
Number of estimated parameters.... 2
Degrees of freedom................ 198
Residual mean..................... -0.001171
Residual standard deviation....... 1.177
Residual variance................. 1.385

Model Residuals:

Time	Observed	Calculated	Residual	Weight

1	10.668	21.695	-11.027	1
2	10.668	21.623	-10.955	1
3	21.946	21.552	0.3937	1
4	22.555	21.481	1.0743	1
5	22.555	21.41	1.1451	1
6	22.555	21.34	1.2156	1
7	21.946	21.269	0.67634	1
8	21.946	21.199	0.74642	1
9	21.946	21.129	0.81627	1
10	21.946	21.06	0.88589	1
11	21.946	20.99	0.95528	1
12	21.946	20.921	1.0244	1
13	21.946	20.852	1.0934	1
14	21.946	20.784	1.1621	1
15	21.336	20.715	0.62096	1
16	21.336	20.647	0.68921	1
17	21.336	20.579	0.75724	1
18	21.336	20.511	0.82504	1
19	21.336	20.443	0.89263	1
20	21.336	20.376	0.95998	1
21	21.336	20.309	1.0271	1
22	21.336	20.242	1.094	1
23	20.422	20.175	0.24633	1
24	20.422	20.109	0.31281	1
25	20.422	20.043	0.37906	1
26	20.422	19.976	0.4451	1
27	20.422	19.911	0.51092	1
28	20.422	19.845	0.57653	1
29	20.422	19.78	0.64191	1
30	20.422	19.715	0.70709	1
31	20.422	19.65	0.77204	1
32	19.812	19.585	0.22719	1
33	19.812	19.52	0.29172	1
34	19.812	19.456	0.35603	1
35	19.812	19.392	0.42014	1
36	19.812	19.328	0.48403	1
37	19.812	19.264	0.54772	1
38	19.812	19.201	0.61119	1
39	19.202	19.138	0.064855	1
40	19.202	19.074	0.12791	1
41	19.202	19.012	0.19076	1
42	19.202	18.949	0.2534	1
43	19.202	18.887	0.31584	1
44	19.202	18.824	0.37807	1
45	19.202	18.762	0.44009	1
46	19.202	18.7	0.50191	1
47	19.202	18.639	0.56353	1
48	19.202	18.577	0.62494	1
49	18.288	18.516	-0.22825	1
50	18.288	18.455	-0.16724	1
51	18.288	18.394	-0.10643	1
52	18.288	18.334	-0.045826	1
53	18.288	18.273	0.014582	1
54	18.288	18.213	0.074791	1
55	18.288	18.153	0.1348	1
56	18.288	18.093	0.19461	1
57	17.678	18.034	-0.35537	1
58	17.678	17.974	-0.29595	1
59	17.678	17.915	-0.23673	1

60	1. 378	17.856	-0.1777	1
61	17.678	17.797	-0.11886	1
62	17.678	17.739	-0.060224	1
63	17.678	17.68	-0.0017768	1
64	17.678	17.622	0.056478	1
65	17.678	17.564	0.11454	1
66	17.678	17.506	0.17241	1
67	17.678	17.448	0.23009	1
68	17.678	17.391	0.28758	1
69	17.678	17.334	0.34488	1
70	17.678	17.276	0.40199	1
71	17.069	17.219	-0.15068	1
72	17.069	17.163	-0.093945	1
73	17.069	17.106	-0.037395	1
74	17.069	17.05	0.018968	1
75	17.069	16.994	0.075145	1
76	17.069	16.938	0.13114	1
77	17.069	16.882	0.18695	1
78	17.069	16.826	0.24257	1
79	17.069	16.771	0.29801	1
80	17.069	16.716	0.35327	1
81	16.154	16.66	-0.50606	1
82	16.154	16.606	-0.45116	1
83	16.154	16.551	-0.39645	1
84	16.154	16.496	-0.34191	1
85	16.154	16.442	-0.28756	1
86	16.154	16.388	-0.23339	1
87	16.154	16.334	-0.17939	1
88	16.154	16.28	-0.12557	1
89	16.154	16.226	-0.071932	1
90	16.154	16.173	-0.018467	1
91	16.154	16.12	0.03482	1
92	15.545	16.066	-0.52167	1
93	16.154	16.014	0.14087	1
94	15.545	15.961	-0.41597	1
95	16.154	15.908	0.24622	1
96	15.545	15.856	-0.31096	1
97	15.545	15.804	-0.25872	1
98	15.545	15.751	-0.20665	1
99	16.154	15.7	0.45485	1
100	15.545	15.648	-0.10302	1
101	15.545	15.596	-0.051462	1
102	15.545	15.545	-7.4347E-005	1
103	15.545	15.494	0.051144	1
104	15.545	15.443	0.10219	1
105	15.545	15.392	0.15308	1
106	14.935	15.341	-0.40581	1
107	14.935	15.29	-0.35526	1
108	14.935	15.24	-0.30488	1
109	14.935	15.19	-0.25467	1
110	14.935	15.14	-0.20462	1
111	14.935	15.09	-0.15473	1
112	14.935	15.04	-0.10501	1
113	14.935	14.991	-0.055459	1
114	14.935	14.941	-0.0060662	1
115	14.935	14.892	0.043164	1
116	14.935	14.843	0.092231	1
117	14.935	14.794	0.14114	1
118	14.021	14.745	-0.72452	1
119	14.021	14.697	-0.67593	1

120	1[illegible]021	14.648	-0.62751	1
121	14.935	14.6	0.33516	1
122	14.935	14.552	0.38326	1
123	14.021	14.504	-0.48319	1
124	14.021	14.456	-0.4354	1
125	14.021	14.409	-0.38777	1
126	14.021	14.361	-0.3403	1
127	14.021	14.314	-0.29298	1
128	14.021	14.267	-0.24582	1
129	14.021	14.22	-0.19881	1
130	14.021	14.173	-0.15196	1
131	14.021	14.126	-0.10526	1
132	14.021	14.08	-0.058715	1
133	14.021	14.033	-0.012324	1
134	14.021	13.987	0.033913	1
135	14.021	13.941	0.079999	1
136	14.021	13.895	0.12593	1
137	13.411	13.849	-0.43789	1
138	13.411	13.803	-0.39225	1
139	13.411	13.758	-0.34677	1
140	13.411	13.713	-0.30144	1
141	13.411	13.667	-0.25626	1
142	13.411	13.622	-0.21123	1
143	13.411	13.578	-0.16634	1
144	13.411	13.533	-0.12161	1
145	13.411	13.488	-0.077017	1
146	13.411	13.444	-0.032575	1
147	13.411	13.399	0.011721	1
148	13.411	13.355	0.055871	1
149	13.411	13.311	0.099875	1
150	13.411	13.267	0.14373	1
151	13.411	13.224	0.18745	1
152	13.411	13.18	0.23102	1
153	13.411	13.137	0.27445	1
154	12.802	13.093	-0.29187	1
155	13.411	13.05	0.36087	1
156	12.802	13.007	-0.20573	1
157	13.411	12.964	0.44673	1
158	12.802	12.922	-0.12015	1
159	12.802	12.879	-0.077577	1
160	12.802	12.837	-0.035141	1
161	12.802	12.794	0.0071543	1
162	12.802	12.752	0.049311	1
163	12.802	12.71	0.091328	1
164	12.802	12.668	0.13321	1
165	12.802	12.627	0.17495	1
166	12.802	12.585	0.21655	1
167	12.802	12.544	0.25802	1
168	12.192	12.502	-0.31025	1
169	12.802	12.461	0.34054	1
170	12.192	12.42	-0.228	1
171	12.192	12.379	-0.18708	1
172	12.192	12.338	-0.14629	1
173	12.192	12.298	-0.10564	1
174	12.192	12.257	-0.065117	1
175	12.192	12.217	-0.024732	1
176	12.192	12.176	0.015521	1
177	12.192	12.136	0.055642	1
178	12.192	12.096	0.09563	1
179	12.192	12.057	0.13549	1

180	12 [illegible]2	12.017	0.1[illegible]21	1
181	12.192	11.977	0.2148	1
182	12.192	11.938	0.25427	1
183	12.192	11.898	0.2936	1
184	12.192	11.859	0.33281	1
185	12.192	11.82	0.37188	1
186	12.192	11.781	0.41083	1
187	12.192	11.742	0.44964	1
188	11.278	11.704	-0.42607	1
189	11.278	11.665	-0.3875	1
190	12.192	11.627	0.56533	1
191	11.278	11.588	-0.31076	1
192	11.278	11.55	-0.27258	1
193	11.278	11.512	-0.23452	1
194	11.278	11.474	-0.19659	1
195	11.278	11.436	-0.15878	1
196	11.278	11.399	-0.1211	1
197	11.278	11.361	-0.083543	1
198	11.278	11.324	-0.04611	1
199	11.278	11.286	-0.0087992	1
200	11.278	11.249	0.028388	1

RESULTS FROM VISUAL CURVE MATCHING

VISUAL MATCH PARAMETER ESTIMATES

	Estimate
K =	1.4925E-004
y0 =	2.1766E+001

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