

Sample Design
Sample Description

FP-122
North Drainage-Soil

FP-123
North Drainage-Soil

FP-124
North Drainage-Soil

137574

PESTICIDES/PCB'S

Parameter	Conc. (ug/kg)	Q	Conc. (ug/kg)	Q	Conc. (ug/kg)	Q
alpha-BHC						
beta-BHC						
delta-BHC						
gamma-BHC						
Heptachlor						
Aldrin						
Heptachlor epoxide						
Endosulfan I						
Dieldrin						
4,4'-DDE						
Endrin						
Endosulfan II						
4,4'-DDD						
Endosulfan sulfate						
4,4'-DDT						
Methoxychlor						
Endrin ketone						
alpha-Chlordane						
gamma-Chlordane						
Toxaphene						
Aroclor-1016						
Aroclor-1221						
Aroclor-1232						
Aroclor-1242						
Aroclor-1248						
Aroclor-1254						
Aroclor-1260						

VOLATILE ORGANICS

Parameters	Conc. (ug/kg)	Q	Conc. (ug/kg)	Q	Conc. (ug/kg)	Q
CHLOROMETHANE						
BROMOMETHANE						
VINYL CHLORIDE						
CHLOROETHANE						
METHYLENE CHLORIDE						
ACETONE						
CARBON DISULFIDE						
1,1 - DICHLOROETHENE						
1,1 - DICHLOROETHANE						
1,2 - DICHLOROETHENE (TOTAL)						
CHLOROFORM						
1,2 - DICHLOROETHANE						
2-BUTANONE						
1,1,1 - TRICHLOROETHANE						
CARBON TETRACHLORIDE						
VINYL ACETATE						
BROMDICHLOROMETHANE						
1,2 - DICHLOROPROPANE						
CIS - 1,3 - DICHLOROPROPENE						
TRICHLOROETHENE						
DIBROMOCHLOROMETHANE						
1,1,2 - TRICHLOROETHANE						
BENZENE						
TRANS - 1,3 - DICHLOROPROPENE						
BROMOFORM						
4 - METHYL - 2 - PENTANONE						
2 - HEXANONE						
TETRACHLOROETHENE						
1,1,2,2 - TETRACHLOROETHANE						
TOLUENE						
CHLOROBENZENE						
METHYLBENZENE						
ETHYLENE (TOTAL)						

AR301083

Sample Design
Sample Description

FP-122
North Drainage-Soil

FP-123
North Drainage-Soil

FP-124
North Drainage-Soil

SEMI-VOLATILE ORGANICS

Parameters	Conc.(ug/kg)	Q	Conc.(ug/kg)	Q	Conc.(ug/kg)	Q
Phenol						
bis(2-Chloroethyl) ether						
2-Chlorophenol						
1,3-Dichlorobenzene						
1,4-Dichlorobenzene						
Benzyl alcohol						
1,2-Dichlorobenzene						
2-Methylphenol						
bis(2-chloroisopropyl)ether						
4-Methylphenol						
N-Nitroso-di-n-propylamine						
Hexachloroethane						
Nitrobenzene						
Isophorone						
2-Nitrophenol						
2,4-Dimethylphenol						
Benzoic acid						
bis(2-Chloroethoxy) methane						
2,4-Dichlorophenol						
1,2,4-Trichlorobenzene						
Naphthalene						
4-Chloroaniline						
Hexachlorobutadiene						
4-Chloro-3-methylphenol						
2-Methylnaphthalene						
Hexachlorocyclopentadiene						
2,4,6-Trichlorophenol						
2,4,5-Trichlorophenol						
2-Chloronaphthalene						
2-Nitroaniline						
Dimethylphthalate						
Acenaphthylene						
2,6-Dinitrotoluene						
3-Nitroaniline						
Acenaphthene						
2,4-Dinitrophenol						
4-Nitrophenol						
Dibenzofuran						
2,4-Dinitrotoluene						
Diethylphthalate						
4-Chlorophenyl-phenylether						
Fluorene						
4-Nitroaniline						
4,6-Dinitro-2-methylphenol						
N-Nitrosodiphenylamine (1)						
4-Bromophenyl-phenylether						
Hexachlorobenzene						
Pentachlorophenol						
Phenanthrene						
Anthracene						
Di-n-butylphthalate						
Fluoranthene						
Pyrene						
Butylbenzylphthalate						
3,3'-Dichlorobenzidine						
Benzo(a)anthracene						
Chrysene						
bis(2-Ethylhexyl) phthalate						
Di-n-octylphthalate						
Benzo(b)fluoranthene						
Benzo(k)fluoranthene						
Benzo(a)pyrene						
Indeno(1,2,3-cd)pyrene						
Dibenz(a,h)anthracene						
Benzo(g,h,i)perylene						

(1) N-Nitrosodiphenylamine can not be distinguished from diphenylamine using the CLP-SOW method.

AR301084

Sample Design
Sample Description

FP-125
Disturbed Area-
Soil(Dup. FP-115)

FP-126
Field Blank

FP-127
Equipment Blank

FIELD PARAMETERS

Temperature (Celsius)
pH (SU)
Specific Conductance (umhos)
Dissolved Oxygen (mg/l)

INORGANICS

Parameters	Conc.(MG/KG)	C	Q	Conc.(ug/L)	C	Q	Conc.(ug/L)	C	Q
Aluminum	10900	u		51.9	u		51.9	u	
Antimony	0.37	u	N	2	u	N	2	u	N
Arsenic	1.3	B	N	2	u		2	u	
Barium	40.8		E,*	2.1	B		4.7	B	
Beryllium	0.42	B		1.8	u		1.8	u	
Cadmium	1.7			4.7	u		4.7	u	
Calcium	185	B		5.9	u		228	B	
Chromium	10.9		N	5.4	u		5.4	u	
Cobalt	4.8	u		26.2	u		26.2	u	
Copper	6.5			6.8	u		6.8	u	
Iron	8780			21.2	B		25.3	B	
Lead	9.5			1.6	B		3.4		
Magnesium	408	B		5.2	u		5.2	u	
Manganese	256		*	5.5	u		5.5	u	
Mercury	0.11	u		0.2	u		0.2	u	
Nickel	5.5	B		24.7	u		34	B	
Potassium	340	B		790	u		790	u	
Selenium	0.25	u	N	1.4	u		1.4	u	
Silver	1.7	u		9.3	u		9.3	u	
Sodium	39.3	B		131	u	E	131	u	E
Thallium	0.36	u		2	u		2	u	
Vanadium	9.2			18.3	u		18.3	u	
Zinc	27		*	17.6	B		14.2	B	
yanide	1.2	u		10	u		10	u	
Solids	85.3%								

AR301085

Sample Design
Sample Description

FP-125
Disturbed Area-
Soil (Dup. FP-115)

FP-126
Field Blank

FP-127
Equipment Blank

PESTICIDES/PCB'S

Parameters	Conc. (ug/kg)	Q	Conc. (ug/L)	Q	Conc. (ug/L)	Q
alpha-BHC			0.05	U	0.05	U
beta-BHC			0.05	U	0.05	U
delta-BHC			0.05	U	0.05	U
gamma-BHC			0.05	U	0.05	U
Heptachlor			0.05	U	0.05	U
Aldrin			0.05	U	0.05	U
Heptachlor epoxide			0.05	U	0.05	U
Endosulfan I			0.05	U	0.05	U
Dieldrin			0.1	U	0.1	U
4,4'-DDE			0.1	U	0.1	U
Endrin			0.1	U	0.1	U
Endosulfan II			0.1	U	0.1	U
4,4'-DDD			0.1	U	0.1	U
Endosulfan sulfate			0.1	U	0.1	U
4,4'-DDT			0.1	U	0.1	U
Methoxychlor			0.5	U	0.5	U
Endrin ketone			0.1	U	0.1	U
alpha-Chlordane			0.5	U	0.5	U
gamma-Chlordane			0.5	U	0.5	U
Toxaphene			1	U	1	U
Aroclor-1016			0.5	U	0.5	U
Aroclor-1221			0.5	U	0.5	U
Aroclor-1232			0.5	U	0.5	U
Aroclor-1242			0.5	U	0.5	U
Aroclor-1248			0.5	U	0.5	U
Aroclor-1254			1	U	1	U
Aroclor-1260			1	U	1	U

VOLATILE ORGANICS

Parameters	Conc. (ug/kg)	Q	Conc. (ug/L)	Q	Conc. (ug/L)	Q
CHLOROMETHANE			10	U	10	U
BROMOMETHANE			10	U	10	U
VINYL CHLORIDE			10	U	10	U
CHLOROETHANE			10	U	10	U
METHYLENE CHLORIDE			5	U	5	U
ACETONE			20	U	22	U
CARBON DISULFIDE			5	U	5	U
1,1 - DICHLOROETHENE			5	U	5	U
1,1 - DICHLOROETHANE			5	U	5	U
1,2 - DICHLOROETHENE (TOTAL)			5	U	5	U
CHLOROFORM			5	U	5	U
1,2 - DICHLOROETHANE			5	U	5	U
2-BUTANONE			10	U	10	U
1,1,1 - TRICHLOROETHANE			5	U	5	U
CARBON TETRACHLORIDE			5	U	5	U
VINYL ACETATE			10	U	10	U
BROMODICHLOROMETHANE			5	U	5	U
1,2 - DICHLOROPROPANE			5	U	5	U
CIS - 1,3 - DICHLOROPROPENE			5	U	5	U
TRICHLOROETHENE			5	U	5	U
DIBROMOCHLOROMETHANE			5	U	5	U
1,1,2 - TRICHLOROETHANE			5	U	5	U
BENZENE			5	U	5	U
TRANS - 1,3 - DICHLOROPROPENE			5	U	5	U
BROMOFORM			5	U	5	U
4 - METHYL - 2 - PENTANONE			10	U	10	U
2 - HEXANONE			10	U	10	U
TETRACHLOROETHENE			5	U	5	U
1,1,2,2 - TETRACHLOROETHANE			5	U	5	U
TOLUENE			5	U	5	U
CHLOROBENZENE			5	U	5	U
ETHYLBENZENE			5	U	5	U
STYRENE			5	U	5	U
XYLENE (TOTAL)			5	U	5	U

AR301086

Sample Design
Sample Description

FP-125
Disturbed Area-
Soil (Dup. FP-115)

FP-126
Field Blank

FP-127
Equipment Blank

SEMI-VOLATILE ORGANICS

Parameters	Conc.(ug/kg)	Q	Conc.(ug/L)	U	Conc.(ug/L)	U
Phenol			10	U	10	U
bis(2-Chloroethyl) ether			10	U	10	U
2-Chlorophenol			10	U	10	U
1,3-Dichlorobenzene			10	U	10	U
1,4-Dichlorobenzene			10	U	10	U
Benzyl Alcohol			10	U	10	U
1,2-Dichlorobenzene			10	U	10	U
2-Methylphenol			10	U	10	U
bis(2-Chloroisopropyl) ether			10	U	10	U
4-Methylphenol			10	U	10	U
N-Nitroso-di-n-propylamine			10	U	10	U
Hexachloroethane			10	U	10	U
Nitrobenzene			10	U	10	U
Isophorone			10	U	10	U
2-Nitrophenol			10	U	10	U
2,4-Dimethylphenol			10	U	10	U
Benzoic acid			50	U	50	U
bis(2-Chloroethoxy) methane			10	U	10	U
2,4-Dichlorophenol			10	U	10	U
1,2,4-Trichlorobenzene			10	U	10	U
Naphthalene			10	U	10	U
4-Chloroaniline			10	U	10	U
Hexachlorobutadiene			10	U	10	U
4-Chloro-3-methylphenol			10	U	10	U
2-Methylnaphthalene			10	U	10	U
Hexachlorocyclopentadiene			10	U	10	U
2,4,6-Trichlorophenol			10	U	10	U
2,4,5-Trichlorophenol			50	U	50	U
2-Chloronaphthalene			10	U	10	U
2-Nitroaniline			50	U	50	U
methylphthalate			10	U	10	U
benaphthylene			10	U	10	U
2,6-Dinitrotoluene			10	U	10	U
3-Nitroaniline			50	U	50	U
Acenaphthene			10	U	10	U
2,4-Dinitrophenol			50	U	50	U
4-Nitrophenol			50	U	50	U
Bibenzofuran			10	U	10	U
2,4-Dinitrotoluene			10	U	10	U
Diethylphthalate			10	U	10	U
4-Chlorophenyl-phenylether			10	U	10	U
Fluorene			10	U	10	U
4-Nitroaniline			50	U	50	U
4,6-Dinitro-2-methylphenol			50	U	50	U
N-Nitrosodiphenylamine (1)			10	U	10	U
4-Bromophenyl-phenylether			10	U	10	U
Hexachlorobenzene			10	U	10	U
Pentachlorophenol			50	U	50	U
Phenanthrene			10	U	10	U
Anthracene			10	U	10	U
Di-n-butylphthalate			10	U	10	U
Fluoranthene			10	U	10	U
Pyrene			10	U	10	U
Butylbenzylphthalate			10	U	10	U
3,3'-Dichlorobenzidine			20	U	20	U
Benzo(a)anthracene			10	U	10	U
Chrysene			10	U	10	U
bis(2-Ethylhexyl) phthalate			10	U	10	U
Di-n-octylphthalate			10	U	10	U
Benzo(b)fluoranthene			10	U	10	U
Benzo(k)fluoranthene			10	U	10	U
Benzo(a)pyrene			10	U	10	U
Indeno(1,2,3-cd)pyrene			10	U	10	U
Benzo(a,h)anthracene			10	U	10	U
Benzo(g,h,i)perylene			10	U	10	U

AR301087U

(1) N-Nitrosodiphenylamine can not be distinguished from diphenylamine using the CLP-30W method.

Sample Design
Sample Description

FP-128
Trip Blank

FP-129
Field Blank

FP-130
Equipment Blank

FIELD PARAMETERS

Temperature (Celsius)
pH (SU)
Specific Conductance (umhos)
Dissolved Oxygen (mg/l)

INORGANICS

Parameters	Co Conc.(ug/L)	C	Q Conc.(ug/L)	C	Q Conc.(ug/L)	C	Q	
Aluminum	51.9	u	51.9	u	51.9	u		
Antimony	2	u	N	2	N	u	N	
Arsenic	2	u	2	u	2	u		
Barium	2.1	u	3	B	2.1	u		
Beryllium	1.8	u	1.8	u	1.8	u		
Cadmium	4.7	u	4.7	u	4.7	u		
Calcium	5.9	u	6.1	B	16.4	B		
Chromium	5.4	u	5.4	u	5.4	u		
Cobalt	26.2	u	26.2	u	26.2	u		
Copper	6.8	u	6.8	u	6.8	u		
Iron	7.9	u	7.9	u	14.1	B		
Lead	2	B	2.2	B	1.3	u		
Magnesium	5.2	u	5.2	u	5.2	u		
Manganese	5.5	u	5.5	u	9.8	B		
Mercury	0.2	u	0.2	u	0.2	u		
Nickel	24.7	u	25.8	B	35.2	B		
Potassium	790	u	790	u	790	u		
Selenium	1.4	u	1.4	u	1.4	u		
Silver	9.3	u	9.3	u	9.3	u		
Sodium	559	B	E	131	E	167	B	E
Thallium	2	u	2	u	2	u		
Vanadium	18.3	u	18.3	u	18.3	u		
Zinc	10.7	u	19.9	B	14.4	B		
Cyanide	10	u	10	u	10	u		

AR301088

Sample Design
Sample Description

FP-128
Trip Blank

FP-129
Field Blank

FP-130
Equipment Blank

PESTICIDES/PCB'S

Parameters	Conc. (ug/L)	Q	Conc. (ug/L)	Q	Conc. (ug/L)	Q
alpha-BHC	0.05	U	0.05	U	0.05	U
beta-BHC	0.05	U	0.05	U	0.05	U
delta-BHC	0.05	U	0.05	U	0.05	U
gamma-BHC	0.05	U	0.05	U	0.05	U
Heptachlor	0.05	U	0.05	U	0.05	U
Aldrin	0.05	U	0.05	U	0.05	U
Heptachlor epoxide	0.05	U	0.05	U	0.05	U
Endosulfan I	0.05	U	0.05	U	0.05	U
Dieldrin	0.1	U	0.1	U	0.1	U
4,4'-DDE	0.1	U	0.1	U	0.1	U
Endrin	0.1	U	0.1	U	0.1	U
Endosulfan II	0.1	U	0.1	U	0.1	U
4,4'-DDD	0.1	U	0.1	U	0.1	U
Endosulfan sulfate	0.1	U	0.1	U	0.1	U
4,4'-DDT	0.1	U	0.1	U	0.1	U
Methoxychlor	0.5	U	0.5	U	0.5	U
Endrin ketone	0.1	U	0.1	U	0.1	U
alpha-Chlordane	0.5	U	0.5	U	0.5	U
gamma-Chlordane	0.5	U	0.5	U	0.5	U
Toxaphene	1	U	1	U	1	U
Aroclor-1016	0.5	U	0.5	U	0.5	U
Aroclor-1221	0.5	U	0.5	U	0.5	U
Aroclor-1232	0.5	U	0.5	U	0.5	U
Aroclor-1242	0.5	U	0.5	U	0.5	U
Aroclor-1248	0.5	U	0.5	U	0.5	U
Aroclor-1254	1	U	1	U	1	U
Aroclor-1260	1	U	1	U	1	U

VOLATILE ORGANICS

Parameters	Conc. (ug/L)	Q	Conc. (ug/L)	Q	Conc. (ug/kg)	Q
CHLOROMETHANE	10	U	10	U	10	U
BROMOMETHANE	10	U	10	U	10	U
VINYL CHLORIDE	10	U	10	U	10	U
CHLOROETHANE	10	U	10	U	10	U
METHYLENE CHLORIDE	5	U	5	U	5	U
ACETONE	21	8	9	83	8	83
CARBON DISULFIDE	5	U	5	U	5	U
1,1 - DICHLOROETHENE	5	U	5	U	5	U
1,1 - DICHLOROETHANE	5	U	5	U	5	U
1,2 - DICHLOROETHENE (TOTAL)	5	U	5	U	5	U
CHLOROFORM	5	U	5	U	5	U
1,2 - DICHLOROETHANE	5	U	5	U	5	U
2-BUTANONE	10	U	10	U	10	U
1,1,1 - TRICHLOROETHANE	5	U	5	U	5	U
CARBON TETRACHLORIDE	5	U	5	U	5	U
VINYL ACETATE	10	U	10	U	10	U
BROMODICHLOROMETHANE	5	U	5	U	5	U
1,2 - DICHLOROPROPANE	5	U	5	U	5	U
CIS - 1,3 - DICHLOROPROPENE	5	U	5	U	5	U
TRICHLOROETHENE	5	U	5	U	5	U
DIBROMOCHLOROMETHANE	5	U	5	U	5	U
1,1,2 - TRICHLOROETHANE	5	U	5	U	5	U
BENZENE	5	U	5	U	5	U
TRANS - 1,3 - DICHLOROPROPENE	5	U	5	U	5	U
BROMOFORM	5	U	5	U	5	U
4 - METHYL - 2 - PENTANONE	10	U	10	U	10	U
2 - HEXANONE	10	U	10	U	10	U
TETRACHLOROETHENE	5	U	5	U	5	U
1,1,2,2 - TETRACHLOROETHANE	5	U	5	U	5	U
TOLUENE	5	U	5	U	5	U
CHLOROBENZENE	5	U	5	U	5	U
THYLBENZENE	5	U	5	U	5	U
XYRENE	5	U	5	U	5	U
YLENE (TOTAL)	5	U	5	U	5	U

AR301089

Sample Design
Sample Description

FP-125
Trip Blank

FP-129
Field Blank

FP-130
Equipment Blank

SEMI-VOLATILE ORGANICS

Parameters	Conc.(ug/L)	Q	Conc.(ug/L)	Q	Conc.(ug/L)	Q
Phenol	10	U	10	U	10	U
bis(2-Chloroethyl) ether	10	U	10	U	10	U
2-Chlorophenol	10	U	10	U	10	U
1,3-Dichlorobenzene	10	U	10	U	10	U
1,4-Dichlorobenzene	10	U	10	U	10	U
Benzyl alcohol	10	U	10	U	10	U
1,2-Dichlorobenzene	10	U	10	U	10	U
2-Methylphenol	10	U	10	U	10	U
bis(2-chloroisopropyl)ether	10	U	10	U	10	U
4-Methylphenol	10	U	10	U	10	U
N-Nitroso-di-n-propylamine	10	U	10	U	10	U
Hexachloroethane	10	U	10	U	10	U
Nitrobenzene	10	U	10	U	10	U
Isophorone	10	U	10	U	10	U
2-Nitrophenol	10	U	10	U	10	U
2,4-Dimethylphenol	10	U	10	U	10	U
Benzoic acid	50	U	50	U	50	U
bis(2-Chloroethoxy) methane	10	U	10	U	10	U
2,4-Dichlorophenol	10	U	10	U	10	U
1,2,4-Trichlorobenzene	10	U	10	U	10	U
Naphthalene	10	U	10	U	10	U
4-Chloroaniline	10	U	10	U	10	U
Hexachlorobutadiene	10	U	10	U	10	U
4-Chloro-3-methylphenol	10	U	10	U	10	U
2-Methylnaphthalene	10	U	10	U	10	U
Hexachlorocyclopentadiene	10	U	10	U	10	U
2,4,6-Trichlorophenol	10	U	10	U	10	U
2,4,5-Trichlorophenol	50	U	50	U	50	U
2-Chloronaphthalene	10	U	10	U	10	U
2-Nitroaniline	50	U	50	U	50	U
Dimethylphthalate	10	U	10	U	10	U
Acenaphthylene	10	U	10	U	10	U
2,6-Dinitrotoluene	10	U	10	U	10	U
3-Nitroaniline	50	U	50	U	50	U
Acenaphthene	10	U	10	U	10	U
2,4-Dinitrophenol	50	U	50	U	50	U
4-Nitrophenol	50	U	50	U	50	U
Dibenzofuran	10	U	10	U	10	U
2,4-Dinitrotoluene	10	U	10	U	10	U
Diethylphthalate	10	U	10	U	10	U
4-Chlorophenyl-phenylether	10	U	10	U	10	U
Fluorene	10	U	10	U	10	U
4-Nitroaniline	50	U	50	U	50	U
4,6-Dinitro-2-methylphenol	50	U	50	U	50	U
N-Nitrosodiphenylamine (1)	10	U	10	U	10	U
4-Bromophenyl-phenylether	10	U	10	U	10	U
Hexachlorobenzene	10	U	10	U	10	U
Pentachlorophenol	50	U	50	U	50	U
Phenanthrene	10	U	10	U	10	U
Anthracene	10	U	10	U	10	U
Di-n-butylphthalate	10	U	10	U	10	U
Fluoranthene	10	U	10	U	10	U
Pyrene	10	U	10	U	10	U
Butylbenzylphthalate	10	U	10	U	10	U
3,3'-Dichlorobenzidine	20	U	20	U	20	U
Benzo(a)anthracene	10	U	10	U	10	U
Chrysene	10	U	10	U	10	U
bis(2-Ethylhexyl) phthalate	10	U	10	U	10	U
Di-n-octylphthalate	10	U	10	U	10	U
Benzo(b)fluoranthene	10	U	10	U	10	U
Benzo(k)fluoranthene	10	U	10	U	10	U
Benzo(a)pyrene	10	U	10	U	10	U
Indeno(1,2,3-cd)pyrene	10	U	10	U	10	U
Dibenz(a,h)anthracene	10	U	10	U	10	U
Benzo(g,h,i)perylene	10	U	10	U	10	U

(1) N-Nitrosodiphenylamine can not be distinguished from diphenylamine using the CLP-35W method.

AR301090

Phase II Test Pit Sampling Results

Sample Design	FP-701	FP-702A	FP-702B
Sample Description	Test Pit-Soil	Test Pit-Soil	Test Pit-Aqueous

FIELD PARAMETERS

Temperature (Celsius)
 pH (SU)
 Specific Conductance (umhos)
 Dissolved Oxygen (mg/l)

INORGANICS

Parameters	Conc. (MG/KG)	C	Q	Conc. (MG/KG)	C	Q	Conc. (ug/L)	C	Q
Aluminum	11400			11500			13200		
Antimony	3.7	B	N	2.2	B	N	66		N
Arsenic	5.7		N	15.7		N	197		
Barium	5360		*	1720		*	34700		
Beryllium	0.36	u		0.33	u		1.8	u	
Cadmium	2.1			0.88	B		6.1		
Calcium	4290			925			15500		
Chromium	25		N	14.3		N	20.6		
Cobalt	5.3	u		4.8	u		26.2	u	
Copper	29.9			8.8			29.5		
Iron	14800			9360			47000		
Lead	6920			217			1890		
Magnesium	937	B		540	B		4760	B	
Manganese	177		*	123		*	945		
Mercury	0.11	u		0.1	u		0.2	u	
Nickel	6.6	B		6	B		52.1		
Potassium	1400			760	B		13100		
Selenium	0.3	B	N	0.22	u	N	1.4	u	
Silver	1.9	u		1.7	u		9.3	u	
Sodium	377	B		136	B		28700		E
Thallium	0.33	u		0.32	u		2	u	
Vanadium	13.3			7.8	B		18.3	u	
Zinc	1510		*	506		*	3820		
Cyanide	1.2	u		1.2	u		10	u	
Hardness Solids	80.3%			84.8%			58.2 mg/L		

AR301091

Sample Design
Sample Description

FP-701
Test Pit-Soil

FP-702A
Test Pit-Soil

FP-702B
Test Pit-Aqueous

PESTICIDES/PCB'S

Parameters	Conc.(ug/kg)	Q	Conc.(ug/kg)	Q	Conc.(ug/L)	Q
alpha-BHC	210	U	20	U	0.05	U
beta-BHC	210	U	20	U	0.05	U
delta-BHC	210	U	20	U	0.05	U
gamma-BHC	210	U	20	U	0.05	U
Heptachlor	210	U	20	U	0.05	U
Aldrin	210	U	20	U	0.05	U
Heptachlor epoxide	210	U	20	U	0.05	U
Endosulfan I	210	U	20	U	0.05	U
Dieldrin	420	U	41	U	0.1	U
4,4'-DDE	420	U	41	U	0.1	U
Endrin	420	U	41	U	0.1	U
Endosulfan II	420	U	41	U	0.1	U
4,4'-DDD	420	U	41	U	0.1	U
Endosulfan sulfate	420	U	41	U	0.1	U
4,4'-DDT	420	U	41	U	0.1	U
Methoxychlor	2100	U	200	U	0.5	U
Endrin ketone	420	U	41	U	0.1	U
alpha-Chlordane	2100	U	200	U	0.5	U
gamma-Chlordane	2100	U	200	U	0.5	U
Toxaphene	4200	U	410	U	1	U
Aroclor-1016	2100	U	200	U	0.5	U
Aroclor-1221	2100	U	200	U	0.5	U
Aroclor-1232	2100	U	200	U	0.5	U
Aroclor-1242	2100	U	200	U	0.5	U
Aroclor-1248	2100	U	200	U	0.5	U
Aroclor-1254	4200	U	410	U	1	U
Aroclor-1259	4200	U	410	U	1	U

VOLATILE ORGANICS

Parameters	Conc.(ug/kg)	Q	Conc.(ug/kg)	Q	Conc.(ug/L)	Q
CHLOROMETHANE	13	U	12	U	10	U
BROMOMETHANE	13	U	12	U	10	U
VINYL CHLORIDE	13	U	12	U	10	U
CHLOROETHANE	13	U	12	U	10	U
METHYLENE CHLORIDE	7	B	9	B	5	U
ACETONE	34	B	12	B	8	B
CARBON DISULFIDE	6	U	6	U	5	U
1,1 - DICHLOROETHENE	6	U	6	U	5	U
1,1 - DICHLOROETHANE	6	U	6	U	5	U
1,2 - DICHLOROETHENE (TOTAL)	4	J	6	U	5	U
CHLOROFORM	6	U	6	U	5	U
1,2 - DICHLOROETHANE	6	U	6	U	5	U
2-BUTANONE	10	J	12	U	10	U
1,1,1 - TRICHLOROETHANE	6	U	6	U	5	U
CARBON TETRACHLORIDE	6	U	6	U	5	U
VINYL ACETATE	13	U	12	U	10	U
BROMODICHLOROMETHANE	6	U	6	U	5	U
1,2 - DICHLOROPROPANE	6	U	6	U	5	U
CIS - 1,3 - DICHLOROPROPENE	6	U	6	U	5	U
TRICHLOROETHENE	6	U	6	U	5	U
DIBROMOCHLOROMETHANE	6	U	6	U	5	U
1,1,2 - TRICHLOROETHANE	6	U	6	U	5	U
BENZENE	6	U	4	J	13	U
TRANS-1,3-DICHLOROPROPENE	6	U	6	U	5	U
BROMOFORM	6	U	6	U	5	U
4 - METHYL - 2 - PENTANONE	9	J	86	U	10	U
2 - HEXANONE	8	J	12	U	10	U
TETRACHLOROETHENE	6	U	6	U	5	U
1,1,2,2 - TETRACHLOROETHANE	6	U	6	U	5	U
TOLUENE	11	U	4	J	5	U
CHLOROBENZENE	6	U	6	U	5	U
ETHYLBENZENE	19	U	6	U	5	U
STYRENE	6	U	6	U	5	U
XYLENE (TOTAL)	100	U	6	U	15	U

AR301092

Sample Design
Sample Description

FP-701
Test Pit-Soil

FP-702A
Test Pit-Soil

FP-702B
Test Pit-Aqueous

SEMI-VOLATILE ORGANICS

Parameters	Conc. (ug/kg)	Q	Conc. (ug/kg)	Q	Conc. (ug/L)	Q
Phenol	1700	U	780	U	10	U
bis(2-Chloroethyl) ether	1700	U	780	U	10	U
2-Chlorophenol	1700	U	780	U	10	U
1,3-Dichlorobenzene	1700	U	780	U	10	U
1,4-Dichlorobenzene	1700	U	780	U	10	U
Benzyl alcohol	1700	U	780	U	10	U
1,2-Dichlorobenzene	1700	U	780	U	10	U
2-Methylphenol	1700	U	780	U	10	U
bis(2-chloroisopropyl) ether	1700	U	780	U	10	U
4-Methylphenol	1700	U	780	U	10	U
N-Nitroso-di-n-propylamine	1700	U	780	U	10	U
Hexachloroethane	1700	U	780	U	10	U
Nitrobenzene	1700	U	780	U	10	U
Isophorone	1700	U	780	U	10	U
2-Nitrophenol	1700	U	780	U	10	U
2,4-Dimethylphenol	1700	U	780	U	10	U
Benzoic acid	8300	U	3900	U	50	U
bis(2-Chloroethoxy) methane	1700	U	780	U	10	U
2,4-Dichlorophenol	1700	U	780	U	10	U
1,2,4-Trichlorobenzene	1700	U	780	U	10	U
Naphthalene	1700	U	780	U	10	U
4-Chloroaniline	1700	U	780	U	10	U
Hexachlorobutadiene	1700	U	780	U	10	U
4-Chloro-3-methylphenol	1700	U	780	U	10	U
2-Methylnaphthalene	1700	U	780	U	10	U
Hexachlorocyclopentadiene	1700	U	780	U	10	U
2,4,6-Trichlorophenol	1700	U	780	U	10	U
2,4,5-Trichlorophenol	8300	U	3900	U	50	U
2-Chloronaphthalene	1700	U	780	U	10	U
2-Nitroaniline	8300	U	3900	U	50	U
Dimethylphthalate	1700	U	780	U	10	U
Acenaphthylene	1700	U	780	U	10	U
2,6-Dinitrotoluene	1700	U	780	U	10	U
2-Nitroaniline	8300	U	3900	U	50	U
Acenaphthene	1700	U	780	U	10	U
2,4-Dinitrophenol	8300	U	3900	U	50	U
4-Nitrophenol	8300	U	3900	U	50	U
Dibenzofuran	1700	U	780	U	10	U
2,4-Dinitrotoluene	1700	U	780	U	10	U
Diethylphthalate	1700	U	780	U	10	U
4-Chlorophenyl-phenylether	1700	U	780	U	10	U
Fluorene	1700	U	780	U	10	U
4-Nitroaniline	8300	U	3900	U	50	U
4,6-Dinitro-2-methylphenol	8300	U	3900	U	50	U
N-Nitrosodiphenylamine (1)	15000	U	780	U	120	U
4-Bromophenyl-phenylether	1700	U	780	U	10	U
Hexachlorobenzene	1700	U	780	U	10	U
Pentachlorophenol	8300	U	3900	U	50	U
Phenanthrene	1400	J	780	U	10	U
Anthracene	1700	U	780	U	10	U
Di-n-butylphthalate	1700	U	780	U	10	U
Fluoranthene	1400	J	780	U	10	U
Pyrene	560	J	780	U	10	U
Butylbenzylphthalate	1700	U	780	U	10	U
3,3'-Dichlorobenzidine	3300	U	1600	U	20	U
Benzo(a)anthracene	1700	U	780	U	10	U
Chrysene	1700	U	780	U	10	U
bis(2-Ethylhexyl) phthalate	5200	U	270	J	10	U
Di-n-octylphthalate	1700	U	780	U	10	U
Benzo(b)fluoranthene	1700	U	780	U	10	U
Benzo(k)fluoranthene	1700	U	780	U	10	U
Benzo(a)pyrene	1700	U	780	U	10	U
Indeno(1,2,3-cd)pyrene	1700	U	780	U	10	U
Bibenz(a,h)anthracene	1700	U	780	U	10	U
Benzo(g,h,i)perylene	1700	U	780	U	10	U

(1) N-Nitrosodiphenylamine can not be distinguished from diphenylamine using the C.A.R. 301.093 method.

TABLE 21
SUMMARY OF SURFACE WATER FLOW DATA

AR301094

TABLE 21
SURFACE WATER FLOW DATA
First Piedmont Rock Quarry
Danville, VA

Station	Date of Measurement					
	5/24	6/2	6/8	6/14	6/22	8/16
FP-301	0.001	0.001	0.001	*	0.002	*
FP-302	0.015	0.007	0.011	*	0.011	*
FP-303	0.001	0.001	0.001	*	0.003	*
FP-303A						0.001
FP-304	a	a	a	*	a	*
FP-305	0.029	0.01	0.023	*	0.054	*
FP-306	*	0.0001b	*	*	*	a
FP-307	0.033	0.015	0.033	*	0.069	*
FP-308	0.037	0.015	0.037	*	0.086	0.008
FP-309	0.002	0.0004	0.003	0.015	0.005	0.0002
FP-310	0.002	a	0.002	*	0.020	*
FP-310B	*	0.006	0.011	*	0.033	*
FP-311	0.017	0.007	0.015	0.069	0.029	0.004
FP-312	*	1.032	2.828	8.831	3.895	*
FP-313	2.5b	1.520	2.843	9.116	3.978	*
FP-314	*	1.577	3.158	*	4.181	*

-All calculated flow rates are in cubic feet per second

*-no measurement taken

a-indicates no flow

b-flow rate estimated

AR301095

TABLE 10
CLIMATOLOGICAL DATA SUMMARY FOR CHATHAM, VA

AR301096

CHATHAM, VA

CLIMATOLOGICAL DATA SUMMARY FOR CHATHAM, VA

PERIOD: 1951-80
ELEVATION: 700 FT

CLIMATOLOGICAL SUMMARY

MONTH	TEMPERATURE (F)										PRECIPITATION TOTALS (INCHES)																								
	MEANS					EXTREMES					MEAN NUMBER OF DAYS					DEGREE DAYS					GREATEST					SNOW					MEAN NUMBER OF HOURS				
	DAILY MAXIMUM	DAILY MINIMUM	MONTHLY	RECORD HIGHEST	RECORD LOWEST	YEAR	DAY	HIGHEST	LOWEST	YEAR	DAY	90 AND ABOVE	32 AND BELOW	32 AND BELOW	0 AND BELOW	HEATING BASE 65	COOLING BASE 65	MEAN	GREATEST MONTHLY	YEARS	DAILY	YEAR	DAY	YEAR	MONTHLY	MAXIMUM	YEAR	.10 OR MORE	.50 OR MORE	1.00 OR MORE					
JAN	46.5	25.1	35.8	76+	-1	72	16	0	3	24	0	905	0	3.41	8,153	78	2,02	79	21	6.4	35.3	66	6	2	1										
FEB	49.0	26.3	37.7	81+	-2	79	10	0	2	21	0	764	0	3.32	6,264	60	2,02	79	25	3.9	17.8	60	7	2	1										
MAR	57.7	33.9	45.8	86+	7+	80	4	0	0	15	0	595	0	4.16	11,764	75	3,58	75	30	2.8	17.5	60	8	3	1										
APR	59.0	42.6	55.8	92+	22+	77	9	0	0	5	0	284	0	3.54	7,717	78	3,79	78	27	.0	.0	0	6	2	1										
MAY	77.3	51.5	64.4	95+	28+	77	10	1	0	1	0	111	92	3.89	10,737	71	4,44	71	13	.0	.0	0	7	3	1										
JUN	83.7	59.0	71.4	100+	33+	77	8	6	0	0	0	17	209	3.60	8,197	72	3,15	72	21	.0	.0	0	6	2	1										
JUL	87.6	63.6	75.6	104+	46+	79	8	11	0	0	0	0	329	3.94	7,906	65	2,78	64	13	.0	.0	0	6	3	1										
AUG	86.5	62.7	74.6	101+	38+	76	31	10	0	0	0	0	298	3.80	8,697	67	6,47	64	31	.0	.0	0	6	2	1										
SEP	80.8	55.6	68.3	104+	32	51	30	4	0	0	0	49	148	3.79	10,817	79	5,09	79	22	.0	.0	0	5	2	1										
OCT	70.4	43.3	56.9	96+	20+	76	19	0	0	5	0	276	24	3.55	10,187	76	4,05	76	16	.0	.0	0	6	2	1										
NOV	59.7	34.9	47.3	85+	10	56	25	0	0	14	0	531	0	3.09	7,497	67	3,46	62	10	.5	5.0	68	5	2	1										
DEC	49.7	27.5	38.6	78+	-2	80	26	0	1	22	0	818	0	3.39	7,537	67	4,44	58	29	1.6	8.0	66	6	2	1										
YEAR	68.2	43.8	56.0	104	34	71	-2	80	26	32	6	107	0	4350	1108	143	48	11,764	75	6,47	64	31	15.2	35.3	66	74	27	12							

* FROM 1951-80 NORMALS
* ESTIMATED VALUE BASED ON DATA FROM SURROUNDING STATIONS
* ALSO ON EARLIER DATES.

DEGREE DAYS TO SELECTED BASE TEMPERATURES (F)

BASE	HEATING DEGREE DAYS												COOLING DEGREE DAYS												
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
65	905	764	595	284	111	17	0	0	49	276	531	816	4350	0	0	0	0	14	165	381	663	3245			
60	750	624	446	159	43	0	0	0	6	115	297	570	2670	0	0	0	0	0	0	0	0	0	0	0	1834
55	595	489	305	74	13	0	0	0	0	85	242	508	2312	0	0	0	0	0	0	0	0	0	0	0	1108
50	452	358	187	21	0	0	0	0	0	32	126	368	1544	0	0	0	0	0	0	0	0	0	0	0	548

BASE	HEATING DEGREE DAYS												COOLING DEGREE DAYS																
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN			
55	0	0	20	98	304	492	639	608	399	145	11	0	2716	0	0	0	13	68	250	432	577	546	345	112	6	0	2349		
57	0	0	0	6	33	180	346	484	453	263	69	0	1834	0	0	0	0	0	8	92	209	329	298	148	24	0	0	1108	
60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
65	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
70	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

DERIVED FROM THE 1951-80 MONTHLY NORMALS

PROBABILITY THAT THE MONTHLY PRECIPITATION WILL BE EQUAL TO OR LESS THAN THE INDICATED PRECIPITATION AMOUNT

MONTHLY PRECIPITATION (INCHES)	PROBABILITY LEVELS											
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
.05	1.01	1.84	1.61	1.55	1.38	1.44	.83	.69	.57	.86	.76	
.10	1.37	2.21	1.93	1.91	1.71	1.81	1.19	1.03	.88	1.15	1.08	
.20	1.86	1.79	2.73	2.36	2.42	2.19	2.34	1.74	1.58	1.39	1.58	
.30	2.27	2.20	3.15	2.71	2.84	2.59	2.79	2.25	2.10	1.88	1.99	
.40	2.67	2.59	3.54	3.03	3.24	2.96	3.21	2.75	2.63	2.38	2.47	
.50	3.09	3.00	3.94	3.36	3.64	3.35	3.65	3.29	3.19	2.93	2.76	
.60	3.55	3.45	4.36	3.71	4.08	3.77	4.12	3.89	3.84	3.56	3.20	
.70	4.09	3.98	4.84	4.11	4.58	4.25	4.67	4.62	4.62	4.33	3.72	
.80	4.78	4.66	5.45	4.62	5.22	4.86	5.37	5.57	5.57	5.36	4.39	
.90	5.87	5.73	6.38	5.38	6.20	5.81	6.45	7.09	7.34	7.03	5.45	
.95	6.87	6.71	7.22	6.07	7.09	6.67	7.43	8.52	8.94	8.62	6.43	

THESE VALUES WERE DETERMINED FROM THE INCOMPLETE GAMMA DISTRIBUTION.

AR301097

TABLE 11

SUMMARY OF AVERAGE MONTHLY CLIMATE DATA

AR301098

TABLE 11

SUMMARY OF AVERAGE MONTHLY CLIMATE DATA

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Temp. ¹ (°F)	35.8	37.7	45.8	55.8	64.4	71.4	75.6	74.6	68.3	56.9	47.3	38.6	-----
Wind Speed ² (mph)	8.8	8.8	9.3	9.2	7.7	6.9	6.6	6.3	6.9	7.4	7.9	7.8	-----
Wind Direction ²	SW	SW	SW	SW	SW	SW	SW ⁴	N	N	N	SW	SW	-----
Precip. ¹ (inches)	3.41	3.32	4.16	3.54	3.89	3.60	3.94	3.80	3.79	3.55	3.09	3.39	43.48
Pan Evaporation ³	ND	ND	ND	4.04	4.36	4.69	4.83	4.58	3.37	2.66	ND	ND	52 ³
Potential Evapotranspiration ⁴	0.16	0.26	0.99	2.35	3.96	5.31	6.23	5.68	3.81	2.08	0.88	0.27	32.09
Potential Moisture Deficit/Excess ⁵	+3.25	+3.06	+3.17	+1.19	-0.07	-1.71	-2.29	-1.89	-0.12	+1.47	+2.21	3.12	+11.39

1. County of Pittsylvania Comprehensive Plan, 1986. Derived from the 1951-1980 monthly normals for Chatham, VA.
2. Ruffner and Bair, 1987. Derived from the 1951-1980 monthly normals for Lynchburg, VA.
3. National Climate Data Center, 1988. Average monthly total pan evaporation derived from the period 1967-1983 for Philpott, VA. Data not available for November through March. Total pan evaporation calculated to be 52 inches. Pan coefficient = 0.77. Lake evaporation = 0.77 pan evaporation.
4. State Climatology Board, 1988. Derived from the 1951-1980 monthly normals for Danville, VA, calculated using Thornthwaite method.
5. Potential moisture deficit excess = Precipitation minus potential evapotranspiration. + = excess, - = deficit.

AR301099

TABLE 12

PITTSYLVANIA COUNTY POPULATION DATA BY AGE BRACKET AND GENDER

AR301100

TABLE 12

PITTSYLVANIA COUNTY POPULATION DATA BY AGE BRACKET AND GENDER

Pre-School Population - Under 5 Years of Age

1970	4,946	2,508 male	2,438 female
1980	4,423	2,250 male	2,171 female
% changed	-10.6 %	-10.2%	-11.0%

School Age Population - 5 to 14 Years of Age

1970	12,811	6,464 male	6,347 female
1980	10,600	5,493 male	5,107 female
% changed	-17.3%	-15.0%	-19.5%

High School - Working Age 15 to 59 Years of Age

1970	33,643	16,576 male	17,076 female
1980	40,892	20,130 male	20,130 female
% changed	+21.5%	+21.4%	21.6%

Pre-Retirement Age - 60 to 64 Years of Age

1970	2,330	1,123 male	1,207 female
1980	3,094	1,399 male	1,695 female
% changed	+32.8	+24.6	+40.4

Retired - Elderly - 65 Years of Age and Older

1970	5,059	2,284 male	2,775 female
1980	7,138	3,145 male	3,993 female
% changed	+41.1%	+37.7 %	+43.9%

Total County Population

1970	58,789
1980	66,147

(from County of Pittsylvania Comprehensive Plan, 1986).

AR301101

AR301102

TABLE 13

SUMMARY OF POPULATION DATA FOR COMMUNITY OF BEAVER PARK

AR301103

TABLE 13

SUMMARY OF POPULATION DATA FOR COMMUNITY OF BEAVER PARK

1972 VADOT Aerial Photograph	U.S.G.S. Map	Tax Records	Site Reconnaissance	RI/FS Work Plan	1988 Dewberry & Davis Aerial Photograph
328	269	242	257	260	266

AR301104

TABLE 14
NATURAL SOILS PHYSICAL DATA

AR301105

TABLE 14

Natural Soils Physical Data
Westinghouse Project No. 4112-88-908A

Soil ID	Soil Name	Texture	Slope (%)	Hydrologic Soil Group	Parent Material
503	Appling	Sandy Loam	2-15	B	Acid Crystalline
511	Cecil	Sandy Loam	2-15	B	Acid Crystalline
513	Cecil	Sandy Clay Loam	2-15	B	Acid Crystalline
516	Chenneby-Toccoa	Fine Sandy Loam	0-2	C	Alluvium
568	Pacolet	Fine Sandy Loam	7-15	B	Acid Crystalline
X12	Udorthent	Loam	---	---	---

from SCS (1988) Unpublished Soil Descriptions for Pittsylvania County and Soil Survey (1977) of Campbell County and City of Lynchburg, Virginia
See Figure 8 for Soil Map
--- No Data

AR301106

TABLE 14

NATURAL SOILS PHYSICAL DATA

Soil series and map symbols	Depth to—		Depth from surface (typical profile)	Classification			Percentage less than 3 inches passing sieve—				Permeability Inches per hour	Available water capacity Inches per inch	Reaction	Shrink-swell potential	Corrosion potential	
	Bedrock	Seasonal high water table		USDA texture	Unified	AASHTO	No. 4 (#75 mm)	No. 10 (#2.0 mm)	No. 40 (#425 μm)	No. 200 (#75 μm)					Uncoated steel	Concrete
Appling, ApC1, ApE1, ...	>5	>5	0-7 7-50	Clay loam, light clay loam, heavy clay loam, clay	ML-OL MH	A-8 A-7	90-100 85-100	85-90 85-85	75-90 75-90	60-75 60-85	0.03-2.0 0.03-2.0	0.14-0.18 0.14-0.18	4.5-5.5 4.5-5.5	Moderate... Moderate...	High to moderate. High to moderate.	(0) (0)
AqB2, AqD2, AqE2, ...	>5	>5	0-86 87-100 11-53	Clay loam, sandy loam, light clay loam, heavy clay loam, clay	Cl, MH M, ML MH	A-4, A-7 A-7, A-1 A-7	95-100 95-100 95-100	95-85 85-95 85-95	70-90 70-90 70-90	70-90 70-90 70-90	0.03-2.0 0.03-2.0 0.03-2.0	0.14-0.18 0.14-0.18 0.14-0.18	4.5-5.5 4.5-5.5 4.5-5.5	Moderate... Moderate... Moderate...	High to moderate. High to moderate. High to moderate.	(0) (0) (0)
AIB2, AIC, AID2, AIE2, AmB2, AmD2, ...	>3	>5	0-9 9-56 56-72	Clay loam, clay, fine sandy loam, light clay loam, heavy clay loam, clay	Cl, MH SM OL, MH	A-4, A-7 A-4, A-7 A-8, A-7	95-100 95-100 95-100	85-95 85-95 85-95	70-90 70-90 70-90	60-70 55-80 60-75	0.03-2.0 2.0-4.3 0.03-2.0	0.14-0.18 0.14-0.18 0.14-0.18	4.5-5.5 4.5-5.5 4.5-5.5	Moderate... Moderate... Moderate...	High to moderate. High to moderate. High to moderate.	(0) (0) (0)
Caull: CaB2, CaD1, CaE2, ...	>5	>5	0-8 8-12 12-16 16-20	Fine gravelly sandy loam, clay loam, clay, fine sandy loam, clay	SM MH SH SH	A-2, A-4 A-7 A-7, A-1 A-7, A-1	85-100 85-100 85-100 85-100	75-85 85-85 85-85 85-85	60-70 60-70 60-70 60-70	30-40 40-60 40-70 40-70	2.0-4.3 0.03-2.0 0.03-2.0 0.03-2.0	0.08-0.14 0.14-0.18 0.14-0.18 0.14-0.18	4.5-5.5 4.5-5.5 4.5-5.5 4.5-5.5	Low... Moderate... Moderate... Moderate...	High to moderate. High to moderate. High to moderate. High to moderate.	(0) (0) (0) (0)
CIB1, CID1, CIE1, CmB1, CmD1, ...	>5	>5	0-7 7-36 36-82	Clay loam, clay, fine sandy loam, clay loam, clay	Cl, MH ML-OL MH	A-4, A-7 A-7 A-4, A-7	85-100 85-100 85-100	85-95 85-95 85-95	75-95 75-95 75-95	60-75 60-75 60-75	0.03-2.0 0.03-2.0 0.03-2.0	0.14-0.18 0.14-0.18 0.14-0.18	4.5-5.5 4.5-5.5 4.5-5.5	Moderate... Moderate... Moderate...	High to moderate. High to moderate. High to moderate.	(0) (0) (0)
Pacolat: PaB2, PaD2, PaE2, ...	>4	>4	0-7 7-27 27-56	Fine sandy loam, clay loam, clay, fine sandy loam	SM MH CL	A-1, A-2 A-7 A-4	85-100 85-100 85-100	85-85 85-85 85-85	75-85 75-90 75-90	35-50 40-60 40-60	2.0-4.3 0.03-2.0 0.03-2.0	0.12-0.14 0.14-0.18 0.14-0.18	4.5-5.5 4.5-5.5 4.5-5.5	Low... Moderate... Moderate...	Moderate to high. Moderate to high. Moderate to high.	(0) (0) (0)
PoC1, PoD1, ...	>4	>4	0-7 7-21 21-52	Clay loam, clay, fine sandy loam, clay loam, clay	MH MH CL	A-7 A-7 A-8	85-100 85-100 85-100	85-85 85-85 85-85	70-90 70-90 70-90	40-60 40-60 40-60	0.03-2.0 0.03-2.0 0.03-2.0	0.10-0.14 0.14-0.18 0.14-0.18	4.5-5.5 4.5-5.5 4.5-5.5	Moderate... Moderate... Moderate...	Moderate to high. Moderate to high. Moderate to high.	(0) (0) (0)
Thomas, Te, ...	>10	>4	0-8 8-52	Fine sandy loam, fine sandy loam	SM SM	A-1 A-1	100 100	100 100	70-85 70-85	10-50 10-50	2.0-4.3 2.0-4.3	0.12-0.14 0.12-0.14	4.5-5.5 4.5-5.5	Low... Low...	Moderate to low. Moderate to low.	(0) (0)

From SCS, Soil Survey, Charlotte County, Virginia (1974)
See Figure 6 for Soil Map.

TABLE 15

NATURAL SOILS CHEMISTRY DATA

AR301108

NATURAL SOILS CHEMISTRY DATA

TRACE CHEMICAL ELEMENT CONTENT OF NATURAL SOILS

SELECTED CHEMICAL ELEMENTS-CONCENTRATIONS IN EARTH'S CRUST (1)

Element	Common Range Average (ppm)	Element	Common Range Average (ppm)	Element	Percent By Weight	Element	Percent By Weight
Aluminum	10,000-300,000	Lithium	5-200	Aluminum	8.8%	Phosphorous	0.12%
Antimony	2-10	Magnesium	600-6,000	Arsenic	0.00005%-(500 ppb)	Potassium	2.59%
Arsenic	1-50	Manganese	20-3,000	Barium	approx. 0.00002% (200 ppb)	Selenium	about 90 ppb
Barium	100-3,000	Mercury	0.01-0.3	Boron	approx. 0.001%	Silicon	27.6%
Beryllium	0.1-40	Molybdenum	0.2-5			Sodium	2.83%
Boron	2-100	Nickel	5-500	Cadmium	0.1 to 0.2 ppm	Sulfur	0.03%
Bromine	1-10	Radium	8 x 10 ⁻⁵	Calcium	3.64%	Tin	0.0006% (6 ppm)
Cadmium	0.01-0.7	Rubidium	50-500	Chromium	Reported 100-300 ppm	Titanium	0.63%
Cesium	0.3-25	Selenium	0.1-2	Cobalt	0.001-0.002%	Tungsten	1.5 ppm
Chlorine	20-900	Silver	0.01-5	Copper	70 ppm	Uranium	0.00005% (500 ppb)
Chromium	1-1,000	Strontium	50-1,000				
Cobalt	1-40	Tin	2-200	Fluorine	0.063%		
Copper	2-100	Tungsten	1	Indium	0.00001% (100 ppb)		
Fluorine	10-4,000	Uranium	0.9-9	Iron	about 5%		
Gallium	0.4-300	Vanadium	20-500	Lead	0.002% (20 ppm)		
Gold	1	Yttrium	25-250	Lithium	0.005% (50 ppm)		
Iodine	0.1-40	Zinc	10-300				
Lanthanum	1-5,000	Zirconium	60-2,000				
Lead	2-200						

NOTE: (1) To 16 Km depth

AR301 09

REF: USEPA Office of Solid Waste and Emergency Response, HAZARDOUS WASTE LAND TREATMENT, SW-874 (April, 1983) Page 273, Table 6.46.

REF: MERCK INDEX, 10th Edition (1983).

TABLE 16

RESISTIVITY SOUNDINGS MODEL RESULTS

AR301110

TABLE 16

RESISTIVITY SOUNDINGS MODEL RESULTS

Sounding	Cover Material		Undisturbed Overburden	
	Appar. Res. (ohm-m)	Thickness (meters) (feet)	Appar. Res. (ohm-m)	Thickness (meters) (feet)
#1	---	--	---	--
#2	---	--	---	--
#3	---	--	4718	0.34 1.12
#4	---	--	5604	0.37 1.21
#5	990	0.54 1.77	---	--
#6	898	0.99 3.25	---	--
#7	---	--	---	--
#8	2214	0.43 1.41	---	--
#9	1297	0.21 0.69	---	--
#10	---	--	4935	0.35 1.15
Range	898- 2214	0.21- 0.99 0.69- 3.25	4718- 5604	0.34- 0.37 1.12- 1.21

NOTES: a. - Fixed Parameter

ND - Not Determined, A-Spacing insufficient to determine thickness

Inf - Model uses apparent infinite thickness.

Resistivity data and sounding curves presented in Appendix B

See Drawing #1 for sounding locations

AR301111

RESISTIVITY SOUNDINGS MODEL RESULTS
(Continued)

Sounding	Landfill Material						
	Dry			Saturated			
	Appar. Res. (ohm-m)	Thickness (meters)(feet)	Appar. Res. (ohm-m)	Thickness (meters)(feet)	Appar. Res. (ohm-m)	Thickness (meters)(feet)	
#1	---	--	1346	4.66 15.92	---	--	
#2	---	--	1101	4.15 13.62	---	--	
#3	---	--	---	--	---	--	
#4	---	--	---	--	---	--	
#5	---	--	---	--	---	--	
#6	---	--	---	--	194	1.18 3.87	
#7	---	--	---	--	568	3.87 12.70	
#8	1415	3 ^a 9.84 ^a	---	--	331	3.5 ^a 11.48 ^a	
#9	---	--	---	--	771	4.41 14.47	
#10	---	--	---	--	---	--	
Range	1415	3 ^a 9.84 ^a	1101- 1346	4.15- 4.66	13.62- 15.92	331- 771	1.18- 4.41 3.87- 14.47

NOTES:
 a. - Fixed Parameter
 ND - Not Determined, A-Spacing insufficient to determine thickness
 Inf- Model uses apparent infinite thickness
 Resistivity data and sounding curves presented in Appendix B
 See Drawing #1 for sounding locations

AR301112

TABLE 16

RESISTIVITY SOUNDINGS MODEL RESULTS
(Continued)

Sounding	Bedrock		Comments
	Appar. Res. (ohm-m)	Deep Thickness (meters) (feet)	
#1	2.27×10^7	Inf.	Inf. Cannot distinguish dry vs. sat refuse
#2	1.94×10^7	Inf.	Inf. Cannot distinguish dry vs. sat. refuse
#3	1.09×10^6	Inf.	Inf.
#4	0.87×10^6	Inf.	Inf.
#5	1.63×10^7	Inf.	Inf.
#6	5.60×10^6	Inf.	Inf. South part of electrode array is close to landfill edge
#7	8.0×10^6	Inf.	Inf. Cover too thin to effect response
#8	1.25×10^6	Inf.	Inf.
#9	1.0×10^7	Inf.	Inf.
#10	-----	---	---
Range	0.87×10^6 2.27×10^7	--- ---	---

NOTES:

a. - Fixed Parameter
 ND - Not Determined, A-Spacing insufficient to determine thickness
 Inf- Model uses apparent infinite thickness
 Resistivity data and sounding curves presented in Appendix B
 See Drawing #1 for sounding locations

AR301113

RESISTIVITY SOUNDINGS MODEL RESULTS
(Continued)

Sounding	Bedrock					
	Dry/Shallow			Saturated/Shallow		
	Appar. Res. (ohm-m)	Thickness (meters)	Thickness (feet)	Appar. Res. (ohm-m)	Thickness (meters)	Thickness (feet)
#1	---	--	--	---	--	--
#2	---	--	--	---	--	--
#3	26427	1.47	4.82	7265	7.34	24.08
#4	23003	1.01	3.31	7839	7.66	25.13
#5	---	--	--	16651	4.37	47.15
#6	---	--	--	---	--	--
#7	---	--	--	---	--	--
#8	---	--	--	---	--	--
#9	---	--	--	---	--	--
#10	13449	4.89	16.04	10928	N.D.	N.D.
Range	13449- 26427	1.01 -4.89	3.31 -16.04	7265- 16651	7.34 -14.43	24.08 -47.15

NOTES:
 a. - Fixed Parameter
 ND - Not Determined, A-Spacing insufficient to determine thickness
 Inf- Model uses apparent infinite thickness.
 Resistivity data and sounding curves presented in Appendix B
 See Drawing #1 for sounding locations

TABLE 17
GROUND-WATER LEVEL DATA

AR301115

Table 17
Water Level Data
First Piedmont Rock Quarry/Route 719 Site
Danville, Virginia

DATA POINT	MEASURING POINT ELEVATION (ft. msl)	STATIC WATER ELEVATIONS (ft. msl)									
		11/2/88	11/7/88	12/1/88	12/15/88	6/2/89	6/6/89	6/13/89	6/22/89	6/29/89	8/16/89
FP-001A	689.30	660.44	659.32	661.32	661.48	666.28	666.27	666.57	667.16	666.95	665.80
FP-001B	690.19	-	-	-	-	665.61	665.66	666.66	666.89	666.40	665.27
FP-002	661.98	641.57	641.56	641.66	641.55	641.58	641.73	642.03	641.81	641.71	641.60
FP-003A	634.19	628.98	629.11	630.55	627.09	628.59	629.26	632.42	631.02	629.56	626.72
FP-003B	633.48	-	-	-	-	607.29	607.57	607.90	608.53	608.07	606.74
P-4	658.04	643.75	644.03	642.68	646.14	647.73	647.41	649.13	648.17	648.85	-
FP-004	657.03	-	-	-	-	641.70	641.81	642.07	641.89	641.79	641.70
FP-005A	622.27	610.20	610.66	611.77	610.32	608.67	608.69	615.40	612.45	609.62	607.76
FP-005B	622.17	-	-	-	-	611.05	614.76	614.13	615.94	617.95	619.26
FP-006A	613.83	-	-	-	-	593.85	594.14	597.24	596.58	594.75	592.54
FP-006B	613.22	-	-	-	-	587.64	587.57	589.66	589.17	588.27	587.03
FP-007A	638.46	-	-	-	-	629.98	630.01	631.96	632.30	630.80	627.80
FP-007B	637.18	-	-	-	-	634.88	634.94	636.03	(1)	635.88	634.17
FP-008A	599.08	-	-	-	-	579.83	579.82	582.74	580.35	579.86	579.18
FP-008B	599.09	-	-	-	-	588.79	588.74	588.65	588.85	588.53	588.23
FP-401	642.91	-	641.65	641.69	641.61	641.69	641.71	641.88	641.78	641.70	-
FP-402	643.87	-	641.65	643.59	641.63	641.70	641.74	641.90	641.81	641.72	-
FP-404	643.73	-	640.72	640.74	640.74	640.85	640.81	640.82	640.83	640.86	-
FP-301	672.06	-	-	DRY	670.56	670.64	670.84	670.66	670.68	670.81	668.70
FP-302	666.64	-	-	665.23	665.23	665.40	665.41	665.44	665.38	665.36	665.13
FP-303	648.56	-	647.03	647.01	647.08	647.02	647.02	647.03	647.03	647.04	647.04
FP-304	598.70	-	DRY	597.63	597.60	DRY	597.67	597.83	597.80	597.68	DRY
FP-305	585.60	-	582.52	582.67	582.62	582.91	582.91	582.71	582.64	582.63	(2)

(1) Static water level above well casing
(2) Staff gage washed away during storm

AR301116

TABLE 18
VERTICAL HYDRAULIC GRADIENTS

AR301117

TABLE 18
VERTICAL HYDRAULIC GRADIENTS
First Piedmont Rock Quarry
Danville, VA

Monitor Well Nest	6/29/89	8/16/89
FP-003A/003B	-0.53	-0.50
FP-005A/005B	+0.28	+0.39
FP-006A/006B	-0.14	-0.12
FP-007A/007B	+0.21	+0.26
FP-008A/008B	+0.19	+0.20

Data in ft/ft
+ = upward
- = downward

AR301118

TABLE 19

SUMMARY OF HYDRAULIC TEST DATA

AR301119

TABLE 19

SUMMARY OF HYDRAULIC TEST DATA
 First Piedmont Rock Quarry
 Danville, Virginia

Monitor Well	Hydraulic Conductivity (ft/day)		Bail/Recovery Test Results
	Waterra Pump Test Results		
	Ha=100 ft. BTOC ¹	Ha=50 ft. BTOC	
FP-001A	0.17	0.18	0.04
FP-001B	0.46	0.50	---
FP-002A	---	---	0.3
FP-003A	0.16	0.16	0.5
FP-003B	0.09	0.10	---
FP-004	0.13	0.14	---
P-4	---	---	0.03
FP-005A	---	---	0.03
FP-007A	0.45	0.48	---
FP-007B	0.05	0.06	---
FP-008A	6.84	7.36	---
FP-008B	0.01	0.02 ²	---

¹Saturated thickness below top of casing

²Not possible to calculate at Ha=50 ft., so Ha=75 ft. was used

AR301120

TABLE 20

MEAN ANNUAL FLOW ESTIMATES

AR301121

TABLE 20

Mean Annual Flow Estimates¹
 First Piedmont Rock Quarry
 Danville, Virginia
 Westinghouse Project No. 4112-88-908A

Drainage Basin Designation ²	Area (A) (sq.mi.)	Basin Slope (S) (ft/mile)	Main Channel Length (L) (miles)	M.A.F. ¹ (cfs)
A-Northern	0.026	399	0.341	0.035
B-Southern	0.047	414	0.455	0.065
C-Upstream Lawless Creek	3.66	56	2.159	3.72
D-Lawless Creek at 719 bridge	3.94	46	2.538	4.00
E-Downstream Lawless Creek	4.09	48	2.765	4.23
Northern Quarry	0.00206	457	0.0756	0.0027
Southern Quarry	0.00407	538	0.1004	0.0054
Internal	0.00224	---	---	---

The mean annual precipitation in Pittsylvania Co. is 43.48-inches (County of Pittsylvania, 1986).

¹U.S. Geological Survey, 1970, Virginia Streamflow Data Program Analysis: Unpublished Open File Report.

MAF (Mean Annual Flow, in cubic ft per second) -

$$0.055A^{0.92} \times S^{0.12} \times L^{0.18} \times (P-20)^{0.76}$$

where A = basin area; S = basin slope as measured at 10% and 85% along main drainage line, L = main channel length, and P = mean annual precipitation.

²See Figure 3 and Drawing 1 for drainage basin areas.

AR301122

TABLE 22

NET GROUND-WATER DISCHARGE TO SURFACE WATER

AR301123

TABLE 22

NET GROUND-WATER DISCHARGE TO SURFACE WATER
 First Piedmont Rock Quarry
 Danville, VA

	Net Increase ¹ in Surface Water Flow		Linear Discharge ² Area (ft)	Net Ground-Water Discharge	
	(cfs)	(gpm)		(cfs/ft)	(gpm/ft)
Northern Drainage Basin	0.024	10.8	850	0.00003	0.013
Southern Drainage Basin	0.084	37.7	1,400	0.00006	0.029
Lawless ³ Creek	0.286	128.4	2,200	0.00008	0.035

¹ Data from June 22, 1989, See Table 21

² Distance between uppermost and lowermost surface water measuring stations.

³ Surface water inflow from the northern and southern drainage basins were subtracted to calculate net ground water discharge.

AR301124

TABLE 23
GROUND-WATER INFLOW AND OUTFLOW AT QUARRY

AR301125

TABLE 23

GROUND-WATER INFLOW AND OUTFLOW AT QUARRY
 First Piedmont Rock Quarry
 Danville, VA

Landfill Area	INFLOW					Ground-Water Flux (ft ³ /day)
	Estimated Hydraulic Conductivity (ft/day)	Hydraulic Gradient (ft/ft)	Linear Cross-Section of Landfill (ft)	Estimated Saturated Thickness (ft)		
Area 1 (East Wall)	0.5	0.09	330	15		222.75
Area 2 (South Wall)	0.05	0.10	140	11		78.1
Area 3 (North Wall)	0.5	0.07	50	20		35.0
Area 4 (Bottom)	0.05	0.03	47,840 ft ²	NA		<u>71.76</u>
	Total					407.61

Note: NA - Not Applicable.

AR301126

TABLE 23 (Continued)

GROUND-WATER INFLOW AND OUTFLOW AT QUARRY
 First Piedmont Rock Quarry
 Danville, VA

OUTFLOW

Landfill Area	Estimated Hydraulic Conductivity (ft/day)	Hydraulic Gradient (ft/ft)	Linear Cross-Section of Landfill (ft)	Estimated Saturated Thickness (ft)	Ground-Water Flux (ft ³ /day)
Area 5 (West Wall)	0.10	0.10	230	12	27.6

AR301127

TABLE 24
WESTINGHOUSE AND EPA SPLIT SAMPLE RESULTS

AR301128

Sample Design	FP-001A	FP-001A
Sample Description	Monitor Well-Aqueous (First Round Sample)	Monitor Well-Aqueous (EPA Results)

PESTICIDES/PCB'S

Parameters	Conc.(ug/L)	Q	Conc.(ug/L)	Q
alpha-BHC	0.05	U		
beta-BHC	0.05	U		
delta-BHC	0.05	U		
gamma-BHC	0.05	U		
Heptachlor	0.05	U		
Aldrin	0.05	U		
Heptachlor epoxide	0.05	U		
Endosulfan I	0.05	U		
Dieldrin	0.1	U		
4,4'-DDE	0.1	U		
Endrin	0.1	U		
Endosulfan II	0.1	U		
4,4'-DDD	0.1	U		
Endosulfan sulfate	0.1	U		
4,4'-DBI	0.1	U		
Methoxychlor	0.5	U		
Endrin ketone	0.1	U		
alpha-Chlordane	0.5	U		
gamma-Chlordane	0.5	U		
Toxaphene	1	U		
Aroclor-1016	0.5	U		
Aroclor-1221	0.5	U		
Aroclor-1232	0.5	U		
Aroclor-1242	0.5	U		
Aroclor-1248	0.5	U		
Aroclor-1254	1	U		
Aroclor-1260	1	U		

VOLATILE ORGANICS

Parameters	Conc.(ug/L)	Q	Conc.(ug/L)	Q
CHLOROMETHANE	10	U		UL
BROMOMETHANE	10	U		UL
VINYL CHLORIDE	10	U		UL
CHLOROETHANE	10	U		UL
METHYLENE CHLORIDE	5	U	2	8
ACETONE	10	U	7	8
CARBON DISULFIDE	5	U		UL
1,1 - DICHLOROETHENE	5	U		UL
1,1 - DICHLOROETHANE	5	U		UL
1,2 - DICHLOROETHENE (TOTAL)	5	U		UL
CHLOROFORM	5	U		UL
1,2 - DICHLOROETHANE	5	U		UL
2-BUTANONE	10	U		UL
1,1,1 - TRICHLOROETHANE	5	U		UL
CARBON TETRACHLORIDE	5	U		UL
VINYL ACETATE	10	U		UL
BROMODICHLOROMETHANE	5	U		UL
1,2 - DICHLOROPROPANE	5	U		UL
CIS - 1,3 - DICHLOROPROPENE	5	U		UL
TRICHLOROETHENE	5	U		UL
DIBROMOCHLOROMETHANE	5	U		UL
1,1,2 - TRICHLOROETHANE	5	U		UL
BENZENE	4	U		UL
TRANS - 1,3 - DICHLOROPROPENE	5	U		UL
BROMOFORM	5	U		UL
4 - METHYL - 2 - PENTANONE	10	U		UL
2 - HEXANONE	10	U		UL
TETRACHLOROETHENE	5	U		UL
1,1,2,2 - TETRACHLOROETHANE	5	U		UL
TOLUENE	5	U		UL
CHLOROBENZENE	5	U		UL
ETHYLBENZENE	5	U		UL
STYRENE	5	U		UL
XYLENE (TOTAL)	2	J		UL

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Sample Design	FP-001A	FP-001A
Sample Description	Monitor Well-Aqueous (First Round Sample)	Monitor Well-Aqueous (EPA Results)

SEMI-VOLATILE ORGANICS

Parameters	Conc.(ug/L)	Q	Conc.(ug/L)	Q
Phenol	10	U		
bis(2-Chloroethyl) ether	10	U		
2-Chlorophenol	10	U		
1,3-Dichlorobenzene	10	U		
1,4-Dichlorobenzene	10	U		
Benzyl alcohol	10	U		
1,2-Dichlorobenzene	10	U		
2-Methylphenol	10	U		
bis(2-chloroisopropyl)ether	10	U		UJ
4-Methylphenol	10	U		
N-Nitroso-di-n-propylamine	10	U		UJ
Hexachloroethane	10	U		
Nitrobenzene	10	U		
Isophorone	10	U		
2-Nitrophenol	10	U		
2,4-Dimethylphenol	10	U		
Benzoic acid	50	U		UJ
bis(2-Chloroethoxy) methane	10	U		
2,4-Dichlorophenol	10	U		
1,2,4-Trichlorobenzene	10	U		
Naphthalene	10	U		
4-Chloroaniline	10	U		
Hexachlorobutadiene	10	U		
4-Chloro-3-methylphenol	10	U		UJ
2-Methylnaphthalene	10	U		UJ
Hexachlorocyclopentadiene	10	U		
2,4,6-Trichlorophenol	10	U		
2,4,5-Trichlorophenol	50	U		
2-Chloronaphthalene	10	U		
2-Nitroaniline	50	U		
Dimethylphthalate	10	U		
Acenaphthylene	10	U		
2,6-Dinitrotoluene	10	U		
3-Nitroaniline	50	U		UJ
Acenaphthene	10	U		
2,4-Dinitrophenol	50	U		
4-Nitrophenol	50	U		
Dibenzofuran	10	U		
2,4-Dinitrotoluene	10	U		UJ
Diethylphthalate	10	U		
4-Chlorophenyl-phenylether	10	U		
Fluorene	10	U		
4-Nitroaniline	50	U		
4,6-Dinitro-2-methylphenol	50	U		
N-Nitrosodiphenylamine (1)	10	U		
4-Bromophenyl-phenylether	10	U		
Hexachlorobenzene	10	U		
Pentachlorophenol	50	U		
Phenanthrene	10	U		
Anthracene	10	U		
Di-n-butylphthalate	10	U		
Fluoranthene	10	U		
Pyrene	10	U		
Butylbenzylphthalate	10	U		
3,3'-Dichlorobenzidine	20	U		UJ
Benzo(a)anthracene	10	U		
Chrysene	10	U		
bis(2-Ethylhexyl) phthalate	10	U	22	8
Di-n-octylphthalate	10	U		
Benzo(b)fluoranthene	10	U		
Benzo(k)fluoranthene	10	U		
Benzo(a)pyrene	10	U		
Indeno(1,2,3-cd)pyrene	10	U		
Dibenz(a,h)anthracene	10	U		
Benzo(g,h,i)perylene	10	U		

(1) N-Nitrosodiphenylamine can not be distinguished from diphenylamine using the EPA-SOW method.

AR 301130

Sample Design
Sample Description

FP-001A
Monitor Well-Aqueous
(First Round Sample)

FP-001A
Monitor Well-Aqueous
(EPA Results)

FIELD PARAMETERS

Temperature (Celsius) 15
pH (SU) 5.22
Specific Conductance (umhos) 313
Dissolved Oxygen (mg/l) 7.1

INORGANICS (TOTAL METALS)

Parameters	Conc.(ug/L)	Q	Conc.(ug/L)	Q	Conc.(ug/L)	Q
Aluminum	16900		13400			
Antimony	2	u				
Arsenic	2	u				
Barium	140	B	[94.6]	B		
Beryllium	1.8	u				
Cadmium	4.7	u	21.7	J		
Calcium	22000		18500			
Chromium	141		82.9	J		
Cobalt	26.2	u				
Copper	57.9			UJ		
Iron	20100		12600	K		
Lead	2.3	B	10.4			
Magnesium	21600		17800			
Manganese	282		177	J		
Mercury	0.2	u				
Nickel	193		122	J		
Potassium	1180	B	[700]			
Selenium	1.4	u	N	UL		
Silver	9.3	u		R		
Sodium	4640	B	[4810]			
Thallium	2	u		UL		
Vanadium	18.3	u				
Zinc	32.3		81.4			
Cyanide	10	u				
Sulfate	18.3 mg/L					

AR301131

Sample Design	FP-001A	FP-001A
Sample Description	Monitor Well-Aqueous (First Round Sample)	Monitor Well-Aqueous (EPA Results)

FIELD PARAMETERS

Temperature (Celsius)	15
pH (SU)	5.22
Specific Conductance (umhos)	313
Dissolved Oxygen (mg/l)	7.1

INORGANICS (DISSOLVED METALS)

Parameters	Conc.(ug/L)	Q	Conc.(ug/L)	Q	Conc.(ug/L)	Q
Aluminum	51.9	u				
Antimony	2	u	[48.9]			
Arsenic	2	u	(3.8)	L		
Barium	134	B	[48.9]			
Beryllium	1.8	u	9.3	J		
Cadmium	4.7	u		UJ		
Calcium	21500		19200			
Chromium	23.6		17	J		
Cobalt	26.2	u				
Copper	13.9	B		UL		
Iron	7.9	u				
Lead	1.3	u	[2.4]	L		
Magnesium	17600		16300			
Manganese	13.2	B				
Mercury	0.2	u				
Nickel	24.7	u	49.5			
Potassium	790	u				
Selenium	1.4	u		UL		
Silver	9.3	u		UJ		
Sodium	8500		[4610]			
Thallium	2	u				
Vanadium	18.3	u				
Zinc	88.3		41.3			
Cyanide				Q		

AR301132

Sample Design
Sample Description

FP-003A
Monitor Well-Aqueous
(First Round Sample)

FP-003A
Monitor Well-Aqueous
(EPA Results)

PESTICIDES/PCB'S

Parameters	Conc.(ug/L)	Q	Conc.(ug/L)	Q
alpha-BHC	0.05	U		
beta-BHC	0.05	U		
delta-BHC	0.05	U		
gamma-BHC	0.05	U		
Heptachlor	0.05	U		
Aldrin	0.05	U		
Heptachlor epoxide	0.05	U		
Endosulfan I	0.05	U		
Dieldrin	0.1	U		
4,4'-DDE	0.1	U		
Endrin	0.1	U		
Endosulfan II	0.1	U		
4,4'-DDD	0.1	U		
Endosulfan sulfate	0.1	U		
4,4'-DDT	0.1	U		
Methoxychlor	0.5	U		
Endrin ketone	0.1	U		
alpha-Chlordane	0.5	U		
gamma-Chlordane	0.5	U		
Toxaphene	1	U		
Aroclor-1016	0.5	U		
Aroclor-1221	0.5	U		
Aroclor-1232	0.5	U		
Aroclor-1242	0.5	U		
Aroclor-1248	0.5	U		
Aroclor-1254	1	U		
Aroclor-1260	1	U		

VOLATILE ORGANICS

Parameters	Conc.(ug/L)	Q	Conc.(ug/L)	Q
CHLOROMETHANE	10	U		
BROMOMETHANE	10	U		
VINYL CHLORIDE	10	U		
CHLOROETHANE	10	U		
METHYLENE CHLORIDE	3	J		UJ
ACETONE	8	BJ	14	B
CARBON DISULFIDE	5	U		
1,1 - DICHLOROETHENE	5	U		
1,1 - DICHLOROETHANE	5	U		
1,2 - DICHLOROETHENE (TOTAL)	5	U		
CHLOROFORM	5	U		
1,2 - DICHLOROETHANE	5	U		
2-BUTANONE	10	U		UJ
1,1,1 - TRICHLOROETHANE	5	U		
CARBON TETRACHLORIDE	5	U		
VINYL ACETATE	10	U		
BROMODICHLOROMETHANE	5	U		
1,2 - DICHLOROPROPANE	5	U		
CIS - 1,3 - DICHLOROPROPENE	5	U		
TRICHLOROETHENE	5	U		
DIBROMOCHLOROMETHANE	5	U		
1,1,2 - TRICHLOROETHANE	5	U		
BENZENE	5	U		UL
TRANS - 1,3 - DICHLOROPROPENE	5	U		
BROMOFORM	5	U		
4 - METHYL - 2 - PENTANONE	10	U		
2 - HEXANONE	10	U		
TETRACHLOROETHENE	5	U		
1,1,2,2 - TETRACHLOROETHANE	5	U		
TOLUENE	5	U		UL
CHLOROBENZENE	5	U		UL
ETHYLBENZENE	5	U		UL
STYRENE	5	U		UL
XYLENE (TOTAL)	5	U		UL

AR301133

Sample Design
Sample Description

FP-003A
Monitor Well-Aqueous
(First Round Sample)

FP-003A
Monitor Well-Aqueous
(EPA Results)

SEMI-VOLATILE ORGANICS

Parameters	Conc.(ug/L)	Q	Conc.(ug/L)	Q
Phenol	10	U		
Bis(2-Chloroethyl) ether	10	U		
2-Chlorophenol	10	U		
1,3-Dichlorobenzene	10	U		
1,4-Dichlorobenzene	10	U		
Benzyl alcohol	10	U		
1,2-Dichlorobenzene	10	U		
2-Methylphenol	10	U		
bis(2-Chloroisopropyl) ether	10	U		
4-Methylphenol	10	U		
N-Nitroso-d1-n-propylamine	10	U		
Hexachloroethane	10	U		
Nitrobenzene	10	U		
Isophorone	10	U		
2-Nitrophenol	10	U		
2,4-Dimethylphenol	10	U		
Benzoic acid	50	U		UJ
bis(2-Chloroethoxy) methane	10	U		
2,4-Dichlorophenol	10	U		
1,2,4-Trichlorobenzene	10	U		
Naphthalene	10	U		
4-Chloroaniline	10	U		
Hexachlorobutadiene	10	U		
4-Chloro-3-methylphenol	10	U		
2-Methylnaphthalene	10	U		
Hexachlorocyclopentadiene	10	U		UJ
2,4,6-Trichlorophenol	10	U		
2,4,5-Trichlorophenol	50	U		
2-Chloronaphthalene	10	U		
2-Nitroaniline	50	U		
Dimethylphthalate	10	U		
Acenaphthylene	10	U		
2,6-Dinitrotoluene	10	U		
3-Nitroaniline	50	U		UJ
Acenaphthene	10	U		
2,4-Dinitrophenol	50	U		
4-Nitrophenol	50	U		
Dibenzofuran	10	U		
2,4-Dinitrotoluene	10	U		
Diethylphthalate	10	U		
4-Chlorophenyl-phenylether	10	U		
Fluorene	10	U		
4-Nitroaniline	50	U		UJ
4,6-Dinitro-2-methylphenol	50	U		
N-Nitrosodiphenylamine (1)	10	U		
4-Bromophenyl-phenylether	10	U		
Hexachlorobenzene	10	U		
Pentachlorophenol	50	U		
Phenanthrene	10	U		
Anthracene	10	U		
D1-n-butylphthalate	10	U		
Fluoranthene	10	U		
Pyrene	10	U		UJ
Butylbenzylphthalate	10	U		
3,3'-Dichlorobenzidine	20	U		UJ
Benzo(a)anthracene	10	U		
Chrysene	10	U		
bis(2-Ethylhexyl) phthalate	9	J	17	B
D1-n-octylphthalate	10	U		
Benzo(b)fluoranthene	10	U		
Benzo(k)fluoranthene	10	U		
Benzo(a)pyrene	10	U		
Indeno(1,2,3-cd)pyrene	10	U		
Dibenz(a,h)anthracene	10	U		
Benzo(g,h,i)perylene	10	U		

1) N-Nitrosodiphenylamine can not be distinguished from diphenylamine using the CLP-SQM Method.

AR301134

Sample Design
Sample Description

FP-003A
Monitor Well-Aqueous
(First Round Sample)

FP-003A
Monitor Well-Aqueous
(First Round Sample)

FIELD PARAMETERS

Temperature (Celsius) 17
pH (SU) 5.26
Specific Conductance (umhos) 284
Dissolved Oxygen (mg/l) 4.3

INORGANICS (TOTAL METALS)

Parameters	Conc.(ug/L)	Q	Conc.(ug/L)	Q
Aluminum	4250		1270	
Antimony	2	u		
Arsenic	2	u		UL
Barium	24.4	B		
Beryllium	1.8	u		
Cadmium	4.7	u	8.9	J
Calcium	594	B	[1510]	
Chromium	5.4	u		UJ
Cobalt	26.2	u	[14.5]	B
Copper	19	B		UJ
Iron	6330		888	K
Lead	8.2		16.4	
Magnesium	403	B		
Manganese	142		60.5	J
Mercury	0.2	u		
Nickel	24.7	u		UJ
Potassium	2430	B	1800	
Selenium	1.4	u		UL
Silver	9.3	u		R
Sodium	32300		28400	
Thallium	2	u		UL
Vanadium	18.3	u		
Zinc	20.2		88.8	
Cyanide	10	u		
Sulfate	19.4 mg/L			

AR301135

Sample Design	FP-003A	FP-003A
Sample Description	Monitor Well-Aqueous (First Round Sample)	Monitor Well-Aqueous (EPA Results)

FIELD PARAMETERS

Temperature (Celsius)	17
pH (SU)	5.26
Specific Conductance (umhos)	284
Dissolved Oxygen (mg/l)	4.3

INORGANICS (DISSOLVED METALS)

Parameters	Conc.(ug/L)	Q	Conc.(ug/L)	Q
Aluminum	51.9	U	[120]	
Antimony	2.4	B		
Arsenic	2	U	[2.0]	L
Barium	97.1	B	[82.3]	
Beryllium	1.8	U	16.4	J
Cadmium	4.7	U		UJ
Calcium	900	B		
Chromium	5.4	U		UJ
Cobalt	26.2	U		
Copper	6.8	U		UL
Iron	7.9	U		
Lead	1.3	U		UL
Magnesium	388	B		
Manganese	47.4			
Mercury	0.2	U		
Nickel	24.7	U		
Potassium	2120	B		
Selenium	1.4	U		
Silver	9.3	U		UJ
Sodium	44000		36900	
Thallium	2	U		
Vanadium	18.3	U		
Zinc	183		113	
Cyanide				Q

AR301136

Sample Design
Sample Description

FP-0038
Monitor Well-Aqueous
(First Round Sample)

FP-0038
Monitor Well-Aqueous
(EPA Results)

FP-0038
Monitor Well-Aqueous
Duplicate(EPA Results)

PESTICIDES/PCB'S

Parameters	Conc.(ug/L)	Q
alpha-BHC	0.05	U
beta-BHC	0.05	U
delta-BHC	0.05	U
gamma-BHC	0.05	U
Heptachlor	0.05	U
Aldrin	0.05	U
Heptachlor epoxide	0.05	U
Endosulfan I	0.05	U
Dieldrin	0.1	U
4,4'-DDE	0.1	U
Endrin	0.1	U
Endosulfan II	0.1	U
4,4'-DDD	0.1	U
Endosulfan sulfate	0.1	U
4,4'-DDT	0.1	U
Methoxychlor	0.5	U
Endrin ketone	0.1	U
alpha-Chlordane	0.5	U
gamma-Chlordane	0.5	U
Toxaphene	1	U
Aroclor-1016	0.5	U
Aroclor-1221	0.5	U
Aroclor-1232	0.5	U
Aroclor-1242	0.5	U
Aroclor-1248	0.5	U
Aroclor-1254	1	U
Aroclor-1260	1	U

VOLATILE ORGANICS

Parameters	Conc.(ug/L)	Q	Conc.(ug/L)	Q	Conc.(ug/L)	Q
CHLOROMETHANE	10	U				
BROMOMETHANE	10	U		UJ		
VINYL CHLORIDE	10	U				
CHLOROETHANE	10	U				
METHYLENE CHLORIDE	5	U	1	8		UJ
ACETONE	10	U	11	8	5	8
CARBON DISULFIDE	5	U				
1,1 - DICHLOROETHENE	5	U				
1,1 - DICHLOROETHANE	5	U				
1,2 - DICHLOROETHENE (TOTAL)	5	U				
CHLOROFORM	5	U				
1,2 - DICHLOROETHANE	5	U				
2-BUTANONE	10	U		UJ		UJ
1,1,1 - TRICHLOROETHANE	5	U				
CARBON TETRACHLORIDE	5	U				
VINYL ACETATE	10	U		UJ		
BROMODICHLOROMETHANE	5	U				
1,2 - DICHLOROPROPANE	5	U				
CIS - 1,3 - DICHLOROPROPENE	5	U				
TRICHLOROETHENE	5	U				
DIBROMOCHLOROMETHANE	5	U				
1,1,2 - TRICHLOROETHANE	5	U				
BENZENE	5	U		UL		UL
TRANS - 1,3 - DICHLOROPROPENE	5	U				
BROMOFORM	5	U				
4 - METHYL - 2 - PENTANONE	10	U		UJ		
2 - HEXANONE	10	U				
TETRACHLOROETHENE	5	U		UJ		
1,1,2,2 - TETRACHLOROETHANE	5	U				
TOLUENE	5	U		UL		UL
CHLOROBENZENE	5	U		UL		UL
ETHYLBENZENE	5	U		UL		UL
STYRENE	5	U		UL		UL
XYLENE (TOTAL)	5	U		UL		UL

AR301137

Sample Design	FP-003B	FP-003B	FP-003B
Sample Description	Monitor Well-Aqueous (First Round Sample)	Monitor Well-Aqueous (EPA Results)	Monitor Well-Aqueous Duplicate(EPA Results)

SEMI-VOLATILE ORGANICS

Parameters	Conc.(ug/L)	Q	Conc.(ug/L)	Q	Conc.(ug/L)	Q
Phenol	10	U				
bis(2-Chloroethyl) ether	10	U				
2-Chlorophenol	10	U				
1,3-Dichlorobenzene	10	U				
1,4-Dichlorobenzene	10	U				
Benzyl alcohol	10	U				
1,2-Dichlorobenzene	10	U				
2-Methylphenol	10	U				
bis(2-Chloroisopropyl) ether	10	U		UJ		
4-Methylphenol	10	U				
N-Nitroso-di-n-propylamine	10	U		UJ		
Hexachloroethane	10	U				
Nitrobenzene	10	U				
Isophorone	10	U				
2-Nitrophenol	10	U				
2,4-Dimethylphenol	10	U				
Benzoic acid	50	U		UJ		
bis(2-Chloroethoxy) methane	10	U				
2,4-Dichlorophenol	10	U				
1,2,4-Trichlorobenzene	10	U				
Naphthalene	10	U				
4-Chloroaniline	10	U				
Hexachlorobutadiene	10	U				
4-Chloro-3-methylphenol	10	U		UJ		
2-Methylnaphthalene	10	U		UJ		
Hexachlorocyclopentadiene	10	U				
2,4,6-Trichlorophenol	10	U				
2,4,5-Trichlorophenol	50	U				
2-Chloronaphthalene	10	U				
2-Nitroaniline	50	U				
Dimethylphthalate	10	U				
Acenaphthylene	10	U				
2,6-Dinitrotoluene	10	U				
3-Nitroaniline	50	U		UJ		
Acenaphthene	10	U				
2,4-Dinitrophenol	50	U				
4-Nitrophenol	50	U				
Dibenzofuran	10	U				
2,4-Dinitrotoluene	10	U		UJ		
Diethylphthalate	10	U				
4-Chlorophenyl-phenylether	10	U				
Fluorene	10	U				
4-Nitroaniline	50	U				UJ
4,6-Dinitro-2-methylphenol	50	U				
N-Nitrosodiphenylamine (1)	10	U				
4-Bromophenyl-phenylether	10	U				
Hexachlorobenzene	10	U				
Pentachlorophenol	50	U				
Phenanthrene	10	U				
Anthracene	10	U				
Di-n-butylphthalate	10	U				
Fluoranthene	10	U				
Pyrene	10	U				
Butylbenzylphthalate	10	U				
3,3'-Dichlorobenzidine	20	U		UJ		UJ
Benzo(a)anthracene	10	U				
Chrysene	10	U				
bis(2-Ethylhexyl) phthalate	5	J	41	8	13	8
Di-n-octylphthalate	10	U				
Benzo(b)fluoranthene	10	U				
Benzo(k)fluoranthene	10	U				
Benzo(a)pyrene	10	U				
Indeno(1,2,3-cd)pyrene	10	U				
Dibenz(a,h)anthracene	10	U				
Benzo(g,h,i)perylene	10	U				

(1) N-Nitrosodiphenylamine can not be distinguished from diphenylamine using the CLP-SDM method

AR301138

Sample Design
Sample Description

FP-0038
Monitor Well-Aqueous
(First Round Sample)

FP-0038
Monitor Well-Aqueous
(EPA Results)

FP-0038
Monitor Well-Aqueous
Duplicate(EPA Results)

FIELD PARAMETERS

Temperature (Celsius) 17
pH (SU) 6.65
Specific Conductance (umhos) 302
Dissolved Oxygen (mg/l) 2.3

INORGANICS (TOTAL METALS)

Parameters	Conc.(ug/L)	Q	Conc.(ug/L)	Q	Conc.(ug/L)	Q
Aluminum	51.9	U	278	B	[198]	B
Antimony	2	U	[38.9]			
Arsenic	2	U			[5.4]	
Barium	2.3	B			[33.7]	B
Beryllium	1.8	U			10.2	
Cadmium	4.7	U		UJ	8.4	UJ
Calcium	30900		28900		28000	
Chromium	5.4	U	14.4	J		UJ
Cobalt	26.2	U			[13.5]	B
Copper	6.8	U	193	J	123	J
Iron	181		415	K	388	K
Lead	1.3	U	6.6		5.8	
Magnesium	11900		10900		10800	
Manganese	244		201	J	264	J
Mercury	0.2	U				
Nickel	24.7	U		UJ		UJ
Potassium	1220	B	[1100]		[1000]	
Selenium	1.4	U		UL		UL
Silver	9.3	U		R		R
Sodium	9020		9890		9930	
Thallium	2	U				
Vanadium	18.3	U				
Zinc	21.7		49.8		49.9	
Cyanide	10	U				
Sulfate	5.7 mg/L					

AR301139

Sample Design	FP-0038	FP-0038	FP-0038
Sample Description	Monitor Well-Aqueous (First Round Sample)	Monitor Well-Aqueous (EPA Results)	Monitor Well-Aqueous Duplicate(EPA Results)

FIELD PARAMETERS

Temperature (Celsius)	17
pH (SU)	6.65
Specific Conductance(umhos)	302
Dissolved Oxygen (mg/l)	2.3

INORGANICS (DISSOLVED METALS)

Parameters	Conc.(ug/L)	Q	Conc.(ug/L)	Q	Conc.(ug/L)	Q
Aluminum	51.9	U				
Antimony	2.4	B				
Arsenic	2	U	[3.7]	L	[2.8]	L
Barium	97.1	B	[66.1]		[151]	
Beryllium	1.8	U		UJ		UJ
Cadmium	4.7	U	9.5	J		UJ
Calcium	900	B	31200		30700	
Chromium	5.4	U		UJ	[9.0]	J
Cobalt	26.2	U				
Copper	6.8	U		UL		UL
Iron	7.9	U				
Lead	1.3	U				
Magnesium	388	B	12500		12200	
Manganese	47.4	U	265		213	
Mercury	0.2	U				
Nickel	24.7	U	41.3		43.4	
Potassium	2120	B				
Selenium	1.4	U				
Silver	9.3	U		UJ		UJ
Sodium	44000	U	9000		11000	
Thallium	2	U				
Vanadium	18.3	U				
Zinc	183	U	26.3			
Cyanide				Q		Q

AR301140

Sample Design
Sample Description

FP-004
Monitor Well-Aqueous
(First Round Sample)

FP-004
Monitor Well-Aqueous
(EPA Results)

PESTICIDES/PCB'S

Parameters	Conc.(ug/L)	Q
alpha-BHC	0.05	U
beta-BHC	0.05	U
delta-BHC	0.05	U
gamma-BHC	0.05	U
Heptachlor	0.05	U
Aldrin	0.05	U
Heptachlor epoxide	0.05	U
Endosulfan I	0.05	U
Dieldrin	0.1	U
4,4'-DDE	0.1	U
Endrin	0.1	U
Endosulfan II	0.1	U
4,4'-DDD	0.1	U
Endosulfan sulfate	0.1	U
4,4'-DDT	0.1	U
Methoxychlor	0.5	U
Endrin ketone	0.1	U
alpha-Chlordane	0.5	U
gamma-Chlordane	0.5	U
Toxaphene	1	U
Aroclor-1016	0.5	U
Aroclor-1221	0.5	U
Aroclor-1232	0.5	U
Aroclor-1242	0.5	U
Aroclor-1248	0.5	U
Aroclor-1254	1	U
Aroclor-1260	1	U

VOLATILE ORGANICS

Parameters	Conc.(ug/L)	Q	Conc.(ug/L)	Q
CHLOROMETHANE	10	U		
BROMOMETHANE	10	U		UJ
VINYL CHLORIDE	10	U		
CHLOROETHANE	10	U		
METHYLENE CHLORIDE	5	U	1	8
ACETONE	10	U		
CARBON DISULFIDE	5	U		
1,1 - DICHLOROETHENE	5	U		
1,1 - DICHLOROETHANE	5	U		
1,2 - DICHLOROETHENE (TOTAL)	5	U		
CHLOROFORM	5	U		
1,2 - DICHLOROETHANE	5	U		
2-BUTANONE	10	U		UJ
1,1,1 - TRICHLOROETHANE	5	U		
CARBON TETRACHLORIDE	5	U		
VINYL ACETATE	10	U		UJ
BROMODICHLOROMETHANE	5	U		
1,2 - DICHLOROPROPANE	5	U		
CIS - 1,3 - DICHLOROPROPENE	5	U		
TRICHLOROETHENE	5	U		
DIBROMOCHLOROMETHANE	5	U		
1,1,2 - TRICHLOROETHANE	5	U		
BENZENE	5	U		UL
TRANS - 1,3 - DICHLOROPROPENE	5	U		
BROMOFORM	5	U		
4 - METHYL - 2 - PENTANONE	10	U		UJ
2 - HEXANONE	10	U		
TETRACHLOROETHENE	5	U		UJ
1,1,2,2 - TETRACHLOROETHANE	5	U		
TOLUENE	5	U		UL
CHLOROENZENE	5	U		UL
ETHYLBENZENE	5	U		UL
STYRENE	5	U		UL
XYLENE (TOTAL)	5	U		UL

AR301141

Sample Design
Sample Description

FP-004
Monitor Well-Aqueous
(First Round Sample)

FP-004
Monitor Well-Aqueous
(EPA Results)

SEMI-VOLATILE ORGANICS

Parameters	Conc.(ug/L)	Q	Conc.(ug/L)	Q
Phenol	10	U		
bis(2-Chloroethyl) ether	10	U		
2-Chlorophenol	10	U		
1,3-Dichlorobenzene	10	U		
1,4-Dichlorobenzene	10	U		
Benzyl alcohol	10	U		
1,2-Dichlorobenzene	10	U		
2-Methylphenol	10	U		
bis(2-Chloroisopropyl) ether	10	U		
4-Methylphenol	10	U		
N-Nitroso-di-n-propylamine	10	U		
Hexachloroethane	10	U		
Nitrobenzene	10	U		
Isophorone	10	U		
2-Nitrophenol	10	U		
2,4-Dimethylphenol	10	U		
Benzoic acid	50	U		UJ
bis(2-Chloroethoxy) methane	10	U		
2,4-Dichlorophenol	10	U		
1,2,4-Trichlorobenzene	10	U		
Naphthalene	10	U		
4-Chloroaniline	10	U		
Hexachlorobutadiene	10	U		
4-Chloro-3-methylphenol	10	U		
2-Methylnaphthalene	10	U		
Hexachlorocyclopentadiene	10	U		UJ
2,4,6-Trichlorophenol	10	U		
2,4,5-Trichlorophenol	50	U		
2-Chloronaphthalene	10	U		
2-Nitroaniline	50	U		
Dimethylphthalate	10	U		
Acenaphthylene	10	U		
2,6-Dinitrotoluene	10	U		
3-Nitroaniline	50	U		UJ
Acenaphthene	10	U		
2,4-Dinitrophenol	50	U		
4-Nitrophenol	50	U		
Dibenzofuran	10	U		
2,4-Dinitrotoluene	10	U		
Diethylphthalate	10	U		
4-Chlorophenyl-phenylether	10	U		
Fluorene	10	U		
4-Nitroaniline	50	U		UJ
4,6-Dinitro-2-methylphenol	50	U		
N-Nitrosodiphenylamine (1)	10	U		
4-Bromophenyl-phenylether	10	U		
Hexachlorobenzene	10	U		
Pentachlorophenol	50	U		
Phenanthrene	10	U		
Anthracene	10	U		
Di-n-butylphthalate	10	U		
Fluoranthene	10	U		
Pyrene	10	U		UJ
Butylbenzylphthalate	10	U		
3,3'-Dichlorobenzidine	20	U		UJ
Benzo(a)anthracene	10	U		
Chrysene	10	U		
bis(2-Ethylhexyl) phthalate	10	U	27	8
Di-n-octylphthalate	10	U		
Benzo(b)fluoranthene	10	U		
Benzo(k)fluoranthene	10	U		
Benzo(a)pyrene	10	U		
Indeno(1,2,3-cd)pyrene	10	U		
Dibenzo(a,h)anthracene	10	U		
Benzo(g,h,i)perylene	10	U		

1) N-Nitrosodiphenylamine is analyzed as diphenylamine using the CLP-SOM method

AR301142

Sample Design
Sample Description

FP-004
Monitor Well-Aqueous
(First Round Sample)

FP-004
Monitor Well-Aqueous
(EPA Results)

FIELD PARAMETERS

Temperature (Celsius) 16
pH (SU) 6.23
Specific Conductance (umhos) 312
Dissolved Oxygen (mg/l) 2.3

INORGANICS (TOTAL METALS)

Parameters	Conc.(ug/L)	Q	Conc.(ug/L)	Q
Aluminum	548		666	
Antimony	2	u		
Arsenic	2	u		
Barium	12.5	B	[58.0]	B
Beryllium	1.8	u	9.7	
Cadmium	4.7	u		UJ
Calcium	19800		17000	
Chromium	5.4	u		UJ
Cobalt	26.2	u		
Copper	16.9	B	43	J
Iron	1060		1090	K
Lead	7.2		13	
Magnesium	11900		10700	
Manganese	147		192	J
Mercury	0.2	u		
Nickel	24.7	u		UJ
Potassium	2300	B	[1800]	
Selenium	1.4	u	N	UL
Silver	9.3	u	16.2	L
Sodium	8010		8010	
Thallium	2	u		
Vanadium	18.3	u		
Zinc	40.1		44	
Cyanide	10	u		
Sulfate	7.52 mg/L			

AR301143

Sample Design	FP-004	FP-004
Sample Description	Monitor Well-Aqueous (First Round Sample)	Monitor Well-Aqueous (EPA Results)

FIELD PARAMETERS

Temperature (Celsius)	16
pH (SU)	6.23
Specific Conductance(umhos)	312
Dissolved Oxygen (mg/l)	2.3

INORGANICS (DISSOLVED METALS)

Parameters	Conc.(ug/L)	Q	Conc.(ug/L)	Q	Conc.(ug/L)	Q
Aluminum	162	B				
Antimony	2	U				
Arsenic	2	U	[3.2]	J		
Barium	169	B	[59.2]			
Beryllium	1.8	U	8.8	J		
Cadmium	4.7	U		UJ		
Calcium	22000		19900			
Chromium	5.4	U		UJ		
Cobalt	26.2	U	[15.0]			
Copper	15.8	B		UL		
Iron	13.1	B				
Lead	1.3	U				
Magnesium	14400		13500			
Manganese	54.5		83.7			
Mercury	0.2	U				
Nickel	24.7	U				
Potassium	2070	B				
Selenium	1.4	U				
Silver	9.3	U		UJ		
Sodium	14500		8840			
Thallium	2	U				
Vanadium	18.3	U				
Zinc	10.7	U	47.8			
Cyanide				Q		

AR301144

Sample Design
Sample Description

FP-007A
Monitor Well-Aqueous
(First Round Sample)

FP-007A
Monitor Well-Aqueous
(EPA Results)

PESTICIDES/PCB'S

Parameters	Conc.(ug/L)	Q	Conc.(ug/L)	Q	Conc.(ug/L)	Q
alpha-BHC	0.05	U				
beta-BHC	0.05	U				
delta-BHC	0.05	U				
gamma-BHC	0.05	U				
Heptachlor	0.05	U				
Aldrin	0.05	U				
Heptachlor epoxide	0.05	U				
Endosulfan I	0.05	U				
Dieldrin	0.1	U				
4,4'-DDE	0.1	U				
Endrin	0.1	U				
Endosulfan II	0.1	U				
4,4'-DDD	0.1	U				
Endosulfan sulfate	0.1	U				
4,4'-DDT	0.1	U				
Methoxychlor	0.5	U				
Endrin ketone	0.1	U				
alpha-Chlordane	0.5	U				
gamma-Chlordane	0.5	U				
Toxaphene	1	U				
Aroclor-1016	0.5	U				
Aroclor-1221	0.5	U				
Aroclor-1232	0.5	U				
Aroclor-1242	0.5	U				
Aroclor-1248	0.5	U				
Aroclor-1254	1	U				
Aroclor-1250	1	U				

VOLATILE ORGANICS

Parameters	Conc.(ug/L)	Q	Conc.(ug/L)	Q	Conc.(ug/L)	Q
CHLOROMETHANE	10	U				
BROMOMETHANE	10	U				UJ
VINYL CHLORIDE	10	U				
CHLOROETHANE	10	U				
METHYLENE CHLORIDE	5	U	2	B		
ACETONE	4	8J	11	B		
CARBON DISULFIDE	5	U				
1,1 - DICHLOROETHENE	5	U				
1,1 - DICHLOROETHANE	5	U				
1,2 - DICHLOROETHENE (TOTAL)	5	U				
CHLOROFORM	5	U				
1,2 - DICHLOROETHANE	5	U				
2-BUTANONE	10	U				UJ
1,1,1 - TRICHLOROETHANE	5	U				
CARBON TETRACHLORIDE	5	U				
VINYL ACETATE	10	U				UJ
BROMDICHLOROMETHANE	5	U				
1,2 - DICHLOROPROPANE	5	U				
CIS - 1,3 - DICHLOROPROPENE	5	U				
TRICHLOROETHENE	5	U				
DIBROMOCHLOROMETHANE	5	U				
1,1,2 - TRICHLOROETHANE	5	U				
BENZENE	5	U				UL
TRANS - 1,3 - DICHLOROPROPENE	5	U				
BROMOFORM	5	U				
4 - METHYL - 2 - PENTANONE	10	U				UJ
2 - HEXANONE	10	U				
TETRACHLOROETHENE	5	U				UJ
1,1,2,2 - TETRACHLOROETHANE	5	U				
TOLUENE	5	U				UL
CHLOROBENZENE	5	U				UL
ETHYLBENZENE	5	U				UL
STYRENE	5	U				UL
XYLENE (TOTAL)	5	U				UL

AR301145

Sample Design
Sample Description

FP-007A
Monitor Well-Aqueous
(First Round Sample)

FP-007A
Monitor Well-Aqueous
(EPA Results)

SEMI-VOLATILE ORGANICS

Parameters	Conc.(ug/L)	Q	Conc.(ug/L)	Q	Conc.(ug/L)	Q
Phenol	10	U				
bis(2-Chloroethyl) ether	10	U				
2-Chlorophenol	10	U				
1,3-Dichlorobenzene	10	U				
1,4-Dichlorobenzene	10	U				
Benzyl alcohol	10	U				
1,2-Dichlorobenzene	10	U				
2-Methylphenol	10	U				
bis(2-Chloroisopropyl) ether	10	U				
4-Methylphenol	10	U				
N-Nitroso-di-n-propylamine	10	U				
Hexachloroethane	10	U				
Nitrobenzene	10	U				
Isophorone	10	U				
2-Nitrophenol	10	U				
2,4-Dimethylphenol	10	U				
Benzoic acid	50	U				
bis(2-Chloroethoxy) methane	10	U				
2,4-Dichlorophenol	10	U				
1,2,4-Trichlorobenzene	10	U				
Naphthalene	10	U				
4-Chloroaniline	10	U				
Hexachlorobutadiene	10	U				
4-Chloro-3-methylphenol	10	U				
2-Methylnaphthalene	10	U				
Hexachlorocyclopentadiene	10	U				
2,4,6-Trichlorophenol	10	U				
2,4,5-Trichlorophenol	50	U				
2-Chloronaphthalene	10	U				
2-Nitroaniline	50	U				
Dimethylphthalate	10	U				
Acenaphthylene	10	U				
2,6-Dinitrotoluene	10	U				
3-Nitroaniline	50	U				
Acenaphthene	10	U				
2,4-Dinitrophenol	50	U				
4-Nitrophenol	50	U				
Dibenzofuran	10	U				
2,4-Dinitrotoluene	10	U				
Diethylphthalate	10	U				
4-Chlorophenyl-phenylether	10	U				
Fluorene	10	U				
4-Nitroaniline	50	U				UJ
4,6-Dinitro-2-methylphenol	50	U				
N-Nitrosodiphenylamine (1)	10	U	3			J
4-Bromophenyl-phenylether	10	U				
Hexachlorobenzene	10	U				
Pentachlorophenol	50	U				
Phenanthrene	10	U				
Anthracene	10	U				
Di-n-butylphthalate	10	U				
Fluoranthene	10	U				
Pyrene	10	U				
Butylbenzylphthalate	10	U				
3,3'-Dichlorobenzidine	20	U				UJ
Benzo(a)anthracene	10	U				
Chrysene	10	U				
bis(2-Ethylhexyl) phthalate	13	U	18			B
Di-n-octylphthalate	10	U				
Benzo(b)fluoranthene	10	U				
Benzo(k)fluoranthene	10	U				
Benzo(a)pyrene	10	U				
Indeno(1,2,3-cd)pyrene	10	U				
Dibenz(a,h)anthracene	10	U				
Benzo(g,h,i)perylene	10	U				

(1) N-Nitrosodiphenylamine can not be distinguished from diphenylamine using the CLP-SOW method

AR301146

Sample Design
Sample Description

FP-007A
Monitor Well-Aqueous
(First Round Sample)

FP-007A
Monitor Well-Aqueous
(EPA Results)

FIELD PARAMETERS

Temperature (Celsius) 14.5
pH (SU) 5.75
Specific Conductance (umhos) 295
Dissolved Oxygen (mg/l) 17.2

INORGANICS (TOTAL METALS)

Parameters	Conc.(ug/L)	Q	Conc.(ug/L)	Q
Aluminum	4410		6270	
Antimony	2	U		
Arsenic	2	U		
Barium	30.2	B	[45.8]	B
Beryllium	1.8	U	10	
Cadmium	4.7	U		UJ
Calcium	9210		8570	
Chromium	5.4	U		UJ
Cobalt	26.2	U	[15.3]	B
Copper	25.8		37	J
Iron	4140		4230	K
Lead	2.1	B	12.3	
Magnesium	3650	B	[3880]	
Manganese	4000		3700	J
Mercury	0.2	U		
Nickel	24.7	U		UJ
Potassium	5290		[4300]	
Selenium	1.4	U	N	UL
Silver	9.3	U	30.6	R
Sodium	19800		17600	
Thallium	2	U		
Vanadium	18.3	U	[23.4]	
Zinc	22.1		58.3	
Cyanide	10	U		
Sulfate	7.92 mg/L			

AR301147

Sample Design	FP-007A	FP-007A
Sample Description	Monitor Well-Aqueous (First Round Sample)	Monitor Well-Aqueous (EPA Results)

FIELD PARAMETERS

Temperature (Celsius)	14.5
pH (SU)	5.75
Specific Conductance(umhos)	295
Dissolved Oxygen (mg/l)	17.2

INORGANICS (DISSOLVED METALS)

Parameters	Conc.(ug/L)	Q	Conc.(ug/L)	Q	Conc.(ug/L)	Q
Aluminum	51.9	u				
Antimony	2	u				
Arsenic	2	u	[2.6]	L		
Barium	161	B	[109]			
Beryllium	1.8	u	5.7	J		
Cadmium	4.7	u	14.2	J		
Calcium	10700		8750			
Chromium	5.4	u		UJ		
Cobalt	26.2	u				
Copper	6.8	u		UL		
Iron	38.2	B				
Lead	1.3	u				
Magnesium	4490	B	[4310]			
Manganese	4600		4140			
Mercury	0.2	u				
Nickel	24.7	u				
Potassium	4410	B	[3400]			
Selenium	1.4	u				
Silver	9.3	u		UJ		
Sodium	27600		22200			
Thallium	2	u				
Vanadium	18.3	u				
Zinc	130		102			
Cyanide				Q		

AR301148

Sample Design	FP-102	FP-102 (SL-01)	FP-103 (SL-03)	FP-103 (SL-07)
Sample Description	Background-Soil (First Round Sample)	Background-Soil (EPA Results)	Grid Samples-Soil (EPA Results)	Grid Samples-Soil (EPA Results) (Duplicate SL-03)

PESTICIDES/PCB'S

Parameters	Conc.(ug/kg)	Q	Conc.(ug/kg)	Q	Conc.(ug/kg)	Q	Conc.(ug/kg)	Q
alpha-BHC	17	U	8		8		8	
beta-BHC	17	U	8		8		8	
delta-BHC	17	U	8		8		8	
gamma-BHC	17	U	8		8		24	
Heptachlor	17	U	8		8		8	
Aldrin	17	U	8		8		8	
Heptachlor epoxide	17	U	8		8		8	
Endosulfan I	17	U	16		16		16	
Dieldrin	35	U	16		16		16	
4,4'-DDE	35	U	16		16		16	
Endrin	35	U	16		16		16	
Endosulfan II	35	U	16		16		16	
4,4'-DDD	35	U	16		16		16	
Endosulfan sulfate	35	U	16		16		16	
4,4'-DDT	35	U	16		16		16	
Methoxychlor	170	U	80		80		80	
Endrin ketone	35	U	16		16		16	
alpha-Chlordane	170	U	80		80		80	
gamma-Chlordane	170	U	80		80		80	
Toxaphene	350	U	160		160		160	
Aroclor-1016	170	U	80		80		80	
Aroclor-1221	170	U	80		80		80	
Aroclor-1232	170	U	80		80		80	
Aroclor-1242	170	U	80		80		80	
Aroclor-1248	170	U	80		80		80	
Aroclor-1254	350	U	160		160		160	
Aroclor-1260	350	U	160		160		160	

VOLATILE ORGANICS

Parameters	Conc.(ug/kg)	Q	Conc.(ug/kg)	Q	Conc.(ug/kg)	Q	Conc.(ug/kg)	Q
CHLOROMETHANE	11	U	10		10		10	
BROMOMETHANE	11	U	10		10		10	
VINYL CHLORIDE	11	U	10		10		10	
CHLOROETHANE	11	U	10		10		10	
METHYLENE CHLORIDE	12	U	5	UJ	9		17	U
ACETONE	4	UJ	10	UJ	27	U	10	UJ
CARBON DISULFIDE	6	U	5	UJ	5	U	5	UJ
1,1 - DICHLOROETHENE	6	U	5		5	UJ	5	
1,1 - DICHLOROETHANE	6	U	5		5		5	
1,2-DICHLOROETHENE (TOTAL)	6	U	5		5		5	
CHLOROFORM	6	U	5		5		5	
1,2 - DICHLOROETHANE	6	U	5		5		5	
2-BUTANONE	11	U	10	UJ	10		10	UJ
1,1,1 - TRICHLOROETHANE	6	U	5		5		5	
CARBON TETRACHLORIDE	6	U	5		5		5	
VINYL ACETATE	11	U	10		10	UJ	10	
BROMODICHLOROMETHANE	6	U	5		5		5	
1,2 - DICHLOROPROPANE	6	U	5		5		5	
CIS -1,3-DICHLOROPROPENE	6	U	5	UJ	5		5	UJ
TRICHLOROETHENE	6	U	5		5		5	
DIBROMOCHLOROMETHANE	6	U	5		5		5	
1,1,2 - TRICHLOROETHANE	6	U	5		5		5	
BENZENE	6	U	5	UJ	5		5	UL
TRANS-1,3-DICHLOROPROPENE	6	U	5		5		5	
BROMOFORM	6	U	5		5		5	
4 - METHYL - 2 - PENTANONE	11	U	10		10		10	
2 - HEXANONE	11	U	10	UJ	10	UJ	10	UJ
TETRACHLOROETHENE	6	U	5		5		5	
1,1,2,2-TETRACHLOROETHANE	6	U	5		5	UJ	5	
TOLUENE	6	U	5		5		5	UL
CHLOROBENZENE	6	U	5		5		5	UL
ETHYLBENZENE	6	U	5		5		5	UL
STYRENE	6	U	5		5		5	UL
XYLENE (TOTAL)	6	U	5		5		5	UL

AR301149

Sample Design
Sample Description

FP-102
Background-Soil
(First Round Sample)

FP-102 (SL-01)
Background-Soil
(EPA Results)

FP-103 (SL-03)
Grid Samples-Soil
(EPA Results)

FP-103 (SL-07)
Grid Samples-Soil
(EPA Results)
(Duplicate SL-03)

SEMI-VOLATILE ORGANICS

Parameters	Conc. (ug/kg)	Q	Conc. (ug/kg)	Q	Conc. (ug/kg)	Q	Conc. (ug/kg)	Q
Phenol	770	U	330		330		330	
bis(2-Chloroethyl) ether	770	U	330		330		330	
2-Chlorophenol	770	U	330		330		330	
1,3-Dichlorobenzene	770	U	330		330		330	
1,4-Dichlorobenzene	770	U	330		330		330	
Benzyl alcohol	770	U	330	UJ	330		330	
1,2-Dichlorobenzene	770	U	330		330		330	UJ
2-Methylphenol	770	U	330		330		330	
bis(2-Chloroisopropyl) ether	770	U	330	UJ	330	UJ	330	
4-Methylphenol	770	U	330		330		330	UJ
N-Nitroso-di-n-propylamine	770	U	330		330		330	
Hexachloroethane	770	U	330		330		330	
Nitrobenzene	770	U	330		330		330	
Isophorone	770	U	330		330		330	
2-Nitrophenol	770	U	330		330		330	
2,4-Dimethylphenol	770	U	330		330		330	
Benzoic acid	3800	U	1600		1600		1600	
bis(2-Chloroethoxy) methane	770	U	330		330		330	
2,4-Dichlorophenol	770	U	330		330		330	
1,2,4-Trichlorobenzene	770	U	330		330		330	
Naphthalene	770	U	330		330		330	
4-Chloroaniline	770	U	330		330		330	
Hexachlorobutadiene	770	U	330		330		330	
4-Chloro-3-methylphenol	770	U	330		330		330	
2-Methylnaphthalene	770	U	330		330		330	
Hexachlorocyclopentadiene	770	U	330		330		330	
2,4,6-Trichlorophenol	770	U	330		330		330	
2,4,5-Trichlorophenol	3800	U	1600		1600		1600	
Chloronaphthalene	770	U	330		330		330	
Nitroaniline	3800	U	1600		1600		1600	
Methylphthalate	770	U	330		330		330	
Acenaphthylene	770	U	330		330		330	
2,6-Dinitrotoluene	770	U	330		330		330	
3-Nitroaniline	3800	U	1600		1600		1600	
Acenaphthene	770	U	330		330		330	
2,4-Dinitrophenol	3800	U	1600		1600	UJ	330	
4-Nitrophenol	3800	U	1600		1600		1600	
Dibenzofuran	770	U	330		330		330	
2,4-Dinitrotoluene	770	U	330		330		330	
Diethylphthalate	770	U	330		330		330	
4-Chlorophenyl-phenylether	770	U	330		330		330	
Fluorene	770	U	330		330		330	
4-Nitroaniline	3800	U	1600		1600	UJ	330	
4,6-Dinitro-2-methylphenol	3800	U	1600		1600		1600	
N-Nitrosodiphenylamine (1)	770	U	330		280		280	B
4-Bromophenyl-phenylether	770	U	330		330		330	
Hexachlorobenzene	770	U	330		330		330	
Pentachlorophenol	3800	U	1600		1600		1600	
Phenanthrene	770	U	330		330		330	
Anthracene	770	U	330		330		330	
Di-n-butylphthalate	770	U	330		330		330	
Fluoranthene	770	U	330		330		330	
Pyrene	770	U	330		330		330	
Butylbenzylphthalate	770	U	330	UJ	330	UJ	330	
3,3'-Dichlorobenzidine	1500	U	1600		1600	UJ	1600	UJ
Benzo(a)anthracene	770	U	330		330		330	
Chrysene	770	U	330		330		330	
bis(2-Ethylhexyl) phthalate	770	U	130	B	600	B	650	B
Di-n-octylphthalate	770	U	330		330		330	
Benzo(b)fluoranthene	770	U	330		330		330	
Benzo(k)fluoranthene	770	U	330		330		330	
Benzo(a)pyrene	770	U	330		330	UJ	330	
Benzo(i,j)perylene	770	U	330		330		330	
Benzo(a,h)anthracene	770	U	330		330		330	
Benzo(g,h,i)perylene	770	U	330		330	UJ	330	

(1) N-Nitrosodiphenylamine can not be distinguished from diphenylamine using the CLP-SOW AR301150

Sample Design	FP-107	FP-107 (SL-05)
Sample Description	Grid Samples-Soil (First Round Sample)	Grid Samples-Soil (EPA Results)

PESTICIDES/PCB'S

Parameters	Conc. (ug/kg)	Q	Conc. (ug/kg)	Q
alpha-BHC	21	U	8	
beta-BHC	21	U	8	
delta-BHC	21	U	8	
gamma-BHC	21	U	8	
Heptachlor	21	U	8	
Aldrin	21	U	8	
Heptachlor epoxide	21	U	8	
Endosulfan I	21	U	16	
Dieldrin	41	U	16	
4,4'-DDE	41	U	16	
Endrin	41	U	16	
Endosulfan II	41	U	16	
4,4'-DDD	41	U	16	
Endosulfan sulfate	41	U	16	
4,4'-DDT	41	U	16	
Methoxychlor	210	U	80	
Endrin ketone	41	U	16	
alpha-Chlordane	210	U	80	
gamma-Chlordane	210	U	80	
Toxaphene	410	U	160	
Aroclor-1016	210	U	80	
Aroclor-1221	210	U	80	
Aroclor-1232	210	U	80	
Aroclor-1242	210	U	80	
Aroclor-1248	210	U	80	
Aroclor-1254	410	U	160	
Aroclor-1260	410	U	160	

VOLATILE ORGANICS

Parameters	Conc. (ug/kg)	Q	Conc. (ug/kg)	Q	Conc. (ug/kg)	Q
CHLOROMETHANE	12	U	10			
BROMOMETHANE	12	U	10			
VINYL CHLORIDE	12	U	10			
CHLOROETHANE	12	U	10			
METHYLENE CHLORIDE	7	6	17		B	
ACETONE	4	83	10		U3	
CARBON DISULFIDE	6	U	5		U3	
1,1 - DICHLOROETHENE	6	U	5			
1,1 - DICHLOROETHANE	6	U	5			
1,2 - DICHLOROETHENE (TOTAL)	6	U	5			
CHLOROFORM	6	U	5			
1,2 - DICHLOROETHANE	6	U	5			
2-BUTANONE	12	U	10		U3	
1,1,1 - TRICHLOROETHANE	6	U	5			
CARBON TETRACHLORIDE	6	U	5			
VINYL ACETATE	12	U	10			
BROMODICHLOROMETHANE	6	U	5			
1,2 - DICHLOROPROPANE	6	U	5			
CIS - 1,3 - DICHLOROPROPENE	6	U	5		U3	
TRICHLOROETHENE	6	U	5			
DIBROMOCHLOROMETHANE	6	U	5			
1,1,2 - TRICHLOROETHANE	6	U	5			
BENZENE	6	U	5		UL	
TRANS - 1,3 - DICHLOROPROPENE	6	U	5			
BROMOFORM	6	U	5			
4 - METHYL - 2 - PENTANONE	12	U	10			
2 - HEXANONE	12	U	10		U3	
TETRACHLOROETHENE	6	U	5			
1,1,2,2 - TETRACHLOROETHANE	6	U	5			
TOLUENE	6	U	5		UL	
CHLOROBENZENE	6	U	5		UL	
ETHYLBENZENE	6	U	5		UL	
STYRENE	6	U	5		UL	
XYLENE (TOTAL)	6	U	5		UL	

AR301151

Sample Design
Sample Description

FP-107
Grid Samples-Soil
(First Round Sample)

FP-107 (SL-05)
Grid Samples-Soil
(EPA Results)

SEMI-VOLATILE ORGANICS

Parameters	Conc. (ug/kg)	Q	Conc. (ug/kg)	Q
Phenol	790	U	330	
bis(2-Chloroethyl) ether	790	U	330	
2-Chlorophenol	790	U	330	
1,3-Dichlorobenzene	790	U	330	
1,4-Dichlorobenzene	790	U	330	
Benzyl alcohol	790	U	330	UJ
1,2-Dichlorobenzene	790	U	330	
2-Methylphenol	790	U	330	
bis(2-chloroisopropyl) ether	790	U	330	UJ
4-Methylphenol	790	U	330	
N-Nitroso-di-n-propylamine	790	U	330	
Hexachloroethane	790	U	330	
Nitrobenzene	790	U	330	
Isophorone	790	U	330	
2-Nitrophenol	790	U	330	
2,4-Dimethylphenol	790	U	330	
Benzoic acid	4000	U	1600	
bis(2-Chloroethoxy) methane	790	U	330	
2,4-Dichlorophenol	790	U	330	
1,2,4-Trichlorobenzene	790	U	330	
Naphthalene	790	U	330	
4-Chloroaniline	790	U	330	
Hexachlorobutadiene	790	U	330	
4-Chloro-3-methylphenol	790	U	330	
2-Methylnaphthalene	790	U	330	
Hexachlorocyclopentadiene	790	U	330	
2,4,6-Trichlorophenol	790	U	330	
2,4,5-Trichlorophenol	4000	U	1600	
2-Chloronaphthalene	790	U	330	
2-Nitroaniline	4000	U	1600	
1-methylphthalate	790	U	330	
benzophenone	790	U	330	
2,6-Dinitrotoluene	790	U	330	
3-Nitroaniline	4000	U	1600	
Acenaphthene	790	U	330	
2,4-Dinitrophenol	4000	U	1600	
4-Nitrophenol	4000	U	1600	
Dibenzofuran	790	U	330	
2,4-Dinitrotoluene	790	U	330	
Diethylphthalate	790	U	330	
4-Chlorophenyl-phenylether	790	U	330	
Fluorene	790	U	330	
4-Nitroaniline	4000	U	1600	
4,6-Dinitro-2-methylphenol	4000	U	1600	
N-Nitrosodiphenylamine (1)	790	U	330	
4-Bromophenyl-phenylether	790	U	330	
Hexachlorobenzene	790	U	330	
Pentachlorophenol	4000	U	1600	
Phenanthrene	790	U	330	
Anthracene	790	U	330	
Di-n-butylphthalate	790	U	330	
Fluoranthene	790	U	330	
Pyrene	790	U	330	
Butylbenzylphthalate	790	U	330	UJ
3,3'-Dichlorobenzidine	1600	U	1600	
Benzo(a)anthracene	790	U	330	
Chrysene	790	U	330	
bis(2-Ethylhexyl) phthalate	790	U	330	
Di-n-octylphthalate	790	U	330	
Benzo(b)fluoranthene	790	U	330	
Benzo(k)fluoranthene	790	U	330	
Benzo(a)pyrene	790	U	330	
Indeno(1,2,3-cd)pyrene	790	U	330	
1-benz(a,h)anthracene	790	U	330	
1-benz(g,h,i)perylene	790	U	330	

1) N-Nitrosodiphenylamine can not be distinguished from diphenylamine using the CLP-80W method.

AR301152

Sample Design Sample Description	FP-114 Disturbed Area- Well Cluster 3-Soil (First Round Sample)	FP-114 (SL-02) Disturbed Area- Well Cluster 3-Soil (EPA Results)	FP-117 Carbon Black Area-Soil (First Round Sample)	FP-117 (SL-06) Carbon Black Area-Soil (EPA Results)
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PESTICIDES/PCB'S

Parameters	Conc.(ug/kg)	Q	Conc.(ug/kg)	Q	Conc.(ug/kg)	Q	Conc.(ug/kg)	Q
alpha-BHC	21	U	8		190	U	8	
beta-BHC	21	U	8		190	U	8	
delta-BHC	21	U	8		190	U	8	
gamma-BHC	21	U	8		190	U	8	
Heptachlor	21	U	8		190	U	8	
Aldrin	21	U	8		190	U	8	
Heptachlor epoxide	21	U	8		190	U	8	
Endosulfan I	21	U	8		190	U	8	
Dieldrin	41	U	16		380	U	16	
4,4'-DDE	41	U	16		380	U	16	
Endrin	41	U	16		380	U	16	
Endosulfan II	41	U	16		380	U	16	
4,4'-DDb	41	U	16		380	U	16	
Endosulfan sulfate	41	U	16		380	U	16	
4,4'-DDT	41	U	16		380	U	16	
Methoxychlor	210	U	80		1900	U	80	
Endrin ketone	41	U	16		380	U	16	
alpha-Chlordane	210	U	80		1900	U	80	
gamma-Chlordane	210	U	80		1900	U	80	
Toxaphene	410	U	160		3800	U	160	
Aroclor-1016	210	U	80		1900	U	80	
Aroclor-1221	210	U	80		1900	U	80	
Aroclor-1232	210	U	80		1900	U	80	
Aroclor-1242	210	U	80		1900	U	80	
Aroclor-1248	210	U	80		1900	U	80	
Aroclor-1254	410	U	160		3800	U	160	
Aroclor-1260	410	U	160		3800	U	160	

VOLATILE ORGANICS

Parameters	Conc.(ug/kg)	Q	Conc.(ug/kg)	Q	Conc.(ug/kg)	Q	Conc.(ug/kg)	Q
CHLOROMETHANE	12	U	10	UJ	11	U	10	UJ
BROMOMETHANE	12	U	10		11	U	10	
VINYL CHLORIDE	12	U	10		11	U	10	
CHLOROETHANE	12	U	10		11	U	10	
METHYLENE CHLORIDE	9	B	15	B	3	BJ	8	B
ACETONE	4	BJ	10	UJ	4	BJ	10	UJ
CARBON DISULFIDE	6	U	5	UJ	6	U	5	UJ
1,1 - DICHLOROETHENE	6	U	5		6	U	5	
1,1 - DICHLOROETHANE	6	U	5		6	U	5	
1,2-DICHLOROETHENE (TOTAL)	6	U	5		6	U	5	
CHLOROFORM	6	U	5		6	U	5	
1,2 - DICHLOROETHANE	6	U	5		6	U	5	
2-BUTANONE	12	U	10		11	U	10	
1,1,1 - TRICHLOROETHANE	6	U	5		6	U	5	
CARBON TETRACHLORIDE	6	U	5		6	U	5	
VINYL ACETATE	12	U	10	UJ	11	U	10	UJ
BROMODICHLOROMETHANE	6	U	5		6	U	5	
1,2 - DICHLOROPROPANE	6	U	5		6	U	5	
CIS-1,3-DICHLOROPROPENE	6	U	5		6	U	5	
TRICHLOROETHENE	6	U	5		6	U	5	
DIBROMOCHLOROMETHANE	6	U	5		6	U	5	
1,1,2 - TRICHLOROETHANE	6	U	5		6	U	5	
BENZENE	6	U	5		6	U	5	
TRANS-1,3-DICHLOROPROPENE	6	U	5		6	U	5	
BROMOFORM	6	U	5		6	U	5	
4 - METHYL - 2 - PENTANONE	12	U	10		11	U	10	
2 - HEXANONE	12	U	10	UJ	11	U	10	UJ
TETRACHLOROETHENE	6	U	5		6	U	5	
1,1,2,2-TETRACHLOROETHANE	6	U	5	UJ	6	U	5	UJ
TOLUENE	6	U	5		6	U	5	
CHLOROBENZENE	6	U	5		6	U	5	
ETHYLBENZENE	6	U	5		6	U	5	
STYRENE	6	U	5		6	U	5	
XYLENE (TOTAL)	6	U	5		6	U	5	

Sample Design Sample Description	FP-114 Disturbed Area- Well Cluster 3-Soil (First Round Sample)	FP-114 (SL-02) Disturbed Area- Well Cluster 3-Soil (EPA Results)	FP-117 Carbon Black Area-Soil (First Round Sample)	FP-117 (SL-02) Carbon Black Area-Soil (EPA Results)
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SEMI-VOLATILE ORGANICS

Parameters	Conc.(ug/kg)	Q	Conc.(ug/kg)	Q	Conc.(ug/kg)	Q	Conc.(ug/kg)	Q
Phenol	820	U	330		390	J	330	
bis(2-Chloroethyl) ether	820	U	330		770	U	330	
2-Chlorophenol	820	U	330		770	U	330	
1,3-Dichlorobenzene	820	U	330		770	U	330	
1,4-Dichlorobenzene	820	U	330		770	U	330	
Benzyl alcohol	820	U	330		770	U	330	UJ
1,2-Dichlorobenzene	820	U	330		770	U	330	
2-Methylphenol	820	U	330		770	U	330	
bis(2-Chloroisopropyl) ether	820	U	330	UJ	770	U	330	UJ
4-Methylphenol	820	U	330		770	U	330	
N-Nitroso-di-n-propylamine	820	U	330		770	U	330	
Hexachloroethane	820	U	330		770	U	330	
Nitrobenzene	820	U	330		770	U	330	
Isophorone	820	U	330		770	U	330	
2-Nitrophenol	820	U	330		770	U	330	
2,4-Dimethylphenol	820	U	330		770	U	330	
Benzoic acid	4100	U	1600		3800	U	1600	
bis(2-Chloroethoxy) methane	820	U	330		770	U	330	
2,4-Dichlorophenol	820	U	330		770	U	330	
1,2,4-Trichlorobenzene	820	U	330		770	U	330	
Naphthalene	820	U	330		220	J	330	
4-Chloroaniline	820	U	330		770	U	330	
Hexachlorobutadiene	820	U	330		770	U	330	
4-Chloro-3-methylphenol	820	U	330		770	U	330	
2-Methylnaphthalene	820	U	330		770	U	330	
Hexachlorocyclopentadiene	820	U	330		770	U	330	
2,4,6-Trichlorophenol	820	U	330		770	U	330	
2,4,5-Trichlorophenol	4100	U	1600		3800	U	1600	
2-Chloronaphthalene	820	U	330		770	U	330	
2-Nitroaniline	4100	U	1600		3800	U	1600	
Dimethylphthalate	820	U	330		770	U	330	
Acenaphthylene	820	U	330		770	U	330	
2,6-Dinitrotoluene	820	U	330		770	U	330	
3-Nitroaniline	4100	U	1600		3800	U	1600	
Acenaphthene	820	U	330		770	U	330	
2,4-Dinitrophenol	4100	U	1600		3800	U	1600	
4-Nitrophenol	4100	U	1600		3800	U	1600	
Dibenzofuran	820	U	330		770	U	330	
2,4-Dinitrotoluene	820	U	330		770	U	330	
Diethylphthalate	820	U	330		770	U	330	
4-Chlorophenyl-phenylether	820	U	330		770	U	330	
Fluorene	820	U	330		770	U	330	
4-Nitroaniline	4100	U	1600		3800	U	1600	
4,6-Dinitro-2-methylphenol	4100	U	1600		3800	U	1600	
N-Nitrosodiphenylamine (1)	820	U	330		6600		43000	B
4-Bromophenyl-phenylether	820	U	330		770	U	330	
Hexachlorobenzene	820	U	330		770	U	330	
Pentachlorophenol	4100	U	1600		3800	U	1600	
Phenanthrene	820	U	330		680	J	330	
Anthracene	820	U	330		770	U	330	
Di-n-butylphthalate	820	U	330		770	U	330	
Fluoranthene	820	U	330		620	J	330	
Pyrene	820	U	330		560	J	330	
Butylbenzylphthalate	820	U	330	UJ	770	U	330	UJ
3,3'-Dichlorobenzidine	1600	U	1600		1500	U	1600	
Benzo(a)anthracene	820	U	330		290	J	330	
Chrysene	820	U	330		310	J	330	
bis(2-Ethylhexyl) phthalate	380	J	1100	B	350	J	330	
Di-n-octylphthalate	820	U	330		770	U	330	
Benzo(b)fluoranthene	820	U	330		220	J	330	
Benzo(k)fluoranthene	820	U	330		160	J	330	
Benzo(a)pyrene	820	U	330		770	U	330	
Indeno(1,2,3-cd)pyrene	820	U	330		770	U	330	
Dibenz(a,h)anthracene	820	U	330		770	U	330	
Benzo(g,h,i)perylene	820	U	330		770	U	330	

(1) N-Nitrosodiphenylamine can not be distinguished from diphenylamine using the DLF-82 method.

Sample Design	FP-121	FP-121 (SL-04)	FP-121 (SL-09)
Sample Description	North Drainage-Soil (First Round Sample)	North Drainage-Soil (EPA Results)	North Drainage-Soil Duplicate (EPA Results)

PESTICIDES/PCB'S

Parameters	Conc.(ug/kg)	Q	Conc.(ug/kg)	Q	Conc.(ug/kg)	Q
alpha-BHC	26	U	8		8	
beta-BHC	26	U	8		8	
delta-BHC	26	U	8		8	
gamma-BHC	26	U	8		8	
Heptachlor	26	U	8		8	
Aldrin	26	U	8		8	
Heptachlor epoxide	26	U	8		8	
Endosulfan I	26	U	8		8	
Dieldrin	53	U	16		16	
4,4'-DDE	53	U	16		16	
Endrin	53	U	16		16	
Endosulfan II	53	U	16		16	
4,4'-DDD	53	U	16		16	
Endosulfan sulfate	53	U	16		16	
4,4'-DDT	53	U	16		16	
Methoxychlor	260	U	80		80	
Endrin ketone	53	U	16		16	
alpha-Chlordane	260	U	80		80	
gamma-Chlordane	260	U	80		80	
Toxaphene	530	U	160		160	
Aroclor-1016	260	U	80		80	
Aroclor-1221	260	U	80		80	
Aroclor-1232	260	U	80		80	
Aroclor-1242	260	U	80		80	
Aroclor-1248	260	U	80		80	
Aroclor-1254	530	U	160		160	
Aroclor-1260	530	U	160		160	

VOLATILE ORGANICS

Parameters	Conc.(ug/kg)	Q	Conc.(ug/kg)	Q	Conc.(ug/kg)	Q
CHLOROMETHANE	16	U	10		10	UL
BROMOMETHANE	16	U	10		10	UL
VINYL CHLORIDE	16	U	10		10	UL
CHLOROETHANE	16	U	10		10	UL
METHYLENE CHLORIDE	4	BJ	190	B	12	B
ACETONE	9	BJ	7	B	54	B
CARBON DISULFIDE	8	U	5	UJ	5	UL
1,1 - DICHLOROETHENE	8	U	5		5	UL
1,1 - DICHLOROETHANE	8	U	5		5	UL
1,2 - DICHLOROETHENE (TOTAL	8	U	5		5	UL
CHLOROFORM	8	U	5		5	UL
1,2 - DICHLOROETHANE	8	U	5		5	UL
2-BUTANONE	16	U	10	UJ	10	R
1,1,1 - TRICHLOROETHANE	8	U	5		5	UL
CARBON TETRACHLORIDE	8	U	5		5	UL
VINYL ACETATE	16	U	10		10	UL
BROMODICHLOROMETHANE	8	U	5		5	UL
1,2 - DICHLOROPROPANE	8	U	5		5	UL
CIS - 1,3 - DICHLOROPROPENE	8	U	5	UJ	5	UL
TRICHLOROETHENE	8	U	5		5	UL
DIBROMOCHLOROMETHANE	8	U	5		5	UL
1,1,2 - TRICHLOROETHANE	8	U	5		5	UL
BENZENE	8	U	5	UL	5	UL
TRANS - 1,3 - DICHLOROPROPE	8	U	5		5	UL
BROMOFORM	8	U	5		5	UL
4 - METHYL - 2 - PENTANONE	16	U	10		14	L
2 - HEXANONE	16	U	10	UJ	10	UL
TETRACHLOROETHENE	8	U	5		5	UL
1,1,2,2 - TETRACHLOROETHANE	8	U	5		5	UL
TOLUENE	8	U	5	UL	5	UL
CHLOROBENZENE	8	U	5	UL	5	UL
ETHYLBENZENE	8	U	5	UL	5	UL
STYRENE	8	U	5	UL	5	UL
XYLENE (TOTAL)	8	U	5	UL	5	UL

AR301155

Sample Design	FP-121	FP-121 (SL-G4)	FP-121 (SL-09)
Sample Description	North Drainage-Soil (First Round Sample)	North Drainage-Soil (EPA Results)	North Drainage-Soil Duplicate (EPA Results)

SEMI-VOLATILE ORGANICS

Parameters	Conc. (ug/kg)	Q	Conc. (ug/kg)	Q	Conc. (ug/kg)	Q
Phenol	1100	U	330		330	
bis(2-Chloroethyl) ether	1100	U	330		330	
2-Chlorophenol	1100	U	330		330	
1,3-Dichlorobenzene	1100	U	330		330	
1,4-Dichlorobenzene	1100	U	330		330	
Benzyl alcohol	1100	U	330	UJ	330	UJ
1,2-Dichlorobenzene	1100	U	330		330	
2-Methylphenol	1100	U	330	UJ	330	
bis(2-chloroisopropyl) ether	1100	U	330		330	
4-Methylphenol	1100	U	330		330	UJ
N-Nitroso-di-n-propylamine	1100	U	330		330	
Hexachloroethane	1100	U	330		330	
Nitrobenzene	1100	U	330		330	
Isophorone	1100	U	330		330	
2-Nitrophenol	1100	U	330		330	
2,4-Dimethylphenol	1100	U	330		330	
Benzoic acid	5300	U	1600		1600	
bis(2-Chloroethoxy) methane	1100	U	330		330	
2,4-Dichlorophenol	1100	U	330		330	
1,2,4-Trichlorobenzene	1100	U	330		330	
Naphthalene	1100	U	330		330	
4-Chloroaniline	1100	U	330		330	
Hexachlorobutadiene	1100	U	330		330	
4-Chloro-3-methylphenol	1100	U	330		330	
2-Methylnaphthalene	1100	U	330		330	
Hexachlorocyclopentadiene	1100	U	330		330	
2,4,6-Trichlorophenol	1100	U	330		330	
2,4,5-Trichlorophenol	5300	U	1600		1600	
2-Chloronaphthalene	1100	U	330		330	
2-Nitroaniline	5300	U	1600		1600	
1-methylphthalate	1100	U	330		330	
1-naphthylene	1100	U	330		330	
1,3-Dinitrotoluene	1100	U	330		330	
3-Nitroaniline	5300	U	1600		1600	
Acenaphthene	1100	U	330		330	
2,4-Dinitrophenol	5300	U	1600		1600	
4-Nitrophenol	5300	U	1600		1600	
Dibenzofuran	1100	U	330		330	
2,4-Dinitrotoluene	1100	U	330		330	
Diethylphthalate	1100	U	330		330	
4-Chlorophenyl-phenylether	1100	U	330		330	
Fluorene	1100	U	330		330	
4-Nitroaniline	5300	U	1600		1600	
4,6-Dinitro-2-methylphenol	5300	U	1600		1600	
N-Nitrosodiphenylamine (1)	1100	U	330		330	
4-Bromophenyl-phenylether	1100	U	330		330	
Hexachlorobenzene	1100	U	330		330	
Pentachlorophenol	5300	U	1600		1600	
Phenanthrene	1100	U	330		330	
Anthracene	1100	U	330		330	
Di-n-butylphthalate	1100	U	330		330	
Fluoranthene	1100	U	330		330	
Pyrene	1100	U	330		330	
Butylbenzylphthalate	1100	U	330	UJ	6100	J
3,3'-Dichlorobenzidine	2100	U	1600		330	UJ
Benzo(a)anthracene	1100	U	330		1600	UJ
Chrysene	1100	U	330		330	UJ
bis(2-Ethylhexyl) phthalate	650	J	330		42000	J
Di-n-octylphthalate	1100	U	330		330	UJ
Benzo(b)fluoranthene	1100	U	330		330	UJ
Benzo(k)fluoranthene	1100	U	330		330	UJ
Benzo(a)pyrene	1100	U	330		330	UJ
Indeno(1,2,3-cd)pyrene	1100	U	330		39000	J
Dibenz(a,h)anthracene	1100	U	330		330	UJ
Dibenz(g,h,i)perylene	1100	U	330		330	UJ

(1) N-Nitrosodiphenylamine can not be distinguished from diphenylamine using the DL-50W method.

AR301156

Sample Design
Sample Description

FP-206 (SD-04-1)
Southern Quarry Drainage-
Sediment (EPA Results)

FP-209 (SD-02-IT)
Upper Northern Drainage-
Sediment (EPA Results)

FP-209 (SD-06-1)
Upper Northern Drainage-
Duplicate-Sediment
(EPA Results)

FP-211 (SD-03-1)
Lower Northern Drainage-
Sediment (EPA Results)

PESTICIDES/PCB'S

Parameters	Conc.(ug/kg)	Q	Conc.(ug/kg)	Q	Conc.(ug/kg)	Q	Conc.(ug/kg)	Q
alpha-BHC	8		8		8		8	
beta-BHC	8		8		8		8	
delta-BHC	8		8		8		8	
gamma-BHC	8		8		8		8	
Heptachlor	8		8		8		8	
Aldrin	8		8		8		8	
Heptachlor epoxide	8		8		8		8	
Endosulfan I	8		8		8		8	
Dieldrin	16		16		16		16	
4,4'-DDE	16		16		16		16	
Endrin	16		16		16		16	
Endosulfan II	16		16		16		16	
4,4'-DDD	16		16		16		16	
Endosulfan sulfate	16		16		16		16	
4,4'-DDT	16		16		16		16	
Methoxychlor	80		80		80		80	
Endrin ketone	16		16		16		16	
alpha-Chlordane	80		80		80		80	
gamma-Chlordane	80		80		80		80	
Toxaphene	160		160		160		160	
Aroclor-1016	80		80		80		80	
Aroclor-1221	80		80		80		80	
Aroclor-1232	80		80		80		80	
Aroclor-1242	80		80		80		80	
Aroclor-1248	80		80		80		80	
Aroclor-1254	160		160		160		160	
Aroclor-1260	160		160		160		160	

VOLATILE ORGANICS

Parameters	Conc.(ug/kg)	Q	Conc.(ug/kg)	Q	Conc.(ug/kg)	Q	Conc.(ug/kg)	Q
CHLOROMETHANE	10	UJ	10	UJ	10	UJ	10	UJ
BROMOMETHANE	10		10		10		10	
VINYL CHLORIDE	10		10		10		10	
CHLOROETHANE	10		10		10		10	
METHYLENE CHLORIDE	16	8	53	8	140	8	18	8
ACETONE	8	8	270	8	1500	UJ	10	UJ
CARBON DISULFIDE	5	UJ	5	UJ	5	UJ	5	
1,1 - DICHLOROETHENE	5		5		5		5	
1,1 - DICHLOROETHANE	5		5		5		5	
1,2 - DICHLOROETHENE (TOTAL	5		5		5		5	
CHLOROFORM	5		5		5		5	
1,2 - DICHLOROETHANE	5		5		5		5	
2-BUTANONE	10		10		10		10	
1,1,1 - TRICHLOROETHANE	5		5		5		5	
CARBON TETRACHLORIDE	5		5		5		5	
VINYL ACETATE	10	UJ	10	UJ	10	UJ	10	
BROMODICHLOROMETHANE	5		5		5		5	
1,2 - DICHLOROPROPANE	5		5		5		5	
CIS - 1,3 - DICHLOROPROPENE	5		5		5		5	
TRICHLOROETHENE	5		5		5		5	
DIBROMOCHLOROMETHANE	5		5		5		5	
1,1,2 - TRICHLOROETHANE	5		5		5		5	
BENZENE	5	UL	5	UL	5	UL	5	
TRANS - 1,3 - DICHLOROPROPE	5		5		5		5	
BROMOFORM	5		5		5		5	
4 - METHYL - 2 - PENTANONE	10		10		10		10	
2 - HEXANONE	10	UJ	10	UJ	10	UJ	10	UJ
TETRACHLOROETHENE	5		5		5		5	
1,1,2,2 - TETRACHLOROETHANE	5	UJ	5		5	UJ	5	
TOLUENE	5	UL	5	UL	5	UL	5	
CHLOROBENZENE	5	UL	5	UL	5	UL	5	
ETHYLBENZENE	5	UL	5	UL	5	UL	5	
STYRENE	5	UL	5	UL	5	UL	5	
XYLENE (TOTAL)	5	UL	5		5	UL	5	

AR 301157

Sample Design	FP-206 (SD-04-1)	FP-209 (SD-02-1)	FP-209 (SD-06-1)	FP-211 (SD-03-1)
Sample Description	Southern Quarry Drainage-Sediment (EPA Results)	Upper Northern Drainage-Sediment (EPA Results)	Upper Northern Drainage-Duplicate-Sediment (EPA Results)	Lower Northern Drainage-Sediment (EPA Results)

SEMI-VOLATILE ORGANICS

Parameters	Conc.(ug/kg)	Q	Conc.(ug/kg)	Q	Conc.(ug/kg)	Q	Conc.(ug/kg)	Q
Phenol	330	UJ	330		330		330	
bis(2-Chloroethyl) ether	330	UJ	330		330		330	
2-Chlorophenol	330	UJ	330		330		330	
1,3-Dichlorobenzene	330	UJ	330		330		330	
1,4-Dichlorobenzene	330	UJ	330		330		330	
Benzyl alcohol	330	UJ	330		330		330	
1,2-Dichlorobenzene	330	UJ	330	UJ	330		330	UJ
2-Methylphenol	330	UJ	330		330		330	
bis(2-Chloroisopropyl)ether	330	UJ	330	UJ	330	UJ	330	
4-Methylphenol	330	UJ	330		330		330	UJ
N-Nitroso-di-n-propylamine	330	UJ	330		330		330	
Hexachloroethane	330	UJ	330		330		330	
Nitrobenzene	330	UJ	330		330		330	
Isophorone	330	UJ	330		330		330	
2-Nitrophenol	330	UJ	330		330		330	
2,4-Dimethylphenol	330	UJ	330		330		330	
Benzoic acid	1600	UJ	1600		330		330	
bis(2-Chloroethoxy) methane	330	UJ	330		1600		1600	
2,4-Dichlorophenol	330	UJ	330		330		330	
1,2,4-Trichlorobenzene	330	UJ	330		330		330	
Naphthalene	330	UJ	330		330		330	
4-Chloroaniline	330	UJ	330		330		330	
Hexachlorobutadiene	330	UJ	330		330		330	
4-Chloro-3-methylphenol	330	UJ	330		330		330	
2-Methylnaphthalene	330	UJ	330		330		330	
Hexachlorocyclopentadiene	330	UJ	330		330		330	
2,4,6-Trichlorophenol	330	UJ	330		330		330	
2,4,5-Trichlorophenol	1600	UJ	1600		330		330	
1-Chloronaphthalene	330	UJ	330		1600		1600	
Nitroaniline	1600	UJ	1600		330		330	
1-methylphthalate	330	UJ	330		1600		1600	
Acenaphthylene	330	UJ	330		330		330	
2,6-Dinitrotoluene	330	UJ	330		330		330	
3-Nitroaniline	1600	UJ	1600		330		330	
Acenaphthene	330	UJ	330		1600		1600	
2,4-Dinitrophenol	1600	UJ	1600		330		330	
4-Nitrophenol	1600	UJ	1600		1600		1600	
Dibenzofuran	330	UJ	330		1600		1600	
2,4-Dinitrotoluene	330	UJ	330		330		330	
Diethylphthalate	330	UJ	330		330		330	
4-Chlorophenyl-phenylether	330	UJ	330		330		330	
Fluorene	330	UJ	330		330		330	
4-Nitroaniline	1600	UJ	1600		330		330	
4,6-Dinitro-2-methylphenol	1600	UJ	1600		1600		1600	
N-Nitrosodiphenylamine (1)	8300	B	1800	B	1600		1600	
4-Bromophenyl-phenylether	330	UJ	330		1400	B	330	
Hexachlorobenzene	330	UJ	330		330	UJ	330	
Pentachlorophenol	1600	UJ	1600		330	UJ	330	
Phenanthrene	330	UJ	330		1600		1600	
Anthracene	330	UJ	330		330		330	
Di-n-butylphthalate	330	UJ	330		330		330	
Fluoranthene	330	UJ	330		330		330	
Pyrene	330	UJ	330		330		330	
Butylbenzylphthalate	330	UJ	330		330		330	
3,3'-Dichlorobenzidine	1600	UJ	1600	UJ	330	UJ	330	UJ
Benzo(a)anthracene	330	UJ	330		1600		1600	
Chrysene	330	UJ	330		330		330	
bis(2-Ethylhexyl) phthalate	330	UJ	330		330		330	
Di-n-octylphthalate	330	UJ	330	B	240	B	83	B
Benzo(b)fluoranthene	330	UJ	330		330		330	
Benzo(k)fluoranthene	330	UJ	330		330		330	
Benzo(a)pyrene	330	UJ	330		330		330	
Benzo(1,2,3-cd)pyrene	330	UJ	330		330		61	J
Benzo(a,h)anthracene	330	UJ	330		330		330	
Benzo(g,h,i)perylene	330	UJ	330		330		330	

(1) N-Nitrosodiphenylamine can not be distinguished from diphenylamine using the CLP-30W method.

Sample Design FP-212 (SB-01-1)
 Sample Description Upstream Lawiess Creek-
 Sediment (EPA Results)

PESTICIDES/PCB'S

Parameters	Conc.(ug/kg)	Q
alpha-BHC	8	
beta-BHC	8	
delta-BHC	8	
gamma-BHC	8	
Heptachlor	8	
Aldrin	8	
Heptachlor epoxide	8	
Endosulfan I	8	
Dieldrin	16	
4,4'-DDE	16	
Endrin	16	
Endosulfan II	16	
4,4'-DDD	16	
Endosulfan sulfate	16	
4,4'-DDT	16	
Methoxychlor	80	
Endrin ketone	16	
alpha-Chlordane	80	
gamma-Chlordane	80	
Toxaphene	160	
Aroclor-1016	80	
Aroclor-1221	80	
Aroclor-1232	80	
Aroclor-1242	80	
Aroclor-1248	80	
Aroclor-1254	160	
Aroclor-1260	160	

VOLATILE INORGANICS

Parameters	Conc.(ug/kg)	Q
CHLOROMETHANE	10	UJ
BROMOMETHANE	10	
VINYL CHLORIDE	10	
CHLOROETHANE	10	
METHYLENE CHLORIDE	11	8
ACETONE	10	UJ
CARBON DISULFIDE	5	
1,1 - DICHLOROETHENE	5	
1,1 - DICHLOROETHANE	5	
1,2 - DICHLOROETHENE (TOTAL	5	
CHLOROFORM	5	
1,2 - DICHLOROETHANE	5	
2-BUTANONE	10	
1,1,1 - TRICHLOROETHANE	5	
CARBON TETRACHLORIDE	5	
VINYL ACETATE	10	
BROMODICHLOROMETHANE	5	
1,2 - DICHLOROPROPANE	5	
CIS - 1,3 - DICHLOROPROPENE	5	
TRICHLOROETHENE	5	
DIBROMOCHLOROMETHANE	5	
1,1,2 - TRICHLOROETHANE	5	
BENZENE	5	
TRANS - 1,3 - DICHLOROPROPE	5	
BROMOFORM	5	
4 - METHYL - 2 - PENTANONE	10	
2 - HEXANONE	10	UJ
TETRACHLOROETHENE	5	
1,1,2,2 - TETRACHLOROETHANE	5	
TOLUENE	5	
CHLOROBENZENE	5	
ETHYLBENZENE	5	
STYRENE	5	
XYLENE (TOTAL)	5	

AR301159

Sample Design
Sample Description

FP-212 (SD-01-1)
Upstream Lawless Creek-
Sediment (EPA Results)

SEMI-VOLATILE ORGANICS

Parameters	Conc. (ug/kg)	Q
Phenol	330	
bis(2-Chloroethyl) ether	330	
2-Chlorophenol	330	
1,3-Dichlorobenzene	330	
1,4-Dichlorobenzene	330	
Benzyl alcohol	330	
1,2-Dichlorobenzene	330	
2-Methylphenol	330	
bis(2-chloroisopropyl) ether	330	UJ
4-Methylphenol	330	
N-Nitroso-di-n-propylamine	330	
Hexachloroethane	330	
Nitrobenzene	330	
Isophorone	330	
2-Nitrophenol	330	
2,4-Dimethylphenol	330	
Benzoic acid	1600	
bis(2-Chloroethoxy) methane	330	
2,4-Dichlorophenol	330	
1,2,4-Trichlorobenzene	330	
Naphthalene	330	
4-Chloroaniline	330	
Hexachlorobutadiene	330	
4-Chloro-3-methylphenol	330	
2-Methylnaphthalene	330	
Hexachlorocyclopentadiene	330	
2,4,6-Trichlorophenol	330	
2,4,5-Trichlorophenol	1600	
2-Chloronaphthalene	330	
2-Nitroaniline	1600	
Dimethylphthalate	330	
Acenaphthylene	330	
2,6-Dinitrotoluene	330	
3-Nitroaniline	1600	
Acenaphthene	330	
2,4-Dinitrophenol	1600	
4-Nitrophenol	1600	
Dibenzofuran	330	
2,4-Dinitrotoluene	330	
Diethylphthalate	330	
4-Chlorophenyl-phenylether	330	
Fluorene	330	
4-Nitroaniline	1600	
4,6-Dinitro-2-methylphenol	1600	
N-Nitrosodiphenylamine (1)	330	
4-Bromophenyl-phenylether	330	
Hexachlorobenzene	330	
Pentachlorophenol	1600	
Phenanthrene	330	
Anthracene	330	
Di-n-butylphthalate	330	
Fluoranthene	330	
Pyrene	330	
Butylbenzylphthalate	330	UJ
3,3'-Dichlorobenzidine	1600	
Benzo(a)anthracene	330	
Chrysene	330	
bis(2-Ethylhexyl) phthalate	330	
Di-n-octylphthalate	330	
Benzo(b)fluoranthene	330	
Benzo(k)fluoranthene	330	
Benzo(a)pyrene	330	
Indeno(1,2,3-cd)pyrene	330	
Dibenz(a,h)anthracene	330	
Benzo(g,h,i)perylene	330	

(1) N-Nitrosodiphenylamine can not be distinguished from diphenylamine using the GLP-SGK method.

AR301160

Sample Design	FP-306 (SW-04-1)	FP-309 (SW-02-1)	FP-309 (SW-06-1)	FP-311 (SW-03-1)
Sample Description	Southern Quarry Drainage-Aqueous (EPA Results)	Upper Northern Drainage-Aqueous (EPA Results)	Upper Northern Drainage-Duplicate-Aqueous (EPA Results)	Northern Drainage Lawless Creek-Aqueous (EPA Results)

PESTICIDES/PCB'S

Parameters	Conc.(ug/L)	Q	Conc.(ug/L)	Q	Conc.(ug/L)	Q	Conc.(ug/L)	Q
alpha-BHC	0.05		0.05		0.05		0.05	
beta-BHC	0.05		0.05		0.05		0.05	
delta-BHC	0.05		0.05		0.05		0.05	
gamma-BHC	0.05		0.05		0.05		0.05	
Heptachlor	0.05		0.05		0.05		0.05	
Aldrin	0.05		0.05		0.05		0.05	
Heptachlor epoxide	0.05		0.05		0.05		0.05	
Endosulfan I	0.05		0.05		0.05		0.05	
Dieldrin	0.1		0.1		0.1		0.1	
4,4'-DDE	0.1		0.1		0.1		0.1	
Endrin	0.1		0.1		0.1		0.1	
Endosulfan II	0.1		0.1		0.1		0.1	
4,4'-DDD	0.1		0.1		0.1		0.1	
Endosulfan sulfate	0.1		0.1		0.1		0.1	
4,4'-DDT	0.1		0.1		0.1		0.1	
Methoxychlor	0.5		0.5		0.5		0.5	
Endrin ketone	0.1		0.1		0.1		0.1	
alpha-Chlordane	0.5		0.5		0.5		0.5	
gamma-Chlordane	0.5		0.5		0.5		0.5	
Toxaphene	1		1		1		1	
Aroclor-1016	0.5		0.5		0.5		0.5	
Aroclor-1221	0.5		0.5		0.5		0.5	
Aroclor-1232	0.5		0.5		0.5		0.5	
Aroclor-1242	0.5		0.5		0.5		0.5	
Aroclor-1248	0.5		0.5		0.5		0.5	
Aroclor-1254	1		1		1		1	
Aroclor-1260	1		1		1		1	

VOLATILE ORGANICS

Parameters	Conc.(ug/L)	Q	Conc.(ug/L)	Q	Conc.(ug/L)	Q	Conc.(ug/L)	Q
CHLOROMETHANE	10		10		10		10	
BROMOMETHANE	10		10		10		10	
VINYL CHLORIDE	10		10		10		10	
CHLOROETHANE	10		10		10		10	
METHYLENE CHLORIDE	17	B	5		8	B	5	
ACETONE	2	B	10		16	B	1	B
CARBON DISULFIDE	5		5		5		5	
1,1 - DICHLOROETHENE	5		5		5		5	
1,1 - DICHLOROETHANE	5		5		5		5	
1,2 - DICHLOROETHENE (TOTAL)	5		5		5		5	
CHLOROFORM	5		5		5		5	
1,2 - DICHLOROETHANE	5		5		5		5	
2-BUTANONE	10	R	10	R	10	R	10	R
1,1,1 - TRICHLOROETHANE	5		5		5		5	
CARBON TETRACHLORIDE	5		5		5		5	
VINYL ACETATE	10	UJ	10	UJ	10	UJ	10	UJ
BROMODICHLOROMETHANE	5		5		5		5	
1,2 - DICHLOROPROPANE	5		5		5		5	
CIS - 1,3 - DICHLOROPROPENE	5		5		5		5	
TRICHLOROETHENE	5		5		5		5	
DIBROMOCHLOROMETHANE	5		5		5		5	
1,1,2 - TRICHLOROETHANE	5		5		5		5	
BENZENE	5	UL	5	UL	5	UL	5	UL
TRANS - 1,3 - DICHLOROPROPENE	5		5		5		5	
BROMOFORM	5		5		5		5	
4 - METHYL - 2 - PENTANONE	10		10	UJ	10		10	UJ
2 - HEXANONE	10		10	UJ	10		10	UJ
TETRACHLOROETHENE	5		5		5		5	
1,1,2,2 - TETRACHLOROETHANE	5		5	UJ	5		5	UJ
TOLUENE	5	UL	5	UL	5	UL	5	UL
CHLOROBENZENE	5	UL	5	UL	5	UL	5	UL
ETHYLBENZENE	5	UL	5	UL	5	UL	5	UL
STYRENE	5	UL	5	UL	5	UL	5	UL
XYLENE (TOTAL)	5	UL	5	UL	5	UL	5	UL

AR301161

Sample Design	FP-306 (SW-04-1)	FP-309 (SW-02-1)	FP-309 (SW-06-1)	FP-311 (SW-03-1)
Sample Description	Southern Quarry Drainage-Aqueous (EPA Results)	Upper Northern Drainage-Aqueous (EPA Results)	Upper Northern Drainage-Duplicate-Aqueous (EPA Results)	Northern Drainage Lawless Creek-Aqueous (EPA Results)

SEMI-VOLATILE ORGANICS

Parameters	Conc.(ug/L)	Q	Conc.(ug/L)	Q	Conc.(ug/L)	Q	Conc.(ug/L)	Q
Phenol	10	R	10	UJ	10		10	
bis(2-Chloroethyl) ether	10	UJ	10	UJ	10		10	
2-Chlorophenol	10	R	10	UJ	10		10	
1,3-Dichlorobenzene	10	UJ	10	UJ	10		10	
1,4-Dichlorobenzene	10	UJ	10	UJ	10		10	
Benzyl alcohol	10	UJ	10	UJ	10		10	
1,2-Dichlorobenzene	10	UJ	10	UJ	10		10	
2-Methylphenol	10	R	10	UJ	10		10	
bis(2-chloroisopropyl) ether	10	UJ	10	UJ	10	UJ	10	UJ
4-Methylphenol	10	R	10	UJ	10		10	
N-Nitroso-di-n-propylamine	10	UJ	10	UJ	10		10	
Hexachloroethane	10	UJ	10	UJ	10		10	
Nitrobenzene	10	UJ	10	UJ	10		10	
Isophorone	10	UJ	10	UJ	10		10	
2-Nitrophenol	10	R	10	UJ	10		10	
2,4-Dimethylphenol	10	R	10	UJ	10		10	
Benzoic acid	50	R	50	UJ	50		50	
bis(2-Chloroethoxy) methane	10	UJ	10	UJ	10		10	
2,4-Dichlorophenol	10	R	10	UJ	10		10	
1,2,4-Trichlorobenzene	10	UJ	10	UJ	10		10	
Naphthalene	10	UJ	10	UJ	10		10	
4-Chloroaniline	10	UJ	10	UJ	10		10	
Hexachlorobutadiene	10	UJ	10	UJ	10		10	
4-Chloro-3-methylphenol	10	R	10	UJ	10		10	
2-Methylnaphthalene	10	UJ	10	UJ	10		10	
Hexachlorocyclopentadiene	10	UJ	10	UJ	10		10	
2,4,6-Trichlorophenol	10	R	10	UJ	10		10	
2,4,5-Trichlorophenol	50	R	50	UJ	50		50	
2-Chloronaphthalene	10	UJ	10	UJ	10		10	
2-Nitroaniline	50	UJ	50	UJ	50		50	
Dimethylphthalate	10	UJ	10	UJ	10		10	
1-Naphthylene	10	UJ	10	UJ	10		10	
2,6-Dinitrotoluene	10	UJ	10	UJ	10		10	
3-Nitroaniline	50	UJ	50	UJ	50		50	
Acenaphthene	10	UJ	10	UJ	10		10	
2,4-Dinitrophenol	50	R	50	UJ	50		50	
4-Nitrophenol	50	R	50	UJ	50		50	
Dibenzofuran	10	UJ	10	UJ	10		10	
2,4-Dinitrotoluene	10	UJ	10	UJ	10		10	
Diethylphthalate	10	UJ	10	UJ	10		10	
4-Chlorophenyl-phenylether	10	UJ	10	UJ	10		10	
Fluorene	10	UJ	10	UJ	10		10	
4-Nitroaniline	50	UJ	50	UJ	50		50	
4,6-Dinitro-2-methylphenol	50	R	50	UJ	50		50	
N-Nitrosodiphenylamine (1)	10	UJ	10	UJ	92		10	
4-Bromophenyl-phenylether	10	UJ	10	UJ	10	UJ	10	UJ
Hexachlorobenzene	10	UJ	10	UJ	10	UJ	10	UJ
Pentachlorophenol	50	R	50	UJ	50		50	
Phenanthrene	10	UJ	10	UJ	10		10	
Anthracene	10	UJ	10	UJ	10		10	
Di-n-butylphthalate	10	UJ	10	UJ	10		10	
Fluoranthene	10	UJ	10	UJ	10		10	
Pyrene	10	UJ	10	UJ	10		10	
Butylbenzylphthalate	10	UJ	10	UJ	10		10	
3,3'-Dichlorobenzidine	20	UJ	20	UJ	20		20	
Benzo(a)anthracene	10	UJ	10	UJ	10		10	
Chrysene	10	UJ	10	UJ	10		10	
bis(2-Ethylhexyl) phthalate	10	UJ	7	8	11	8	10	UJ
Di-n-octylphthalate	10	UJ	10	UJ	10		10	
Benzo(b)fluoranthene	10	UJ	10	UJ	10		10	
Benzo(k)fluoranthene	10	UJ	10	UJ	10		10	
Benzo(a)pyrene	10	UJ	10	UJ	10		10	
Indeno(1,2,3-cd)pyrene	10	UJ	10	UJ	10		10	
Dibenz(a,h)anthracene	10	UJ	10	UJ	10		10	
Benzo(g,h,i)perylene	10	UJ	10	UJ	10		10	

(1) N-Nitrosodiphenylamine can not be distinguished from diphenylamine using the CLP-50W method. AR301162

Sample Design FP-312 (SW-01-1)
 Sample Description Upstream Lawless Creek-
 Solid Aqueous (EPA Results)

PESTICIDES/PCB'S

Parameters	Conc.(ug/L)	Q
alpha-BHC	0.05	
beta-BHC	0.05	
delta-BHC	0.05	
gamma-BHC	0.05	
Heptachlor	0.05	
Aldrin	0.05	
Heptachlor epoxide	0.05	
Endosulfan I	0.05	
Dieldrin	0.1	
4,4'-DDE	0.1	
Endrin	0.1	
Endosulfan II	0.1	
4,4'-DDD	0.1	
Endosulfan sulfate	0.1	
4,4'-DDT	0.1	
Methoxychlor	0.5	
Endrin ketone	0.1	
alpha-Chlordane	0.5	
gamma-Chlordane	0.5	
Toxaphene	1	
Aroclor-1016	0.5	
Aroclor-1221	0.5	
Aroclor-1232	0.5	
Aroclor-1242	0.5	
Aroclor-1248	0.5	
Aroclor-1254	1	
Aroclor-1260	1	

VOLATILE ORGANICS

Parameters	Conc.(ug/L)	Q
CHLOROMETHANE	10	
BROMOMETHANE	10	
VINYL CHLORIDE	10	
CHLOROETHANE	10	
METHYLENE CHLORIDE	5	
ACETONE	13	
CARBON DISULFIDE	5	
1,1 - DICHLOROETHENE	5	
1,1 - DICHLOROETHANE	5	
1,2 - DICHLOROETHENE (TOTAL)	5	
CHLOROFORM	5	
1,2 - DICHLOROETHANE	5	
2-BUTANONE	10	R
1,1,1 - TRICHLOROETHANE	5	
CARBON TETRACHLORIDE	5	
VINYL ACETATE	10	UJ
BROMODICHLOROMETHANE	5	
1,2 - DICHLOROPROPANE	5	
CIS - 1,3 - DICHLOROPROPENE	5	
TRICHLOROETHENE	5	
DIBROMOCHLOROMETHANE	5	
1,1,2 - TRICHLOROETHANE	5	
BENZENE	5	UL
TRANS - 1,3 - DICHLOROPROPENE	5	
BROMOFORM	5	
4 - METHYL - 2 - PENTANONE	10	UJ
2 - HEXANONE	10	UJ
TETRACHLOROETHENE	5	
1,1,2,2 - TETRACHLOROETHANE	5	UJ
TOLUENE	5	UL
CHLOROENZENE	5	UL
ETHYLBENZENE	5	UL
STYRENE	5	UL
XYLENE (TOTAL)	5	UL

AR301163

Sample Design
Sample Description

FP-512 (SW-01-1)
Upstream Lawless Creek
Aqueous (EPA Results)

SEMI-VOLATILE ORGANICS

Parameters	Conc. (ug/L)	Q
Phenol	10	
bis(2-Chloroethyl) ether	10	
2-Chlorophenol	10	
1,3-Dichlorobenzene	10	
1,4-Dichlorobenzene	10	
Benzyl alcohol	10	
1,2-Dichlorobenzene	10	
2-Methylphenol	10	
bis(2-chloroisopropyl)ether	10	UJ
4-Methylphenol	10	
N-Nitroso-di-n-propylamine	10	
Hexachloroethane	10	
Nitrobenzene	10	
Isophorone	10	
2-Nitrophenol	10	
2,4-Dimethylphenol	10	
Benzoic acid	50	
bis(2-Chloroethoxy) methane	10	
2,4-Dichlorophenol	10	
1,2,4-Trichlorobenzene	10	
Naphthalene	10	
4-Chloroaniline	10	
Hexachlorobutadiene	10	
4-Chloro-3-methylphenol	10	
2-Methylnaphthalene	10	
Hexachlorocyclopentadiene	10	
2,4,6-Trichlorophenol	10	
2,4,5-Trichlorophenol	50	
2-Chloronaphthalene	10	
2-Nitroaniline	50	
Dimethylphthalate	10	
Benaphthylene	10	
1,3-Dinitrotoluene	10	
3-Nitroaniline	50	
Acenaphthene	10	
2,4-Dinitrophenol	50	
4-Nitrophenol	50	
Dibenzofuran	10	
2,4-Dinitrotoluene	10	
Diethylphthalate	10	
4-Chlorophenyl-phenylether	10	
Fluorene	10	
4-Nitroaniline	50	
4,6-Dinitro-2-methylphenol	10	
N-Nitrosodiphenylamine (1)	10	
4-Bromophenyl-phenylether	10	UJ
Hexachlorobenzene	10	UJ
Pentachlorophenol	50	
Phenanthrene	10	
Anthracene	10	
Di-n-butylphthalate	10	
Fluoranthene	10	
Pyrene	10	
Butylbenzylphthalate	10	
3,3'-Dichlorobenzidine	20	
Benzo(a)anthracene	10	
Chrysene	10	
bis(2-Ethylhexyl) phthalate	5	UJ
Di-n-octylphthalate	10	
Benzo(b)fluoranthene	10	
Benzo(k)fluoranthene	10	
Benzo(a)pyrene	10	
Indeno(1,2,3-cd)pyrene	10	
Dibenz(a,h)anthracene	10	
Benzo(g,h,i)perylene	10	

(1) N-Nitrosodiphenylamine can not be distinguished from diphenylamine using the CLP-SDM method.

AR301164

Sample Design
Sample Description

FP-7026
Test Pit-Aqueous
(First Round Sample)

FP-7026 (TP-01)
Test Pit-Aqueous
(EPA Results)

FP-7026 (IP-02)
Test Pit-Aqueous
Duplicate Sample
(EPA Results)

PESTICIDES/PCB S

Parameters	Conc.(ug/L)	Q	Conc.(ug/L)	Q	Conc.(ug/L)	Q
alpha-BHC	0.05	U	0.05		0.05	
beta-BHC	0.05	U	0.05		0.05	
delta-BHC	0.05	U	0.05		0.05	
gamma-BHC	0.05	U	0.05		0.05	
Heptachlor	0.05	U	0.05		0.05	
Aldrin	0.05	U	0.05		0.05	
Heptachlor epoxide	0.05	U	0.05		0.05	
Endosulfan I	0.05	U	0.05		0.05	
Dieldrin	0.1	U	0.1		0.1	
4,4'-DDE	0.1	U	0.1		0.1	
Endrin	0.1	U	0.1		0.1	
Endosulfan II	0.1	U	0.1		0.1	
4,4'-DDD	0.1	U	0.1		0.1	
Endosulfan sulfate	0.1	U	0.1		0.1	
4,4'-DDT	0.1	U	0.1		0.1	
Methoxychlor	0.5	U	0.5		0.5	
Endrin ketone	0.1	U	0.1		0.1	
alpha-Chlordane	0.5	U	0.5		0.5	
gamma-Chlordane	0.5	U	0.5		0.5	
Toxaphene	1	U	1		1	
Aroclor-1016	0.5	U	0.5		0.5	
Aroclor-1221	0.5	U	0.5		0.5	
Aroclor-1232	0.5	U	0.5		0.5	
Aroclor-1242	0.5	U	0.5		0.5	
Aroclor-1248	0.5	U	0.5		0.5	
Aroclor-1254	1	U	1		1	
Aroclor-1260	1	U	1		1	

VOLATILE ORGANICS

Parameters	Conc.(ug/kg)	Q	Conc.(ug/kg)	Q	Conc.(ug/kg)	Q
CHLOROMETHANE	10	U	10	UL	10	UL
BROMOMETHANE	10	U	10	UL	10	UL
VINYL CHLORIDE	10	U	10	UL	10	UL
CHLOROETHANE	10	U	10	UL	10	UL
METHYLENE CHLORIDE	5	U	6	S	5	UL
ACETONE	8	BJ	28	S	10	UL
CARBON DISULFIDE	5	U	5	UL	5	UL
1,1 - DICHLOROETHENE	5	U	5	UL	5	UL
1,1 - DICHLOROETHANE	5	U	5	UL	5	UL
1,2 - DICHLOROETHENE (TOTAL)	5	U	5	UL	5	UL
CHLOROFORM	5	U	1	S	5	UL
1,2 - DICHLOROETHANE	5	U	5	UL	5	UL
2-BUTANONE	10	U	10	UL	10	UL
1,1,1 - TRICHLOROETHANE	5	U	5	UL	5	UL
CARBON TETRACHLORIDE	5	U	5	UL	5	UL
VINYL ACETATE	10	U	10	UL	10	UL
BROMODICHLOROMETHANE	5	U	5	UL	5	UL
1,2 - DICHLOROPROPANE	5	U	5	UL	5	UL
CIS - 1,3 - DICHLOROPROPENE	5	U	5	UL	5	UL
TRICHLOROETHENE	5	U	5	UL	5	UL
DIBROMOCHLOROMETHANE	5	U	5	UL	5	UL
1,1,2 - TRICHLOROETHANE	5	U	5	UL	5	UL
BENZENE	13		1	S	5	UL
TRANS-1,3-DICHLOROPROPENE	5	U	5	UL	5	UL
BROMOFORM	5	U	5	UL	5	UL
4 - METHYL - 2 - PENTANONE	10		10	UL	10	UL
2 - HEXANONE	10	U	10	UL	10	UL
TETRACHLOROETHENE	5	U	5	UL	5	UL
1,1,2,2 - TETRACHLOROETHANE	5	U	5	UL	5	UL
TOLUENE	5	J	5	UL	5	UL
CHLOROBENZENE	5	U	5	UL	5	UL
ETHYLBENZENE	5	U	5	UL	5	UL
STYRENE	5	U	5	UL	5	UL
XYLENE (TOTAL)	15		5	UL	5	UL

AR301165

Sample Design	FP-7025	FP-7025 (IP-01)	FP-7025 (IP-02)			
Sample Description	Test Pit-Aqueous (First Round Sample)	Test Pit-Aqueous (EPA Results)	Test Pit-Aqueous Duplicate Sample (EPA Results)			
SEMI-VOLATILE ORGANICS						
Parameters	Conc. (ug/L)	Q	Conc. (ug/L)	Q	Conc. (ug/kg)	Q
Phenol	10	U	10		10	
bis(2-Chloroethyl) ether	10	U	10		10	
2-Chlorophenol	10	U	10		10	
1,3-Dichlorobenzene	10	U	10		10	
1,4-Dichlorobenzene	10	U	10		10	
Benzyl alcohol	10	U	10	UJ	10	
1,2-Dichlorobenzene	10	U	10		10	
2-Methylphenol	10	U	10		10	
bis(2-chloroisopropyl) ether	10	U	10	UJ	10	UJ
4-Methylphenol	10	U	10		10	
N-Nitroso-di-n-propylamine	10	U	10		10	
Hexachloroethane	10	U	10		10	
Nitrobenzene	10	U	10		10	
Isophorone	10	U	10		10	
2-Nitrophenol	10	U	10		10	
2,4-Dimethylphenol	10	U	10		10	
Benzoic acid	50	U	50		50	
bis(2-Chloroethoxy) methane	10	U	10		10	
2,4-Dichlorophenol	10	U	10		10	
1,2,4-Trichlorobenzene	10	U	10		10	
Naphthalene	10	U	10		10	
4-Chloroaniline	10	U	10		10	
Hexachlorobutadiene	10	U	10		10	
4-Chloro-3-methylphenol	10	U	10		10	
2-Methylnaphthalene	10	U	10		10	
Hexachlorocyclopentadiene	10	U	10		10	
2,4,6-Trichlorophenol	10	U	10		10	
2,4,5-Trichlorophenol	50	U	50		50	
2-Chloronaphthalene	10	U	10		10	
2-Nitroaniline	50	U	50		50	
Dimethylphthalate	10	U	10		10	
Acenaphthylene	10	U	10		10	
2,6-Dinitrotoluene	10	U	10		10	
3-Nitroaniline	50	U	50		50	
Acenaphthene	10	U	10		10	
2,4-Dinitrophenol	50	U	50		50	UJ
4-Nitrophenol	50	U	50		50	
Dibenzofuran	10	U	10		10	
2,4-Dinitrotoluene	10	U	10		10	
Diethylphthalate	10	U	10		10	
4-Chlorophenyl-phenylether	10	U	10		10	
Fluorene	10	U	10		10	
4-Nitroaniline	50	U	50		50	UJ
4,6-Dinitro-2-methylphenol	50	U	50		50	
N-Nitrosodiphenylamine (1)	120	U	310		300	J
4-Bromophenyl-phenylether	10	U	10		10	
Hexachlorobenzene	10	U	10		10	
Pentachlorophenol	50	U	50		50	
Phenanthrene	10	U	10		10	
Anthracene	10	U	10		10	
Di-n-butylphthalate	10	U	10		10	
Fluoranthene	10	U	10		10	
Pyrene	10	U	10		10	UJ
Butylbenzylphthalate	10	U	10	UJ	10	UJ
3,3'-Dichlorobenzidine	20	U	20		20	UJ
Benzo(a)anthracene	10	U	10		10	
Chrysene	10	U	10		10	
bis(2-Ethylhexyl) phthalate	10	U	31	B	5	B
Di-n-octylphthalate	10	U	10		10	
Benzo(b)fluoranthene	10	U	10		10	
Benzo(k)fluoranthene	10	U	10		10	UJ
Benzo(a)pyrene	10	U	10		10	
Indeno(1,2,3-cd)pyrene	10	U	10		10	
Dibenz(a,h)anthracene	10	U	10		10	UJ
Benzo(g,h,i)perylene	10	U	10		10	

(1) N-Nitrosodiphenylamine cannot be distinguished from diphenylamine using the SLA-SDW method.

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TABLE 25

MOST STRINGENT GROUND-WATER AND SURFACE WATER ARARS

AR301167

TABLE 25

Most Stringent Ground Water and Surface Water ARARs

Compound	Ground Water ARAR (mg/l)	Surface Water ARAR (mg/l)
Barium	1	1
Arsenic	0.05	0.000022
Zinc	0.05	0.047
Nickel	--	1.3×10^{-10}
Cadmium	0.0004	0.0011
Lead	0.05	0.0032
Antimony	--	0.15
Copper	1.0	0.012
Mercury	0.00005	0.000012
Vanadium	--	--
Selenium	0.01	0.01
Benzene	0.005	0.00066

These ARARs consist of the most stringent values from the Federal Safe Drinking Water Act/RCRA values, Clean Water Act's Water Quality Criteria and Virginia Water Quality Standards.

See Appendix N for a complete listing of ARARs.

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TABLE 26

COMPARISON OF GROUND-WATER DATA TO ARARS

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TABLE 26

COMPARISON OF GROUND WATER DATA TO ARARS

Location	Aluminum	Antimony	Arsenic	Barium
FP-001A(TOT)	16,900.	0.	0.	140.
FP-001B(TOT)	405.	0.	0.	5.9
FP-002(TOT)	789.	0.	0.	0.
FP-001A(DIS)	0.	0.	0.	134.
FP-001B(DIS)	102.	0.	0.	106.
FP-002(DIS)	179.	0.	0.	136.
FP-003A(TOT)	4,250.	0.	0.	24.4
FP-003B(TOT)	0.	0.	0.	2.3
FP-004(TOT)	548.	0.	0.	12.5
FP-003A(DIS)	0.	2.4	0.	97.1
FP-003B(DIS)	69.	0.	0.	150.
FP-004(DIS)	162.	0.	0.	169.
FP-005A(TOT)	1,480.	0.	0.	3.2
FP-005B(TOT)	193.	0.	0.	0.
FP-006A(TOT)	14,500.	0.	0.	114.
FP-005A(DIS)	264.	0.	0.	69.7
FP-005B(DIS)	62.	0.	0.	127.
FP-006A(DIS)	0.	0.	0.	104.
FP-006B(TOT)	1,590.	0.	0.	108.
FP-007A(TOT)	4410.	0.	0.	30.2
FP-007B(TOT)	231.	0.	0.	4.
FP-006B(DIS)	72.8	0.	0.	158.
FP-007A(DIS)	0.	0.	0.	161.
FP-007B(DIS)	153.	0.	0.	161.
FP-008A(TOT)	63,100.	0.	0.	350.
FP-008B(TOT)	1,230.	0.	0.	35.
FP-009A(TOT)	5,500.	0.	0.	31.1
FP-008A(DIS)	67.9	0.	0.	104.
FP-008B(DIS)	0.	0.	0.	147.
FP-009A(DIS)	76.3	0.	0.	77.5
TOTAL	116,334.00	2.40	0.00	2,756.00
NUMBER	24	1	0	28
AVERAGE	4,847.3	2.4	0	98.4
ARAR	50	--	50	1000

Values above background (i.e., Background values are illustrated in FP-001A, FP-001B, and FP-002) and above their most stringent ARAR are indicated in Bold Print.

All data in $\mu\text{g/L}$.

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TABLE 26 (Continued)
COMPARISON OF GROUND WATER DATA TO ARARS

LOCATION	BERYLLIUM	CADMIUM	CALCIUM
FP-001A(TOT)	0.	0.	22,000.
FP-001B(TOT)	0.	0.	20,800.
FP-002(TOT)	0.	0.	16,200.
FP-001A(DIS)	0.	0.	21,500.
FP-001B(DIS)	0.	0.	22,400.
FP-002(DIS)	0.	0.	18,300.
FP-003A(TOT)	0.	0.	594.
FP-003B(TOT)	0.	0.	30,900.
FP-004(TOT)	0.	0.	19,800.
FP-003A(DIS)	0.	0.	900.
FP-003B(DIS)	0.	0.	34,700.
FP-004(DIS)	0.	0.	22,000.
FP-005A(TOT)	0.	0.	30,000.
FP-005B(TOT)	0.	0.	16,800.
FP-006A(TOT)	0.	0.	5,870.
FP-005A(DIS)	0.	0.	34,200.
FP-005B(DIS)	0.	0.	18,100.
FP-006A(DIS)	0.	0.	6,260.
FP-006B(TOT)	0.	5.9	49,100.
FP-007A(TOT)	0.	0.	9,210.
FP-007B(TOT)	0.	0.	32,600.
FP-006B(DIS)	0.	0.	55,000.
FP-007A(DIS)	0.	0.	10,700.
FP-007B(DIS)	0.	0.	37,200.
FP-008A(TOT)	22.	10.	31,500.
FP-008B(TOT)	0.	0.	35,300.
FP-009A(TOT)	0.	0.	623.
FP-008A(DIS)	0.	0.	27,800.
FP-008B(DIS)	0.	0.	37,600.
FP-009A(DIS)	0.	0.	844.
TOTAL	22.00	15.90	668,801.00
NUMBER	1	2	30
AVERAGE	22.0	7.95	22,293
ARAR		0.4	120,000

Values above background (i.e., Background values are illustrated in FP-001A, FP-001B, and FP-002) and above their most stringent ARAR are indicated in Bold Print.

All data in $\mu\text{g/L}$.

AR301171

TABLE 26 (Continued)
COMPARISON OF GROUND WATER DATA TO ARARS

LOCATION	CHROMIUM	COBALT	COPPER
FP-001A(TOT)	141.	0.	57.9
FP-001B(TOT)	30.2	0.	9.2
FP-002(TOT)	0.	0.	13.8
FP-001A(DIS)	23.6	0.	13.9
FP-001B(DIS)	32.3	0.	8.4
FP-002(DIS)	0.	0.	0.
FP-003A(TOT)	0.	0.	19.
FP-003B(TOT)	0.	0.	0.
FP-004(TOT)	0.	0.	16.9
FP-003A(DIS)	0.	0.	0.
FP-003B(DIS)	0.	0.	0.
FP-004(DIS)	0.	0.	15.8
FP-005A(TOT)	0.	0.	7.1
FP-005B(TOT)	0.	27.9	0.
FP-006A(TOT)	13.6	0.	27.2
FP-005A(DIS)	0.	0.	0.
FP-005B(DIS)	0.	0.	0.
FP-006A(DIS)	0.	0.	0.
FP-006B(TOT)	0.	35.9	11.4
FP-007A(TOT)	0.	0.	25.8
FP-007B(TOT)	0.	0.	0.
FP-006B(DIS)	0.	0.	0.
FP-007A(DIS)	0.	0.	0.
FP-007B(DIS)	0.	0.	0.
FP-008A(TOT)	30.	26.2	51.6
FP-008B(TOT)	0.	0.	11.2
FP-009A(TOT)	0.	0.	17.5
FP-008A(DIS)	0.	0.	0.
FP-008B(DIS)	0.	0.	0.
FP-009A(DIS)	0.	0.	8.6
TOTAL	270.70	90.00	315.30
NUMBER	6	3	16
AVERAGE	45.1	30.0	19.7
ARAR	50.0	--	1,000

Values above background (i.e., Background values are illustrated in FP-001A, FP-001B, and FP-002) and above their most stringent ARAR are indicated in Bold Print.

All data in $\mu\text{g/L}$.

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TABLE 26 (Continued)

COMPARISON OF GROUND WATER DATA TO ARARS

LOCATION	IRON	LEAD	MAGNESIUM
FP-001A(TOT)	20,100.	2.3	21,600.
FP-001B(TOT)	412.	0.	9,160.
FP-002(TOT)	1,020.	1.3	8,730.
FP-001A(DIS)	0.	0.	17,600.
FP-001B(DIS)	22.8	0.	10,500.
FP-002(DIS)	25.5	0.	10,800.
FP-003A(TOT)	6,330.	8.2	403.
FP-003B(TOT)	181.	0.	11,900.
FP-004(TOT)	1,060.	7.2	11,900.
FP-003A(DIS)	0.	0.	388.
FP-003B(DIS)	74.1	0.	14,200.
FP-004(DIS)	13.1	0.	14,400.
FP-005A(TOT)	2,290.	1.9	8,950.
FP-005B(TOT)	432.	0.	3,620.
FP-006A(TOT)	15,100.	14.3	4,130.
FP-005A(DIS)	16.3	0.	11,000.
FP-005B(DIS)	27.5	0.	4,410.
FP-006A(DIS)	11.7	0.	2,290.
FP-006B(TOT)	2,430.	3.	7,880.
FP-007A(TOT)	4,140.	2.1	3,650.
FP-007B(TOT)	425.	0.	9,800.
FP-006B(DIS)	12.2	0.	8,370.
FP-007A(DIS)	38.2	0.	4,490.
FP-007B(DIS)	17.	0.	12,000.
FP-008A(TOT)	50,900.	28.8	7,950.
FP-008B(TOT)	1,230.	2.2	10,300.
FP-009A(TOT)	8,600.	10.2	421.
FP-008A(DIS)	29.4	0.	6,000.
FP-008B(DIS)	8.3	0.	11,600.
FP-009A(DIS)	9.5	0.	353.
TOTAL	114,955.60	81.50	248,795.00
NUMBER	28	11	30
AVERAGE	4,105.6	7.41	8,293.17
ARAR	300	50.0	--

Values above background (i.e., Background values are illustrated in FP-001A, FP-001B, and FP-002) and above their most stringent ARAR are indicated in Bold Print.

All data in $\mu\text{g/L}$.

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TABLE 26 (Continued)

COMPARISON OF GROUND WATER DATA TO ARARS

LOCATION	MANGANESE	MERCURY	NICKEL
FP-001A(TOT)	282.	0.	193.
FP-001B(TOT)	10.4	0.	0.
FP-002(TOT)	67.7	0.	0.
FP-001A(DIS)	13.2	0.	0.
FP-001B(DIS)	7.6	0.	0.
FP-002(DIS)	26.9	0.	0.
FP-003A(TOT)	142.	0.	0.
FP-003B(TOT)	244.	0.	0.
FP-004(TOT)	147.	0.	0.
FP-003A(DIS)	47.4	0.	0.
FP-003B(DIS)	286.	0.	0.
FP-004(DIS)	54.5	0.	0.
FP-005A(TOT)	97.5	0.	0.
FP-005B(TOT)	48.4	0.	0.
FP-006A(TOT)	438.	0.	0.
FP-005A(DIS)	41.5	0.	0.
FP-005B(DIS)	5.8	0.	0.
FP-006A(DIS)	28.3	0.	0.
FP-006B(TOT)	215.	0.	0.
FP-007A(TOT)	4,000.	0.	0.
FP-007B(TOT)	358.	0.	0.
FP-006B(DIS)	170.	0.	0.
FP-007A(DIS)	4,600.	0.	0.
FP-007B(DIS)	200.	0.	0.
FP-008A(TOT)	6,350.	0.57	0.
FP-008B(TOT)	407.	0.	0.
FP-009A(TOT)	176.	0.	0.
FP-008A(DIS)	1,260.	0.	0.
FP-008B(DIS)	420.	0.	0.
FP-009A(DIS)	34.1	0.	0.
TOTAL	20,178.30	0.57	193.00
NUMBER	30	1	1
AVERAGE	672.6	0.57	193.0
ARAR	50.0	0.05	--

Values above background (i.e., Background values are illustrated in FP-001A, FP-001B, and FP-002) and above their most stringent ARAR are indicated in Bold Print.

All data in $\mu\text{g/L}$.

AR301174

TABLE 26 (Continued)
COMPARISON OF GROUND WATER DATA TO ARARS

LOCATION	POTASSIUM	SELENIUM	SILVER
FP-001A(TOT)	1,180.	0.	0.
FP-001B(TOT)	3,020.	0.	0.
FP-002(TOT)	1,680.	0.	0.
FP-001A(DIS)	0.	0.	0.
FP-001B(DIS)	3,410.	0.	0.
FP-002(DIS)	1,350.	0.	0.
FP-003A(TOT)	2,430.	0.	0.
FP-003B(TOT)	1,220.	0.	0.
FP-004(TOT)	2,300.	0.	0.
FP-003A(DIS)	2,120.	0.	0.
FP-003B(DIS)	1,350.	0.	0.
FP-004(DIS)	2,070.	0.	0.
FP-005A(TOT)	2,070.	0.	0.
FP-005B(TOT)	6,870.	0.	0.
FP-006A(TOT)	4,440.	0.	0.
FP-005A(DIS)	1,420.	0.	0.
FP-005B(DIS)	6,860.	0.	0.
FP-006A(DIS)	2,470.	0.	0.
FP-006B(TOT)	8,890.	0.	0.
FP-007A(TOT)	5,290.	0.	0.
FP-007B(TOT)	2,860.	0.	0.
FP-006B(DIS)	5,070.	0.	0.
FP-007A(DIS)	4,410.	0.	0.
FP-007B(DIS)	2,220.	0.	0.
FP-008A(TOT)	6,120.	0.	0.
FP-008B(TOT)	1,870.	0.	0.
FP-009A(TOT)	3,390.	0.	0.
FP-008A(DIS)	3,780.	0.	0.
FP-008B(DIS)	1,280.	0.	0.
FP-009A(DIS)	2,140.	0.	0.
TOTAL	93,580.00	0.00	0.00
NUMBER	29	0	0
AVERAGE	3,226.9	0	0
ARAR		10.0	50.0

Values above background (i.e., Background values are illustrated in FP-001A, FP-001B, and FP-002) and above their most stringent ARAR are indicated in Bold Print.

All data in µg/L.

TABLE 26 (Continued)

COMPARISON OF GROUND WATER DATA TO ARARS

LOCATION	SODIUM	THALLIUM	VANADIUM
FP-001A(TOT)	4,640.	0.	0.
FP-001B(TOT)	16,300.	0.	0.
FP-002(TOT)	11,500.	0.	0.
FP-001A(DIS)	8,500.	0.	0.
FP-001B(DIS)	24,000.	0.	0.
FP-002(DIS)	17,000.	0.	0.
FP-003A(TOT)	32,300.	0.	0.
FP-003B(TOT)	9,020.	0.	0.
FP-004(TOT)	8,010.	0.	0.
FP-003A(DIS)	44,000.	0.	0.
FP-003B(DIS)	15,200.	0.	0.
FP-004(DIS)	14,500.	0.	0.
FP-005A(TOT)	9,660.	0.	0.
FP-005B(TOT)	12,300.	0.	0.
FP-006A(TOT)	8,940.	0.	0.
FP-005A(DIS)	15,000.	0.	0.
FP-005B(DIS)	18,700.	0.	0.
FP-006A(DIS)	14,300.	0.	0.
FP-006B(TOT)	12,500.	0.	0.
FP-007A(TOT)	19,800.	0.	0.
FP-007B(TOT)	27,100.	0.	0.
FP-006B(DIS)	17,000.	0.	0.
FP-007A(DIS)	27,600.	0.	0.
FP-007B(DIS)	34,300.	0.	0.
FP-008A(TOT)	11,500.	0.	50.1
FP-008B(TOT)	9,860.	0.	0.
FP-009A(TOT)	33,100.	0.	0.
FP-008A(DIS)	17,500.	0.	0.
FP-008B(DIS)	14,200.	0.	0.
FP-009A(DIS)	41,600.	0.	0.
TOTAL	549,930.00	0.00	50.10
NUMBER	30	0	1
AVERAGE	18,331.0	0	50.1
ARAR	25,000	--	--

Values above background (i.e., Background values are illustrated in FP-001A, FP-001B, and FP-002) and above their most stringent ARAR are indicated in Bold Print.

All data in $\mu\text{g/L}$.

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TABLE 26 (Continued)
COMPARISON OF GROUND WATER DATA TO ARARS

LOCATION	ZINC	CYANIDE
FP-001A(TOT)	32.3	0.
FP-001B(TOT)	61.3	0.
FP-002(TOT)	16.6	0.
FP-001A(DIS)	88.3	0.
FP-001B(DIS)	10.7	0.
FP-002(DIS)	123.	0.
FP-003A(TOT)	20.2	0.
FP-003B(TOT)	21.7	0.
FP-004(TOT)	40.1	0.
FP-003A(DIS)	183.	0.
FP-003B(DIS)	0.	0.
FP-004(DIS)	0.	0.
FP-005A(TOT)	20.3	0.
FP-005B(TOT)	50.8	0.
FP-006A(TOT)	55.2	0.
FP-005A(DIS)	18.6	0.
FP-005B(DIS)	0.	0.
FP-006A(DIS)	121.	0.
FP-006B(TOT)	504.	0.
FP-007A(TOT)	22.1	0.
FP-007B(TOT)	57.7	0.
FP-006B(DIS)	402.	0.
FP-007A(DIS)	130.	0.
FP-007B(DIS)	133.	0.
FP-008A(TOT)	2,050.	0.
FP-008B(TOT)	213.	0.
FP-009A(TOT)	21.5	0.
FP-008A(DIS)	529.	0.
FP-008B(DIS)	0.	0.
FP-009A(DIS)	142.	0.
TOTAL	5,067.40	0.00
NUMBER	26	0
AVERAGE	194.9	0
ARAR	50.0	5.0

Values above background (i.e., Background values are illustrated in FP-001A, FP-001B, and FP-002) and above their most stringent ARAR are indicated in Bold Print.

All data in $\mu\text{g/L}$.

AR301177

TABLE 26 (Continued)

COMPARISON OF SURFACE WATER DATA TO ARARS

LOCATION	ALUMINUM	ANTIMONY	ARSENIC
FP-303	316.	0.	0.
FP-306	5,310.	0.	0.
FP-308	167.	0.	0.
FP-309	0.	2.6	13.7
FP-311	357.	0.	0.
FP-312	97.2	0.	0.
FP-313	118.	0.	0.
FP-314	118.	0.	0.
FP-319 (Dup. of FP-306)	5,230.	0.	0.
TOTAL	11,713.20	2.60	13.70
NUMBER	8	1	1
AVERAGE	1,464.2	2.6	13.7
ARAR	50.0	150	0.0022

Values above background (i.e., Background values are illustrated in FP-303 and FP-312) and above their most stringent ARAR are indicated in Bold Print.

All data in $\mu\text{g/L}$.

AR301178

TABLE 27
COMPARISON OF SURFACE WATER DATA TO ARARS

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TABLE 27
COMPARISON OF SURFACE WATER DATA TO ARARS

LOCATION	ALUMINUM	ANTIMONY	ARSENIC
FP-303	316.	0.	0.
FP-306	5,310.	0.	0.
FP-308	167.	0.	0.
FP-309	0.	2.6	13.7
FP-311	357.	0.	0.
FP-312	97.2	0.	0.
FP-313	118.	0.	0.
FP-314	118.	0.	0.
FP-319 (Dup. of FP-306)	5,230.	0.	0.
TOTAL	11,713.20	2.60	13.70
NUMBER	8	1	1
AVERAGE	1,464.2	2.6	13.7
ARAR	50.0	150	0.0022

Values above background (i.e., Background values are illustrated in FP-303 and FP-312) and above their most stringent ARAR are indicated in Bold Print.

All data in $\mu\text{g/L}$.

AR301180



TABLE 27 (Continued)

COMPARISON OF SURFACE WATER DATA TO ARARS

LOCATION	BARIUM
FP-303	0.
FP-306	42.1
FP-308	29.4
FP-309	5,600.
FP-311	109.
FP-312	11.5
FP-313	20.5
FP-314	4.1
FP-319 (Dup. of FP-306)	40.7
TOTAL	5,857.30
NUMBER	18
AVERAGE	732.2
ARAR	1000

Values above background (i.e., Background values are illustrated in FP-303 and FP-312) and above their most stringent ARAR are indicated in Bold Print.

All data in $\mu\text{g/L}$.

AR301181



TABLE 27 (Continued)

COMPARISON OF SURFACE WATER DATA TO ARARS

LOCATION	BERYLLIUM	CADMIUM	CALCIUM
FP-303	0.	0.	2,160.
FP-306	6.4	105.	18,100.
FP-308	0.	0.	6,100.
FP-309	0.	0.	23,600.
FP-311	0.	0.	6,770.
FP-312	0.	5.4	5,770.
FP-313	0.	0.	6,060.
FP-314	0.	7.3	5,750.
FP-319 (Dup. of FP-306)	6.3	93.7	17,400.
TOTAL	12.70	211.40	91,710.00
NUMBER	2	4	9
AVERAGE	6.35	52.8	10,190.0
ARAR	0.0068	1.1	--

Values above background (i.e., Background values are illustrated in FP-303 and FP-312) and above their most stringent ARAR are indicated in Bold Print.

All data in $\mu\text{g/L}$.

AR301182

TABLE 27 (Continued)

COMPARISON OF SURFACE WATER DATA TO ARARS

LOCATION	CHROMIUM	COBALT	COPPER
FP-303	0.	0.	0.
FP-306	0.	0.	27.3
FP-308	0.	0.	0.
FP-309	0.	0.	0.
FP-311	0.	0.	0.
FP-312	0.	0.	0.
FP-313	0.	0.	0.
FP-314	0.	0.	0.
FP-319 (Dup. of FP-306)	0.	0.	24.5
TOTAL	0.00	0.00	51.80
NUMBER	0	0	2
AVERAGE	0	0	25.9
ARAR	11		12

Values above background (i.e., Background values are illustrated in FP-303 and FP-312) and above their most stringent ARAR are indicated in Bold Print.

All data in $\mu\text{g/L}$.

AR301183

TABLE 27 (Continued)

COMPARISON OF SURFACE WATER DATA TO ARARS

LOCATION	IRON	LEAD	MAGNESIUM
FP-303	193.	1.6	935
FP-306	25.6	5.8	4,230.
FP-308	62.7	0.	2,730.
FP-309	59,800.	4.1	8,740.
FP-311	604.	2.4	2,860.
FP-312	564.	1.4	2,720.
FP-313	647.	1.5	2,850.
FP-314	604.	0.	2,640.
FP-319 (Dup. of FP-306)	28.7	4.1	4,090.
TOTAL	62,529.00	20.90	31,795.00
NUMBER	9	7	9
AVERAGE	6,947.7	2.98	3,532.8
ARAR	300	3.2	--

Values above background (i.e., Background values are illustrated in FP-303 and FP-312) and above their most stringent ARAR are indicated in Bold Print.

All data in $\mu\text{g/L}$.

AR301184

TABLE 27 (Continued)

COMPARISON OF SURFACE WATER DATA TO ARARS

LOCATION	MANGANESE	MERCURY	NICKEL
FP-303	0.	0.	37.6
FP-306	3,030.	0.	42.4
FP-308	91.5	0.	0.
FP-309	1,540.	0.	0.
FP-311	43.3	0.	29.
FP-312	50.	0.	0.
FP-313	79.	0.	0.
FP-314	57.7	0.	0.
FP-319 (Dup. of FP-306)	2,930.	0.	36.9
TOTAL	7,821.50	0.00	145.90
NUMBER	8	0	4
AVERAGE	977.7	0	36.5
ARAR	50	0.012	1.3x10 ⁻¹⁰

Values above background (i.e., Background values are illustrated in FP-303 and FP-312) and above their most stringent ARAR are indicated in Bold Print.

All data in $\mu\text{g/L}$.

AR301185

TABLE 27 (Continued)

COMPARISON OF SURFACE WATER DATA TO ARARS

LOCATION	POTASSIUM	SELENIUM	SILVER
FP-303	1,210.	0.	0.
FP-306	4,690.	0.	0.
FP-308	1,620.	0.	0.
FP-309	24,200.	0.	0.
FP-311	4,300.	0.	0.
FP-312	1,200.	0.	0.
FP-313	1,220.	0.	0.
FP-314	1,300.	0.	0.
FP-319 (Dup. of FP-306)	4,650.	0.	0.
TOTAL	44,390.00	0.00	0.00
NUMBER	9	0	0
AVERAGE	4,932.2	0	0
ARAR	--	10	0.12

Values above background (i.e., Background values are illustrated in FP-303 and FP-312) and above their most stringent ARAR are indicated in Bold Print.

All data in $\mu\text{g/L}$.

AR301186

TABLE 27 (Continued)

COMPARISON OF SURFACE WATER DATA TO ARARS

LOCATION	SODIUM	THALLIUM	VANADIUM
FP-303	4,920.	0.	0.
FP-306	11,600.	0.	0.
FP-308	9,010.	0.	0.
FP-309	30,600.	0.	0.
FP-311	10,100.	0.	0.
FP-312	5,720.	0.	0.
FP-313	6,090.	0.	0.
FP-314	5,730.	0.	0.
FP-319 (Dup. of FP-306)	11,500.	0.	0.
TOTAL	95,270.00	0.00	0.00
NUMBER	9	0	0
AVERAGE	10,585.6	0	0
ARAR	--	13	--

Values above background (i.e., Background values are illustrated in FP-303 and FP-312) and above their most stringent ARAR are indicated in Bold Print.

All data in $\mu\text{g/L}$.

AR301187

TABLE 27 (Continued)

COMPARISON OF SURFACE WATER DATA TO ARARS

LOCATION	ZINC	CYANIDE
FP-303	23.1	0.
FP-306	111,000.	0.
FP-308	4,320.	0.
FP-309	48.1	0.
FP-311	32.8	0.
FP-312	0.	0.
FP-313	26.5	0.
FP-314	16.3	0.
FP-319 (Dup. of FP-306)	107,000.	0.
TOTAL	218,146.80	0.00
NUMBER	7	0
AVERAGE	31,163.8	0
ARAR	110	5.2

Values above background (i.e., Background values are illustrated in FP-303 and FP-312) and above their most stringent ARAR are indicated in **Bold Print**.

All data in $\mu\text{g/L}$.

AR301188

TABLE 27 (Continued)

COMPARISON OF SURFACE WATER DATA TO ARARS

LOCATION	ALUMINUM	ANTIMONY	ARSENIC
FP-303	351.	0.	0.
FP-306	3,870.	0.	0.
FP-307	0.	0.	0.
FP-308	0.	0.	0.
FP-309	0.	0.	12.5
FP-310	0.	0.	0.
FP-311	0.	0.	0.
FP-312	204.	0.	0.
FP-313	0.	0.	0.
FP-314	168.	0.	0.
FP-315 (Dup. of FP-309)	0.	3.7	12.5
TOTAL	4,593.00	3.70	25.00
NUMBER	4	1	2
AVERAGE	1,148	3.7	12.5
ARAR	50.0	150	0.0022

Values above background (i.e., Background values are illustrated in FP-303 and FP-312) and above their most stringent ARAR are indicated in Bold Print.

All data in $\mu\text{g/L}$.

AR301189

TABLE 27 (Continued)

COMPARISON OF SURFACE WATER DATA TO ARARS

LOCATION	BARIUM	BERYLLIUM	CADMIUM
FP-303	0.	0.	0.
FP-306	12.8	8.4	63.4
FP-307	0.	0.	0.
FP-308	0.	0.	0.
FP-309	4,240.	0.	0.
FP-310	73.9	0.	0.
FP-311	74.4	0.	0.
FP-312	0.	0.	0.
FP-313	0.	0.	0.
FP-314	0.	0.	0.
FP-315 (Dup. of FP-309)	4,160.	0.	0.
TOTAL	8,561.10	8.40	63.40
NUMBER	5	1	1
AVERAGE	1,712	8.4	63.4
ARAR	1000	0.0068	1.1

Values above background (i.e., Background values are illustrated in FP-303 and FP-312) and above their most stringent ARAR are indicated in Bold Print.

All data in $\mu\text{g/L}$.

AR301190

TABLE 27 (Continued)

COMPARISON OF SURFACE WATER DATA TO ARARS

LOCATION	CALCIUM	CHROMIUM	COBALT
FP-303	5,010.	0.	0.
FP-306	13,500.	0.	0.
FP-307	6,240.	0.	0.
FP-308	5,840.	0.	0.
FP-309	22,000.	0.	0.
FP-310	7,740.	0.	0.
FP-311	7,840.	0.	0.
FP-312	5,940.	0.	0.
FP-313	5,860.	0.	0.
FP-314	5,950.	0.	0.
FP-315 (Dup. of FP-309)	21,400.	0.	0.
TOTAL	107,320.00	0.00	0.00
NUMBER	11	0	0
AVERAGE	9,756	0	0
ARAR	--	11	--

Values above background (i.e., Background values are illustrated in FP-303 and FP-312) and above their most stringent ARAR are indicated in Bold Print.

All data in $\mu\text{g/L}$.

AR301191

TABLE 27 (Continued)

COMPARISON OF SURFACE WATER DATA TO ARARS

LOCATION	COPPER	IRON	LEAD
FP-303	0.	582.	0.
FP-306	27.5	64.6	5.4
FP-307	17.9	144.	0.
FP-308	0.	169.	0.
FP-309	0.	42,600.	1.8
FP-310	0.	338.	0.
FP-311	0.	392.	0.
FP-312	0.	854.	2.6
FP-313	18.3	899.	0.
FP-314	0.	880.	0.
FP-315 (Dup. of FP-309)	0.	42,100.	1.4
TOTAL	63.70	89,022.60	11.20
NUMBER	3	11	4
AVERAGE	21.2	8,093	2.8
ARAR	12	300	3.2

Values above background (i.e., Background values are illustrated in FP-303 and FP-312) and above their most stringent ARAR are indicated in Bold Print.

All data in $\mu\text{g/L}$.

AR301192

TABLE 27 (Continued)

COMPARISON OF SURFACE WATER DATA TO ARARS

LOCATION	MAGNESIUM	MANGANESE	MERCURY
FP-303	3,430.	28.9	0.
FP-306	3,640.	2,780.	0.
FP-307	3,060.	127.	0.
FP-308	2,780.	80.8	0.
FP-309	8,380.	1,430.	0.
FP-310	3,310.	75.1	0.
FP-311	3,480.	52.4	0.
FP-312	2,660.	38.4	0.
FP-313	2,640.	60.5	0.
FP-314	2,740.	73.5	0.
FP-315 (Dup. of FP-309)	8,270.	1,450.	0.
TOTAL	44,390.00	6,196.60	0.00
NUMBER	11	11	0
AVERAGE	4,035	563	0
ARAR	--	50	0.012

Values above background (i.e., Background values are illustrated in FP-303 and FP-312) and above their most stringent ARAR are indicated in Bold Print.

All data in $\mu\text{g/L}$.

AR301193

TABLE 27 (Continued)

COMPARISON OF SURFACE WATER DATA TO ARARS

LOCATION	NICKEL	POTASSIUM	SELENIUM
FP-303	0.	1,290.	0.
FP-306	0.	3,890.	0.
FP-307	0.	1,810.	0.
FP-308	0.	1,500.	0.
FP-309	0.	21,800.	0.
FP-310	0.	8,100.	0.
FP-311	0.	3,720.	0.
FP-312	0.	1,890.	0.
FP-313	0.	1,420.	0.
FP-314	0.	2,360.	0.
FP-315 (Dup. of FP-309)	0.	21,400.	0.
TOTAL	0.00	69,180.00	0.00
NUMBER	0	11	0
AVERAGE	0	6,289	0
ARAR	1.3x10⁻¹⁰	--	10

Values above background (i.e., Background values are illustrated in FP-303 and FP-312) and above their most stringent ARAR are indicated in Bold Print.

All data in $\mu\text{g/L}$.

AR301194

TABLE 27 (Continued)

COMPARISON OF SURFACE WATER DATA TO ARARS

LOCATION	SILVER	SODIUM	THALLIUM
FP-303	0.	7,680.	0.
FP-306	0.	12,000.	0.
FP-307	0.	9,140.	0.
FP-308	0.	8,820.	0.
FP-309	0.	27,900.	0.
FP-310	0.	15,500.	0.
FP-311	0.	9,950.	0.
FP-312	0.	6,370.	0.
FP-313	0.	6,140.	0.
FP-314	0.	6,840.	0.
FP-315 (Dup of FP-309)	8.8	26,700.	0.
TOTAL	8.80	137,040.00	0.00
NUMBER	1	11	0
AVERAGE	8.8	12,458	0
ARAR	0.12	--	13

Values above background (i.e., Background values are illustrated in FP-303 and FP-312) and above their most stringent ARAR are indicated in Bold Print.

All data in $\mu\text{g/L}$.

AR301195

TABLE 27 (Continued)

COMPARISON OF SURFACE WATER DATA TO ARARS

LOCATION	VANADIUM	ZINC	CYANIDE
FP-303	0.	10.5	0.
FP-306	0.	67,600.	0.
FP-307	0.	2,720.	0.
FP-308	0.	2,040.	0.
FP-309	0.	24.1	0.
FP-310	0.	12.5	0.
FP-311	0.	13.6	0.
FP-312	0.	0.	0.
FP-313	0.	28.	0.
FP-314	0.	27.1	0.
FP-315 (Dup. of FP-309)	0.	18.8	0.
TOTAL	0.00	72,494.60	0.00
NUMBER	0	10	0
AVERAGE	0	7,249	0
ARAR	--	110	5.2

Values above background (i.e., Background values are illustrated in FP-303 and FP-312) and above their most stringent ARAR are indicated in Bold Print.

All data in $\mu\text{g/L}$.

AR301196

TABLE 28

RISK OF ADVERSE EFFECTS TO HUMAN HEALTH

AR301197

TABLE 28-1
INGESTION OF LEACHATE

EXPOSURE TO NON-CARCINOGENS

Non-Carcinogenic Contaminant of Concern	RfD or Other Standard (mg/kg/day)	CONCENTRATION		EXPOSURE Average Case (mg/kg/day)	DOSE Reasonable Worst Case (mg/kg/day)	HAZARD Average Case	INDEX Reasonable Worst Case	END POINT
		Average (mg/l)	Maximum (mg/l)					
ANTIMONY	4e-4	4.75e-2	6.6e-2	1.36e-3	3.3e-3	3.39	8.25	
BARIUM	5e-2	2.04e1	3.47e1	5.83e-1	1.735e0	11.66	34.70	
BIS (2 EH) PHTHALATE	2e-2	BDL	BDL	0	0	.00	.00	
CADMIUM	5e-4	7.5e-3	8.9e-3	2.14e-4	4.45e-4	.43	.89	
COPPER	3.7e-2	1.72e-2	2.95e-2	4.91e-4	1.48e-3	.01	.04	
LEAD	1.4e-4	9.5e-1	1.89e0	2.71e-2	9.45e-2	193.88	675.00	
MANGANESE	5e-1	8.08e-1	9.45e-1	2.31e-2	4.73e-2	.05	.09	
MERCURY	2e-3	BDL	BDL	0	0	.00	.00	
NICKEL	2e-2	3.1e-2	5.21e-2	8.86e-4	2.61e-3	.04	.13	
SELENIUM	3e-3	BDL	BDL	0	0	.00	.00	
VANADIUM	9e-3	BDL	BDL	0	0	.00	.00	
ZINC	2e-1	2.08e0	3.82e0	5.94e-2	1.91e-1	.30	.96	
TOTAL						209.76	720.06	

ASSUMPTIONS and NOTES

Ingested metals are 100% bioavailable; concentrations of leachate are dissolved concentrations.
 Exposure averaged over a 1-year period.
 Average = Daily ingestion by 70 kg adults of 2 liters of the arithmetic mean concentration of leachate in the quarry and seeping into the North Drainage.
 Worst Case = Daily ingestion by 20 kg child of 1 liter of the lower of the 95% confidence limits of the mean or the highest observed concentration of leachate in the quarry or seeping into the North Drainage.

EXPOSURE TO CARCINOGENS

Carcinogenic Contaminant of Concern	Cancer Weight of Evidence	Cancer Potency Factor (mg/kg/d)	CONCENTRATION		EXPOSURE Average Case (mg/kg/day)	DOSE Reasonable Worst Case (mg/kg/day)	LIFETIME Average Case	CANCER RISK Reasonable Worst Case
			Average (mg/l)	Maximum (mg/l)				
ARSENIC	A	1.75e0	1.1e-1	1.97e-1	3.69e-3	6.61e-3	6.46e-3	1.16e-2
BENZENE	A	2.9e-2	1.1e-2	1.3e-2	3.69e-4	4.36e-4	1.07e-5	1.27e-5
BIS (2 EH) PHTHALATE	B2	1.4e-2	BDL	BDL	0	0	0	0
CADMIUM	NA	NA	7.5e-3	8.9e-3	2.52e-4	2.99e-4	0	0
NICKEL	NA	NA	3.1e-2	5.21e-2	1.04e-3	1.75e-3	0	0
TOTAL							6.47e-3	1.16e-2

ASSUMPTIONS and NOTES

Assumptions for exposure to non-carcinogenic compounds apply.
 NA = Non-carcinogenic by the oral route.
 Life-time exposure assumes 10 years of childhood (20 kg, 1 liter/d), 5 years adolescence (36 kg, 2 liter/d), and 55 years of adulthood (70 kg, 2 liter/d) with exposure averaged over 70 years.

AR301198

TABLE 28-1 (Continued)

HUMAN INGESTION OF LEACHATE

FORMULAE

EXPOSURE TO NON-CARCINOGENS

$$\text{Exposure Dose} = \frac{\text{Ca} \times \text{I}}{\text{W}}$$

where:

- Ca = Contaminant concentration in mg/l
- I = ingestion rate in liters/day
- W = weight of human in kg

EXPOSURE TO CARCINOGENS

$$\text{Exposure Dose} = \frac{\text{ED}(\alpha) \times \text{Ca} \times \text{I}(\alpha)}{\text{W}(\alpha) \times \text{LT}}$$

where:

- ED(α) = exposure duration
- Ca = Contaminant concentration in mg/l
- I(α) = ingestion rate in liters/day for each ED
- W(α) = weight of human in kg for each ED
- LT = lifetime in years

SAMPLE LOCATIONS

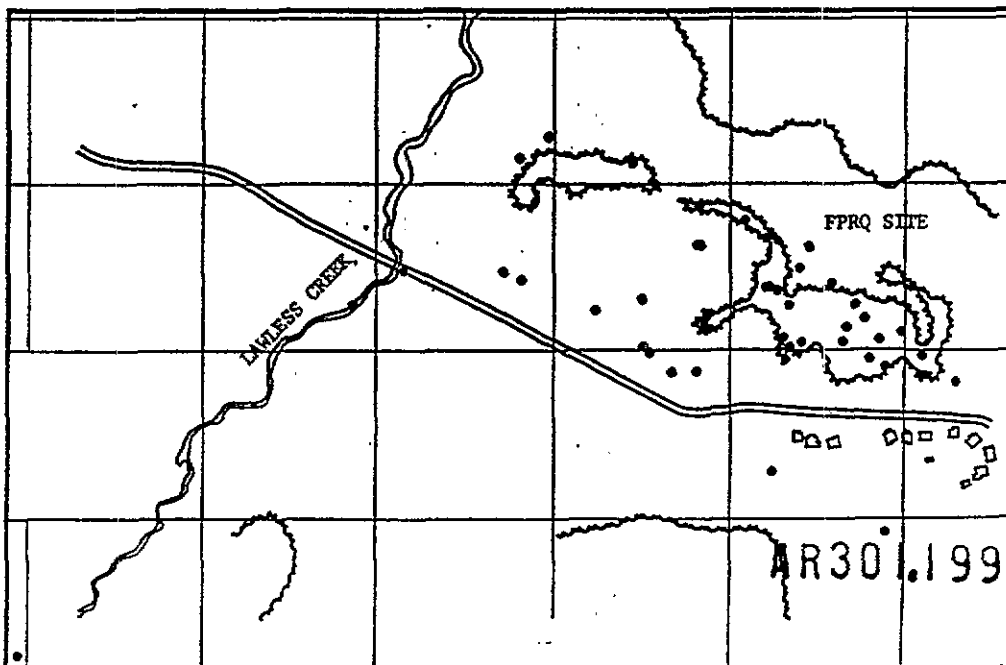


TABLE 28-2
INCIDENTAL INGESTION OF SOURCE MATERIAL - CHILDREN

EXPOSURE TO NON-CARCINOGENS

Non-Carcinogenic Contaminant of Concern	RfD or Other Standard (mg/kg/day)	CONCENTRATION		EXPOSURE Average Case (mg/kg/day)	DOSE Reasonable Worst Case (mg/kg/day)	HAZARD Average Case	INDEX Reasonable Worst Case	END POINT
		Average (mg/kg)	Maximum (mg/kg)					
ANTIMONY	4e-4	1.72e0	3.05e0	1.23e-6	2.67e-5	.00	.07	
BARIUM	5e-2	2.49e2	5.69e2	1.77e-4	4.99e-3	.00	.10	
BIS (2EH) PHTHALATE	2e-2	1.17e1	2.93e1	8.33e-6	2.57e-4	.00	.01	
CADMIUM	5e-4	2.25e0	3.66e0	1.60e-6	3.21e-5	.00	.06	
COPPER	3.7e-2	1.75e1	2.79e1	1.25e-5	2.45e-4	.00	.01	
LEAD	1.4e-4	3.11e2	6.68e2	2.22e-4	5.86e-3	1.58	41.83	
MANGANESE	5e-1	1.84e2	2.44e2	1.31e-4	2.14e-3	.00	.00	
MERCURY	2e-3	9.8e-2	1.7e-1	6.98e-8	1.49e-6	.00	.00	
NICKEL	2e-2	4.98e0	6.96e0	3.55e-6	6.10e-5	.00	.00	
SELENIUM	3e-3	3.4e-1	6.01e-1	2.42e-7	5.27e-6	.00	.00	
VANADIUM	9e-3	6.22e0	9.19e0	4.43e-6	8.06e-5	.00	.01	
ZINC	2e-1	1.1e3	2.6e3	7.84e-4	2.28e-2	.00	.11	
TOTAL						1.60	42.21	

ASSUMPTIONS and NOTES

Ingested metals in soil matrix are 50 (average case) to 100% (worst case) bioavailable; exposures averaged over 1 year. Average = Ingestion by a 20 kg child of 200 mg of soil per play day, child plays 2 days per week for 26 weeks per year in source material at the site. Ingested concentrations are arithmetic mean of site source samples. Worst = Ingestion by a 20 kg child of 400 mg of soil per play day, child plays 4 days per week for 40 weeks per year in source material at the site. Ingested concentrations are the lower of the 95% confidence limits of the mean or the highest observed concentration of site source samples.

EXPOSURE TO CARCINOGENS

Carcinogenic Contaminant of Concern	Cancer Weight of Evidence	Cancer Potency Factor (mg/kg/d)	CONCENTRATION		EXPOSURE Average Case (mg/kg/day)	DOSE Reasonable Worst Case (mg/kg/day)	LIFETIME Average Case	CANCER RISK Reasonable Worst Case
			Average (mg/kg)	Maximum (mg/kg)				
ARSENIC	A	1.75e0	4.45e0	7.64e0	7.18e-7	1.64e-5	1.26e-6	2.87e-5
BENZENE	A	2.9e-2	BOL	BOL	0	0	0	0
BIS (2EH) PHTHALATE	B2	1.4e-2	1.17e1	2.93e1	1.89e-6	6.29e-5	2.64e-8	8.81e-7
CADMIUM	NA	NA	2.25e0	3.66e0	3.63e-7	7.86e-6	0	0
NICKEL	NA	NA	4.98e0	6.96e0	8.04e-7	1.49e-5	0	0
TOTAL							1.28e-6	2.96e-5

ASSUMPTIONS and NOTES

NA = Non-carcinogenic by the oral route. Assumptions for exposure to non-carcinogenic compounds apply. Life-time exposure assumes 15 years of childhood (20 kg) and 10 years (average) to 30 years (worst case) of adulthood (70 kg) with exposure averaged over 70 years. Average = Assumes child ingests 200 mg per play day for 15 years, adults ingest 60 mg per activity day for 10 years. Outdoor activity occurs 2 days per week for 26 weeks of the year. Worst = Assumes child ingests 400 mg per play day for 15 years, adults ingest 100 mg per activity day for 30 years. Outdoor activity occurs 4 days a week for 40 weeks per year.

AR301200

TABLE 28-2 (Continued)

INCIDENTAL INGESTION OF SOURCE MATERIAL - CHILDREN

FORMULAE

EXPOSURE TO NON-CARCINOGENS

$$\text{Exposure Dose} = \frac{\text{Ca} \times \text{I} \times \text{F}}{\text{W}}$$

where:

- Ca - Contaminant concentration in mg/kg
- I - ingestion rate in liters/day
- F - daily frequency
- W - weight of human in kg

EXPOSURE TO CARCINOGENS

$$\text{Exposure Dose} = \frac{\text{ED}(\alpha) \times \text{P} \times \text{Ca} \times \text{I}(\alpha) \times \text{F}}{\text{W}(\alpha) \times \text{LT}}$$

where:

- ED(α) - exposure duration
- P - proportion of year exposed
- Ca - Contaminant concentration in mg/kg
- I(α) - ingestion rate in liters/day for each ED
- F - daily frequency
- W(α) - weight of human in kg for each ED
- LT - lifetime in years

SAMPLE LOCATIONS

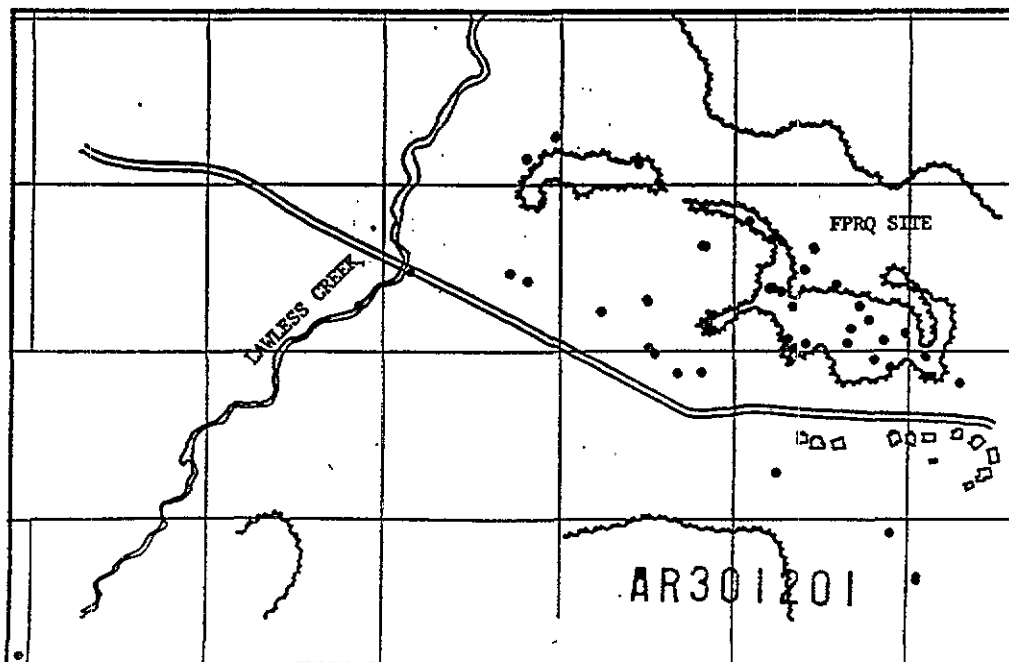


TABLE 28-3
INCIDENTAL INGESTION OF SOURCE MATERIAL - ADULTS

EXPOSURE TO NON-CARCINOGENS

Non-Carcinogenic Contaminant of Concern	RfD or Other Standard (ng/kg/day)	CONCENTRATION		EXPOSURE Average Case (ng/kg/day)	DOSE Reasonable Worst Case (ng/kg/day)	HAZARD Average Case	INDEX Reasonable Worst Case	END POINT
		Average (ng/kg)	Maximum (ng/kg)					
ANTIMONY	4e-4	1.72e0	3.05e0	1.05e-7	1.91e-6	.00	.00	
BARIUM	5e-2	2.49e2	5.69e2	1.52e-5	3.56e-4	.00	.01	
BIS (2EH) PHTHALATE	2e-2	1.17e1	2.93e1	7.14e-7	1.83e-5	.00	.00	
CADMIUM	5e-4	2.25e0	3.66e0	1.37e-7	2.29e-6	.00	.00	
COPPER	3.7e-2	1.75e1	2.79e1	1.07e-6	1.75e-5	.00	.00	
LEAD	1.4e-4	3.11e2	6.68e2	1.90e-5	4.18e-4	.14	2.99	
MANGANESE	5e-1	1.84e2	2.44e2	1.12e-5	1.53e-4	.00	.00	
MERCURY	2e-3	9.8e-2	1.7e-1	5.98e-9	1.06e-7	.00	.00	
NICKEL	2e-2	4.98e0	6.96e0	3.04e-7	4.36e-6	.00	.00	
SELENIUM	3e-3	3.4e-1	6.01e-1	2.08e-8	3.76e-7	.00	.00	
VANADIUM	9e-3	6.22e0	9.19e0	3.80e-7	5.75e-6	.00	.00	
ZINC	2e-1	1.1e3	2.6e3	6.72e-5	1.63e-3	.00	.01	
TOTAL						.14	3.02	

ASSUMPTIONS and NOTES

Ingested metals in soil matrix are 50 (average case) to 100% (worst case) bioavailable; exposures averaged over 1 year. Average = Ingestion by a 70 kg adult of 60 mg of soil per activity day, adult gardens 2 days per week for 26 weeks per year in source material at the site. Ingested concentrations are arithmetic mean of site source samples. Worst = Ingestion by a 70 kg adult of 100 mg of soil per activity day, adult gardens 4 days per week for 40 weeks per year in source material at the site. Ingested concentrations are the lower of the 95% confidence limits of the mean or the highest observed concentration of site source samples.

EXPOSURE TO CARCINOGENS

Carcinogenic Contaminant of Concern	Cancer Weight of Evidence	Cancer Potency Factor (mg/kg/d)	CONCENTRATION		EXPOSURE Average Case (ng/kg/day)	DOSE Reasonable Worst Case (ng/kg/day)	LIFETIME Average Case	CANCER RISK Reasonable Worst Case
			Average (ng/kg)	Maximum (ng/kg)				
ARSENIC	A	1.75e0	4.45e0	7.64e0	7.18e-7	1.64e-5	1.26e-6	2.87e-5
BENZENE	A	2.9e-2	BOL	BOL	0	0	0	0
BIS (2EH) PHTHALATE	B2	1.4e-2	1.17e1	2.93e1	1.89e-6	6.29e-5	2.64e-8	8.81e-7
CADMIUM	NA	NA	2.25e0	3.66e0	3.63e-7	7.86e-6	0	0
NICKEL	NA	NA	4.98e0	6.96e0	8.04e-7	1.49e-5	0	0
TOTAL							1.28e-6	2.96e-5

ASSUMPTIONS and NOTES

NA = Non-carcinogenic by the oral route. Assumptions for exposure to non-carcinogenic compounds apply. Life-time exposure assumes 15 years of childhood (20 kg) and 10 years (average) to 30 years (worst case) of adulthood (70 kg) with exposure averaged over 70 years. Average = Assumes child ingests 200 mg per play day for 15 years, adults ingest 60 mg per activity day for 10 years. Outdoor activity occurs 2 days per week for 26 weeks of the year. Worst = Assumes child ingests 400 mg per play day for 15 years, adults ingest 100 mg per activity day for 30 years. Outdoor activity occurs 4 days a week for 40 weeks per year.

AR301202

TABLE 28-3 (Continued)

INCIDENTAL INGESTION OF SOURCE MATERIAL - ADULTS

FORMULAE

EXPOSURE TO NON-CARCINOGENS

$$\text{Exposure Dose} = \frac{Ca \times I \times F}{W}$$

where:

- Ca - Contaminant concentration in mg/kg
- I - ingestion rate in liters/day
- F - daily frequency
- W - weight of human in kg

EXPOSURE TO CARCINOGENS

$$\text{Exposure Dose} = \frac{ED(\alpha) \times P \times Ca \times I(\alpha) \times F}{W(\alpha) \times LT}$$

where:

- ED(α) - exposure duration
- P - proportion of year exposed
- Ca - Contaminant concentration in mg/kg
- I(α) - ingestion rate in liters/day for each ED
- F - daily frequency
- W(α) - weight of human in kg for each ED
- LT - lifetime in years

SAMPLE LOCATIONS

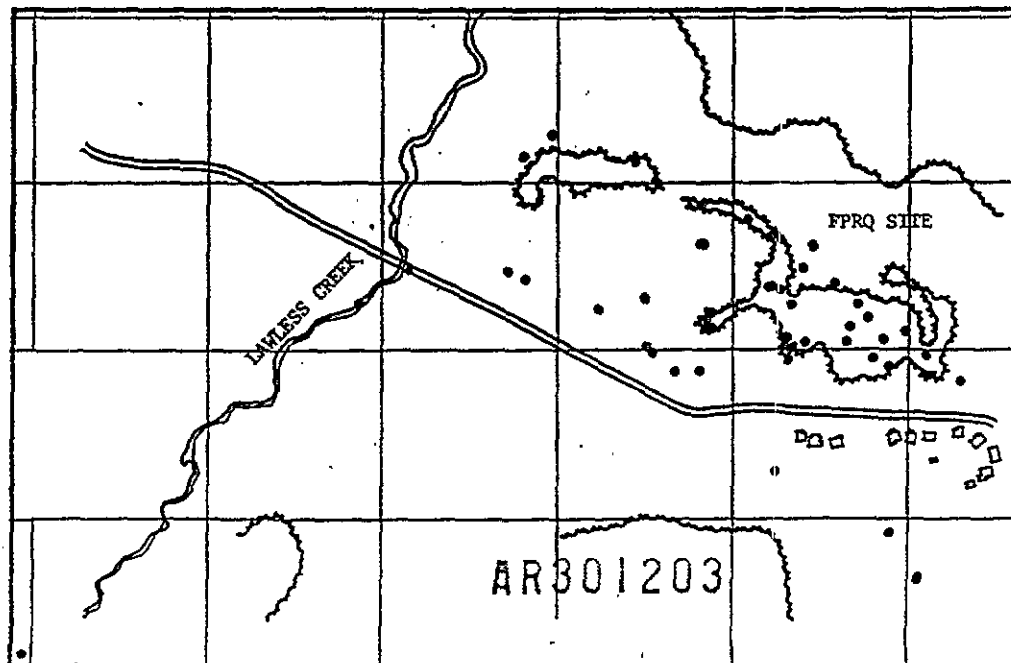


TABLE 28-4
INCIDENTAL INGESTION OF WATER FROM NORTH AND SOUTH PONDS - CHILDREN

EXPOSURE TO NON-CARCINOGENS

Non-Carcinogenic Contaminant of Concern	RfD or Other Standard (mg/kg/day)	CONCENTRATION		EXPOSURE Average Case (mg/kg/day)	DOSE Reasonable Worst Case (mg/kg/day)	HAZARD Average Case	INDEX Reasonable Worst Case	END POINT
		Average (mg/l)	Maximum (mg/l)					
ANTIMONY	4e-4	BDL	BDL	0	0	.00	.00	
BARIUM	5e-2	5.62e0	8.42e0	1.00e-3	9.23e-3	.02	.18	
BIS (2EH) PHTHALATE	2e-2	BDL	BDL	0	0	.00	.00	
CADMIUM	5e-4	6.12e-3	8e-3	1.09e-6	8.77e-6	.00	.02	
COPPER	3.7e-2	BDL	BDL	0	0	.00	.00	
LEAD	1.4e-4	1.46e-2	2.11e-2	2.6e-6	2.31e-5	.02	.17	
MANGANESE	5e-1	1.09e0	1.21e0	1.94e-4	1.33e-3	.00	.00	
MERCURY	2e-3	BDL	BDL	0	0	.00	.00	
NICKEL	2e-2	BDL	BDL	0	0	.00	.00	
SELENIUM	3e-3	BDL	BDL	0	0	.00	.00	
VANADIUM	9e-3	BDL	BDL	0	0	.00	.00	
ZINC	2e-1	1.51e-1	2.19e-1	2.69e-5	2.4e-4	.00	.00	
TOTAL						.04	.37	

ASSUMPTIONS and NOTES

Ingested metals in water are 100% bioavailable; exposures averaged over 1 year.
Average = Ingestion by a 20 kg child of 25 ml of water per play day while wading in water, child plays 2 days per week for 26 weeks per year in ponds at the site. Ingested concentrations are arithmetic mean of site samples.
Worst = Ingestion by a 20 kg child of 50 ml of water per play day, child plays 4 days per week for 40 weeks per year in ponds at the site. Ingested concentrations are the lower of the 95% confidence limits of the mean or the highest observed concentration of site samples.

EXPOSURE TO CARCINOGENS

Carcinogenic Contaminant of Concern	Cancer Weight of Evidence	Cancer Potency Factor (mg/kg/d)	CONCENTRATION		EXPOSURE Average Case (mg/kg/day)	DOSE Reasonable Worst Case (mg/kg/day)	LIFETIME CANCER RISK	
			Average (mg/l)	Maximum (mg/l)			Average Case	Reasonable Worst Case
ARSENIC	A	1.75e0	3.8e-2	5.8e-2	1.45e-6	1.36e-5	2.54e-6	2.38e-5
BENZENE	A	2.9e-2	BDL	BDL	0	0	0	0
BIS (2EH) PHTHALATE	B2	1.4e-2	BDL	BDL	0	0	0	0
CADMIUM	NA	NA	6.12e-3	8e-3	2.34e-7	1.88e-6	0	0
NICKEL	NA	NA	BDL	BDL	0	0	0	0
TOTAL							2.54e-6	2.38e-5

ASSUMPTIONS and NOTES

NA = Non-carcinogenic by the oral route. Assumptions for exposure to non-carcinogenic compounds apply.
Life-time exposure assumes 15 years of childhood (20 kg), exposures averaged over 70 years. Adults ingest no pond water.
Average = Assumes child ingests 25 ml per play day for 15 years. Play occurs 2 days per week for 26 weeks per year.
Worst = Assumes child ingests 50 ml per play day for 15 years, play occurs 4 days per week, 40 weeks per year.

TABLE 28-4(Continued)

INCIDENTAL INGESTION OF WATER FROM NORTH AND SOUTH PONDS - CHILDREN

FORMULAE

EXPOSURE TO NON-CARCINOGENS

$$\text{Exposure Dose} = \frac{\text{Ca} \times \text{I} \times \text{F}}{\text{W}}$$

where:

- Ca - Contaminant concentration in mg/l
- I - ingestion rate in liters/day
- F - daily frequency
- W - weight of child in kg

EXPOSURE TO CARCINOGENS

$$\text{Exposure Dose} = \frac{\text{ED} \times \text{P} \times \text{Ca} \times \text{I} \times \text{F}}{\text{W} \times \text{LT}}$$

where:

- ED - exposure duration
- P - proportion of year exposed
- Ca - Contaminant concentration in mg/l
- I - ingestion rate in liters/day
- F - daily frequency
- W - weight of child in kg
- LT - lifetime in years

SAMPLE LOCATIONS

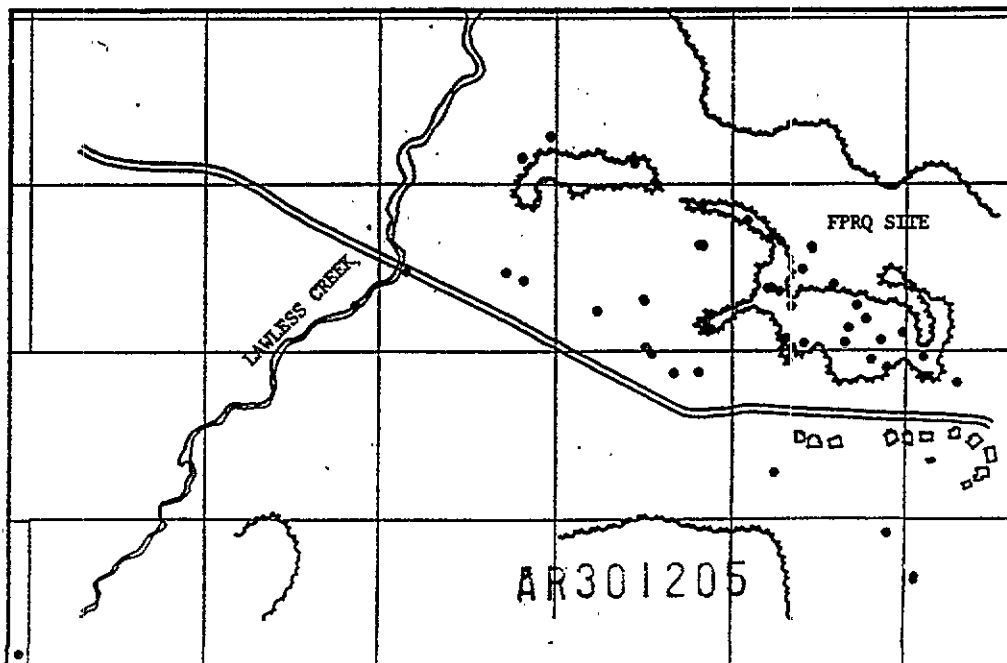


TABLE 28-5
INGESTION OF GROUNDWATER

EXPOSURE TO NON-CARCINOGENS

Non-Carcinogenic Contaminant of Concern	RfD or Other Standard (mg/kg/day)	CONCENTRATION		EXPOSURE Average Case (mg/kg/day)	DOSE Reasonable Worst Case (mg/kg/day)	HAZARD Average Case	INDEX Reasonable Worst Case	END POINT
		Average (mg/l)	Maximum (mg/l)					
ANTIMONY	4e-4	1.12e-3	1.32e-3	3.2e-5	6.6e-5	.08	.17	
BARIUM	5e-2	1.21e-1	1.39e-1	3.46e-3	6.95e-3	.07	.14	
BIS (2 EH) PHTHALATE	2e-2	7.5e-3	8.97e-3	2.14e-4	4.49e-4	.01	.02	
CADMIUM	5e-4	BDL	BDL	0	0	.00	.00	
COPPER	3.7e-2	4.87e-3	6.73e-3	1.39e-4	3.37e-4	.00	.01	
LEAD	1.4e-4	BDL	BDL	0	0	.00	.00	
MANGANESE	5e-1	5.96e-1	1.25e0	1.70e-2	6.25e-2	.03	.13	
MERCURY	2e-3	BDL	BDL	0	0	.00	.00	
NICKEL	2e-2	BDL	BDL	0	0	.00	.00	
SELENIUM	3e-3	BDL	BDL	0	0	.00	.00	
VANADIUM	9e-3	BDL	BDL	0	0	.00	.00	
ZINC	2e-1	1.4e-1	2.23e-1	4e-3	1.12e-2	.02	.06	
TOTAL						.22	.52	

ASSUMPTIONS and NOTES

Ingested metals are 100% bioavailable; concentrations of material are dissolved concentrations.
 Exposure averaged over a 1-year period.
 Average = Daily ingestion by 70 kg adults of 2 liters of the arithmetic mean concentration of material in the downgradient groundwater.
 Worst Case = Daily ingestion by 20 kg child of 1 liter of the lower of the 95% confidence limits of the mean or the highest observed concentration of material in the downgradient groundwater.

EXPOSURE TO CARCINOGENS

Carcinogenic Contaminant of Concern	Cancer Weight of Evidence	Cancer Potency Factor (mg/kg/d)	CONCENTRATION		EXPOSURE Average Case (mg/kg/day)	DOSE Reasonable Worst Case (mg/kg/day)	LIFETIME Average Case	CANCER RISK Reasonable Worst Case
			Average (mg/l)	Maximum (mg/l)				
ARSENIC	A	1.75e0	BDL	BDL	0	0	0	0
BENZENE	A	2.9e-2	BDL	BDL	0	0	0	0
BIS (2 EH) PHTHALATE	B2	1.4e-2	7.5e-3	8.97e-3	2.52e-4	3.01e-4	3.52e-6	4.21e-6
CADMIUM	NA	NA	BDL	BDL	0	0	0	0
NICKEL	NA	NA	BDL	BDL	0	0	0	0
TOTAL							3.52e-6	4.21e-6

ASSUMPTIONS and NOTES

Assumptions for exposure to non-carcinogenic compounds apply.
 NA = Non-carcinogenic by the oral route.
 Life-time exposure assumes 10 years of childhood (20 kg, 1 liter/d), 5 years adolescence (36 kg, 2 liter/d) and 55 years of adulthood (70 kg, 2 liter/d) with exposure averaged over 70 years.

AR301200

TABLE 28-5(Continued)

HUMAN INGESTION OF DOWN GRADIENT GROUND WATER

FORMULAE

EXPOSURE TO NON-CARCINOGENS

$$\text{Exposure Dose} = \frac{\text{Ca} \times \text{I}}{\text{W}}$$

where:

- Ca - Contaminant concentration in mg/l
- I - ingestion rate in liters/day
- W - weight of human in kg

EXPOSURE TO CARCINOGENS

$$\text{Exposure Dose} = \frac{\text{ED}(\alpha) \times \text{Ca} \times \text{I}(\alpha)}{\text{W}(\alpha) \times \text{LT}}$$

where:

- ED(α) - exposure duration
- Ca - Contaminant concentration in mg/l
- I(α) - ingestion rate in liters/day for each ED
- W(α) - weight of human in kg for each ED
- LT - lifetime in years

SAMPLE LOCATIONS

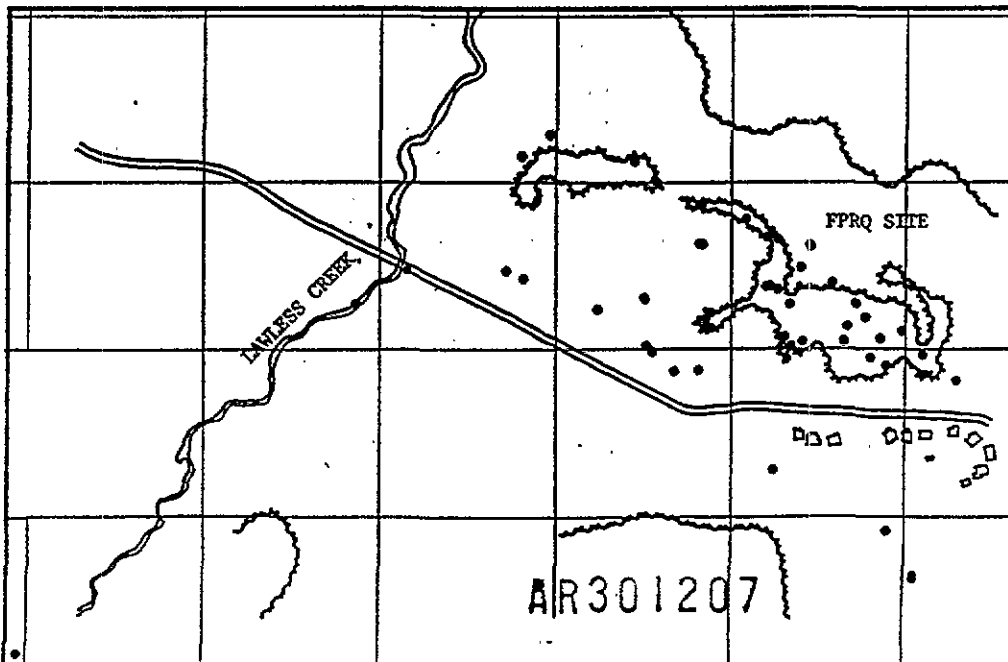


TABLE 28-6
INCIDENTAL INGESTION OF NORTH DRAINAGE WATER - CHILDREN

EXPOSURE TO NON-CARCINOGENS

Non-Carcinogenic Contaminant of Concern	RfD or Other Standard (mg/kg/day)	CONCENTRATION		EXPOSURE Average Case (mg/kg/day)	DOSE Reasonable Worst Case (mg/kg/day)	HAZARD Average Case	INDEX Reasonable Worst Case	END POINT
		Average (mg/l)	Maximum (mg/l)					
ANTIMONY	4e-4	1.72e-3	2.59e-3	3.06e-7	2.84e-6	.00	.01	
BARIUM	5e-2	2.38e0	4.3e0	4.24e-4	4.71e-3	.01	.09	
BIS (2EH) PHTHALATE	2e-2	BDL	BDL	0	0	.00	.00	
CADMIUM	5e-4	BDL	BDL	0	0	.00	.00	
COPPER	3.7e-2	BDL	BDL	0	0	.00	.00	
LEAD	1.4e-4	1.78e-3	2.8e-3	3.17e-7	3.07e-6	.00	.02	
MANGANESE	5e-1	7.65e-1	1.35e0	1.36e-4	1.48e-3	.00	.00	
MERCURY	2e-3	BDL	BDL	0	0	.00	.00	
NICKEL	2e-2	1.72e-2	2.16e-2	3.06e-6	2.37e-5	.00	.00	
SELENIUM	3e-3	BDL	BDL	0	0	.00	.00	
VANADIUM	9e-3	BDL	BDL	0	0	.00	.00	
ZINC	2e-1	2.5e-2	3.52e-2	4.45e-6	3.86e-5	.00	.00	
TOTAL						.01	.13	

ASSUMPTIONS and NOTES

Ingested metals in water are 100% bioavailable; exposures averaged over 1 year.
 Average = Ingestion by a 20 kg child of 25 ml of water per play day while wading in water, child plays 2 days per week for 26 weeks per year in water at the site. Ingested concentrations are arithmetic mean of site samples.
 Worst = Ingestion by a 20 kg child of 50 ml of water per play day, child plays 4 days per week for 40 weeks per year in water at the site. Ingested concentrations are the lower of the 95% confidence limits of the mean or the highest observed concentration of site samples.

EXPOSURE TO CARCINOGENS

Carcinogenic Contaminant of Concern	Cancer Weight of Evidence	Cancer Potency Factor (mg/kg/d)	CONCENTRATION		EXPOSURE Average Case (mg/kg/day)	DOSE Reasonable Worst Case (mg/kg/day)	LIFETIME CANCER RISK Average Case	CANCER RISK Reasonable Worst Case
			Average (mg/l)	Maximum (mg/l)				
ARSENIC	A	1.75e0	6.87e-3	1.18e-2	2.62e-7	2.77e-6	4.59e-7	4.85e-6
BENZENE	A	2.9e-2	BDL	BDL	0	0	0	0
BIS (2EH) PHTHALATE	B2	1.4e-2	BDL	BDL	0	0	0	0
CADMIUM	NA	NA	BDL	BDL	0	0	0	0
NICKEL	NA	NA	1.72e-2	2.16e-2	6.56e-7	5.07e-6	0	0
TOTAL							4.59e-7	4.85e-6

ASSUMPTIONS and NOTES

NA = Non-carcinogenic by the oral route. Assumptions for exposure to non-carcinogenic compounds apply.
 Life-time exposure assumes 15 years of childhood (20 kg), exposures averaged over 70 years. Adults ingest no water.
 Average = Assumes child ingests 25 ml per play day for 15 years. Play occurs 2 days per week for 26 weeks per year.
 Worst = Assumes child ingests 50 ml per play day for 15 years, play occurs 4 days per week, 40 weeks per year.

AR301208

TABLE 6-6 (Continued)

INCIDENTAL INGESTION OF WATER FROM NORTH DRAINAGE - CHILDREN

FORMULAE

EXPOSURE TO NON-CARCINOGENS

$$\text{Exposure Dose} = \frac{\text{Ca} \times \text{I} \times \text{F}}{\text{W}}$$

where:

- Ca = contaminant concentration in mg/l
- I = ingestion rate in liters/day
- F = daily frequency
- W = weight of child in kg

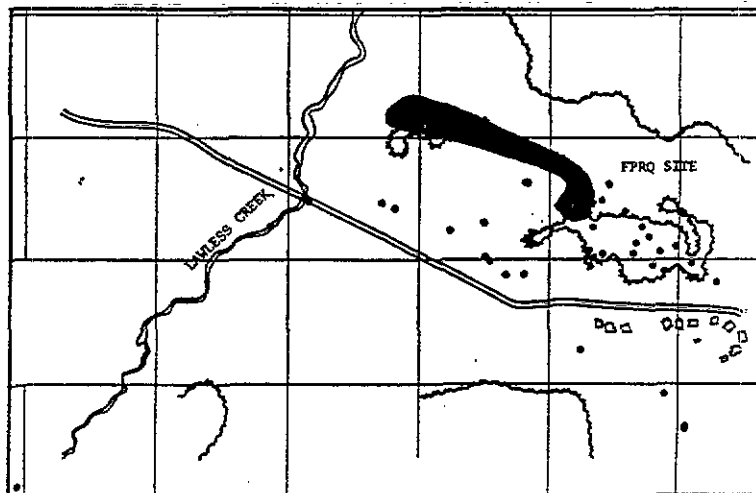
EXPOSURE TO CARCINOGENS

$$\text{Exposure Dose} = \frac{\text{ED} \times \text{P} \times \text{Ca} \times \text{I} \times \text{F}}{\text{W} \times \text{LT}}$$

where:

- ED = exposure duration
- P = proportion of year exposed
- Ca = contaminant concentration in mg/l
- I = ingestion rate in liters/day
- F = daily frequency
- W = weight of child in kg
- LT = lifetime in years

SAMPLE LOCATIONS



- FP-309(1) Upper N.
- FP-309(2) Upper N.
- FP-315(2) Upper N.
- Dup. FP-309
- FP-310(2) Mid. N.
- FP-311(1) Lower N.
- FP-311(2) Lower N.

TABLE 28-7
INCIDENTAL INGESTION OF SOUTH DRAINAGE WATER - CHILDREN

EXPOSURE TO NON-CARCINOGENS

Non-Carcinogenic Contaminant of Concern	RfD or Other Standard (mg/kg/day)	CONCENTRATION		EXPOSURE Average Case (mg/kg/day)	DOSE Reasonable Worst Case (mg/kg/day)	HAZARD Average Case	INDEX Reasonable Worst Case	END POINT
		Average (mg/l)	Maximum (mg/l)					
ANTIMONY	4e-4	BDL	BDL	0	0	.00	.00	
BARIUM	5e-2	2.16e-2	3.5e-2	3.85e-6	3.84e-5	.00	.00	
BIS (2EH) PHTHALATE	2e-2	BDL	BDL	0	0	.00	.00	
CADMIUM	5e-4	4.49e-2	8.13e-2	8.00e-6	8.91e-5	.02	.18	
COPPER	3.7e-2	1.83e-2	2.62e-2	3.26e-6	2.87e-5	.00	.00	
LEAD	1.4e-4	2.83e-3	4.74e-3	5.04e-7	5.19e-6	.00	.04	
MANGANESE	5e-1	1.51e0	2.67e0	2.69e-4	2.93e-3	.00	.01	
MERCURY	2e-3	BDL	BDL	0	0	.00	.00	
NICKEL	2e-2	2.3e-2	3.28e-2	4.10e-6	3.59e-5	.00	.00	
SELENIUM	3e-3	BDL	BDL	0	0	.00	.00	
VANADIUM	9e-3	BDL	BDL	0	0	.00	.00	
ZINC	2e-1	4.91e1	8.87e1	8.74e-3	9.72e-2	.04	.49	
TOTAL						.06	.71	

ASSUMPTIONS and NOTES

Ingested metals in water are 100% bioavailable; exposures averaged over 1 year.
Average = Ingestion by a 20 kg child of 25 ml of water per play day while wading in water, child plays 2 days per week for 26 weeks per year in water at the site. Ingested concentrations are arithmetic mean of site samples.
Worst = Ingestion by a 20 kg child of 50 ml of water per play day, child plays 4 days per week for 40 weeks per year in water at the site. Ingested concentrations are the lower of the 95% confidence limits of the mean or the highest observed concentration of site samples.

EXPOSURE TO CARCINOGENS

Carcinogenic Contaminant of Concern	Cancer Weight of Evidence	Cancer Potency Factor (mg/kg/d)	CONCENTRATION		EXPOSURE Average Case (mg/kg/day)	DOSE Reasonable Worst Case (mg/kg/day)	LIFETIME Average Case	CANCER RISK Reasonable Worst Case
			Average (mg/l)	Maximum (mg/l)				
ARSENIC	A	1.75e0	BDL	BDL	0	0	0	0
BENZENE	A	2.9e-2	BDL	BDL	0	0	0	0
BIS (2EH) PHTHALATE	B2	1.4e-2	BDL	BDL	0	0	0	0
CADMIUM	NA	NA	4.49e-2	8.13e-2	1.71e-6	1.91e-5	0	0
NICKEL	NA	NA	2.3e-2	3.28e-2	8.78e-7	7.70e-6	0	0
TOTAL							0	0

ASSUMPTIONS and NOTES

NA = Non-carcinogenic by the oral route. Assumptions for exposure to non-carcinogenic compounds apply.
Life-time exposure assumes 15 years of childhood (20 kg), exposures averaged over 70 years. Adults ingest no water.
Average = Assumes child ingests 25 ml per play day for 15 years. Play occurs 2 days per week for 26 weeks per year.
Worst = Assumes child ingests 50 ml per play day for 15 years, play occurs 4 days per week, 40 weeks per year.

AR301210

TABLE 6-7 (Continued)

INCIDENTAL INGESTION OF WATER FROM SOUTH DRAINAGE - CHILDREN

FORMULAE

EXPOSURE TO NON-CARCINOGENS

$$\text{Exposure Dose} = \frac{\text{Ca} \times \text{I} \times \text{F}}{\text{W}}$$

where:

- Ca = contaminant concentration in mg/l
- I = ingestion rate in liters/day
- F = daily frequency
- W = weight of child in kg

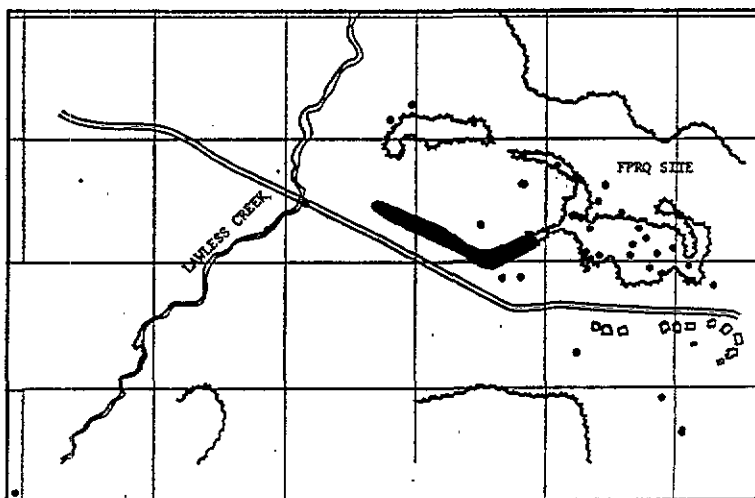
EXPOSURE TO CARCINOGENS

$$\text{Exposure Dose} = \frac{\text{ED} \times \text{P} \times \text{Ca} \times \text{I} \times \text{F}}{\text{W} \times \text{LT}}$$

where:

- ED = exposure duration
- P = proportion of year exposed
- Ca = contaminant concentration in mg/l
- I = ingestion rate in liters/day
- F = daily frequency
- W = weight of child in kg
- LT = lifetime in years

SAMPLE LOCATIONS



- FP-306(1) Upper S.
- FP-306(2) Upper S.
- FP-307(2) Mid. S.
- FP-308(1) Lower S.
- FP-308(2) Lower S.
- FP-319(1) Upper S.
- Dup. FP-306

EXPOSURE TO NON-CARCINOGENS

Non-Carcinogenic Contaminant of Concern	RfD or Other Standard (ng/kg/day)	CONCENTRATION		EXPOSURE Average Case (ng/kg/day)	DOSE Reasonable Worst Case (ng/kg/day)	HAZARD Average Case	INDEX Reasonable Worst Case	END POINT
		Average (ng/kg)	Maximum (ng/kg)					
ANTIMONY	4e-4	1.01e0	1.85e0	7.19e-7	1.62e-5	.00	.04	
BARIUM	5e-2	3.06e3	5.99e3	2.18e-3	5.25e-2	.04	1.05	
BIS (2EH) PHTHALATE	2e-2	BDL	BDL	0	0	.00	.00	
CADMIUM	5e-4	1.01e1	2e1	7.19e-6	1.75e-4	.01	.35	
COPPER	3.7e-2	7.92e0	1.01e1	5.64e-6	8.85e-5	.00	.00	
LEAD	1.4e-4	3.22e1	4.95e1	2.29e-5	4.34e-4	.16	3.10	
MANGANESE	5e-1	3.74e2	5.92e2	2.66e-4	5.19e-3	.00	.01	
MERCURY	2e-3	BDL	BDL	0	0	.00	.00	
NICKEL	2e-2	1.84e1	3.64e1	1.31e-5	3.19e-4	.00	.02	
SELENIUM	3e-3	6.89e-1	9.99e-1	4.91e-7	8.76e-6	.00	.00	
VANADIUM	9e-3	1.03e1	1.35e1	7.34e-6	1.18e-4	.00	.01	
ZINC	2e-1	3.05e2	5.08e2	2.17e-4	4.45e-3	.00	.02	
TOTAL						.23	4.61	

ASSUMPTIONS and NOTES

Ingested metals in sediment are 50 (average case) to 100% (worst case) bioavailable; exposures averaged over 1 year.
Average = Ingestion by a 20 kg child of 200 mg of soil per play day, child plays 2 days per week for 26 weeks per year in sediments at the site. Ingested concentrations are arithmetic mean of site samples.
Worst = Ingestion by a 20 kg child of 400 mg of soil per play day, child plays 4 days per week for 40 weeks per year in sediments at the site. Ingested concentrations are the lower of the 95% confidence limits of the mean or the highest observed concentration of site samples.

EXPOSURE TO CARCINOGENS

Carcinogenic Contaminant of Concern	Cancer Weight of Evidence	Cancer Potency Factor (ng/kg/d)	CONCENTRATION		EXPOSURE Average Case (ng/kg/day)	DOSE Reasonable Worst Case (ng/kg/day)	LIFETIME Average Case	CANCER RISK Reasonable Worst Case
			Average (ng/kg)	Maximum (ng/kg)				
ARSENIC	A	1.75e0	4.2e1	9.35e1	6.41e-6	1.76e-4	1.12e-5	3.07e-4
BENZENE	A	2.9e-2	BDL	BDL	0	0	0	0
BIS (2EH) PHTHALATE	B2	1.4e-2	BDL	BDL	0	0	0	0
CADMIUM	NA	NA	1.01e1	2e1	1.54e-6	3.76e-5	0	0
NICKEL	NA	NA	1.84e1	3.64e1	2.81e-6	6.84e-5	0	0
TOTAL							1.12e-5	3.07e-4

ASSUMPTIONS and NOTES

NA = Non-carcinogenic by the oral route. Assumptions for exposure to non-carcinogenic compounds apply.
Life-time exposure assumes 15 years of childhood (20 kg), no adult exposure to sediments.
Average = Assumes child ingests 200 mg per play day, 2 days per week for 26 weeks per year.
Worst = Assumes child ingests 400 mg per play day, 4 days per week for 40 weeks per year.

AR301212

TABLE 6-8 (Continued)

INCIDENTAL INGESTION OF NORTH DRAINAGE SEDIMENTS - CHILDREN

FORMULAE

EXPOSURE TO NON-CARCINOGENS

$$\text{Exposure Dose} = \frac{\text{Ca} \times \text{I} \times \text{F} \times \text{A}}{\text{W}}$$

where:

- Ca = contaminant concentration in mg/kg
- I = soil ingestion rate in mg/day
- F = daily frequency
- W = weight in kg
- A = bioavailability in percent

EXPOSURE TO CARCINOGENS

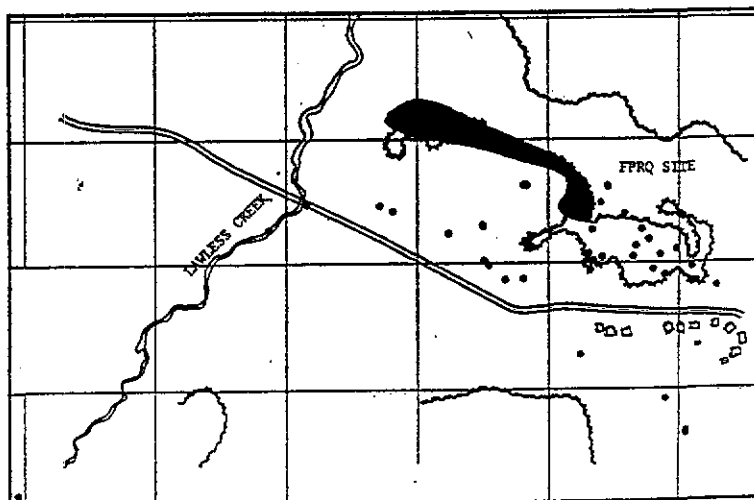
$$\frac{\text{ED}(\alpha) \times \text{P} \times \text{Ca} \times \text{I}(\alpha) \times \text{F} \times \text{A}}{\text{W}(\alpha)}$$

$$\text{Exposure Dose} = \frac{\text{ED}(\alpha) \times \text{P} \times \text{Ca} \times \text{I}(\alpha) \times \text{F} \times \text{A}}{\text{W}(\alpha) \times \text{LT}}$$

where:

- ED(α) = exposure duration
- P = proportion of year exposed
- Ca = contaminant concentration in mg/kg
- I(α) = soil ingestion rate in mg/day for each ED
- F = daily frequency
- W(α) = weight in kg for each ED
- LT = lifetime in years
- A = bioavailability in percent

SAMPLE LOCATIONS



- FP-209(1) Upper N.
- FP-209(2) Upper N.
- FP-215(2) Upper N.
- Dup. FP-209
- FP-210(2) Mid. N.
- FP-211(1) Lower N.
- FP-211(2) Lower N.

AR301213

TABLE 28-9
INCIDENTAL INGESTION OF SOUTH DRAINAGE SEDIMENTS - CHILDREN

EXPOSURE TO NON-CARCINOGENS

Non-Carcinogenic Contaminant of Concern	RfD or Other Standard (mg/kg/day)	CONCENTRATION		EXPOSURE Average Case (mg/kg/day)	DOSE Reasonable Worst Case (mg/kg/day)	HAZARD Average Case	INDEX Reasonable Worst Case	END POINT
		Average (mg/kg)	Maximum (mg/kg)					
ANTIMONY	4e-4	BDL	BDL	0	0	.00	.00	
BARIUM	5e-2	1.06e1	1.41e1	7.55e-6	1.24e-4	.00	.00	
BIS (2EH) PHTHALATE	2e-2	BDL	BDL	0	0	.00	.00	
CADMIUM	5e-4	BDL	BDL	0	0	.00	.00	
COPPER	3.7e-2	1.21e1	2.35e1	8.62e-6	2.06e-4	.00	.01	
LEAD	1.4e-4	1.17e1	1.36e1	8.33e-6	1.19e-4	.06	.85	
MANGANESE	5e-1	2e2	3.21e2	1.42e-4	2.81e-3	.00	.01	
MERCURY	2e-3	BDL	BDL	0	0	.00	.00	
NICKEL	2e-2	BDL	BDL	0	0	.00	.00	
SELENIUM	3e-3	BDL	BDL	0	0	.00	.00	
VANADIUM	9e-3	3.48e0	5.69e0	2.48e-6	4.99e-5	.00	.01	
ZINC	2e-1	3e2	4.6e2	2.14e-4	4.03e-3	.00	.02	
TOTAL						.06	.89	

ASSUMPTIONS and NOTES

Ingested metals in sediment are 50 (average case) to 100% (worst case) bioavailable; exposures averaged over 1 year. Average = Ingestion by a 20 kg child of 200 mg of soil per play day, child plays 2 days per week for 26 weeks per year in sediments. Ingested concentrations are arithmetic mean of site samples. Worst = Ingestion by a 20 kg child of 400 mg of soil per play day, child plays 4 days per week for 40 weeks per year in sediments. Ingested concentrations are the lower of the 95% confidence limits of the mean or the highest observed concentration of sediment samples.

EXPOSURE TO CARCINOGENS

Carcinogenic Contaminant of Concern	Cancer Weight of Evidence	Cancer Potency Factor (mg/kg/d)	CONCENTRATION		EXPOSURE Average Case (mg/kg/day)	DOSE Reasonable Worst Case (mg/kg/day)	LIFETIME Average Case	CANCER RISK Reasonable Worst Case
			Average (mg/kg)	Maximum (mg/kg)				
ARSENIC	A	1.75e0	6.3e-1	7.54e-1	9.62e-8	1.42e-6	1.68e-7	2.48e-6
BENZENE	A	2.9e-2	BDL	BDL	0	0	0	0
BIS (2EH) PHTHALATE	B2	1.4e-2	BDL	BDL	0	0	0	0
CADMIUM	NA	NA	BDL	BDL	0	0	0	0
NICKEL	NA	NA	BDL	BDL	0	0	0	0
TOTAL							1.68e-7	2.48e-6

ASSUMPTIONS and NOTES

NA = Non-carcinogenic by the oral route. Assumptions for exposure to non-carcinogenic compounds apply. Life-time exposure assumes 15 years of childhood (20 kg), no adult exposure to sediments. Average = Assumes child ingests 200 mg per play day, 2 days per week for 26 weeks per year. Worst = Assumes child ingests 400 mg per play day, 4 days per week, 40 weeks per year.

AR301214

TABLE 6-9 (Continued)

INCIDENTAL INGESTION OF SOUTH DRAINAGE SEDIMENTS - CHILDREN

FORMULAE

EXPOSURE TO NON-CARCINOGENS

$$\text{Exposure Dose} = \frac{\text{Ca} \times \text{I} \times \text{F} \times \text{A}}{\text{W}}$$

where:

- Ca = contaminant concentration in mg/kg
- I = soil ingestion rate in mg/day
- F = daily frequency
- W = weight in kg
- A = bioavailability in percent

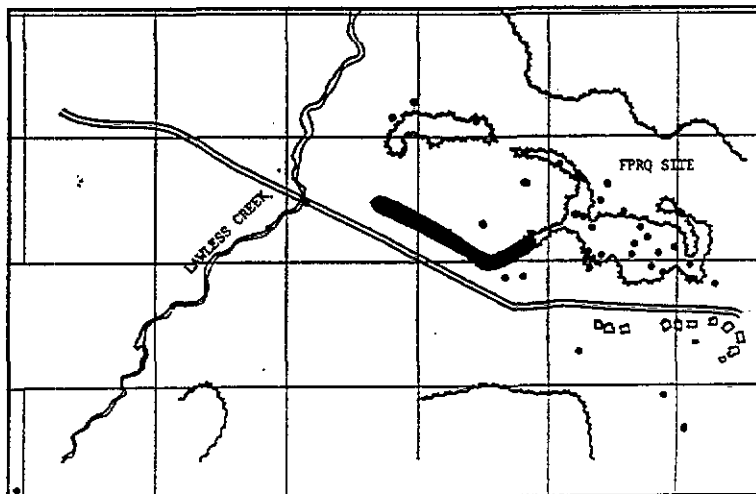
EXPOSURE TO CARCINOGENS

$$\text{Exposure Dose} = \frac{\text{ED}(\alpha) \times \text{P} \times \text{Ca} \times \text{I}(\alpha) \times \text{F} \times \text{A}}{\text{W}(\alpha) \times \text{LT}}$$

where:

- ED(α) = exposure duration
- P = proportion of year exposed
- Ca = contaminant concentration in mg/kg
- I(α) = soil ingestion rate in mg/day for each ED
- F = daily frequency
- W(α) = weight in kg for each ED
- LT = lifetime in years
- A = bioavailability in percent

SAMPLE LOCATIONS



- FP-206(1) Upper S.
- FP-206(2) Upper S.
- FP-207(2) Mid. S.
- FP-208(1) Lower S.
- FP-208(2) Lower S.
- FP-219(1) Upper S.
- Dup. FP-206

AR301215

TABLE 28-10
INGESTION OF RESIDENTIAL POTABLE WATER FROM LAWLESS CREEK

EXPOSURE TO NON-CARCINOGENS

Non-Carcinogenic Contaminant of Concern	RfD or Other Standard (mg/kg/day)	CONCENTRATION		EXPOSURE Average Case (mg/kg/day)	DOSE Reasonable Worst Case (mg/kg/day)	HAZARD Average Case	INDEX Reasonable Worst Case	END POINT
		Average (mg/l)	Maximum (mg/l)					
ANTIMONY	4e-4	BDL	BDL	0	0	.00	.00	
BARIUM	5e-2	7.23e-3	1.63e-2	2.07e-4	8.15e-4	.00	.02	
BIS (2 EH) PHTHALATE	2e-2	BDL	BDL	0	0	.00	.00	
CADMIUM	5e-4	3.59e-3	6.11e-3	1.03e-4	3.06e-4	.21	.61	
COPPER	3.7e-2	8.1e-3	1.53e-2	2.31e-4	7.65e-4	.01	.02	
LEAD	1.4e-4	7.88e-4	1.28e-3	2.25e-5	6.4e-5	.16	.46	
MANGANESE	5e-1	5.52e-2	7.9e-2	1.58e-3	3.95e-3	.00	.01	
MERCURY	2e-3	BDL	BDL	0	0	.00	.00	
NICKEL	2e-2	BDL	BDL	0	0	.00	.00	
SELENIUM	3e-3	BDL	BDL	0	0	.00	.00	
VANADIUM	9e-3	BDL	BDL	0	0	.00	.00	
ZINC	2e-1	2.45e-2	2.8e-2	7e-4	1.4e-3	.00	.01	
TOTAL						.38	1.12	

ASSUMPTIONS and NOTES

Ingested metals are 100% bioavailable; concentrations are dissolved concentrations.
 Exposure averaged over a 1-year period.
 Average = Daily ingestion by 70 kg adults of 2 liters of the arithmetic mean concentration of material in Lawless Creek.
 Worst Case = Daily ingestion by 20 kg child of 1 liter of the lower of the 95% confidence limits of the mean or the highest observed concentration of contaminants in Lawless Creek.

EXPOSURE TO CARCINOGENS

Carcinogenic Contaminant of Concern	Cancer Weight of Evidence	Cancer Potency Factor (mg/kg/d)	CONCENTRATION		EXPOSURE Average Case (mg/kg/day)	DOSE Reasonable Worst Case (mg/kg/day)	LIFETIME CANCER RISK	
			Average (mg/l)	Maximum (mg/l)			Average Case	Reasonable Worst Case
ARSENIC	A	1.75e0	BDL	BDL	0	0	0	0
BENZENE	A	2.9e-2	BDL	BDL	0	0	0	0
BIS (2 EH) PHTHALATE	B2	1.4e-2	BDL	BDL	0	0	0	0
CADMIUM	NA	NA	3.59e-3	6.11e-3	1.20e-4	2.05e-4	0	0
NICKEL	NA	NA	BDL	BDL	0	0	0	0
TOTAL							0	0

ASSUMPTIONS and NOTES

Assumptions for exposure to non-carcinogenic compounds apply.
 NA = Non-carcinogenic by the oral route.
 Life-time exposure assumes 10 years of childhood (20 kg, 1 liter/d), 5 years adolescence (36 kg, 2 liter/d), and 55 years of adulthood (70 kg, 2 liter/d) with exposure averaged over 70 years.

TABLE 6-10 (Continued)

INGESTION OF POTABLE WATER FROM LAWLESS CREEK

FORMULAE

EXPOSURE TO NON-CARCINOGENS

$$\text{Exposure Dose} = \frac{\text{Ca} \times \text{I}}{\text{W}}$$

where:

- Ca = contaminant concentration in mg/l
- I = ingestion rate in liters/day
- W = weight in kg

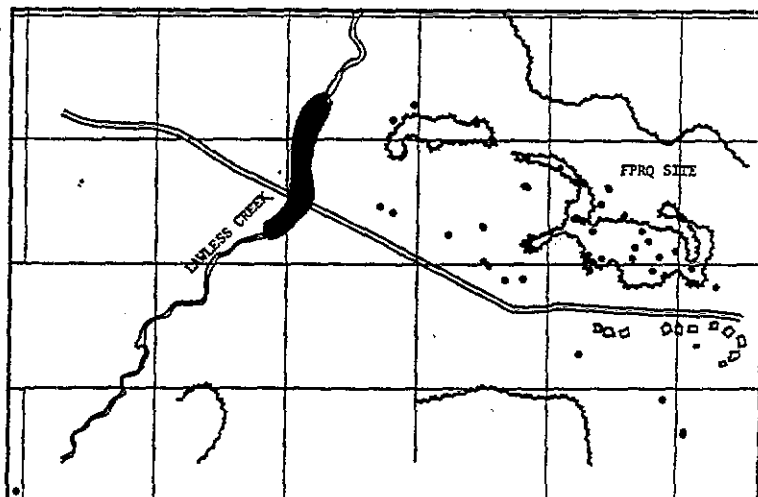
EXPOSURE TO CARCINOGENS

$$\text{Exposure Dose} = \frac{\text{ED}(\alpha) \times \text{Ca} \times \text{I}(\alpha)}{\text{W}(\alpha) \times \text{LT}}$$

where:

- ED(α) = exposure duration
- Ca = contaminant concentration in mg/l
- I(α) = ingestion rate in liters/day for each ED
- W(α) = weight in kg for each ED
- LT = lifetime in years

SAMPLE LOCATIONS



- FP-313(1) S. Road
- FP-313(2) S. Road
- FP-314(1) Downstream
- FP-314(2) Downstream

AR301217

TABLE 28-11
INCIDENTAL INGESTION OF QUARRY SOIL - CHILDREN

EXPOSURE TO NON-CARCINOGENS

Non-Carcinogenic Contaminant of Concern	RfD or Other Standard (mg/kg/day)	CONCENTRATION		EXPOSURE Average Case (mg/kg/day)	DOSE Reasonable Worst Case (mg/kg/day)	HAZARD Average Case	INDEX Reasonable Worst Case	END POINT
		Average (mg/kg)	Maximum (mg/kg)					
ANTIMONY	4e-4	5.16e-1	1.01e0	3.68e-7	8.85e-6	.00	.02	
BARIUM	5e-2	1.92e2	3.86e2	1.37e-4	3.38e-3	.00	.07	
BIS (2EH) PHTHALATE	2e-2	BDL	BDL	0	0	.00	.00	
CADMIUM	5e-4	1.28e0	1.71e0	9.12e-7	1.50e-5	.00	.03	
COPPER	3.7e-2	8.14e0	9.75e0	5.80e-6	8.55e-5	.00	.00	
LEAD	1.4e-4	2.73e2	6.25e2	1.94e-4	5.48e-3	1.39	39.14	
MANGANESE	5e-1	1.28e2	1.68e2	9.12e-5	1.47e-3	.00	.00	
MERCURY	2e-3	BDL	BDL	0	0	.00	.00	
NICKEL	2e-2	1.21e1	1.67e1	8.62e-6	1.46e-4	.00	.01	
SELENIUM	3e-3	1.69e-1	2.23e-1	1.20e-7	1.96e-6	.00	.00	
VANADIUM	9e-3	2.02e1	2.49e1	1.44e-5	2.18e-4	.00	.02	
ZINC	2e-1	1.04e2	1.7e2	7.41e-5	1.49e-3	.00	.01	
TOTAL						1.40	39.30	

ASSUMPTIONS and NOTES

Ingested metals in soil matrix are 50 (average case) to 100% (worst case) bioavailable; exposures averaged over 1 year. Average = Ingestion by a 20 kg child of 200 mg of soil per play day, child plays 2 days per week for 26 weeks per year in quarry soil. Ingested concentrations are arithmetic mean of quarry soil samples. Worst = Ingestion by a 20 kg child of 400 mg of soil per play day, child plays 4 days per week for 40 weeks per year in quarry soil. Ingested concentrations are the lower of the 95% confidence limits of the mean or the highest observed concentration of site samples.

EXPOSURE TO CARCINOGENS

Carcinogenic Contaminant of Concern	Cancer Weight of Evidence	Cancer Potency Factor (mg/kg/d)	CONCENTRATION		EXPOSURE Average Case (mg/kg/day)	DOSE Reasonable Worst Case (mg/kg/day)	LIFETIME Average Case	CANCER RISK Reasonable Worst Case
			Average (mg/kg)	Maximum (mg/kg)				
ARSENIC	A	1.75e0	5.19e0	8.44e0	8.37e-7	1.81e-5	1.47e-6	3.17e-5
BENZENE	A	2.9e-2	BDL	BDL	0	0	0	0
BIS (2EH) PHTHALATE	B2	1.4e-2	BDL	BDL	0	0	0	0
CADMIUM	NA	NA	1.28e0	1.71e0	2.07e-7	3.67e-6	0	0
NICKEL	NA	NA	1.21e1	1.67e1	1.95e-6	3.59e-5	0	0
TOTAL							1.47e-6	3.17e-5

ASSUMPTIONS and NOTES

NA = Non-carcinogenic by the oral route. Assumptions for exposure to non-carcinogenic compounds apply. Life-time exposure assumes 15 years of childhood (20 kg) and 10 years (average) to 30 years (worst case) of adulthood (70 kg) with exposure averaged over 70 years. Average = Assumes child ingests 200 mg per play day for 15 years, adults ingest 60 mg per activity day for 10 years. Outdoor activity occurs 2 days per week for 26 weeks of the year. Worst = Assumes child ingests 400 mg per play day for 15 years, adults ingest 100 mg per activity day for 30 years. Outdoor activity occurs 4 days a week for 40 weeks per year.

AR301218

TABLE 6-11 (Continued)

INCIDENTAL INGESTION OF QUARRY SOIL - CHILDREN

FORMULAE

EXPOSURE TO NON-CARCINOGENS

$$\text{Exposure Dose} = \frac{\text{Ca} \times \text{I} \times \text{F} \times \text{A}}{\text{W}}$$

where:

- Ca = contaminant concentration in mg/kg
- I = soil ingestion rate in mg/day
- F = daily frequency
- W = weight in kg
- A = bioavailability in percent

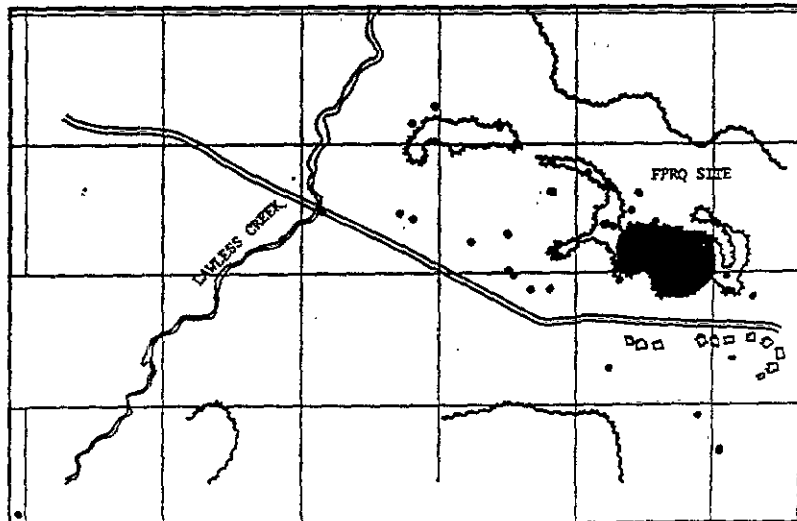
EXPOSURE TO CARCINOGENS

$$\text{Exposure Dose} = \frac{\text{ED}(\alpha) \times \text{P} \times \text{Ca} \times \text{I}(\alpha) \times \text{F} \times \text{A}}{\text{W}(\alpha) \times \text{LT}}$$

where:

- ED(α) = exposure duration
- P = proportion of year exposed
- Ca = contaminant concentration in mg/kg
- I(α) = soil ingestion rate in mg/day for each ED
- F = daily frequency
- W(α) = weight in kg for each ED
- A = bioavailability in percent
- LT = lifetime in years

SAMPLE LOCATIONS



- FP-103 Grid
- FP-104 Grid
- FP-105 Grid
- FP-106 Grid
- FP-107 Grid
- FP-108 Grid
- FP-109 Grid

AR301219

TABLE 28-12
INCIDENTAL INGESTION OF QUARRY SOIL - ADULTS

EXPOSURE TO NON-CARCINOGENS

Non-Carcinogenic Contaminant of Concern	RfD or Other Standard (ng/kg/day)	CONCENTRATION		EXPOSURE Average Case (ng/kg/day)	DOSE Reasonable Worst Case (ng/kg/day)	HAZARD Average Case	INDEX Reasonable Worst Case	END POINT
		Average (ng/kg)	Maximum (ng/kg)					
ANTIMONY	4e-4	5.16e-1	1.01e0	3.15e-8	6.32e-7	.00	.00	
BARIUM	5e-2	1.92e2	3.86e2	1.17e-5	2.42e-4	.00	.00	
BIS (2EH) PHTHALATE	2e-2	BDL	BDL	0	0	.00	.00	
CADMIUM	5e-4	1.28e0	1.71e0	7.82e-8	1.07e-6	.00	.00	
COPPER	3.7e-2	8.14e0	9.75e0	4.97e-7	6.11e-6	.00	.00	
LEAD	1.4e-4	2.73e2	6.25e2	1.67e-5	3.91e-4	.12	2.80	
MANGANESE	5e-1	1.28e2	1.68e2	7.82e-6	1.05e-4	.00	.00	
MERCURY	2e-3	BDL	BDL	0	0	.00	.00	
NICKEL	2e-2	1.21e1	1.67e1	7.39e-7	1.05e-5	.00	.00	
SELENIUM	3e-3	1.69e-1	2.23e-1	1.03e-8	1.40e-7	.00	.00	
VANADIUM	9e-3	2.02e1	2.49e1	1.23e-6	1.56e-5	.00	.00	
ZINC	2e-1	1.04e2	1.7e2	6.35e-6	1.06e-4	.00	.00	
TOTAL						.12	2.81	

ASSUMPTIONS and NOTES

Ingested metals in soil matrix are 50 (average case) to 100% (worst case) bioavailable; exposures averaged over 1 year. Average = Ingestion by a 70 kg adult of 60 mg of soil per activity day, adult gardens 2 days per week for 26 weeks per year in quarry soil. Ingested concentrations are arithmetic mean of quarry soil samples. Worst = Ingestion by a 70 kg adult of 100 mg of soil per activity day, adult gardens 4 days per week for 40 weeks per year in quarry soil. Ingested concentrations are the lower of the 95% confidence limits of the mean or the highest observed concentration of site samples.

EXPOSURE TO CARCINOGENS

Carcinogenic Contaminant of Concern	Cancer Weight of Evidence	Cancer Potency Factor (ng/kg/d)	CONCENTRATION		EXPOSURE Average Case (ng/kg/day)	DOSE Reasonable Worst Case (ng/kg/day)	LIFETIME Average Case	CANCER RISK Reasonable Worst Case
			Average (ng/kg)	Maximum (ng/kg)				
ARSENIC	A	1.75e0	5.19e0	8.44e0	8.37e-7	1.81e-5	1.47e-6	3.17e-5
BENZENE	A	2.9e-2	BDL	BDL	0	0	0	0
BIS (2EH) PHTHALATE	B2	1.4e-2	BDL	BDL	0	0	0	0
CADMIUM	NA	NA	1.28e0	1.71e0	2.07e-7	3.67e-6	0	0
NICKEL	NA	NA	1.21e1	1.67e1	1.95e-6	3.59e-5	0	0
TOTAL							1.47e-6	3.17e-5

ASSUMPTIONS and NOTES

NA = Non-carcinogenic by the oral route. Assumptions for exposure to non-carcinogenic compounds apply. Life-time exposure assumes 15 years of childhood (20 kg) and 10 years (average) to 30 years (worst case) of adulthood (70 kg) with exposure averaged over 70 years. Average = Assumes child ingests 200 mg per play day for 15 years, adults ingest 60 mg per activity day for 10 years. Outdoor activity occurs 2 days per week for 26 weeks of the year. Worst = Assumes child ingests 400 mg per play day for 15 years, adults ingest 100 mg per activity day for 30 years. Outdoor activity occurs 4 days a week for 40 weeks per year.

R301220

TABLE 6-12 (Continued)

INCIDENTAL INGESTION OF QUARRY SOIL - ADULTS

FORMULAE

EXPOSURE TO NON-CARCINOGENS

$$\text{Exposure Dose} = \frac{\text{Ca} \times \text{I} \times \text{F} \times \text{A}}{\text{W}}$$

where:

- Ca = contaminant concentration in mg/kg
- I = soil ingestion rate in mg/day
- F = daily frequency
- W = weight in kg
- A = bioavailability in percent

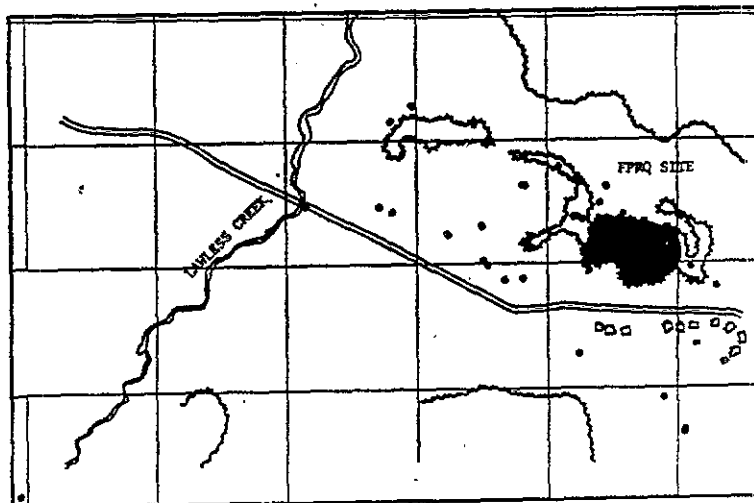
EXPOSURE TO CARCINOGENS

$$\text{Exposure Dose} = \frac{\text{ED}(\alpha) \times \text{P} \times \text{Ca} \times \text{I}(\alpha) \times \text{F} \times \text{A}}{\text{W}(\alpha) \times \text{LT}}$$

where:

- ED(α) = exposure duration
- P = proportion of year exposed
- Ca = contaminant concentration in mg/kg
- I(α) = soil ingestion rate in mg/day for each ED
- F = daily frequency
- W(α) = weight in kg for each ED
- A = bioavailability in percent
- LT = lifetime in years

SAMPLE LOCATIONS



- FP-103 Grid
- FP-104 Grid
- FP-105 Grid
- FP-106 Grid
- FP-107 Grid
- FP-108 Grid
- FP-109 Grid

AR301221

TABLE 28-13
INCIDENTAL INGESTION OF NORTH DRAINAGE SOIL - CHILDREN

EXPOSURE TO NON-CARCINOGENS

Non-Carcinogenic Contaminant of Concern	RfD or Other Standard (mg/kg/day)	CONCENTRATION		EXPOSURE Average Case (mg/kg/day)	DOSE Reasonable Worst Case (mg/kg/day)	HAZARD Average Case	INDEX Reasonable Worst Case	END POINT
		Average (mg/kg)	Maximum (mg/kg)					
ANTIMONY	4e-4	7.11e-1	8.54e-1	5.06e-7	7.49e-6	.00	.02	
BARIUM	5e-2	1.48e3	1.82e3	1.05e-3	1.60e-2	.02	.32	
BIS (2EH) PHTHALATE	2e-2	BDL	BDL	0	0	.00	.00	
CADMIUM	5e-4	4.71e0	6.88e0	3.36e-6	6.03e-5	.01	.12	
COPPER	3.7e-2	1.16e1	9.25e0	8.26e-6	8.11e-5	.00	.00	
LEAD	1.4e-4	1.41e2	1.74e2	1.00e-4	1.53e-3	.72	10.90	
MANGANESE	5e-1	1.542e3	1.66e3	1.10e-3	1.46e-2	.00	.03	
MERCURY	2e-3	BDL	BDL	0	0	.00	.00	
NICKEL	2e-2	6.89e0	6.9e0	4.91e-6	6.05e-5	.00	.00	
SELENIUM	3e-3	2.68e-1	2.55e-1	1.91e-7	2.24e-6	.00	.00	
VANADIUM	9e-3	1.15e1	1.12e1	8.19e-6	9.82e-5	.00	.01	
ZINC	2e-1	5.78e2	6.18e2	4.12e-4	5.42e-3	.00	.03	
TOTAL						.75	11.43	

ASSUMPTIONS and NOTES

Ingested metals in soil matrix are 50 (average case) to 100% (worst case) bioavailable; exposures averaged over 1 year.
 Average = Ingestion by a 20 kg child of 200 mg of soil per play day, child plays 2 days per week for 26 weeks per year in soil at the site. Ingested concentrations are arithmetic mean of site samples.
 Worst = Ingestion by a 20 kg child of 400 mg of soil per play day, child plays 4 days per week for 40 weeks per year in soil at the site. Ingested concentrations are the lower of the 95% confidence limits of the mean or the highest observed concentration of site samples.

EXPOSURE TO CARCINOGENS

Carcinogenic Contaminant of Concern	Cancer Weight of Evidence	Cancer Potency Factor (mg/kg/d)	CONCENTRATION		EXPOSURE Average Case (mg/kg/day)	DOSE Reasonable Worst Case (mg/kg/day)	LIFETIME Average Case	CANCER RISK Reasonable Worst Case
			Average (mg/kg)	Maximum (mg/kg)				
ARSENIC	A	1.75e0	2.04e1	2.56e1	3.29e-6	5.50e-5	5.76e-6	9.62e-5
BENZENE	A	2.9e-2	BDL	BDL	0	0	0	0
BIS (2EH) PHTHALATE	B2	1.4e-2	BDL	BDL	0	0	0	0
CADMIUM	NA	NA	4.71e0	6.88e0	7.60e-7	1.48e-5	0	0
NICKEL	NA	NA	6.89e0	6.9e0	1.11e-6	1.48e-5	0	0
TOTAL							5.76e-6	9.62e-5

ASSUMPTIONS and NOTES

NA = Non-carcinogenic by the oral route. Assumptions for exposure to non-carcinogenic compounds apply.
 Life-time exposure assumes 15 years of childhood (20 kg) and 10 years (average) to 30 years (worst case) of adulthood (70 kg) with exposure averaged over 70 years.
 Average = Assumes child ingests 200 mg per play day for 15 years, adults ingest 60 mg per activity day for 10 years. Outdoor activity occurs 2 days per week for 26 weeks of the year.
 Worst = Assumes child ingests 400 mg per play day for 15 years, adults ingest 100 mg per activity day for 30 years. Outdoor activity occurs 4 days a week for 40 weeks per year.

AR301222

TABLE 6-13 (Continued)

INCIDENTAL INGESTION OF NORTH DRAINAGE SOIL - CHILDREN

FORMULAE

EXPOSURE TO NON-CARCINOGENS

$$\text{Exposure Dose} = \frac{\text{Ca} \times \text{I} \times \text{F} \times \text{A}}{\text{W}}$$

where:

- Ca = contaminant concentration in mg/kg
- I = soil ingestion rate in mg/day
- F = daily frequency
- W = weight in kg
- A = bioavailability in percent

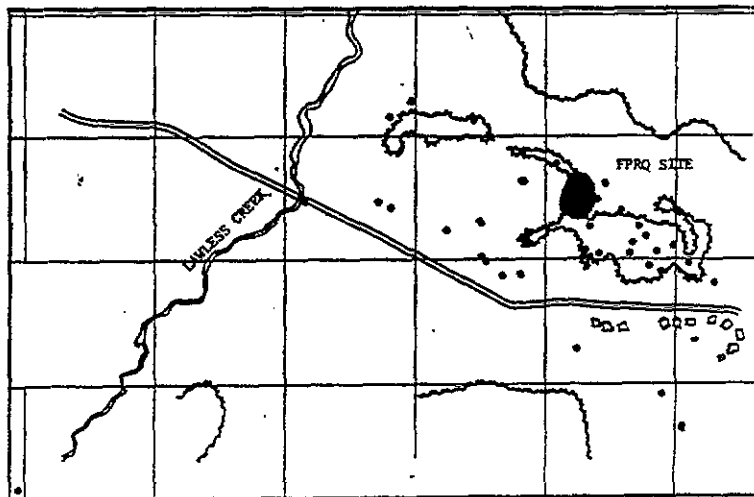
EXPOSURE TO CARCINOGENS

$$\text{Exposure Dose} = \frac{\text{ED}(\alpha) \times \text{P} \times \text{Ca} \times \text{I}(\alpha) \times \text{F} \times \text{A}}{\text{W}(\alpha) \times \text{LT}}$$

where:

- ED(α) = exposure duration
- P = proportion of year exposed
- Ca = contaminant concentration in mg/kg
- I(α) = soil ingestion rate in mg/day for each ED
- F = daily frequency
- W(α) = weight in kg for each ED
- LT = lifetime in years
- A = bioavailability in percent

SAMPLE LOCATIONS



FP-121 Grid
 FP-122 Grid
 FP-123 Grid
 FP-124 Grid

AR301223

TABLE 28-14
INCIDENTAL INGESTION OF NORTH DRAINAGE SOIL - ADULTS

EXPOSURE TO NON-CARCINOGENS

Non-Carcinogenic Contaminant of Concern	Rfd or Other Standard (mg/kg/day)	CONCENTRATION		EXPOSURE Average Case (mg/kg/day)	DOSE Reasonable Worst Case (mg/kg/day)	HAZARD Average Case	INDEX Reasonable Worst Case	END POINT
		Average (mg/kg)	Maximum (mg/kg)					
ANTIMONY	4e-4	7.11e-1	8.54e-1	4.34e-8	5.35e-7	.00	.00	
BARIUM	5e-2	1.48e3	1.82e3	9.04e-5	1.14e-3	.00	.02	
BIS (2EH) PHTHALATE	2e-2	BDL	BDL	0	0	.00	.00	
CADMIUM	5e-4	4.71e0	6.89e0	2.88e-7	4.31e-6	.00	.01	
COPPER	3.7e-2	1.16e1	9.25e0	7.08e-7	5.79e-6	.00	.00	
LEAD	1.4e-4	1.41e2	1.74e2	8.61e-6	1.09e-4	.06	.78	
MANGANESE	5e-1	1.542e3	1.66e3	9.41e-5	1.04e-3	.00	.00	
MERCURY	2e-3	BDL	BDL	0	0	.00	.00	
NICKEL	2e-2	6.89e0	6.9e0	4.21e-7	4.32e-6	.00	.00	
SELENIUM	3e-3	2.68e-1	2.55e-1	1.64e-8	1.60e-7	.00	.00	
VANADIUM	9e-3	1.5e0	1.12e1	9.16e-8	7.01e-6	.00	.00	
ZINC	2e-1	5.78e2	6.18e2	3.53e-5	3.87e-4	.00	.00	
TOTAL						.06	.82	

ASSUMPTIONS and NOTES

Ingested metals in soil matrix are 50 (average case) to 100% (worst case) bioavailable; exposures averaged over 1 year. Average = Ingestion by a 70 kg adult of 60 mg of soil per activity day, adult gardens 2 days per week for 26 weeks per year in soil at the site. Ingested concentrations are arithmetic mean of site samples. Worst = Ingestion by a 70 kg adult of 100 mg of soil per activity day, adult gardens 4 days per week for 40 weeks per year in soil at the site. Ingested concentrations are the lower of the 95% confidence limits of the mean or the highest observed concentration of site samples.

EXPOSURE TO CARCINOGENS

Carcinogenic Contaminant of Concern	Cancer Weight of Evidence	Cancer Potency Factor (mg/kg/d)	CONCENTRATION		EXPOSURE Average Case (mg/kg/day)	DOSE Reasonable Worst Case (mg/kg/day)	LIFETIME CANCER RISK	
			Average (mg/kg)	Maximum (mg/kg)			Average Case	Reasonable Worst Case
ARSENIC	A	1.75e0	2.04e1	2.56e1	3.29e-6	5.50e-5	5.76e-6	9.62e-5
BENZENE	A	2.9e-2	BDL	BDL	0	0	0	0
BIS (2EH) PHTHALATE	B2	1.4e-2	BDL	BDL	0	0	0	0
CADMIUM	NA	NA	4.71e0	6.89e0	7.60e-7	1.48e-5	0	0
NICKEL	NA	NA	6.89e0	6.9e0	1.11e-6	1.48e-5	0	0
TOTAL							5.76e-6	9.62e-5

ASSUMPTIONS and NOTES

NA = Non-carcinogenic by the oral route. Assumptions for exposure to non-carcinogenic compounds apply. Life-time exposure assumes 15 years of childhood (20 kg) and 10 years (average) to 30 years (worst case) of adulthood (70 kg) with exposure averaged over 70 years. Average = Assumes child ingests 200 mg per play day for 15 years, adults ingest 60 mg per activity day for 10 years. Outdoor activity occurs 2 days per week for 26 weeks of the year. Worst = Assumes child ingests 400 mg per play day for 15 years, adults ingest 100 mg per activity day for 30 years. Outdoor activity occurs 4 days a week for 40 weeks per year.

301224

TABLE 6-14 (Continued)

INCIDENTAL INGESTION OF NORTH DRAINAGE SOIL - ADULTS

FORMULAE

EXPOSURE TO NON-CARCINOGENS

$$\text{Exposure Dose} = \frac{\text{Ca} \times \text{I} \times \text{F} \times \text{A}}{\text{W}}$$

where:

- Ca = contaminant concentration in mg/kg
- I = soil ingestion rate in mg/day
- F = daily frequency
- W = weight in kg
- A = bioavailability in percent

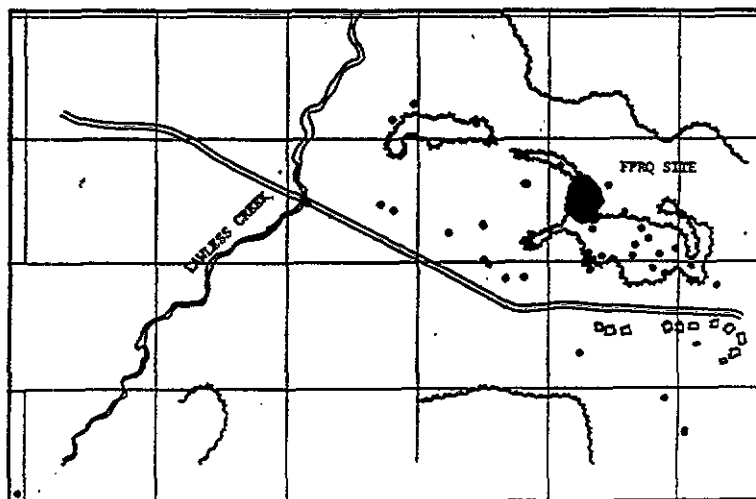
EXPOSURE TO CARCINOGENS

$$\text{Exposure Dose} = \frac{\text{ED}(\alpha) \times \text{P} \times \text{Ca} \times \text{I}(\alpha) \times \text{F} \times \text{A}}{\text{W}(\alpha) \times \text{LT}}$$

where:

- ED(α) = exposure duration
- P = proportion of year exposed
- Ca = contaminant concentration in mg/kg
- I(α) = soil ingestion rate in mg/day for each ED
- F = daily frequency
- W(α) = weight in kg for each ED
- LT = lifetime in years
- A = bioavailability in percent

SAMPLE LOCATIONS



- FP-121 Grid
- FP-122 Grid
- FP-123 Grid
- FP-124 Grid

AR301225

TABLE 28-15
INCIDENTAL INGESTION OF SOUTH DRAINAGE SOIL (DISTURBED AREA) - CHILDREN

EXPOSURE TO NON-CARCINOGENS

Non-Carcinogenic Contaminant of Concern	RfD or Other Standard (mg/kg/day)	CONCENTRATION		EXPOSURE Average Case (mg/kg/day)	DOSE Reasonable Worst Case (mg/kg/day)	HAZARD Average Case	INDEX Reasonable Worst Case	END POINT
		Average (mg/kg)	Maximum (mg/kg)					
ANTIMONY	4e-4	BDL	BDL	0	0	.00	.00	
BARIUM	5e-2	5.34e1	8.72e1	3.80e-5	7.64e-4	.00	.02	
BIS (2EH) PHTHALATE	2e-2	BDL	BDL	0	0	.00	.00	
CADMIUM	5e-4	1.18e0	1.7e0	8.41e-7	1.49e-5	.00	.03	
COPPER	3.7e-2	8.75e0	1.26e1	6.23e-6	1.10e-4	.00	.00	
LEAD	1.4e-4	9.4e0	1.07e1	6.70e-6	9.38e-5	.05	.67	
MANGANESE	5e-1	3.78e2	8.7e2	2.69e-4	7.63e-3	.00	.02	
MERCURY	2e-3	BDL	BDL	0	0	.00	.00	
NICKEL	2e-2	1.05e1	1.79e1	7.48e-6	1.57e-4	.00	.01	
SELENIUM	3e-3	1.63e-1	2.36e-1	1.16e-7	2.07e-6	.00	.00	
VANADIUM	9e-3	1.49e1	2.26e1	1.06e-5	1.98e-4	.00	.02	
ZINC	2e-1	2.8e1	3.47e1	1.99e-5	3.04e-4	.00	.00	
TOTAL						.05	.77	

ASSUMPTIONS and NOTES

Ingested metals in soil matrix are 50 (average case) to 100% (worst case) bioavailable; exposures averaged over 1 year. Average = Ingestion by a 20 kg child of 200 mg of soil per play day, child plays 2 days per week for 26 weeks per year in soil at the site. Ingested concentrations are arithmetic mean of site samples.
Worst = Ingestion by a 20 kg child of 400 mg of soil per play day, child plays 4 days per week for 40 weeks per year in soil at the site. Ingested concentrations are the lower of the 95% confidence limits of the mean or the highest observed concentration of site samples.

EXPOSURE TO CARCINOGENS

Carcinogenic Contaminant of Concern	Cancer Weight of Evidence	Cancer Potency Factor (mg/kg/d)	CONCENTRATION		EXPOSURE Average Case (mg/kg/day)	DOSE Reasonable Worst Case (mg/kg/day)	LIFETIME Average Case	CANCER RISK Reasonable Worst Case
			Average (mg/kg)	Maximum (mg/kg)				
ARSENIC	A	1.75e0	1.65e0	2e0	2.66e-7	4.29e-6	4.66e-7	7.51e-6
BENZENE	A	2.9e-2	BDL	BDL	0	0	0	0
BIS (2EH) PHTHALATE	B2	1.4e-2	BDL	BDL	0	0	0	0
CADMIUM	NA	NA	1.18e0	1.7e0	1.90e-7	3.65e-6	0	0
NICKEL	NA	NA	1.05e1	1.79e1	1.69e-6	3.84e-5	0	0
TOTAL							4.66e-7	7.51e-6

ASSUMPTIONS and NOTES

NA = Non-carcinogenic by the oral route. Assumptions for exposure to non-carcinogenic compounds apply. Life-time exposure assumes 15 years of childhood (20 kg) and 10 years (average) to 30 years (worst case) of adulthood (70 kg) with exposure averaged over 70 years.
Average = Assumes child ingests 200 mg per play day for 15 years, adults ingest 60 mg per activity day for 10 years. Outdoor activity occurs 2 days per week for 26 weeks of the year.
Worst = Assumes child ingests 400 mg per play day for 15 years, adults ingest 100 mg per activity day for 30 years. Outdoor activity occurs 4 days a week for 40 weeks per year.

NR301226

TABLE 6-15 (Continued)

INCIDENTAL INGESTION OF SOUTH DRAINAGE (DISTURBED AREA) SOIL - CHILDREN

FORMULAE

EXPOSURE TO NON-CARCINOGENS

$$\text{Exposure Dose} = \frac{\text{Ca} \times \text{I} \times \text{F} \times \text{A}}{\text{W}}$$

where:

- Ca = contaminant concentration in mg/kg
- I = soil ingestion rate in mg/day
- F = daily frequency
- W = weight in kg
- A = bioavailability in percent

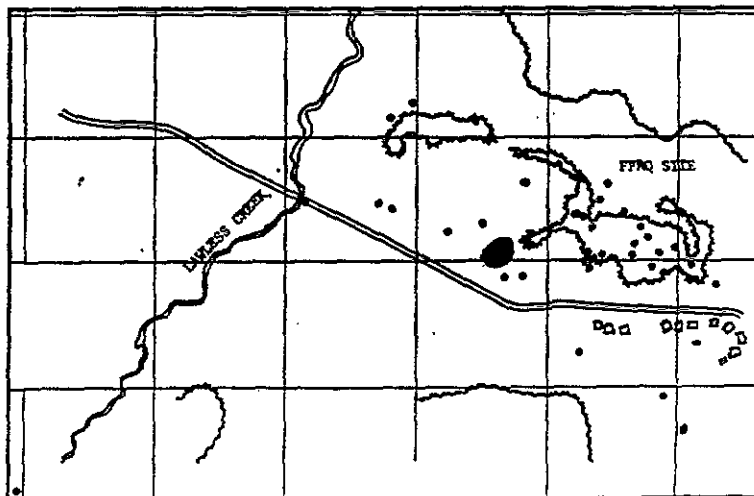
EXPOSURE TO CARCINOGENS

$$\text{Exposure Dose} = \frac{\text{ED}(\alpha) \times \text{P} \times \text{Ca} \times \text{I}(\alpha) \times \text{F} \times \text{A}}{\text{W}(\alpha) \times \text{LT}}$$

where:

- ED(α) = exposure duration
- P = proportion of year exposed
- Ca = contaminant concentration in mg/kg
- I(α) = soil ingestion rate in mg/day for each ED
- F = daily frequency
- W(α) = weight in kg for each ED
- LT = lifetime in years
- A = bioavailability in percent

SAMPLE LOCATIONS



- FP-114 Disturbed Area
- FP-115 Disturbed Area
- FP-116 Disturbed Area
- FP-125 Disturbed Area
- Dup FP-115

AR301227

TABLE 28-16
INCIDENTAL INGESTION OF SOUTH DRAINAGE SOIL (DISTURBED AREA) - ADULTS

EXPOSURE TO NON-CARCINOGENS

Non-Carcinogenic Contaminant of Concern	RfD or Other Standard (mg/kg/day)	CONCENTRATION		EXPOSURE Average Case (mg/kg/day)	DOSE Reasonable Worst Case (mg/kg/day)	HAZARD Average Case	INDEX Reasonable Worst Case	END POINT
		Average (mg/kg)	Maximum (mg/kg)					
ANTIMONY	4e-4	BDL	BDL	0	0	.00	.00	
BARIUM	5e-2	5.34e1	8.72e1	3.26e-6	5.46e-5	.00	.00	
BIS (2EH) PHTHALATE	2e-2	BDL	BDL	0	0	.00	.00	
CADMIUM	5e-4	1.18e0	1.7e0	7.20e-8	1.06e-6	.00	.00	
COPPER	3.7e-2	8.75e0	1.26e1	5.34e-7	7.89e-6	.00	.00	
LEAD	1.4e-4	9.4e0	1.07e1	5.74e-7	6.70e-6	.00	.05	
MANGANESE	5e-1	3.78e2	8.7e2	2.31e-5	5.45e-4	.00	.00	
MERCURY	2e-3	BDL	BDL	0	0	.00	.00	
NICKEL	2e-2	1.05e1	1.79e1	6.41e-7	1.12e-5	.00	.00	
SELENIUM	3e-3	1.63e-1	2.36e-1	9.95e-9	1.48e-7	.00	.00	
VANADIUM	9e-3	1.49e1	2.26e1	9.10e-7	1.42e-5	.00	.00	
ZINC	2e-1	2.8e1	3.47e1	1.71e-6	2.17e-5	.00	.00	
TOTAL						.00	.05	

ASSUMPTIONS and NOTES

Ingested metals in soil matrix are 50 (average case) to 100% (worst case) bioavailable; exposures averaged over 1 year. Average = Ingestion by a 70 kg adult of 60 mg of soil per activity day, adult gardens 2 days per week for 26 weeks per year in soil at the site. Ingested concentrations are arithmetic mean of site samples. Worst = Ingestion by a 70 kg adult of 100 mg of soil per activity day, adult gardens 4 days per week for 40 weeks per year in soil at the site. Ingested concentrations are the lower of the 95% confidence limits of the mean or the highest observed concentration of site samples.

EXPOSURE TO CARCINOGENS

Carcinogenic Contaminant of Concern	Cancer Weight of Evidence	Cancer Potency Factor (mg/kg/d)	CONCENTRATION		EXPOSURE Average Case (mg/kg/day)	DOSE Reasonable Worst Case (mg/kg/day)	LIFETIME Average Case	CANCER RISK Reasonable Worst Case
			Average (mg/kg)	Maximum (mg/kg)				
ARSENIC	A	1.75e0	1.65e0	2e0	2.66e-7	4.29e-6	4.66e-7	7.51e-6
BENZENE	A	2.9e-2	BDL	BDL	0	0	0	0
BIS (2EH) PHTHALATE	B2	1.4e-2	BDL	BDL	0	0	0	0
CADMIUM	NA	NA	1.18e0	1.7e0	1.90e-7	3.65e-6	0	0
NICKEL	NA	NA	1.05e1	1.79e1	1.69e-6	3.84e-5	0	0
TOTAL							4.66e-7	7.51e-6

ASSUMPTIONS and NOTES

NA = Non-carcinogenic by the oral route. Assumptions for exposure to non-carcinogenic compounds apply. Life-time exposure assumes 15 years of childhood (20 kg) and 10 years (average) to 30 years (worst case) of adulthood (70 kg) with exposure averaged over 70 years. Average = Assumes child ingests 200 mg per play day for 15 years, adults ingest 60 mg per activity day for 10 years. Outdoor activity occurs 2 days per week for 26 weeks of the year. Worst = Assumes child ingests 400 mg per play day for 15 years, adults ingest 100 mg per activity day for 30 years. Outdoor activity occurs 4 days a week for 40 weeks per year.

AP301228

TABLE 6-16 (Continued)

INCIDENTAL INGESTION OF SOUTH DRAINAGE (DISTURBED AREA) SOIL - ADULTS

FORMULAE

EXPOSURE TO NON-CARCINOGENS

$$\text{Exposure Dose} = \frac{\text{Ca} \times \text{I} \times \text{F} \times \text{A}}{\text{W}}$$

where:

- Ca = contaminant concentration in mg/kg
- I = soil ingestion rate in mg/day
- F = daily frequency
- W = weight in kg
- A = bioavailability in percent

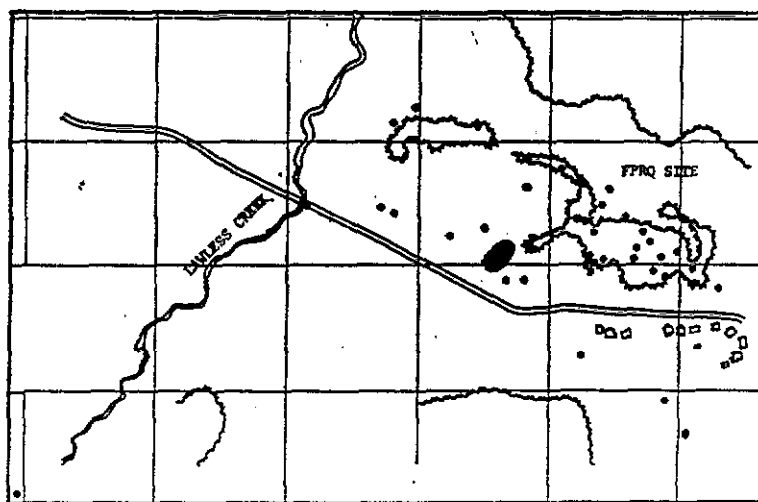
EXPOSURE TO CARCINOGENS

$$\text{Exposure Dose} = \frac{\text{ED}(\alpha) \times \text{P} \times \text{Ca} \times \text{I}(\alpha) \times \text{F} \times \text{A}}{\text{W}(\alpha) \times \text{LT}}$$

where:

- ED(α) = exposure duration
- P = proportion of year exposed
- Ca = contaminant concentration in mg/kg
- I(α) = soil ingestion rate in mg/day for each ED
- F = daily frequency
- W(α) = weight in kg for each ED
- LT = lifetime in years
- A = bioavailability in percent

SAMPLE LOCATIONS



- FP-114 Disturbed Area
- FP-115 Disturbed Area
- FP-116 Disturbed Area
- FP-125 Disturbed Area
- Dup FP-115

TABLE 28-17
INHALATION OF AIR-BORNE CONTAMINANTS IN QUARRY

EXPOSURE TO NON-CARCINOGENS

Non-Carcinogenic Contaminant of Concern	RfD or Other Standard (mg/kg/day)	CONCENTRATION		EXPOSURE Average Case (mg/kg/day)	DOSE Reasonable Worst Case (mg/kg/day)	HAZARD Average Case	INDEX Reasonable Worst Case	END POINT
		Average (mg/kg)	Maximum (mg/kg)					
ANTIMONY*	4e-4	5.16e-1	1.01e0	2.3e-15	1.5e-11	.00	.00	
BARIUM	1.4e-4	1.92e2	3.86e2	8.4e-13	5.88e-9	.00	.00	
BIS (2EH) PHTHALATE	2e-2	BDL	BDL	0	0	.00	.00	
CADMIUM*	5e-4	1.28e0	1.71e0	5.6e-15	2.6e-11	.00	.00	
COPPER	1e-2	8.14e0	9.75e0	3.6e-14	1.5e-10	.00	.00	
LEAD	4.3e-4	2.73e2	6.25e2	1.2e-12	9.51e-9	.00	.00	
MANGANESE	5e-1	1.28e2	1.68e2	5.6e-13	2.56e-9	.00	.00	
MERCURY	5.1e-5	BDL	BDL	0	0	.00	.00	
NICKEL*	2e-2	1.21e1	1.67e1	5.3e-14	2.5e-10	.00	.00	
SELENIUM	1e-3	1.69e-1	2.23e-1	7.4e-16	3.4e-12	.00	.00	
VANADIUM*	9e-3	2.02e1	2.49e1	8.9e-14	3.8e-10	.00	.00	
ZINC	1e-2	1.04e2	1.7e2	4.6e-13	2.59e-9	.00	.00	
TOTAL						.00	.00	

ASSUMPTIONS and NOTES

For constituents marked with "*", oral chronic health standards are used to account for swallowing particulates, since there are no inhalation standards for chronic inhalation.
 Inhaled metals in soil matrix are 100% bioavailable.
 Average = Inhalation by a 70 kg adult of 1.4 cubic meters of air per hour, containing 1.37x10E-6 ug per cubic meter of dust for 16 hours per day.
 Worst = Inhalation by a 70 kg adult of 3.0 cubic meters of air per hour, containing 2.22x10-3 ug per cubic meter of dust for 16 hours per day.

EXPOSURE TO CARCINOGENS

Carcinogenic Contaminant of Concern	Cancer Weight of Evidence	Cancer Potency Factor (mg/kg/d)	CONCENTRATION		EXPOSURE Average Case (mg/kg/day)	DOSE Reasonable Worst Case (mg/kg/day)	LIFETIME Average Case	CANCER RISK Reasonable Worst Case
			Average (mg/kg)	Maximum (mg/kg)				
ARSENIC	A	5e1	5.19e0	8.44e0	1.1e-14	1.3e-10	5.7e-13	6.42e-9
BENZENE	A	2.9e-2	BDL	BDL	0	0	0	0
BIS (2EH) PHTHALATE	B2	NA	BDL	BDL	0	0	0	0
CADMIUM	A	6.1e0	1.28e0	1.71e0	2.8e-15	2.6e-11	1.7e-14	1.6e-10
NICKEL	A	1.19e0	1.21e1	1.67e1	2.7e-14	2.5e-10	3.2e-14	3.0e-10
TOTAL							6.2e-13	6.89e-9

ASSUMPTIONS and NOTES

Assumptions for exposure to non-carcinogenic compounds apply.
 Life-time exposure assumes a 70 kg person with exposure averaged over 70 years.
 Average = Assumes lifetime inhalation for 204,400 hours (8 hours per day, 70 years).
 Worst = Assumes lifetime inhalation for 408,800 hours (16 hours per day, 70 years).

AR301230

TABLE 6-17 (Continued)

INHALATION OF AIR-BORNE CONTAMINANTS ON SITE

FORMULAE

EXPOSURE TO NON-CARCINOGENS

$$\text{Exposure Dose} = \frac{\text{Ca} \times \text{Cb} \times \text{I} \times \text{D} \times \text{CF}}{\text{W}}$$

where:

- Ca = contaminant concentration in mg/kg
- Cb = dust concentration in mg/cubic meter
- I = inhalation rate in cubic meters/day
- D = daily duration in hours
- CF = correction factor to convert to mg
- W = weight in kg

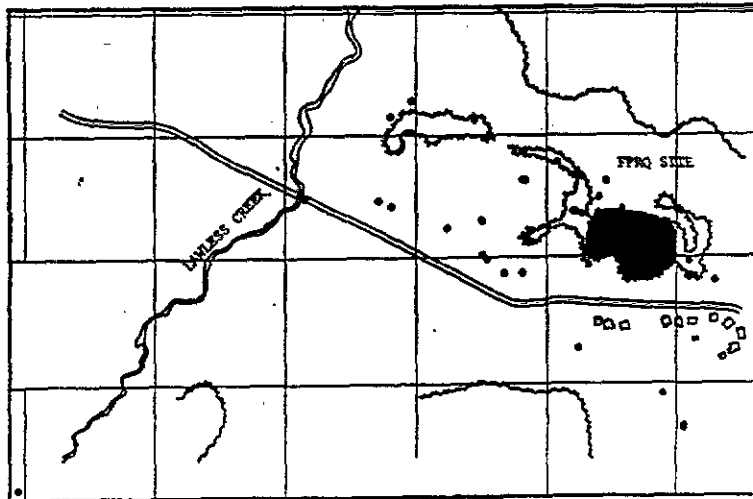
EXPOSURE TO CARCINOGENS

$$\text{Exposure Dose} = \frac{\text{Ca} \times \text{Cb} \times \text{I} \times \text{ED} \times \text{CF}}{\text{W} \times \text{LT} \times \text{D}}$$

where:

- Ca = contaminant concentration in mg/kg
- Cb = dust concentration in mg/cubic meter
- I = inhalation rate in cubic meters/day
- ED = exposure duration in total lifetime hours
- CF = correction factor to convert to mg
- W = weight in kg
- LT = lifetime in years
- D = 365 days per year

SAMPLE LOCATIONS



- FP-103 Grid
- FP-104 Grid
- FP-105 Grid
- FP-106 Grid
- FP-107 Grid
- FP-108 Grid
- FP-109 Grid

AR301231

APPENDICES

AR301232

APPENDIX A
FIELD SAMPLING AND
ANALYSIS FORMS

AR301233

PROJECT: First Piedmont Rock Quarry
 PROJECT #: 1079-89-103B/4112-88-930
 LOCATION: Danville, Virginia
 PERSONNEL: Bill Robertson

INSTRUMENTS:

TEMPERATURE:
 CONDUCTIVITY:
 pH:
 OTHER:

FP-130

FP-131

FP-132

GENERAL: LOCATION	Waste Pile East Side	Waste Pile West Side	Waste Pile Total
SOURCE	Soil	Soil	Soil
DATE	1/24/90	1/24/90	1/24/90
CLOCK TIME			
SAMPLING CONDITIONS SAMPLING METHOD	From Composite Excavations	From Composite Excavations	From Composite Excavations
DEPTH SAMPLE TAKEN	Surface to 1 ft	Surface to 1 ft	Surface to 1 ft
BOREHOLE/WELL DEPTH	-----	-----	-----
WATER HEIGHT ON GAUGE OR STAFF	-----	-----	-----
DISCHARGE (CFS OR GPM)	-----	-----	-----
FIELD MEASUREMENTS AND ANALYSIS TEMPERATURE (C)	-----	-----	-----
ELEC. MEASURED COND. (umhos/cm AT 25 C OR uS)	-----	-----	-----
pH (s.u.)	-----	-----	-----
DO (mg/L)	-----	-----	-----
OVA/HNu (ppm)	-----	-----	-----
ANALYSIS REQUESTED INORGANICS	EP Tox Metals	EP Tox Metals	TAL
ORGANICS	-----	-----	-----
OTHER	Waste Characterization	Waste Characterization	CN
LABORATORY SENT TO: DATE:	IEA 1/25/90	IEA 1/25/90	IEA 1/25/90
SAMPLED/ANALYZED BY:	BR	BR	BR

WESTINGHOUSE ENVIRONMENTAL AND GEOTECHNICAL SERVICES, INC.

AR301234

FIELD SAMPLING AND ANALYSES DATA

PROJECT: First Piedmont Rock Quarry
 PROJECT #: 1079-89-103B/4112-88-930
 LOCATION: Danville, Virginia
 PERSONNEL: Bill Robertson

INSTRUMENTS:
 TEMPERATURE:
 CONDUCTIVITY:
 pH:
 OTHER:

	FP-133	FP-134	FP-135
GENERAL: LOCATION	Carbon Black Pile	Carbon Black Pile - East	Carbon Black Pile - West
SOURCE	Soil	Carbon Black	Carbon Black
DATE	1/24/90	1/24/90	1/24/90
CLOCK TIME	-----	-----	-----
SAMPLING CONDITIONS SAMPLING METHOD	From Composite Excavations	From Composite Excavations	From Composite Excavations
DEPTH SAMPLE TAKEN	Surface to 1 ft	Surface to 1 ft	Surface to 1 ft
BOREHOLE/WELL DEPTH	-----	-----	-----
WATER HEIGHT ON GAUGE OR STAFF	-----	-----	-----
DISCHARGE (CFS OR GPM)	-----	-----	-----
FIELD MEASUREMENTS AND ANALYSIS TEMPERATURE (C)	-----	-----	-----
ELEC. MEASURED COND. (umhos/cm AT 25 C OR US)	-----	-----	-----
pH (s.u.)	-----	-----	-----
DO (mg/L)	-----	-----	-----
OVA/HNu (ppm)	-----	-----	-----
ANALYSIS REQUESTED INORGANICS	TAL Metals	EP Tox Metals	EP Tox Metals
ORGANICS	-----	-----	-----
OTHER	CN	Waste Characterization	Waste Characterization
LABORATORY SENT TO: DATE:	IEA 1/25/90	IEA 1/25/90	IEA 1/25/90
SAMPLED/ANALYZED BY:	BR	BR	BR

WESTINGHOUSE ENVIRONMENTAL AND GEOTECHNICAL SERVICES, INC.

AR301235

FIELD SAMPLING AND ANALYSED DATA

PROJECT: First Piedmont Rock Quarry
 PROJECT #: 1079-89-103B/4112-88-930
 LOCATION: Danville, Virginia
 BY: NNEL: Bill Robertson

INSTRUMENTS:
 TEMPERATURE:
 CONDUCTIVITY:
 pH:
 OTHER:

FP-136

GENERAL: LOCATION	Carbon Black Pile		
SOURCE	Soil		
DATE	1/24/90		
CLOCK TIME	-----		
SAMPLING CONDITIONS SAMPLING METHOD	From Composite Excavations		
DEPTH SAMPLE TAKEN	Surface to 1 ft		
BOREHOLE/WELL DEPTH	-----		
WATER HEIGHT ON GAUGE OR STAFF	-----		
DISCHARGE (CFS OR GPM)	-----		
FIELD MEASUREMENTS AND ANALYSIS TEMPERATURE (C)	-----		
ELEC. MEASURED COND. (umhos/cm AT 25 C OR us)	-----		
pH (s.u.)	-----		
DO (mg/L)	-----		
OVA/HNu (ppm)	-----		
ANALYSIS REQUESTED INORGANICS	TAL		
ORGANICS	-----		
OTHER	CN MS/MSD		
LABORATORY SENT TO: DATE:	IEA 1/25/90		
SAMPLED/ANALYZED BY:	BR		

WESTINGHOUSE ENVIRONMENTAL AND GEOTECHNICAL SERVICES, INC.

AR301236

INSTRUMENTS:

OBJECT: First Piedmont Rock Quarry TEMPERATURE: Omega PHH-43
 OBJECT #: 1079-89-103B/4112-88-930 CONDUCTIVITY: Omega CDH-70
 LOCATION: Danville, Virginia pH: Omega PHH-43
 PERSONNEL: Bill Robertson OTHER:

FP-233

FP-234

FP-235

GENERAL: LOCATION	Confluence of Drainage	Field Blank	Below Carbon Black MS/MSD
SOURCE	Water	Water	Water
DATE	1/25/90	1/25/90	1/25/90
CLOCK TIME	10:20	10:50	11:00
SAMPLING CONDITIONS SAMPLING METHOD	Directly from Source	Lab Supplied Water	Directly from Source
DEPTH SAMPLE TAKEN	Surface	-----	Surface
BOREHOLE/WELL DEPTH	-----	-----	-----
WATER HEIGHT ON GAUGE OR STAFF	-----	-----	-----
DISCHARGE (CFS OR GPM)	~ 10 gpm	-----	~ 10 gpm
FIELD MEASUREMENTS AND ANALYSIS TEMPERATURE (C)	8.0 C	-----	8.0 C
ELEC. MEASURED COND. (umhos/cm AT 25 C OR US)	.64 US	-----	.60 US
pH (s.u.)	6.16	-----	7.92
DO (mg/L)	-----	-----	-----
OVA/HNu (ppm)	-----	-----	-----
ANALYSIS REQUESTED INORGANICS	TAL	TAL	TAL
ORGANICS	-----	-----	-----
OTHER	CN	CN	CN
LABORATORY SENT TO: DATE:	IEA 1/25/90	IEA 1/25/90	IEA 1/25/90
SAMPLED/ANALYZED BY:	BR	BR	BR

WESTINGHOUSE ENVIRONMENTAL AND GEOTECHNICAL SERVICES, INC.

AR301237

FIELD SAMPLING AND ANALYSES DATA

PROJECT: First Piedmont Rock Quarry
 PROJECT #: 1079-89-103B/4112-88-930
 LOCATION: Danville, Virginia
 BY: WNEL: Bill Robertson

INSTRUMENTS:

TEMPERATURE: Omega PHH-43
 CONDUCTIVITY: Omega CDH-70
 pH: Omega PHH-43
 OTHER:

FP-230

FP-231

FP-232

GENERAL: LOCATION	Below Waste Pile	Below Carbon Black Pile	Old Disposal Area
SOURCE	Water	Water	Water
DATE	1/25/90	1/25/90	1/25/90
CLOCK TIME	9:50	11:00	10:35
SAMPLING CONDITIONS SAMPLING METHOD	Directly from Source	Directly from Source	Directly from Source
DEPTH SAMPLE TAKEN	Surface	Surface	Surface
BOREHOLE/WELL DEPTH	-----	-----	-----
WATER HEIGHT ON GAUGE OR STAFF	-----	-----	-----
DISCHARGE (CFS OR GPM)	~ 10 gpm	~10 gpm	~ 10 gpm
FIELD MEASUREMENTS AND ANALYSIS TEMPERATURE (C)	8. C	8. C	8. C
ELEC. MEASURED COND. (umhos/cm AT 25 C OR US)	.53 us	.59 us	.58 us
pH (s.u.)	6.32	7.89	6.85
DO (mg/L)	-----	-----	-----
OVA/HNu (ppm)	-----	-----	-----
ANALYSIS REQUESTED INORGANICS	TAL	TAL	TAL
ORGANICS	-----	-----	-----
OTHER	CN	CN	CN
LABORATORY SENT TO: DATE:	IEA 1/25/90	IEA 1/25/90	IEA 1/25/90
SAMPLED/ANALYZED BY:	BR	BR	BR

WESTINGHOUSE ENVIRONMENTAL AND GEOTECHNICAL SERVICES, INC.

AR301238

APPENDIX B
LABORATORY RESULTS

AR301239

DATA SUMMARY FORM: I N O R G A N I C S

Site Name: First Piedmont Rock Quarry WATER SAMPLES (ug/L)

Case #: Water Sampling Date: 1-25-90

*Due to dilution, sample quantitation limit is affected. See dilution table for specifics.

Sample No.	EP-230	EP-231	EP-232	EP-233
Dilution Factor	1	1	1	1
Location	Below Waste Pile	Below Carbon Black	Old Disposal	Confuence Drainage
ANALYTE				
200	Aluminum	1870	2080	1580
00	Antimony			
10	*Arsenic			
200	Barium	236		
6	Beryllium			
6	*Cadmium		5.3	14.1
5000	Calcium	B 9180	6770 B	7540
10	*Chromium			
50	Cobalt			
25	Copper			
100	Iron	1360	1120	475
5	*Lead	12.2	4.6	
5000	Magnesium	B	B	B
15	Manganese	21.5	349	700
0.2	Mercury			
40	*Nickel			
5000	Potassium	5340		
5	Selenium			
10	Silver			
5000	Sodium	12400	10500	9840
10	Thallium			
50	Vanadium			
20	Zinc	55.9 J	7600 J	20400 J
10	*Cyanide			

CRDL = Contract Required Detection Limit *Action Level Exists SEE NARRATIVE FOR CODE DEFINITIONS

revised 10/88

AR301240

DATA SUMMARY: INORGANICS

Site Name: First Piedmont Rock Quarry

SOIL SAMPLES
(mg/Kg)

Case #: Soil Sampling Date: 1-24-90

*Due to dilution, sample quantitation limit is affected.
See dilution table for specifics.

NDL	ANALYTE	Sample No.	Dilution Factor	% Solids	Location	Sample No.	Dilution Factor	% Solids	Location
40	Aluminum	EP-132	1	29.8	Waste Pile	EP-133	1	20.8	Carbon Black Pile
12	Antimony	26200				14800			
2	Arsenic	543				71.2			
40	Barium	2760				135			
1	Beryllium					J			J
1	Cadmium	16.8				J	12.9		J
1000	Calcium	1280				J			J
2	Chromium	59.2				J	14.8		J
10	Cobalt								
5	Copper	75.9				34.6			
20	Iron	34600				25200			
1	*Lead	5270				K	71.8		K
1000	Magnesium	1590				J			J
3	Manganese	698				J	246		J
0.2	Mercury								
4	Nickel	13.5							
1000	Potassium	1770				J			J
1	Selenium								
2	Silver								
1000	Sodium					J			J
2	Thallium								
10	Vanadium	27.6				J	11.4		J
4	Zinc	29200				L	947		L
2	Cyanide								

CRDL = Contract Required Detection Limit

*Action Level Exists

SEE NARRATIVE FOR CODE DEFINITIONS

revised 10/08

AR301241

APPENDIX B
LABORATORY RESULTS

AR301242

IEA, INC.
CASE 637-12 & 637-14
SDG FP 132
METALS DATA

1 OF 1

AR301243

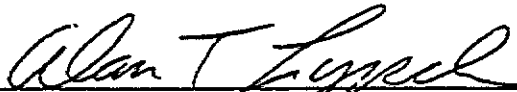
INORGANIC ANALYSES
CASE NARRATIVE

CASE: 637-12 and 637-14

SDG No.: FP_132

SAMPLES: FP_132, FP_133, FP_136, FP_230, FP_231, FP_232, FP_234,
FP_235, FP_233

Nine samples were received for CLP metals and cyanide analysis on 1/25/90. All samples were received in good condition. Upon receipt at IEA, samples were assigned an "EPA" 6-character sample number for simplicity in forms generation. Also, the two cases were run as one Sample Delivery Group (SDG) for simplicity in forms generation. The client ID's for these samples are located at the top of each data sheet (Form 1) and on the IEA Assigned Number Index (page 1). The analyses took place with no deviations from CLP protocol.



Alan T. Lynch
Metals Supervisor

AR301244

1
INORGANIC ANALYSIS DATA SHEET

FP_132

Name: IEA, INC.

SDG No.: FP_132

Lab Code: IEA

Lab Sample ID: 637-12-1

Matrix (soil/water): SOIL

Client ID: FP132

Level (low/med): LOW

Date Received: 01/25/90

% Solids: 29.8

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	26200		*	P
7440-36-0	Antimony	25.6	U	N	P
7440-38-2	Arsenic	543			F
7440-39-3	Barium	2760			P
7440-41-7	Beryllium	1.8	B		P
7440-43-9	Cadmium	16.8			P
7440-70-2	Calcium	1280	B	F	P
7440-47-3	Chromium	59.2		*	P
7440-48-4	Cobalt	7.1	B		P
7440-50-8	Copper	75.9			P
7439-89-6	Iron	34600		*	P
7439-92-1	Lead	5270			P
7439-95-4	Magnesium	1590	B		P
7439-96-5	Manganese	698		*	P
7439-97-6	Mercury	0.29	U		CV
7440-02-0	Nickel	13.5	B		P
7440-09-7	Potassium	1770	B		P
7782-49-2	Selenium	0.75	U		F
7440-22-4	Silver	3.8	U		P
7440-23-5	Sodium	790	B		P
7440-28-0	Thallium	0.63	U		F
7440-62-2	Vanadium	27.6	B		P
7440-66-6	Zinc	29200		N	P
	Cyanide	1.5	U		C

Color Before: BLACK

Clarity Before:

Texture: MED

Color After: COLORLESS

Clarity After:

Artifacts:

Comments:

FP132

COVER PAGE - INORGANIC ANALYSES DATA PACKAGE

Lab Name: IEA, INC.

Contract:

Lab Code: IEA

Case No.: 637-12
637-14

SAS No.:

SDG No.: FP_132

SOW No.: 7/88

Sample No.	Lab Sample ID.
FP 132	637-12-1
FP 133	637-12-2
FP 136	637-12-3
FP 136D	637-12-3D
FP 136S	637-12-3S
FP 230	637-14-1
FP 231	637-14-2
FP 232	637-14-3
FP 233	637-14-4
FP 234	637-14-5
FP 235	637-14-6
FP 235D	637-14-6D
FP 235S	637-14-6S

Were ICP interelement corrections applied? Yes/No NO

Were ICP background corrections applied? Yes/No YES

If yes, were raw data generated before application of background corrections? Yes/No NO

Comments:

- Q-FLAG QUALIFIER DEFINITIONS
- E - ICP serial dilution not within control limits
- N - Spike sample recovery not within control limits
- * - Duplicate analysis not within control limits

I certify that this data package is in compliance with the terms, and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on floppy diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: Alan Lynch Name: Alan Lynch

Date: 3-2-90 Title: METALS SUPERVISOR

ENVIROFORMS/CLP 788

SAMPLE NO.

1
INORGANIC ANALYSIS DATA SHEET

FP_133

Lab Name: IEA, INC.

SDG No.: FP_132

Lab Code: IEA

Lab Sample ID: 637-12-2

Matrix (soil/water): SOIL

Client ID: FP133

Level (low/med): LOW

Date Received: 01/25/90

% Solids: 20.8

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	14800	-	*	P
7440-36-0	Antimony	37.4	U	N	P
7440-38-2	Arsenic	71.2	B	-	F
7440-39-3	Barium	135	B	-	P
7440-41-7	Beryllium	1.1	B	-	P
7440-43-9	Cadmium	12.9	-	-	P
7440-70-2	Calcium	433	B	E	P
7440-47-3	Chromium	14.8	-	*	P
7440-48-4	Cobalt	10.0	U	-	P
7440-50-8	Copper	34.6	-	-	P
7439-89-6	Iron	25200	-	*	P
7439-92-1	Lead	71.8	-	-	F
7439-95-4	Magnesium	715	B	-	P
7439-96-5	Manganese	246	-	*	P
7439-97-6	Mercury	0.31	U	-	CV
7440-02-0	Nickel	16.8	U	-	P
7440-09-7	Potassium	979	B	-	P
7782-49-2	Selenium	1.1	U	-	F
7440-22-4	Silver	5.5	U	-	P
7440-23-5	Sodium	289	B	-	P
7440-28-0	Thallium	0.94	U	-	F
7440-62-2	Vanadium	11.4	B	-	P
7440-66-6	Zinc	947	-	N	P
	Cyanide	2.2	U	-	C

Color Before: BLACK

Clarity Before:

Texture: MED

Color After: COLORLESS

Clarity After:

Artifacts:

Comments:

FP133

FORM I - INAR301247

7/88

1 003

1
INORGANIC ANALYSIS DATA SHEET

FP_136

Lab Name: IEA, INC.

SDG No.: FP_132

Lab Sample ID: 637-12-3

Lab Code: IEA

Matrix (soil/water): SOIL

Client ID: FP136

Level (low/med): LOW

Date Received: 01/25/90

% Solids: 18.9

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	20100		*	P
7440-36-0	Antimony	38.6	U	N	P
7440-38-2	Arsenic	59.7	B		F
7440-39-3	Barium	170	B		P
7440-41-7	Beryllium	1.4	B		P
7440-43-9	Cadmium	3.6	B		P
7440-70-2	Calcium	534	B	E	P
7440-47-3	Chromium	13.2		*	P
7440-48-4	Cobalt	10.3	U		P
7440-50-8	Copper	39.4			P
7439-89-6	Iron	33700		*	P
7439-92-1	Lead	79.1			F
7439-95-4	Magnesium	1070	B		P
7439-96-5	Manganese	282		*	P
7439-97-6	Mercury	0.34 - 0.42	U		CV
7440-02-0	Nickel	17.3	U		P
7440-09-7	Potassium	2620	B		P
7782-49-2	Selenium	1.3	U		F
7440-22-4	Silver	5.7	U		P
7440-23-5	Sodium	321	B		P
7440-28-0	Thallium	1.0 - 5.2	U		F
7440-62-2	Vanadium	12.0	B		P
7440-66-6	Zinc	710		N	P
	Cyanide	2.5	U		C

3/6/90

Color Before: BLACK

Clarity Before:

Texture: MED

Color After: COLORLESS

Clarity After:

Artifacts:

Comments:

1
INORGANIC ANALYSIS DATA SHEET

FP_230

Name: IEA, INC.

SDG No.: FP_132

Lab Sample ID: 637-14-1

Lab Code: IEA

Matrix (soil/water): WATER

Client ID: FP230

Level (low/med): LOW

Date Received: 01/25/90

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	1870			P
7440-36-0	Antimony	40.1	U		P
7440-38-2	Arsenic	1.3	B	N	F
7440-39-3	Barium	25.0	B		P
7440-41-7	Beryllium	0.70	U		P
7440-43-9	Cadmium	3.2	U		P
7440-70-2	Calcium	2580	B		P
7440-47-3	Chromium	4.1	U		P
7440-48-4	Cobalt	10.7	U		P
7440-50-8	Copper	5.0	B		P
7439-89-6	Iron	1360			P
7439-92-1	Lead	1.3	B		F
7439-95-4	Magnesium	1400	B		P
7439-96-5	Manganese	21.5			P
7439-97-6	Mercury	0.20	U		CV
7440-02-0	Nickel	18.0	U		P
7440-09-7	Potassium	674	U		P
7782-49-2	Selenium	1.2	U		F
7440-22-4	Silver	5.9	U		P
7440-23-5	Sodium	3970	B		P
7440-28-0	Thallium	1.0	U		F
7440-62-2	Vanadium	8.1	U		P
7440-66-6	Zinc	55.9		E	P
	Cyanide	10.0	U		C

Color Before: LT.BROWN

Clarity Before: CLOUDY

Texture:

Color After: COLORLESS

Clarity After: CLEAR

Artifacts:

Comments:

FP230

1
INORGANIC ANALYSIS DATA SHEET

FP_231

Name: IEA, INC.

SDG No.: FP_132

Lab Code: IEA

Lab Sample ID: 637-14-2

Matrix (soil/water): WATER

Client ID: FP231

Level (low/med): LOW

Date Received: 01/25/90

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	3190			P
7440-36-0	Antimony	40.1	U		P
7440-38-2	Arsenic	1.4	B	N	F
7440-39-3	Barium	236			P
7440-41-7	Beryllium	0.70	U		P
7440-43-9	Cadmium	3.2	U		P
7440-70-2	Calcium	9180			P
7440-47-3	Chromium	4.1	U		P
7440-48-4	Cobalt	10.7	U		P
7440-50-8	Copper	3.9	U		P
7439-89-6	Iron	3010			P
7439-92-1	Lead	12.2			F
7439-95-4	Magnesium	3590	B		P
7439-96-5	Manganese	381			P
7439-97-6	Mercury	0.20	U		CV
7440-02-0	Nickel	18.0	U		P
7440-09-7	Potassium	5340			P
7782-49-2	Selenium	1.2	U		F
7440-22-4	Silver	5.9	U		P
7440-23-5	Sodium	12400			P
7440-28-0	Thallium	1.0	U		F
7440-62-2	Vanadium	8.1	U		P
7440-66-6	Zinc	403		E	P
	Cyanide	10.0	U		C

Color Before: GREY

Clarity Before: CLOUDY

Texture:

Color After: COLORLESS

Clarity After: CLEAR

Artifacts:

Comments:

FP231

ENVIROFORMS/CLP 788

SAMPLE NO.

1
INORGANIC ANALYSIS DATA SHEET

FP_232

b Name: IEA, INC.

SDG No.: FP_132

Lab Code: IEA

Lab Sample ID: 637-14-3

Matrix (soil/water): WATER

Client ID: FP232

Level (low/med): LOW

Date Received: 01/25/90

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	2080	-		P
7440-36-0	Antimony	40.1	U		P
7440-38-2	Arsenic	1.4	B	N	F
7440-39-3	Barium	89.7	B		P
7440-41-7	Beryllium	0.70	U		P
7440-43-9	Cadmium	5.3	-		P
7440-70-2	Calcium	6770	-		P
7440-47-3	Chromium	4.1	U		P
7440-48-4	Cobalt	10.7	U		P
7440-50-8	Copper	4.3	B		P
7439-89-6	Iron	1120	-		P
7439-92-1	Lead	4.6	-		F
7439-95-4	Magnesium	2360	B		P
7439-96-5	Manganese	349	-		P
7439-97-6	Mercury	0.20	U		CV
7440-02-0	Nickel	18.0	U		P
7440-09-7	Potassium	3910	B		P
7782-49-2	Selenium	1.2	U		F
7440-22-4	Silver	5.9	U		P
7440-23-5	Sodium	10500	-		P
7440-28-0	Thallium	1.0	U		F
7440-62-2	Vanadium	8.1	U		P
7440-66-6	Zinc	7600	-	E	P
	Cyanide	10.0	U		C

Color Before: GREY

Clarity Before: CLOUDY

Texture:

Color After: COLORLESS

Clarity After: CLEAR

Artifacts:

Comments:

FP232

FORM I - IN

AR301251

7/88

1 007

1
INORGANIC ANALYSIS DATA SHEET

FP_233

Company Name: IEA, INC.

SDG No.: FP_132

Lab Code: IEA

Lab Sample ID: 637-14-4

Matrix (soil/water): WATER

Client ID: FP233

Level (low/med): LOW

Date Received: 01/25/90

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	1580	-		P
7440-36-0	Antimony	40.1	U		P
7440-38-2	Arsenic	1.0	U	N	F
7440-39-3	Barium	52.9	B		P
7440-41-7	Beryllium	0.96	B		P
7440-43-9	Cadmium	14.1	-		P
7440-70-2	Calcium	7540	-		P
7440-47-3	Chromium	4.1	U		P
7440-48-4	Cobalt	10.7	U		P
7440-50-8	Copper	4.2	B		P
7439-89-6	Iron	475	-		P
7439-92-1	Lead	2.2	B		F
7439-95-4	Magnesium	2310	B		P
7439-96-5	Manganese	700	-		P
7439-97-6	Mercury	0.20	U		CV
7440-02-0	Nickel	18.0	U		P
7440-09-7	Potassium	3140	B		P
7782-49-2	Selenium	0.10	U		F
7440-22-4	Silver	5.9	U		P
7440-23-5	Sodium	9840	-		P
7440-28-0	Thallium	1.0	U		F
7440-62-2	Vanadium	8.1	U		P
7440-66-6	Zinc	20400	-	E	P
	Cyanide	10.0	U		C

Color Before: COLORLESS

Clarity Before: CLOUDY

Texture:

Color After: COLORLESS

Clarity After: CLEAR

Artifacts:

Comments:

1
INORGANIC ANALYSIS DATA SHEET

FP_234

Name: IEA, INC.

SDG No.: FP_132

Lab Code: IEA

Lab Sample ID: 637-14-5

Matrix (soil/water): WATER

Client ID: FP234

Level (low/med): LOW

Date Received: 01/25/90

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	71.2	U		P
7440-36-0	Antimony	40.1	U		P
7440-38-2	Arsenic	1.0	U	N	F
7440-39-3	Barium	1.7	U		P
7440-41-7	Beryllium	0.70	U		P
7440-43-9	Cadmium	3.2	U		P
7440-70-2	Calcium	222	B		P
7440-47-3	Chromium	4.1	U		P
7440-48-4	Cobalt	10.7	U		P
7440-50-8	Copper	3.9	U		P
7439-89-6	Iron	4.0	U		P
7439-92-1	Lead	1.0	U		F
7439-95-4	Magnesium	22.3	B		P
7439-96-5	Manganese	4.0	U		P
7439-97-6	Mercury	0.20	U		CV
7440-02-0	Nickel	18.0	U		P
7440-09-7	Potassium	674	U		P
7782-49-2	Selenium	1.2	U		F
7440-22-4	Silver	5.9	U		P
7440-23-5	Sodium	110	B		P
7440-28-0	Thallium	1.0	U		F
7440-62-2	Vanadium	8.1	U		P
7440-66-6	Zinc	4.0	U	E	P
	Cyanide	10.0	U		C

Color Before: COLORLESS

Clarity Before: CLEAR

Texture:

Color After: COLORLESS

Clarity After: CLEAR

Artifacts:

Comments:

FP234

1
INORGANIC ANALYSIS DATA SHEET

FP_235

Co Name: IEA, INC.

SDG No.: FP_132

Lab Sample ID: 637-14-6

Lab Code: IEA

Matrix (soil/water): WATER

Client ID: FP235

Level (low/med): LOW

Date Received: 01/25/90

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	1660	-	-	P
7440-36-0	Antimony	40.1	U	-	P
7440-38-2	Arsenic	1.7	B	N	F
7440-39-3	Barium	227	-	-	P
7440-41-7	Beryllium	0.70	U	-	P
7440-43-9	Cadmium	3.2	U	-	P
7440-70-2	Calcium	9420	-	-	P
7440-47-3	Chromium	4.1	U	-	P
7440-48-4	Cobalt	10.7	U	-	P
7440-50-8	Copper	3.9	U	-	P
7439-89-6	Iron	1530	-	-	P
7439-92-1	Lead	11.7	-	-	F
7439-95-4	Magnesium	3620	B	-	P
7439-96-5	Manganese	332	-	-	P
7439-97-6	Mercury	0.20	U	-	CV
7440-02-0	Nickel	18.0	U	-	P
7440-09-7	Potassium	5060	-	-	P
7782-49-2	Selenium	1.2	U	-	F
7440-22-4	Silver	5.9	U	-	P
7440-23-5	Sodium	12900	-	-	P
7440-28-0	Thallium	1.0	U	-	F
7440-62-2	Vanadium	8.1	U	-	P
7440-66-6	Zinc	313	-	E	P
	Cyanide	10.0	U	-	C

Color Before: GREY

Clarity Before: CLOUDY

Texture:

Color After: COLORLESS

Clarity After: CLEAR

Artifacts:

Comments:

FP235



Industrial & Environmental Analysts, Inc.

P.O. Box 12846

Research Triangle Park, North Carolina 27709

(919) 677-0090

FAX (919) 677-0427

March 7, 1990

Doug Fraser
Westinghouse Env. & Geotechnical Services, Inc.
P.O. Box 1308
Cary, NC 27512

Reference IEA Report No.: 637013

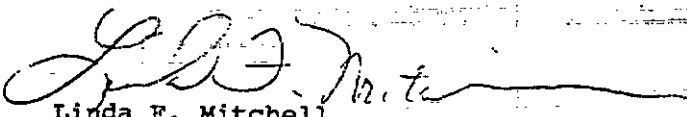
Dear Mr. Fraser,

Transmitted herewith are the results of analyses on four samples submitted to our laboratory on January 25, 1990.

Please see the enclosed reports for your results.

Very truly yours,

INDUSTRIAL & ENVIRONMENTAL ANALYSTS, INC.


Linda F. Mitchell
Director, Technical Support Services

State Certification:

Alabama - #40210

Georgia - #816

Kansas - #E-158

New Jersey - #67719

Tennessee - #00296

Virginia - #00179

South Carolina - #99021

North Carolina - #37720

#84

AR301255



IEA LABORATORY RESULTS

IEA Project #: 637-013
Client Name: Westinghouse Env. & Geotechnical Services, Inc.

Sample #	Client ID	Parameter	Results	Date Analyzed
1	FP-130	Corrosivity	<6.35 mmpy	02/07/90
	FP-130 Duplicate	Corrosivity	<6.35 mmpy	02/07/90
	FP-130 Triplicate	Corrosivity	<6.35 mmpy	02/07/90
2	FP-131	Corrosivity	<6.35 mmpy	02/07/90
	FP-131 Duplicate	Corrosivity	<6.35 mmpy	02/07/90
	FP-131 Triplicate	Corrosivity	<6.35 mmpy	02/07/90
3	FP-134	Corrosivity	<6.35 mmpy	02/07/90
	FP-134 Duplicate	Corrosivity	<6.35 mmpy	02/07/90
	FP-134 Triplicate	Corrosivity	<6.35 mmpy	02/07/90
4	FP-135	Corrosivity	<6.35 mmpy	02/07/90
	FP-135 Duplicate	Corrosivity	<6.35 mmpy	02/07/90
	FP-135 Triplicate	Corrosivity	<6.35 mmpy	02/07/90
1	FP-130	Ignitability	>200 F	01/30/90
	FP-130 Duplicate	Ignitability	>200 F	01/30/90
	FP-130 Triplicate	Ignitability	>200 F	01/30/90
2	FP-131	Ignitability	>200 F	01/31/90
	FP-131 Duplicate	Ignitability	>200 F	01/31/90
	FP-131 Triplicate	Ignitability	>200 F	01/31/90
3	FP-134	Ignitability	>200 F	02/01/90
	FP-134 Duplicate	Ignitability	>200 F	02/01/90
	FP-134 Triplicate	Ignitability	>200 F	02/01/90
4	FP-135	Ignitability	>200 F	02/02/90
	FP-135 Duplicate	Ignitability	>200 F	02/02/90
	FP-135 Triplicate	Ignitability	>200 F	02/02/90
1	FP-130	Arsenic - EP TOX	<0.005 mg/L	02/13/90
2	FP-131	Arsenic - EP TOX	<0.005 mg/L	02/13/90
3	FP-134	Arsenic - EP TOX	<0.005 mg/L	02/13/90
4	FP-135	Arsenic - EP TOX	<0.005 mg/L	02/13/90
1	FP-130	Barium - EP TOX	1.4 mg/L	02/12/90
2	FP-131	Barium - EP TOX	1.6 mg/L	02/12/90
3	FP-134	Barium - EP TOX	0.11 mg/L	02/12/90
4	FP-135	Barium - EP TOX	0.20 mg/L	02/12/90
1	FP-130	Cadmium - EP TOX	0.01 mg/L	02/12/90
2	FP-131	Cadmium - EP TOX	0.03 mg/L	02/12/90
3	FP-134	Cadmium - EP TOX	<0.01 mg/L	02/12/90
4	FP-135	Cadmium - EP TOX	<0.01 mg/L	02/12/90
1	FP-130	Chromium -EP TOX	<0.03 mg/L	02/12/90
2	FP-131	Chromium -EP TOX	<0.03 mg/L	02/12/90
3	FP-134	Chromium -EP TOX	<0.03 mg/L	02/12/90
4	FP-135	Chromium -EP TOX	<0.03 mg/L	02/12/90
1	FP-130	Mercury - EP TOX	<0.0005 mg/L	02/26/90
2	FP-131	Mercury - EP TOX	<0.0005 mg/L	02/26/90
3	FP-134	Mercury - EP TOX	<0.0005 mg/L	02/26/90
4	FP-135	Mercury - EP TOX	<0.0005 mg/L	02/26/90
1	FP-130	Lead - EP TOX	0.70 mg/L	02/12/90

AR301256



IEA LABORATORY RESULTS

IEA Project #: 637-013
Client Name: Westinghouse Env. & Geotechnical Services, Inc.

Sample #	Client ID	Parameter	Results	Date Analyzed
2	FP-131	Lead - EP TOX	0.87 mg/L	02/12/90
3	FP-134	Lead - EP TOX	<0.005 mg/L	02/14/90
4	FP-135	Lead - EP TOX	<0.005 mg/L	02/14/90
1	FP-130	Selenium - EP TOX	<0.01 mg/L	02/14/90
2	FP-131	Selenium - EP TOX	<0.01 mg/L	02/14/90
3	FP-134	Selenium - EP TOX	<0.01 mg/L	02/14/90
4	FP-135	Selenium - EP TOX	<0.01 mg/L	02/14/90
1	FP-130	Silver - EP TOX	<0.05 mg/L	02/12/90
2	FP-131	Silver - EP TOX	<0.05 mg/L	02/12/90
3	FP-134	Silver - EP TOX	<0.05 mg/L	02/12/90
4	FP-135	Silver - EP TOX	<0.05 mg/L	02/12/90

AR301257



REACTIVITY

IEA Sample Number: 637-013-1
Sample Identification: FP-130
Date Analyzed: 02/06/90 By: Morris

Results

Number	Compound	
1	pH	4.6
2	Reactivity toward water	N/R
3	Sulfide Reactivity	<25 mg/kg
4	Cyanide Reactivity	<0.50 mg/kg
5	Explosive Nature	N/R
6	Overall Reactivity	N/R

Comments:

BQL = Below Quantitation Limit
N/R = Not Reactive



REACTIVITY

IEA Sample Number: 637-013-1
Sample Identification: FP-130 Duplicate
Date Analyzed: 02/06/90 By: Morris

Number	Compound	Results
1	pH	4.0
2	Reactivity toward water	N/R
3	Sulfide Reactivity	<25 mg/kg
4	Cyanide Reactivity	<0.50 mg/kg
5	Explosive Nature	N/R
6	Overall Reactivity	N/R

Comments:

BQL = Below Quantitation Limit
N/R = Not Reactive



REACTIVITY

IEA Sample Number: 637-013-1
Sample Identification: FP-130 Triplicate
Date Analyzed: 02/06/90 By: Morris

Results

Number	Compound	Results
1	pH	4.6
2	Reactivity toward water	N/R
3	Sulfide Reactivity	<25 mg/kg
4	Cyanide Reactivity	<0.50 mg/kg
5	Explosive Nature	N/R
6	Overall Reactivity	N/R

Comments:

BQL = Below Quantitation Limit
N/R = Not Reactive



REACTIVITY

IEA Sample Number: 637-013-2
Sample Identification: FP-131
Date Analyzed: 02/06/90 By: Morris

Number	Compound	Results
1	pH	5.0
2	Reactivity toward water	N/R
3	Sulfide Reactivity	<25 mg/kg
4	Cyanide Reactivity	<0.50 mg/kg
5	Explosive Nature	N/R
6	Overall Reactivity	N/R

Comments:

BQL = Below Quantitation Limit
N/R = Not Reactive



REACTIVITY

IEA Sample Number: 637-013-2
Sample Identification: FP-131 Duplicate
Date Analyzed: 02/06/90 By: Morris

Results

Number	Compound	Results
1	pH	5.6
2	Reactivity toward water	N/R
3	Sulfide Reactivity	<25 mg/kg
4	Cyanide Reactivity	0.50 mg/kg
5	Explosive Nature	N/R
6	Overall Reactivity	N/R

Comments:

BQL = Below Quantitation Limit
N/R = Not Reactive



REACTIVITY

IEA Sample Number: 637-013-2
Sample Identification: FP-131 Triplicate
Date Analyzed: 02/06/90 By: Morris

Number	Compound	Results
1	pH	6.0
2	Reactivity toward water	N/R
3	Sulfide Reactivity	<25 mg/kg
4	Cyanide Reactivity	0.50 mg/kg
5	Explosive Nature	N/R
6	Overall Reactivity	N/R

Comments:

BQL = Below Quantitation Limit
N/R = Not Reactive



REACTIVITY

IEA Sample Number: 637-013-3
Sample Identification: FP-134
Date Analyzed: 02/06/90 By: Morris

Results

Number	Compound	Results
1	pH	3.9
2	Reactivity toward water	N/R
3	Sulfide Reactivity	<25 mg/kg
4	Cyanide Reactivity	0.50 mg/kg
5	Explosive Nature	N/R
6	Overall Reactivity	N/R

Comments:

BQL = Below Quantitation Limit
N/R = Not Reactive



REACTIVITY

IEA Sample Number: 637-013-3
Sample Identification: FP-134 Duplicate
Date Analyzed: 02/06/90 By: Morris

Number	Compound	Results
1	pH	3.9
2	Reactivity toward water	N/R
3	Sulfide Reactivity	<25 mg/kg
4	Cyanide Reactivity	0.50 mg/kg
5	Explosive Nature	N/R
6	Overall Reactivity	N/R

Comments:

BQL = Below Quantitation Limit
N/R = Not Reactive

AR301265



REACTIVITY

IEA Sample Number: 637-013-3
Sample Identification: FP-134 Triplicate
Date Analyzed: 02/06/90 By: Morris

Results

Number	Compound	
1	pH	4.0
2	Reactivity toward water	N/R
3	Sulfide Reactivity	<25 mg/kg
4	Cyanide Reactivity	0.50 mg/kg
5	Explosive Nature	N/R
6	Overall Reactivity	N/R

Comments:

BQL = Below Quantitation Limit
N/R = Not Reactive



REACTIVITY

IEA Sample Number: 637-013-4
Sample Identification: FP-135
Date Analyzed: 02/06/90 By: Morris

Results

Number	Compound	Results
1	pH	3.7
2	Reactivity toward water	N/R
3	Sulfide Reactivity	<25 mg/kg
4	Cyanide Reactivity	0.50 mg/kg
5	Explosive Nature	N/R
6	Overall Reactivity	N/R

Comments:

BQL = Below Quantitation Limit
N/R = Not Reactive

AR301267



REACTIVITY

IEA Sample Number: 637-013-4
Sample Identification: FP-135 Duplicate
Date Analyzed: 02/06/90 By: Morris

Results

Number	Compound	
1	pH	3.7
2	Reactivity toward water	N/R
3	Sulfide Reactivity	<25 mg/kg
4	Cyanide Reactivity	0.50 mg/kg
5	Explosive Nature	N/R
6	Overall Reactivity	N/R

Comments:

BQL = Below Quantitation Limit
N/R = Not Reactive



REACTIVITY

IEA Sample Number: 637-013-4
Sample Identification: FP-135 Triplicate
Date Analyzed: 02/06/90 By: Morris

Number	Compound	Results
1	pH	3.7
2	Reactivity toward water	N/R
3	Sulfide Reactivity	<25 mg/kg
4	Cyanide Reactivity	0.50 mg/kg
5	Explosive Nature	N/R
6	Overall Reactivity	N/R

Comments:

BQL = Below Quantitation Limit
N/R = Not Reactive



ICP LINEAR RANGES

IEA Project: 637-013

Analyte	Wavelength	Linear Range
Barium	455.410	100 mg/L
Cadmium	214.438	10 mg/L
Chromium	267.716	10 mg/L
Lead	220.350	100 mg/L
Silver	328.068	1 mg/L

AR301270



CALIBRATION VERIFICATION

IEA Project 637-013

Element	Date	ICV Value	ICV Found	% Recovery	CCV Value	CCV Start	% Recovery	CCV End	% Recovery
Arsenic	02-13-90	0.0256	0.0257	100	0.0400	0.0394	98	0.0426	107
Barium	02-12-90	10.000	9.741	97	10.000	10.035	100	9.859	99
Cadmium	02-12-90	2.000	2.095	105	2.000	2.133	107	2.072	104
Chromium	02-12-90	0.500	0.500	100	0.500	0.510	102	0.492	98
Lead	02-14-90	0.0347	0.0372	107	0.0545	0.0544	100	0.0540	99
Mercury	02-26-90	0.00040	0.00037	93	0.00060	0.00056	93	0.00056	93
Selenium	02-14-90	0.0250	0.0257	103	0.0400	0.0394	98	0.0390	98
Silver	02-12-90	0.500	0.510	102	0.500	0.523	105	0.492	98
Lead (ICP)	02-12-90	4.000	4.110	103	4.000	4.219	105	4.086	102

Control limit is 90% - 110% for all metals except Hg which is 80% - 120%

AR301271



LABORATORY CONTROL SAMPLE

IEA Project: 637-013

Element	Date	Liquid (ug/L)			Solid (mg/kg)			Limits
		True	Found	% Recovery	True	Found	% Recovery	
Arsenic	02-13-90	40.0	37.0	93				
Barium	02-26-90	2000.0	2018.0	101				
Cadmium	02-26-90	50.0	50.4	101				
Chromium	02-26-90	200.0	204.7	102				
Lead	02-14-90	20.0	18.8	94				
Selenium	03-08-90	10.0	9.1	91				
Silver	02-26-90	50.0	51.7	103				
Lead (ICP)	02-26-90	500.0	507.8	102				

Liquid LCS control limit is 80% - 120% Recovery except for Silver, Antimony, and Mercury

AR301272



METAL BLANKS

IEA Project: 637-013

Analyte	Analysis Date	Initial Calibration Blank (ppm)	Continuing Calibration Blank (ppm)		Prep Blank	Method
			#1	#2		
Arsenic	02-13-90	<0.005	<0.005	<0.005	<0.005	Furnace
Barium	02-12-90	<0.10	<0.10	<0.10	<0.10	Plasma
Cadmium	02-12-90	<0.01	<0.01	<0.01	<0.01	Plasma
Chromium	02-12-90	<0.03	<0.03	<0.03	<0.03	Plasma
Lead	02-14-90	<0.005	<0.005	<0.005	<0.005	Furnace
Mercury	02-26-90	<0.0005	<0.0005	<0.0005	<0.0005	Cold Vapor
Platinum	02-14-90	<0.01	<0.01	<0.01	<0.01	Furnace
Silver	02-12-90	<0.05	<0.05	<0.05	<0.05	Plasma
Lead	02-12-90	<0.10	<0.10	<0.10	<0.10	Plasma

AR301273



PREP DUPLICATE

IEA Project: 637-013

Analyte	Analysis Date	Sample I.D. #	Sample Conc. (ppm)	Duplicate Conc. (ppm)	% RPD	Method
Arsenic	02-13-90	637-013-3	<0.005	<0.005	0	Furnace
Barium	02-12-90	637-013-3	0.11	0.10	10	Plasma
Cadmium	02-12-90	637-013-3	<0.01	<0.01	0	Plasma
Chromium	02-12-90	637-013-3	<0.03	<0.03	0	Plasma
Lead	02-14-90	637-013-3	<0.005	<0.005	0	Furnace
Mercury	02-26-90	637-013-3	<0.0005	<0.0005	0	Cold Vapor
Selenium	02-14-90	637-013-3	<0.01	<0.01	0	Furnace
Copper	02-12-90	637-013-3	<0.05	<0.05	0	Plasma

Control limit is 20 RPD if both sample and duplicate are greater than
10 X Detection Limit

AR301274



MATRIX SPIKE RECOVERY

IEA Project: 637-013

Analyte	Analysis Date	Sample I.D. #	Sample Result (ppm)	Spiked Result (ppm)	Spike Added	% Recovery	Method
Arsenic	02-13-90	637-013-3	<0.005	0.0359	0.040	90	Furnace
Barium	02-12-90	637-013-3	0.11	2.129	2.000	101	Plasma
Cadmium	02-12-90	637-013-3	<0.01	0.056	0.050	112	Plasma
Chromium	02-12-90	637-013-3	<0.03	0.199	0.200	100	Plasma
Lead	02-14-90	637-013-3	<0.005	0.0202	0.020	101	Furnace
Mercury	02-26-90	637-013-3	<0.0005	0.00093	0.0010	93	Cold Vapor
Selenium	02-14-90	637-013-3	<0.01	0.0074	0.010	74	Furnace
Silver	02-12-90	637-013-3	<0.05	0.053	0.05	106	Plasma

Control Limit is 75% to 125% Recovery

AR301275



POST DIGEST SPIKE RECOVERY

IEA Project: 637-013

Analyte	Analysis Date	Sample I.D. #	Sample Result (ppm)	Spiked Result (ppm)	Spike Added	% Recovery	Method
Selenium	02-14-90	637-013-3	<0.01	0.0095	0.010	95	Furnace

AR301276

FPRQ TASK 8.1 RI
Appendix A Addendum
Westinghouse Project No. 4112-88-908A

Sample Preservation

Samples collected in conjunction with the remedial investigation of the First Piedmont Rock Quarry were preserved in accordance with the guidelines presented in the EPA reference methods for each sample constituent. Samples of soil and solid matrix materials were preserved by cooling the sample as quickly as possible and maintaining the temperature at 4°C using refreezable ice packs. Liquid samples were preserved as follows:

<u>Analysis</u>	<u>Preservative</u>
Metals	ph<2 with nitric acid & refrigerated
Cyanide	ph>12 with NaOH and refrigerated
TOC	ph<2 with H ₂ SO ₄ and refrigerated
CLP Organics	Cool and maintain at 4°C
VOA	Cool and maintain at 4°C
Simi Volatiles	Cool and maintain at 4°C

Revision 1
May 18, 1990

AR301279



BOREHOLE LOG

PROJECT First Piedmont Rock Quarry
 LOCATION Danville, Virginia
 PROJECT NO. 4112-88-904

Borehole ID : FP-006B
 Logged by: D. Allwine

LOCATION: 11317.0 N 8899.0 E GROUND ELEV.: 611.22 ft. msl TOTAL DEPTH: 48.1 ft. BOREHOLE DIAH.: ^{10.0" (0-32.8')} _{6.0" (32.8-48.1')}	DRILLER: Graham and Currie	START DATE: 5/18/89	END DATE: 5/29/89
	RIG: Schramm TH-64	TIME: 1500	1120
	BIT(S): 6.0" and 10.0" O.D. Button Bits	COMPLETED AS:	
	FLUID: Potable Water	Monitor Well	

DEPTH	SAMPLER	RECOVER	HVAL	HNu	XGAS	SCYHBL	COHPL	MATERIAL DESCRIPTIONS AND COMMENTS
0				0				0.0 - 4.0 SAND, Fine-grained with some Medium and Coarse-grained, Silty, Brown, with Some Fine to Medium-grained GRAVEL (Residium)
4				0				4.0 - 15.0 SILT, with Coarse-grained SAND and fine-grained GRAVEL in upper Few Feet, Orange-brown, Gray, Laminated with Little Mica (Saprolite)
8				0				
12				0				
16				0				15.0 - EOB* GRANITE GNEISS, Light Gray Overall Color, Hard, Competent (Bedrock)
20				0				19.5 - 31.5 Fractures
24				0				
28				0				
32				0				33.9 Fracture
36				0				36.9 Fracture
40				0				39.0 Fracture
44				0				41.2 Fracture
48				0				44.9 - 48.1 Fractures
52								EOB - 48.1 ft.
								Soil description based on split-spoon samples collected from adjacent well FP-006A as confirmed by cuttings produced during drilling of FP-006B. Rock descriptions based on drill cuttings.

*EOB - End of Boring

AR301280



Westinghouse

CALIPER LOG

HOLE DIAMETER IN INCHES



TEMPERATURE LOG

RELATIVE TEMPERATURE IN °C

DOWN LOG UP LOG



DEPTH IN FEET

00

10

20

30

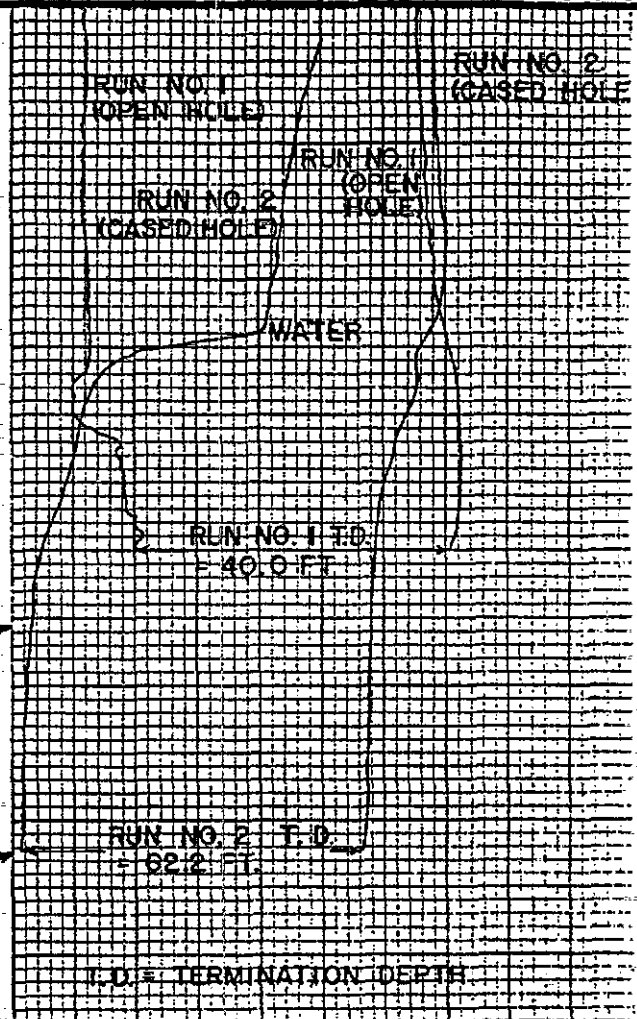
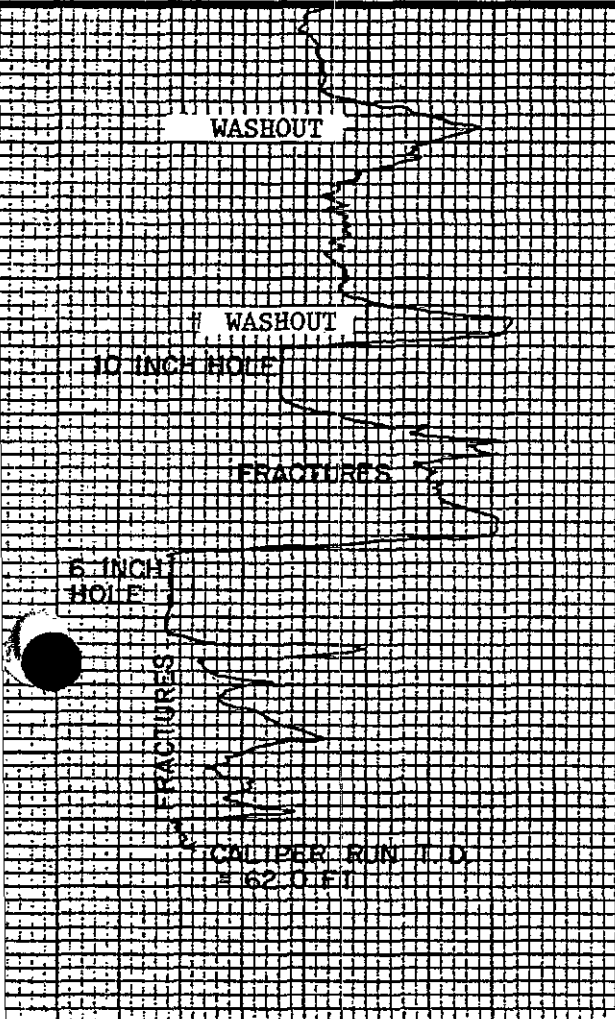
40

SURFACE CASING 45.5

50

60 DRILLED DEPTH 62.4

70



T.D. = TERMINATION DEPTH

WELL NO.: FP-001B

LOGGED BY:

Upper Zone - B. Rinoski/ J. Stahlings

Lower Zone - B. Robertson/ D. Alwine

DATE LOGGED:

Upper Zone - 5-16-89

Lower Zone - 5-25-89

DRILLED DEPTH: 62.4 Ft.

Caliper - 62.0'

LOGGED DEPTH: Temp. - 62.2'

CALIPER TOOL: MICROTEC #1104

TEMPERATURE TOOL: MOUNT SOPRIS #DPL-2481

DATA LOGGER: MOUNT SOPRIS #2500

Handwritten signature and date: 5/29/89

PROJECT

First Piedmont Rock Quarry
Danville, Virginia



Westinghouse

SCALE: As Shown

JOB NO: 4112-88-904

FIG. NO: AR301281

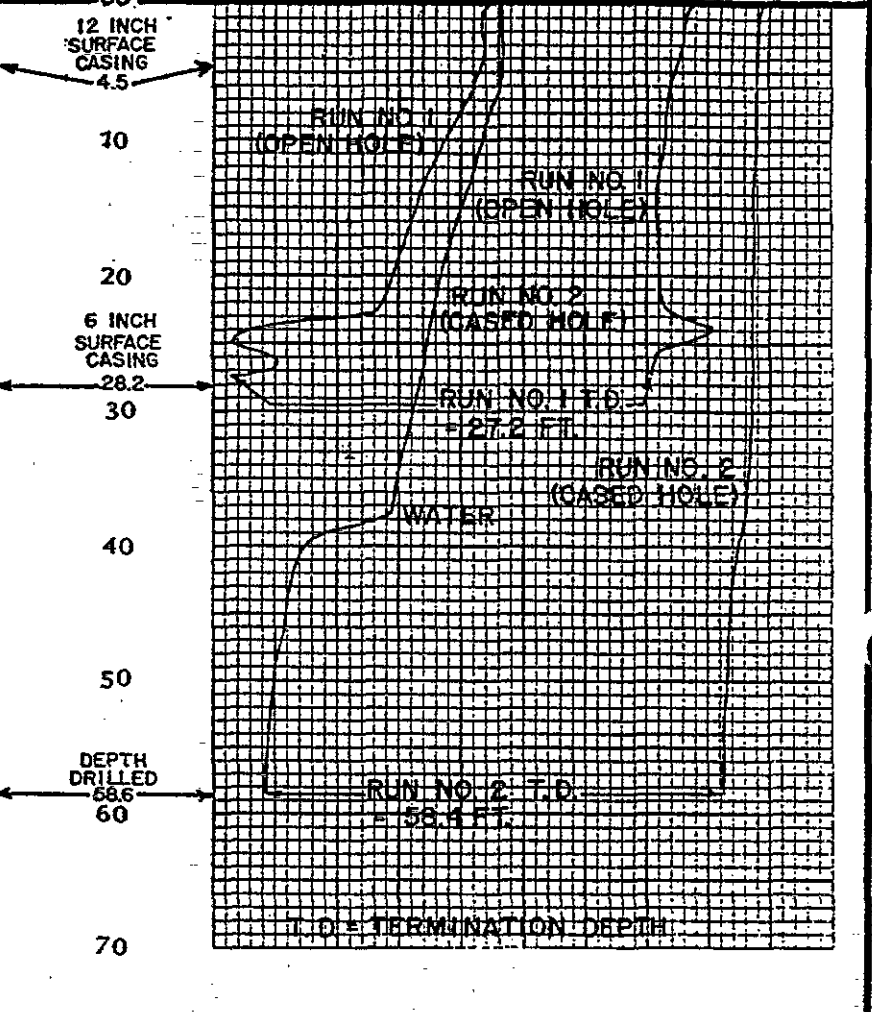
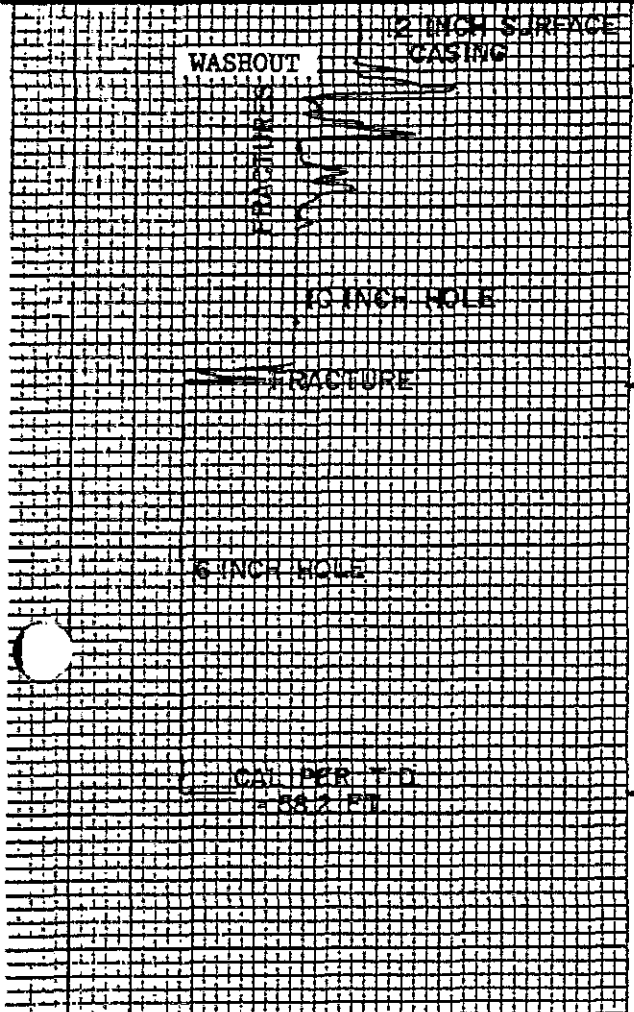
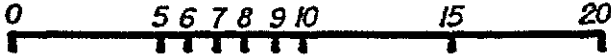
CALIPER LOG

TEMPERATURE LOG

HOLE DIAMETER IN INCHES

DEPTH IN FEET

RELATIVE TEMPERATURE IN °C



WELL NO.: FP-005B

LOGGED BY:

Upper Zone - B. Rinowski/ J. Stahlings

Lower Zone - B. Robertson/ D. Alwine

DATE LOGGED:

Upper Zone - 5-24-89

Lower Zone - 5-30-89

DRILLED DEPTH: 58.6 Ft.

Caliper - 58.2'

LOGGED DEPTH: Temp. - 58.4'

CALIPER TOOL: MICROTEC *1104

TEMPERATURE TOOL: MOUNT SOPRIS *DPL-2481

DATA LOGGER: MOUNT SOPRIS *2500

PROJECT

First Piedmont Rock Quarry
Danville, Virginia



Westinghouse

SCALE: As Shown

JOB NO: 4112-88-904

FIG. NO: AR301282

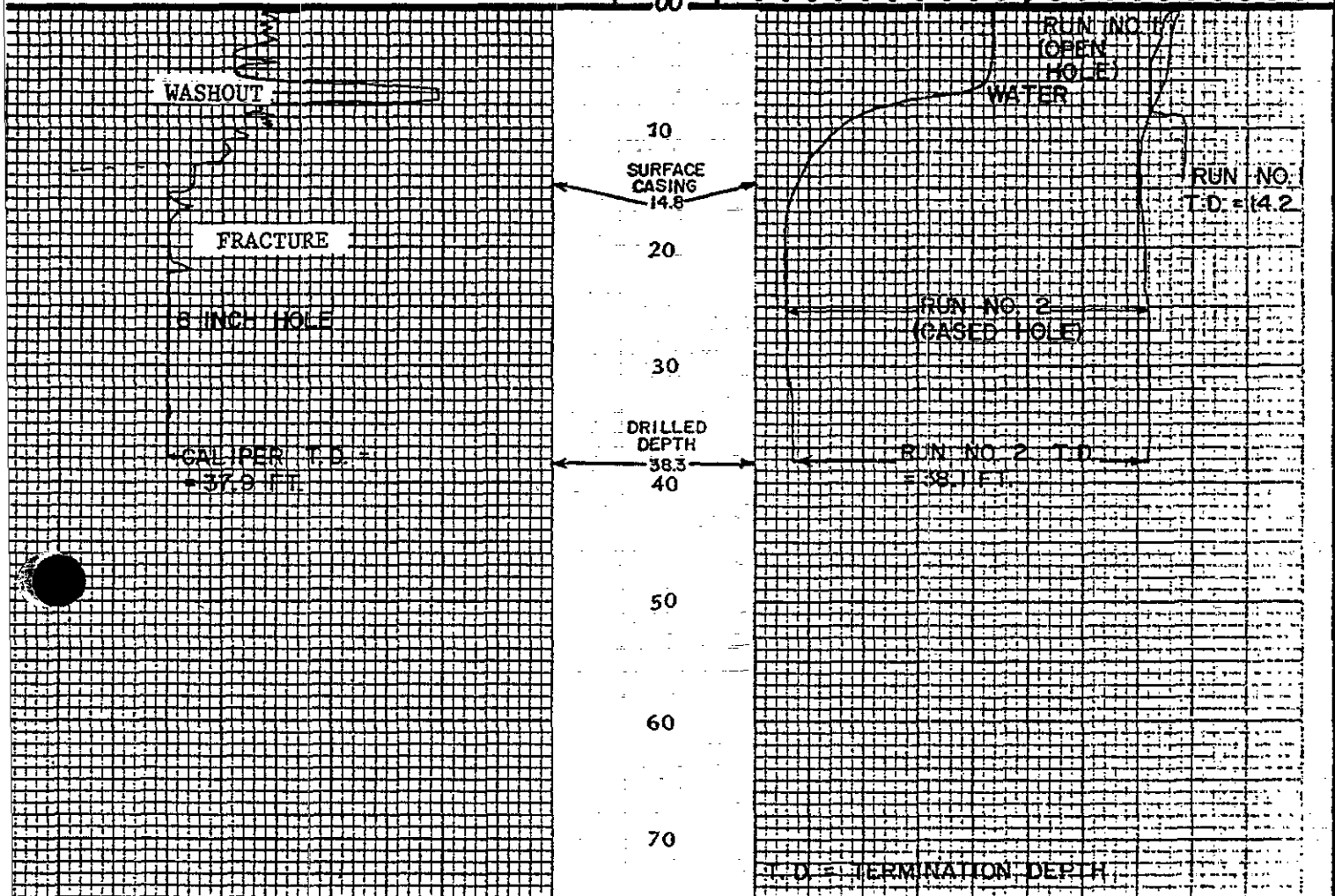
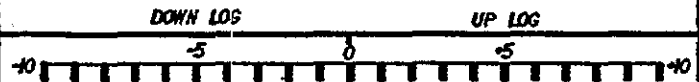
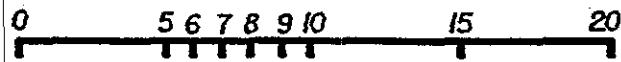
CALIPER LOG

TEMPERATURE LOG

HOLE DIAMETER IN INCHES

DEPTH IN FEET

RELATIVE TEMPERATURE IN °C



WELL NO.: FP-007B

DRILLED DEPTH: 38.3 Ft.

LOGGED BY:

Caliper - 37.9'

Upper Zone - B. Rynowski / J. Stahlings

LOGGED DEPTH: Temp. - 38.1'

Lower Zone - B. Robertson / D. Altwine

CALIPER TOOL: MICROTEC #1104

DATE LOGGED:

TEMPERATURE TOOL: MOUNT SOPRIS #DPL-2481

Upper Zone - 5-15-89

DATA LOGGER: MOUNT SOPRIS #2500

Lower Zone - 5-31-89

PROJECT



Westinghouse

SCALE: As Shown

JOB NO: 4112-88-904

FIG. NO: AR301283

First Piedmont Rock Quarry
Danville, Virginia

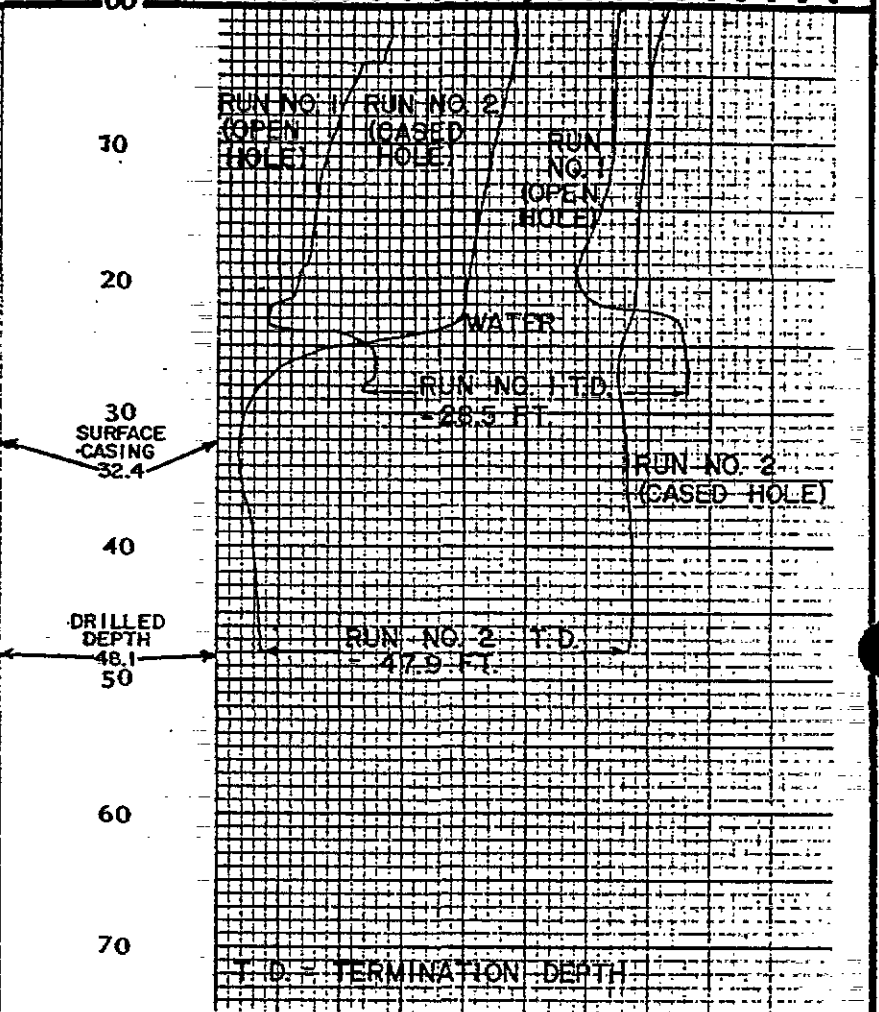
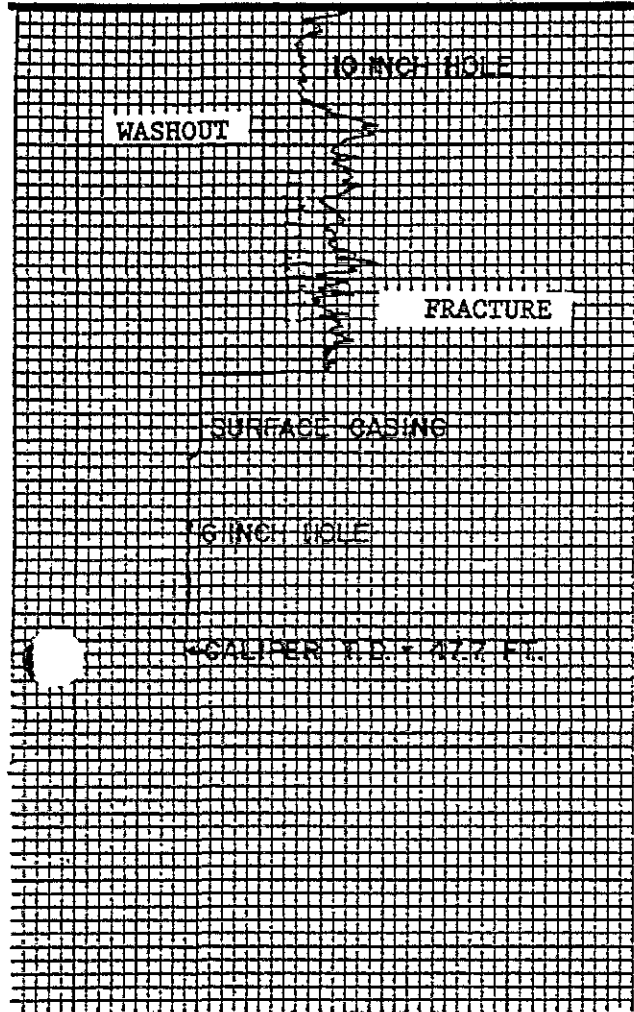
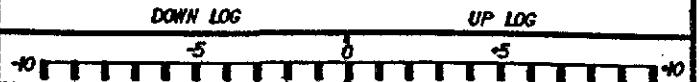
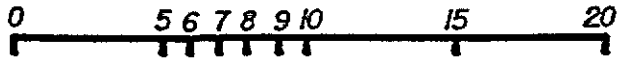
CALIPER LOG

TEMPERATURE LOG

HOLE DIAMETER IN INCHES

DEPTH IN FEET

RELATIVE TEMPERATURE IN °C



WELL NO.: FP-006B

LOGGED BY:

Upper Zone - B. Rlnowski/ J. Stahlings

Lower Zone - B. Robertson/ D. Allwine

DATE LOGGED:

Upper Zone - 5-18-89

Lower Zone - 5-29-89

DRILLED DEPTH: 48.1 Ft.

Caliper - 47.7'

LOGGED DEPTH: Temp. - 47.9'

CALIPER TOOL: MICROTEC #1104

TEMPERATURE TOOL: MOUNT SOPRIS #DPL-2481

DATA LOGGER: MOUNT SOPRIS #2500

PROJECT
 First Piedmont Rock Quarry
 Danville, Virginia



SCALE: As Shown
 JOB NO: 301284
 FIG. NO: _____

N. PHASE III REMEDIAL INVESTIGATION
RESULTS

AR301285





Westinghouse Environmental
and Geotechnical Services, Inc.

2800 East Parham Road
Richmond, Virginia 23228
(804) 264-5068
Fax (804) 266-7274

April 12, 1990

U.S. Environmental Protection Agency Region III
841 Chestnut Building
Philadelphia, Pennsylvania 19107

Attention: Mr. Andrew Palestini
Mail Code: 3HW24

Reference: First Piedmont Rock Quarry/Route 719 Site,
Phase III Feasibility Study
Westinghouse Job No. 1079-89-103B/4112-88-930

Dear Mr. Palestini:

On behalf of Goodyear Tire and Rubber Company, Corning Glass Works, and First Piedmont Corporation (Respondents), Westinghouse Environmental and Geotechnical Services, Inc. (Westinghouse) is pleased to present the results of the Phase III Feasibility Study (FS) sampling and analysis efforts at the First Piedmont Rock Quarry/Route 719 Site (FPRQ). These site activities were based on the results of the Remedial Investigation (RI), Risk Assessment (RA), and our correspondence and meetings in December, 1989.

INTRODUCTION

The objectives of the Phase III FS sampling and analysis were to:

1. determine the source of zinc to the southern drainage, and
2. provide additional data on the chemical characteristics of the waste pile and carbon black pile in order to better define remedial options.

The RI efforts indicated that the elevated zinc concentrations found in the southern drainage and its tributary, the southern quarry drainage, were not resulting from the quarry disposal area. It was hypothesized that the zinc may be coming from either the waste pile, carbon black pile, or the old disposal area located between the quarry and the southern drainage (Figure 1). It should be noted that the respondents had no involvement with the old disposal area at which disposal occurred 20 to 30 years prior to landfilling at the First Piedmont quarry, and that the old disposal area is not considered to be part of the FPRQ site.

In order to evaluate the source of zinc, the following activities were performed:

1. One composite sample (FP-132) of the soil material below the waste pile and one sample (FP-133) of carbon black were collected and analyzed for target analytical constituents (TAL).
A matrix spike/matrix spike duplicate (MS/MSD) sample (FP-136) was also collected from the carbon black pile.
2. Water samples were collected along the southern quarry drainage from downstream of the waste pile (FP-230), downstream of the carbon black pile (FP-231), within the old disposal area (FP-232), and downstream of these areas above the confluence of the southern quarry and southern

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drainages (FP-233). An MS/MSD sample (FP-235) was also collected at location FP-231. Sample location FP-233 is equivalent to station FP-306 at which two rounds of water and sediment samples were collected during the RI.

In the Phase II FS, both onsite and offsite disposal options for the carbon black and waste piles (Figure 1) were retained for further evaluation. In order to further evaluate the remedial options, two composite samples of the soil material below the waste pile and of carbon black were collected and analyzed to determine RCRA waste characteristics.

Table 1 summarizes the sampling and analysis efforts. Sample locations are shown on Figure 2. Field sampling forms are presented in Appendix A. Laboratory results are given in Appendix B.

METHODS OF INVESTIGATION

The following summarizes the field and laboratory methods for the Phase III activities. All field techniques were in accordance with the Project Operation Plans. IEA, the project laboratory, performed all analyses in accordance with the most recent Contract Laboratory Program (CLP) Statement of Work (SOW), or for the RCRA waste characterization, SW-846, Third Edition. Split samples were collected by the EPA contractor, CDM Federal Programs, Inc.

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Waste Pile Soil Sampling

Samples from the waste pile were collected on January 24, 1990. The pile was divided in half from east to west, and five locations within each half were cleared of surface debris to expose the underlying soil. From each half of the waste pile, a portion of soil from each cleared area was collected in an aluminum foil pan and thoroughly mixed prior to being placed in the sample containers. This process was repeated for each half of the pile.

One composite sample from each half of the waste pile was placed in the appropriate sample containers and submitted for RCRA characterization analysis. Following the collection of the two RCRA samples (FP-130 and FP-131), the remaining soil from each half of the pile was combined and mixed into a single composite sample (FP-132) for TAL analysis.

Carbon Black Pile Soil Sampling

The carbon black pile was sampled by dividing the pile in half from north to south. A composite of the soil from each half was collected in an aluminum foil pan and thoroughly mixed. Samples (FP-134 and FP-135) from each portion of this pile were placed in laboratory supplied sample containers for RCRA characterization. Following the collection of the RCRA characterization samples, the remaining material from each area was combined and mixed into a single composite sample (FP-133) for TAL analysis.

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Page 5

A sample from the carbon black pile was also submitted as a MS/MSD sample (FP-136).

Water Samples

Four water samples were collected on January 25, 1990, following an overnight rainfall event of one inch as measured in the site rain gage. Samples FP-230 and FP-231 from below the waste pile and carbon black pile, respectively, were collected from shallow excavations made in the drainage path the day prior to sampling. These excavations were made to assure adequate depth in the drainage way for the sample bottles to be emersed to collect the sample. Samples FP-232 from within the old disposal area, and FP-233 just above the confluence of the southern quarry and southern drainages were obtained along the drainage path by placing the bottle under the falling water and allowing the bottles to fill. A MS/MSD sample (FP-235) was collected at station FP-231. A field blank (FP-234) was also collected at the carbon black pile by pouring laboratory supplied water into the sample container.

DATA QUALITY

This section presents an evaluation of the quality of data collected during surface-water and waste material sampling. The data quality objectives for the project are specified in the project Sampling and Analysis Plan (SAP) and the Quality Assurance Project Plan (QAPP). The U.S. EPA Functional Guidelines for Evaluating Inorganics Analyses (modified for Region III), and the

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current Contract Laboratory Program - Statement of Work (CLP-SOW) for inorganics were used to perform the data validation and QC checks presented in the following sections.

FIELD DATA

Field data sheets were independently reviewed by senior Westinghouse personnel. These data are 100 percent complete and representative of the materials sampled. The data are also considered to be accurate based on proper instrument calibration.

In field measurements of temperature, pH, and specific conductance were made on aqueous samples immediately following sample collection. Dissolved oxygen was not measured. All field data are included on field sampling and analysis forms in Appendix A.

LABORATORY DATA

Inorganic laboratory data were validated in accordance with the QAPP and the U.S. EPA Functional Guidelines for Evaluating Inorganics Analyses (modified for Region III). Most of the analytical data required no qualification. Validation of the laboratory data indicates that some analyses have a qualified usability. Data are presented by case according to matrix.

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Case: Water

Surface-water samples included in this case are: No. FP-230, No. FP-231, No. FP-232, and No. FP-233.

All instrument calibrations met CLP-SOW criteria. Initial and continuing calibration verification (ICV and CCV) percent recoveries (% R) for all analytes were within the 90 - 110 percent control limits. Contract required detection limits (CRDL) and holding times were also met.

Magnesium and calcium were detected in the laboratory blanks. Concentrations of calcium and magnesium greater than the Instrument Detection Limit (IDL) but less than five times the amount in the blank are qualified as not detected substantially above the level reported in any field or laboratory blank.

All Inductively Coupled Plasma (ICP) interference check sample results met the specified criteria.

All laboratory control sample analysis results were within specified control limits.

All duplicate and matrix spike sample analysis results, except for arsenic, were also within specified control limits. In the duplicate sample analysis, the Relative Percent Difference (RPD) value for arsenic exceeded the control limit of plus or minus the CRDL for sample values less than five times the CRDL. Although the detected concentrations of arsenic did not exceed the CRDL, arsenic results are qualified as estimated. In the spike sample analysis,

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the spike recovery value for arsenic falls within the 30 - 74 percent criteria for sample results less than the IDL. The results for arsenic are therefore also qualified as not detected, but the quantitation limit is probably higher. The analysis suggests that arsenic was reported at a lower concentration than the true value.

In the ICP serial dilution analysis, zinc exceeded the 10 percent difference criteria. Positive results for zinc are qualified as estimated.

Case: Soil

Soil samples included in this case are: No. FP-132 and No. FP-133.

All instrument calibrations, CRDLs, and holding times met CPL-SOW criteria. No metals were identified in laboratory blanks.

All ICP interference check sample results met specified criteria.

All laboratory control sample analysis results were within specified control limits.

In the duplicate sample analysis, iron and manganese exceeded the 35 percent RPD control limit for sample values greater than five times the CRDL. In addition, beryllium, cadmium, chromium, magnesium, potassium, and vanadium also exceeded the control limit of plus or minus the CRDL for sample values less than five times

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the CRDL. Positive results for the above analytes are qualified as estimated.

In the matrix spike sample analysis, lead and zinc were outside the spike recovery control limits. Concentrations of lead greater than the IDL are qualified as biased high. Concentrations of zinc below the IDL are qualified as biased low. In addition antimony is qualified as not detected, but the quantitation limit is probably higher because the percent recovery is within the 30 - 74 percent control limits, and the sample results are less than the IDL.

In the ICP serial dilution analysis, calcium, potassium, sodium, and vanadium exceed the 10 percent difference criteria. Positive results for these analytes are qualified as estimated.

FINDINGS

This section summarizes the results of the sampling and analysis. The results are evaluated independently and compared to previous results. Analytical data are presented in Appendix B.

Waste Pile

The TAL analysis of the waste pile (FP-132) indicate that the concentrations of aluminum, arsenic, cadmium, chromium, lead, and zinc are elevated above background soil levels. Lead and zinc were found in the highest concentration above background.

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The results for FP-132 were compared to previous results from samples FP-410, FP-110, FP-111, FP-112, and FP-113. The results for FP-132 are generally higher than the previous results. Aluminum, arsenic, cadmium, and lead were slightly higher than the previous results. Zinc concentrations were significantly higher than the previous results.

In samples FP-130 and FP-131, submitted for RCRA characterization, only very low levels of barium and lead were detected in the EP toxicity analyses at concentrations far below EP toxicity criteria. All other metals were below the detection limits. The waste pile samples had a low pH but were non-reactive. These results confirm that the waste pile material has elevated metal concentrations but is not a characteristic hazardous waste.

Carbon Black Pile

Sample FP-133 from the carbon black pile was analyzed for TAL constituents. The results for this sample indicate very low concentrations for the trace metals cadmium, copper, lead, and zinc. These results are generally consistent with the results of soil samples (FP-117, FP-118, FP-119, and FP-120) previously collected at the carbon black pile. The zinc concentration in sample FP-133 was considerably higher than the previous samples.

In the EP toxicity analyses (FP-134 and FP-135), only very low levels of barium were detected at concentrations well below the EP toxicity criteria. No other metals were detected in the extracts. The carbon black had a low pH but exhibited no reactivity.

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Therefore, the carbon black is not a characteristic hazardous waste.

Southern Quarry Drainage

Surface water in the southern quarry drainage was sampled at four locations (Figure 2). One inch of rainfall was recorded at the onsite rain gauge the night prior to sampling. Flow in the southern quarry drainage was not measured directly; however, it is estimated that about ten gallons per minute (gpm) were flowing in the drainage with slightly increasing flow downstream. For comparison, it should be noted that the flow at FP-306 (equivalent to FP-233) was significantly less than one gpm during the RI sampling efforts. Therefore, flow during the recent sampling was at least ten times greater than during previous sampling efforts.

In general, low concentrations of aluminum, cadmium, calcium, iron, lead, manganese, sodium, and zinc were found in most or all of the water samples. The results from the southern quarry drainage indicate two general trends. The concentrations for aluminum, iron, lead, and sodium increase between the waste pile (FP-230) and the carbon black pile (FP-231) and then decrease downstream at stations FP-232 and FP-233. In contrast, manganese and zinc progressively increase downstream from the waste pile.

Zinc concentrations increase from about 0.05 milligrams per liter (mg/L) at FP-230 below the waste pile to about 0.4 mg/L at FP-231 below the carbon black pile. Below the carbon black pile,

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zinc concentrations increased to 7.6 mg/L at FP-232 within the old disposal area, and to 20.4 mg/L at FP-233 (FP-306).

These data indicate that surface water runoff from the waste pile and carbon black pile is not the source of elevated zinc levels in the southern drainage. In addition, the data indicate that the zinc concentrations in the southern quarry drainage are relatively low until the old disposal area.

The data at FP-233 were compared to previous results at FP-306. At FP-306, zinc concentrations were 111 mg/L during Round 1 and 67.6 mg/L during Round 2. These data suggest that the zinc concentrations are inversely proportional to flow (i.e., decreasing zinc levels with increasing flow).

CONCLUSIONS

The waste pile contains elevated levels of several trace metals including zinc. However, the waste pile materials are not a characteristic RCRA waste. Trace metal concentrations in the carbon black pile are low. This material is also not a characteristic RCRA waste. Therefore, these materials may be disposed of within the quarry or offsite at a licensed solid waste facility.

Zinc levels in the southern quarry drainage increase slightly from the waste pile to the carbon black pile and increase significantly at and below the old disposal area. These data


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indicate that the zinc in the southern drainage is not due to surface water runoff from the waste or carbon black piles.

We trust this information meets your needs. If you have any questions, please call us at (804) 346-8498 (or at (804) 264-5068 after March 31, 1990).

Sincerely,
Westinghouse Environmental and
Geotechnical Services, Inc.


Douglas R. Fraser, P. G.
Environmental Services Manager

DRF/lfm

cc: Jim Wren - Goodyear
Bob Heldridge - Goodyear
Neal Rountree - Goodyear
Burl Madren - Corning
Blake Manual - Corning
Tommy Stump - FPC
Khoa Nguyen - VDWM
John Funk - Westinghouse
Bill Robertson - Westinghouse

AR301298

TABLES

AR301299

TABLE 1

SAMPLING STATION INFORMATION
 FIRST PIEDMONT ROCK QUARRY
 WESTINGHOUSE JOB NO. 1079-89-103B/4112-88-930

Surface Water

<u>Sample pt. 1 Designation</u>	<u>Matrix</u>	<u>General 1 Location</u>	<u>QA/QC Samples</u>	<u>Analytical Parameters</u>	<u>QA/QC 2 Level</u>	<u>Field Parameter</u>	<u>QA/QC 2 Level</u>
FP-230	Water	Below Waste Pile		TAL ³	IV	pH, Cond., Temp.	I
FP-231	Water	Below Carbon Black Pile	1-Field Blank (FP-234)	TAL	IV	pH, Cond., Temp.	I
FP-232	Water	Within Old Disposal Area		TAL	IV	pH, Cond., Temp.	I
FP-233	Water	Confluence of Southern Quarry and Southern Drainages; Same Location as FP-306		TAL	IV	pH, Cond., Temp.	I
FP-234	Water	Field Blank Collected at FP-231		TAL	IV	pH, Cond., Temp.	I
FP-235	Water	MS/MSD Sample Collected at FP-231		TAL	IV	pH, Cond., Temp.	I

DR3
C1300

TABLE 1

SAMPLING STATION INFORMATION
 FIRST PIEDMONT ROCK QUARRY
 WESTINGHOUSE JOB NO. 1079-89-103B/4112-88-930

Soil/Waste Material

<u>Sample pt.¹ Designation</u>	<u>Matrix</u>	<u>General¹ Location</u>	<u>QA/QC Samples</u>	<u>Analytical Parameters</u>	<u>QA/QC² Level</u>	<u>Field Parameter</u>	<u>QA/QC² Level</u>
FP-130	Solid	East Side of Waste Pile	----	RCRA ⁴ Characteristics	III	None	---
FP-131	Solid	West Side of Waste Pile	----	RCRA Characteristics	III	None	---
FP-132	Solid	Waste Pile	----	TAL	IV	None	---
FP-133	Solid	Carbon Black Pile	----	TAL	IV	None	---
FP-134	Solid	East Side of Carbon Black Pile	----	RCRA Characteristics	III	None	---
FP-135	Solid	West Side of Carbon Black Pile	----	RCRA Characteristics	III	None	---
FP-136	Solid	MS/MSD Sample of Carbon Black Pile	----	TAL	IV	None	---

¹ See Figure 2 for sample locations

² EPA, 1987, Data Quality Objective for Remedial Response Activities;

³ EPA/540/6-87/003

⁴ TAL - Target Analyte List

RCRA Characteristics included in EP Toxicity for RCRA Metals, corrosivity ignitability, pH, water reactivity, sulfide reactivity, cyanide reactivity, explosive nature, and overall reactivity.

AR301301

TABLE 2

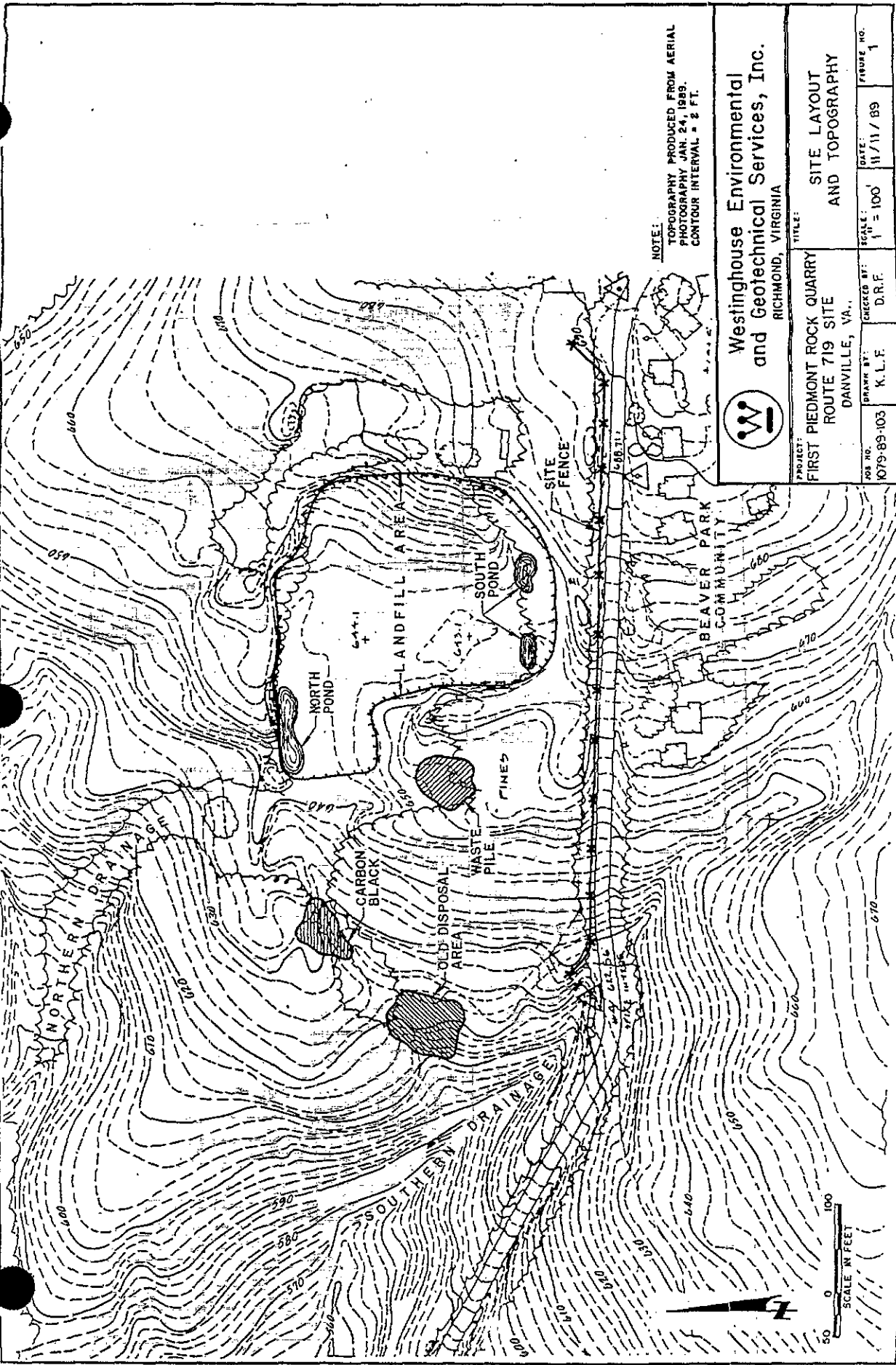
FIELD DATA FROM PHASE III SAMPLING
 CONDUCTED JANUARY 25, 1990
 FIRST PIEDMONT ROCK QUARRY
 WESTINGHOUSE JOB NO. 1079-89-103B/4112-88-930

<u>Sample Designation</u>	<u>pH (S.U)</u>	<u>Temperature (°C)</u>	<u>Conductivity (uS)</u>
FP-230	6.32	8	.53
FP-231	7.89	8	.59
FP-232	6.85	8	.58
FP-233	6.16	8	.64
FP-234	--	--	--
FP-235	7.92	8	.60


AR301302

FIGURES

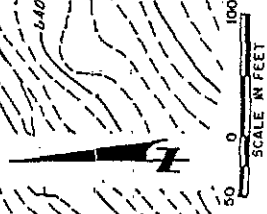
AR301303



NOTE:
 TOPOGRAPHY PRODUCED FROM AERIAL
 PHOTOGRAPHY JAN. 24, 1989.
 CONTOUR INTERVAL = 2 FT.

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PROJECT: FIRST PIEDMONT ROCK QUARRY ROUTE 719 SITE DANVILLE, VA.		SCALE: 1" = 100'	DATE: 11/11/89
JOB NO. 1079-89-103	DRAWN BY: K.L.F.	CHECKED BY: D.R.F.	FIGURE NO. 1

AR301304



A & S SUPPLY CO., INC.

AR301304

EXPLANATION

FP-131 SOIL SAMPLING LOCATION

FP-230 WATER SAMPLE LOCATION



TOPOGRAPHY FROM AERIAL PHOTOGRAPHY
JAN. 24, 1989
CONTOUR INTERVAL = 2 FT.

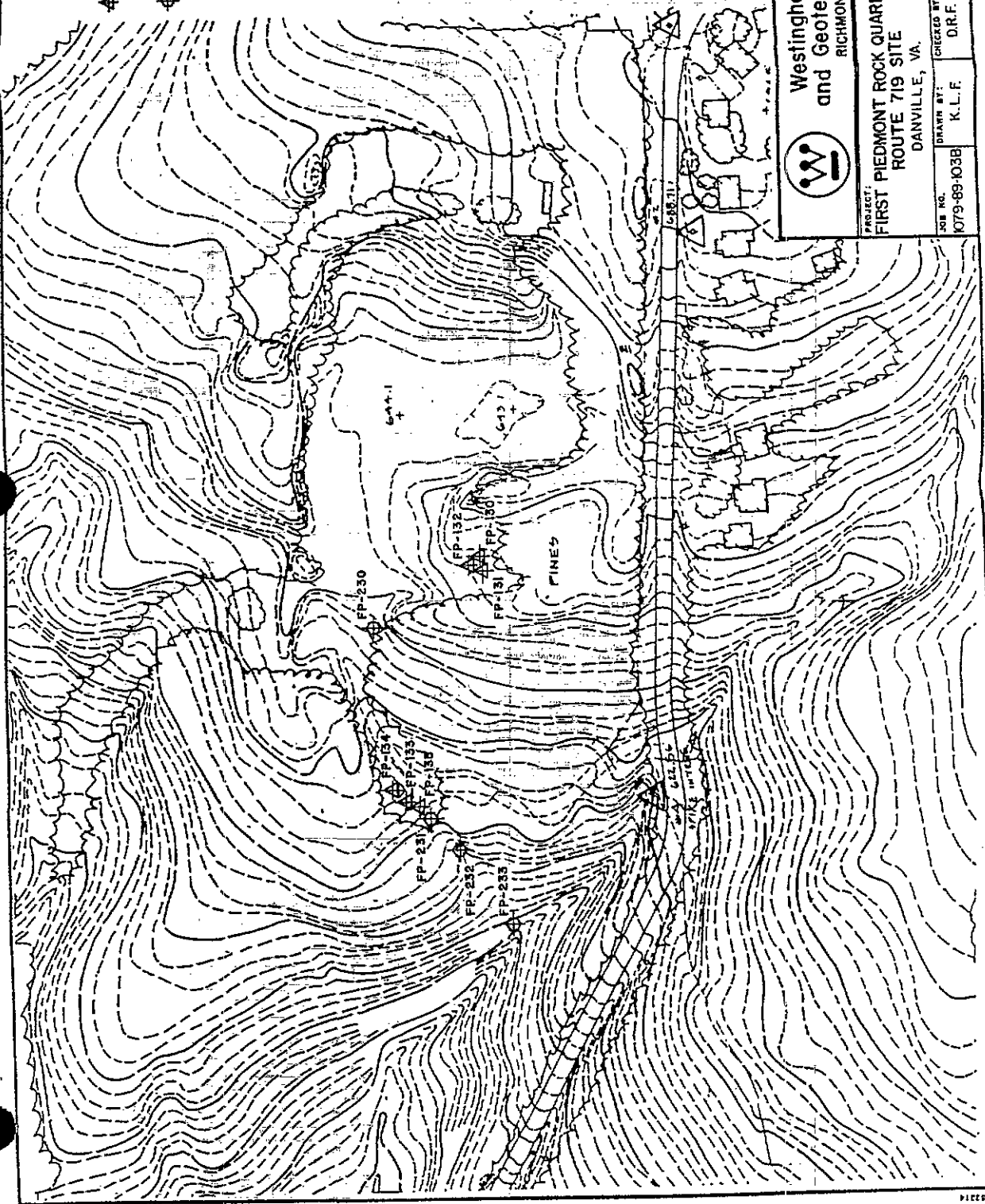


**Westinghouse Environmental
and Geotechnical Services, Inc.**
RICHMOND, VIRGINIA

PROJECT: FIRST PIEDMONT ROCK QUARRY
ROUTE 719 SITE
DANVILLE, VA.

TITLE: PHASE III
SAMPLING LOCATIONS

JOB NO. 079-89-03B	DRAWN BY: K.L.F.	CHECKED BY: D.R.F.	SCALE: 1" = 100'	DATE: 3/22/90	FIGURE NO. 2
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AR301305

AR301305

FIGURES

AR301306

GRAPH SCHEDULE AND PROGRESS REPORT

PROJECT: FPRO 4112-88-900

PREPARED BY: Douglas R. Fraser

PREPARED FOR: Sampling And Analysis Plan



Remedial Investigation/Feasibility Study

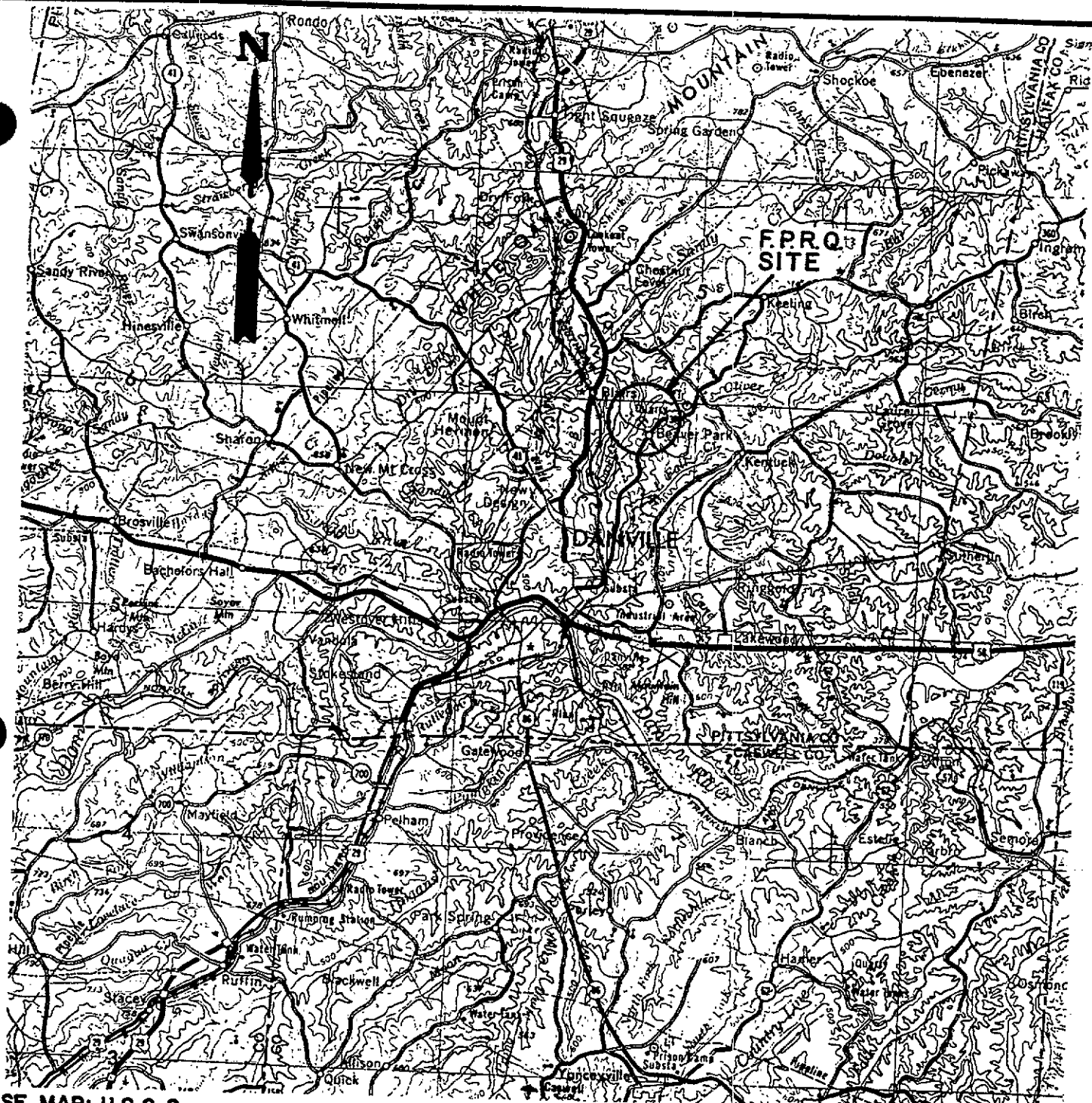
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	Month	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	
Task 5: Data Validation	PROPOSED																									
Subtask 5.1: Validation of Analytical Data	ACTUAL																									
Subtask 5.2: Validation of Field Data	PROPOSED																									
Task 6: Site Characterization and Remedial Measure Development	ACTUAL																									
Task 7: Risk Assessment	PROPOSED																									
Subtask 7.1: Preliminary Health and Environmental Effects Assessment	PROPOSED																									
Subtask 7.2: Public Health Assessment of No-Action Alternative	ACTUAL																									
Task 8: Remedial Investigation Report	PROPOSED																									
Subtask 8.1: Draft Remedial Investigation Report	ACTUAL																									
Subtask 8.2: Final Remedial Investigation Report	PROPOSED																									
Task 9: EPA Designated Activities	ACTUAL																									
Task 10: Community Relations	PROPOSED																									
Task 11: Quality Assurance	ACTUAL																									
Subtask 11.1: System Audits	PROPOSED																									
Subtask 11.2: Performance Audits	ACTUAL																									
Task 12: Technical Management	PROPOSED																									
Subtask 12.1: Monthly Progress Reports	ACTUAL																									
Subtask 12.2: Meetings	PROPOSED																									
Feasibility Study	ACTUAL																									
Task 1: Development of Preliminary Alternatives	PROPOSED																									
Task 2: Screening of Preliminary Alternatives	ACTUAL																									
Task 3: Detailed Analysis of Alternatives	PROPOSED																									
Task 4: Feasibility Study Report	ACTUAL																									
Subtask 4.1: Draft Feasibility Study Report	PROPOSED																									
Subtask 4.2: Final Feasibility Study Report	ACTUAL																									
	PROPOSED																									
	ACTUAL																									

EXPLANATION:
 --- INTERMITTENT ACTIVITY
 --- INTENSE ACTIVITY
 ▲ DRAFT REPORT
 ▲ FINAL REPORT
 ● TASK COMPLETION
 ● MEETING
 ◇ TECHNICAL MEMORANDUM

Final F.S. Report Due September, 1990.

COMMENTS: RI/FS schedule is based on August 17, 1988 EPA final approval of project plans and Work Plan schedule

FIGURE: 1 APPROVED BY: DATE OF REPORT: July 15, 1988 REVISION DATE: September 21, 1988 SHEET NO.: 2



BASE MAP: U.S.G. S.
 GREENSBORO, N.C. 1°x2°
 MCT/WBR

CONTOUR INTERVAL = 50 Ft.

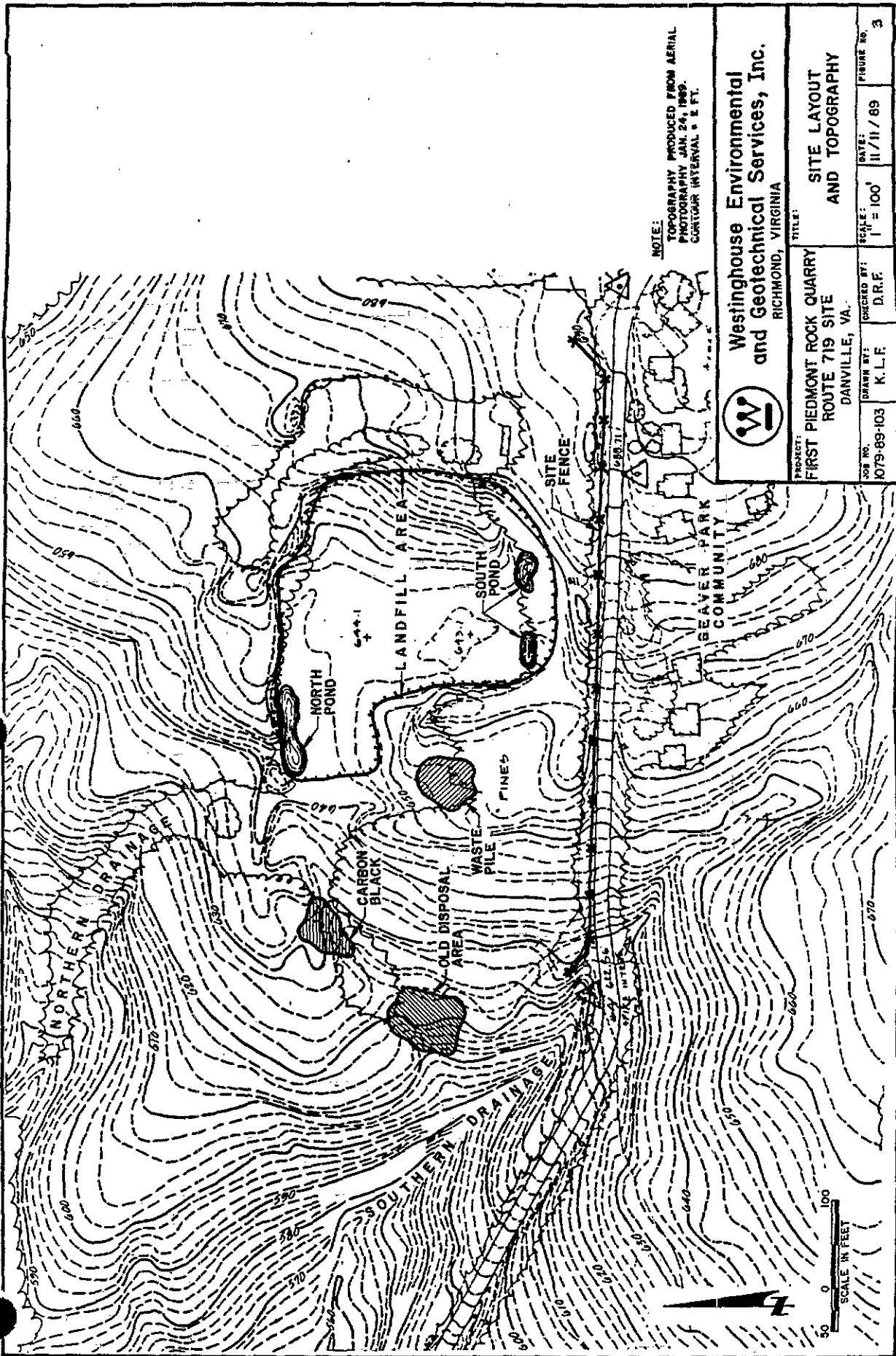
REGIONAL SITE LOCATION

PROJECT
 FIRST PIEDMONT ROCK
 QUARRY
 DANVILLE, VA.



Westinghouse

SCALE: 1:250,000
 JOB NO: 4112-88-904
 FIELD NO: 304309



NOTE:
 TOPOGRAPHY PRODUCED FROM AERIAL
 PHOTOGRAPHY JAN. 24, 1989.
 CONTOUR INTERVAL = 5 FT.

**Westinghouse Environmental
 and Geotechnical Services, Inc.**
 RICHMOND, VIRGINIA



PROJECT: FIRST PIEDMONT ROCK QUARRY ROUTE 719 SITE DANVILLE, VA.		TITLE: SITE LAYOUT AND TOPOGRAPHY	
JOB NO. 1079-89-103	DRAWN BY: K.L.F.	SCALE: 1" = 100'	DATE: 11/11/89
		CHECKED BY: D.R.F.	FIGURE NO. 3

AR301310

A & E SUPPLY CO., INC.

AR301310

N

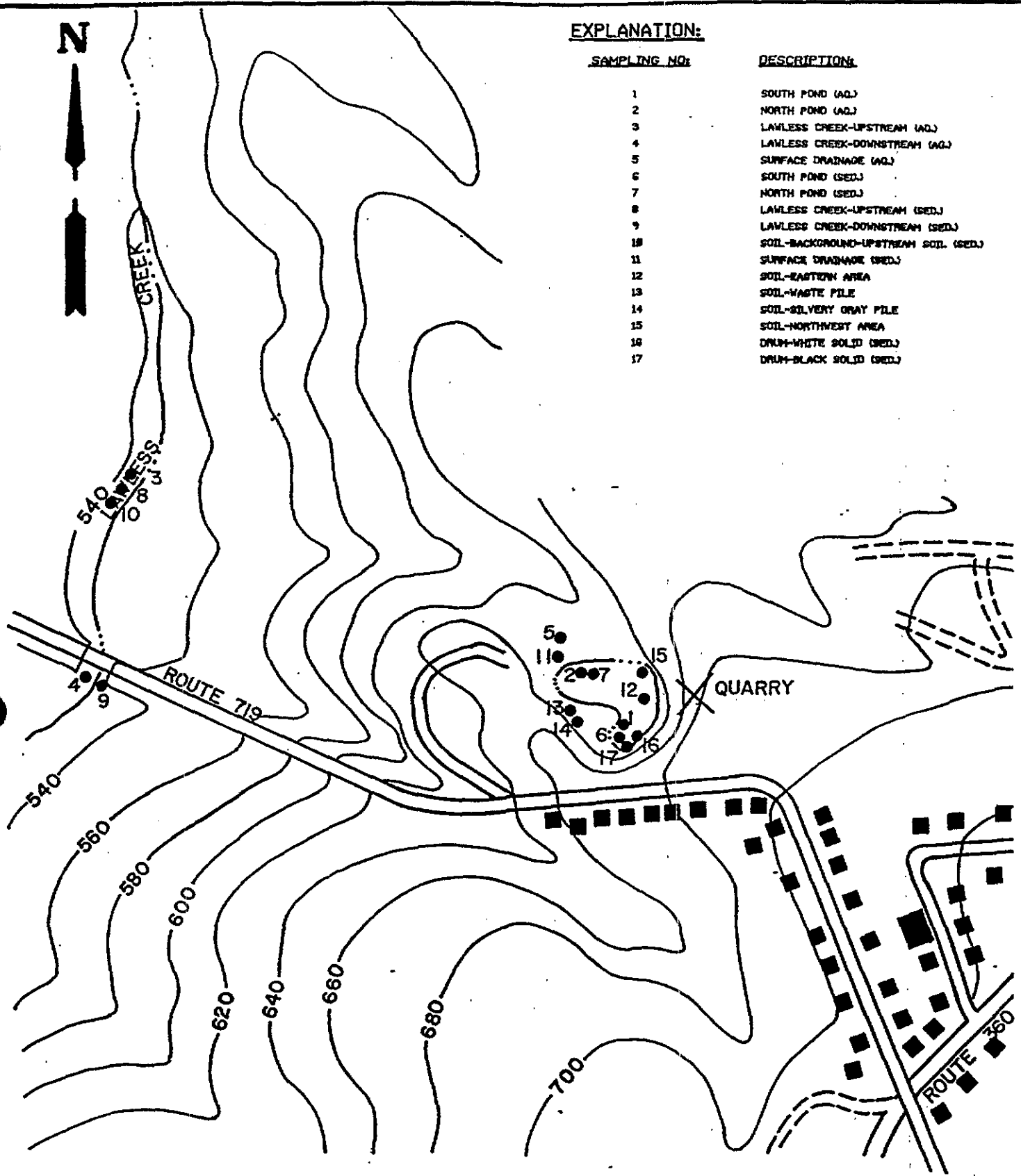


EXPLANATION:

SAMPLING NO.

DESCRIPTION:

- | | |
|----|-------------------------------------|
| 1 | SOUTH POND (AQ) |
| 2 | NORTH POND (AQ) |
| 3 | LAWLESS CREEK-UPSTREAM (AQ) |
| 4 | LAWLESS CREEK-DOWNSTREAM (AQ) |
| 5 | SURFACE DRAINAGE (AQ) |
| 6 | SOUTH POND (SED) |
| 7 | NORTH POND (SED) |
| 8 | LAWLESS CREEK-UPSTREAM (SED) |
| 9 | LAWLESS CREEK-DOWNSTREAM (SED) |
| 10 | SOIL-BACKGROUND-UPSTREAM SOIL (SED) |
| 11 | SURFACE DRAINAGE (SED) |
| 12 | SOIL-EASTON AREA |
| 13 | SOIL-WASTE PILE |
| 14 | SOIL-SILVERY GRAY PILE |
| 15 | SOIL-NORTHWEST AREA |
| 16 | DRUM-WHITE SOLID (SED) |
| 17 | DRUM-BLACK SOLID (SED) |



HISTORICAL SITE SAMPLING LOCATIONS

DUNCAN-PARKELL FROM 200 919-88-1077

PROJECT
FIRST PIEDMONT ROCK
QUARRY
DANVILLE, VA.



SCALE: N.T.S.
JOB NO: 4112-88-904 F
FIG. NO: 4
 AR301311

EXPLANATION

- PIEZOMETER
- FP-004 MONITOR WELL: A-SHALLOW WELL
B-DEEP WELL
- FP-209 SURFACE WATER AND SEDIMENT SAMPLING STATION
- FP-210 SURFACE WATER FLOW MEASUREMENT STATION

NOTES:
 LOCATIONS FP-263A, FP-383A, FP-287,
 FP-397, FP-21B AND FP-31B WERE SAMPLED
 DURING THE SECOND ROUND ONLY.
 TOPOGRAPHY PRODUCED FROM AERIAL
 PHOTOGRAPHY JANUARY 24, 1989.
 CONTOUR INTERVAL = 2 Ft.



**Westinghouse Environmental
 and Geotechnical Services, Inc.**
 RICHMOND, VIRGINIA

PROJECT:
**FIRST PIEDMONT ROCK QUARRY
 ROUTE 719 SITE
 DANVILLE, VA.**

TITLE:
**MONITORING/SAMPLING LOCATIONS
 AND STUDY AREA TOPOGRAPHY**

JOB NO.
 1079-89-103

DRAWN BY:

SCALE:

DATE:

FIGURE NO.

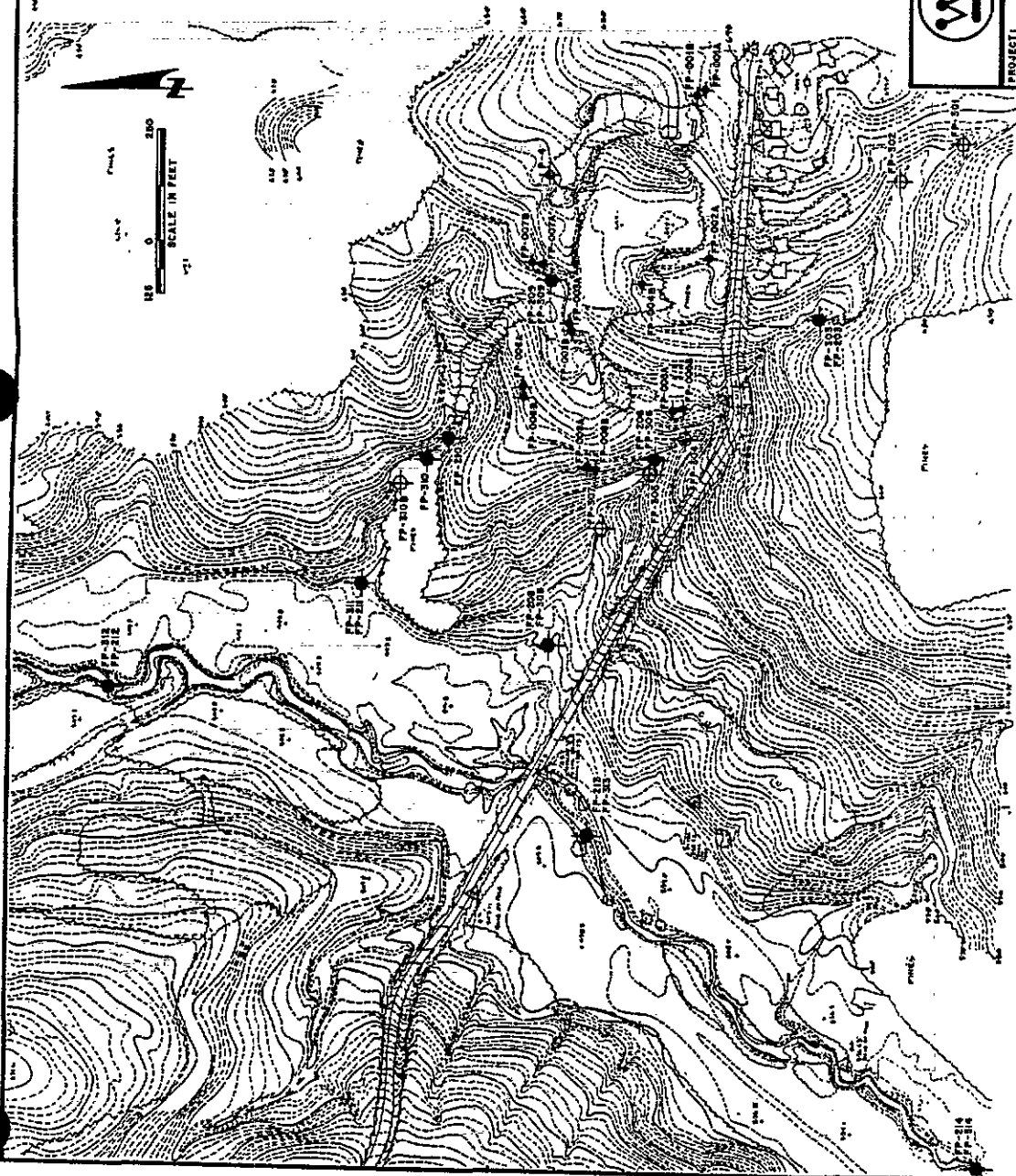
1079-89-103

1079-89-103

1079-89-103

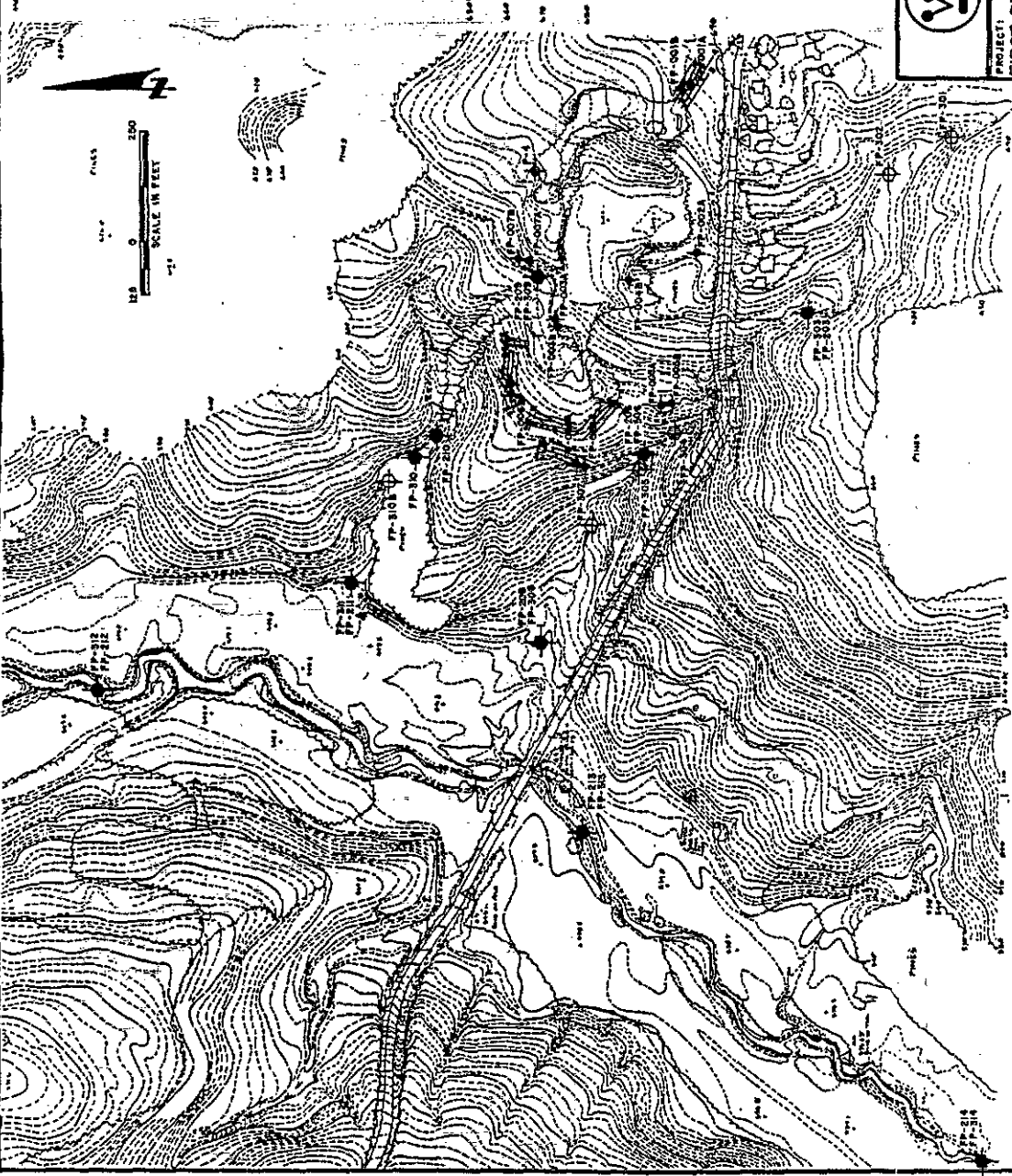
1079-89-103

5



A. E. SUPPLY CO., INC.

AA301312



EXPLANATION

- PEZOMETER
- MONITOR WELL: A - SHALLOW WELL
B - DEEP WELL
- SURFACE WATER AND SEDIMENT SAMPLING STATION
- SURFACE WATER FLOW MEASUREMENT STATION
- VLF SURVEY LINE (LINE DESIGNATION);
SEE APPENDICES A AND B.

NOTES:
 LOCATIONS FP-283A, FP-383A, FP-287,
 FP-387, FP-218 AND FP-318 WERE SAMPLED
 DURING THE SECOND ROUND ONLY.
 TOPOGRAPHY PRODUCED FROM AERIAL
 PHOTOGRAPHY JANUARY 24, 1989.
 CONTOUR INTERVAL = 2 Ft.



**Westinghouse Environmental
 and Geotechnical Services, Inc.**
 RICHMOND, VIRGINIA

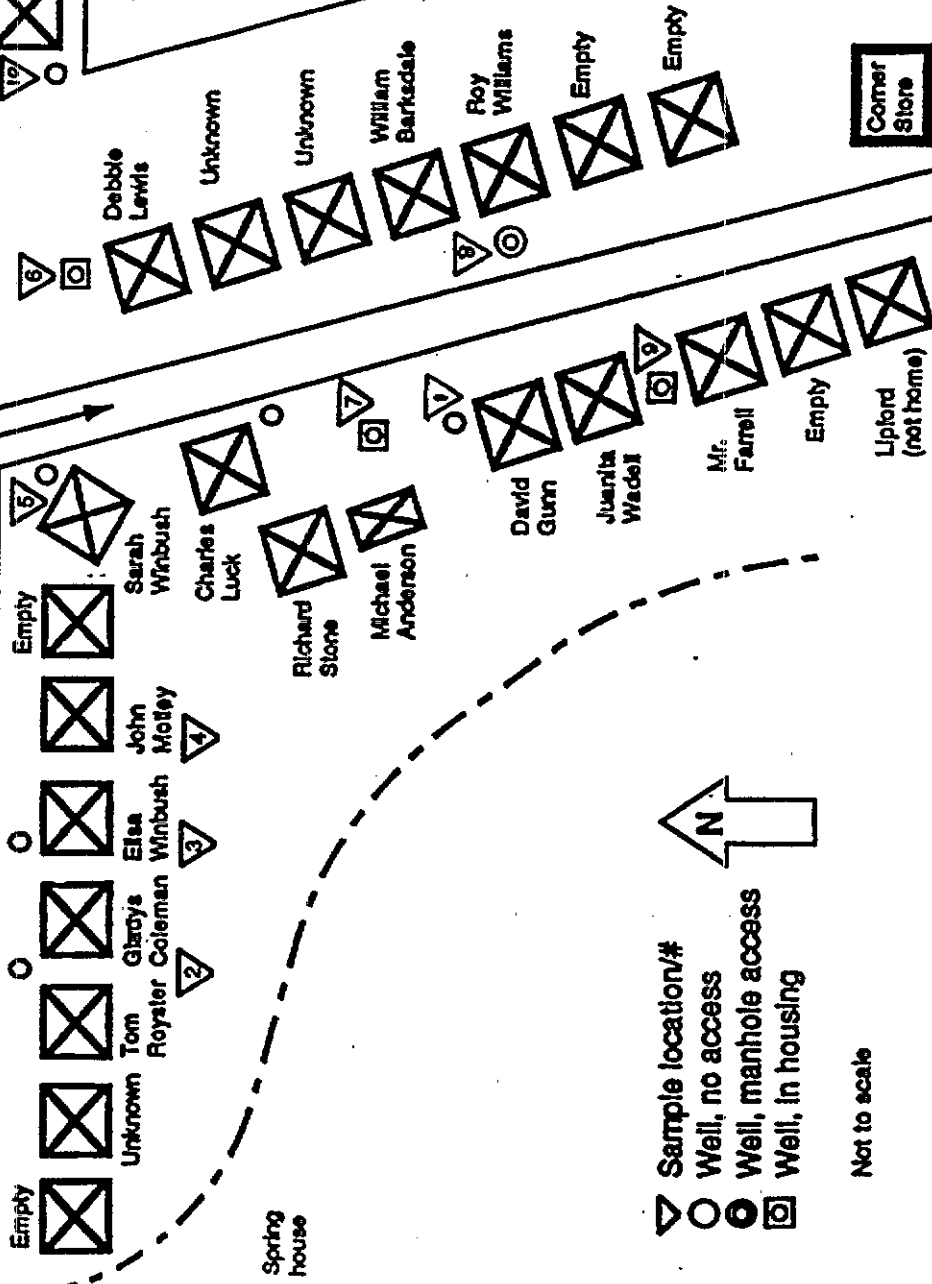
PROJECT: FIRST PIEDMONT ROCK QUARRY ROUTE 719 SITE DANVILLE, VA.		TITLE: EM SURVEY AREAS	
JOB NO. 1079-89-103	DRAWN BY: [Signature]	CHECKED BY: [Signature]	SCALE: 1" = 200'
FIGURE NO. 6		FIGURE NO. 6	

A & E SUPPLY CO., INC.

AR301313

Quarry

Route 719



Route 360

PRIVATE WELL SAMPLING LOCATION MAP

- △ Sample location/#
- Well, no access
- Well, manhole access
- Well, in housing

Not to scale

AR301314

PROJECT

FIRST PIEDMONT ROCK QUARRY
ROUTE 719 SITE
DANVILLE, VA.



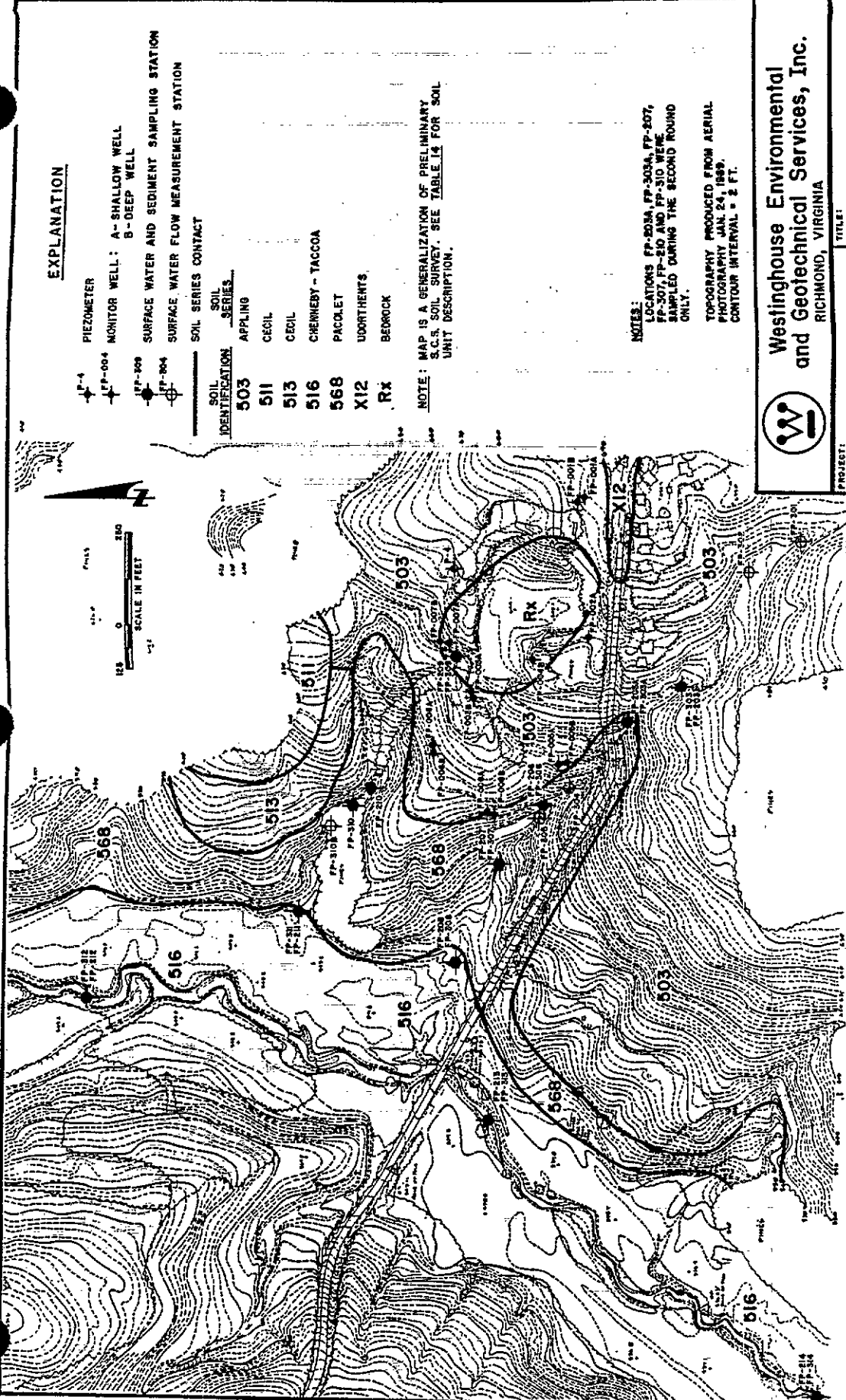
Westinghouse

SCALE: N. T. S.

JOB NO: 4112-88-904D

FIG NO: 7

SME-5



EXPLANATION

- PIEZOMETER
- MONITOR WELL: A- SHALLOW WELL
B- DEEP WELL
- SURFACE WATER AND SEDIMENT SAMPLING STATION
- SURFACE WATER FLOW MEASUREMENT STATION
- SOIL SERIES CONTACT

SOIL IDENTIFICATION	SERIES
503	APPLING
511	CECIL
513	CECIL
516	CHEMNEY - TACCOA
568	PACOLET
X12	UDORTMENTS
Rx	BEDROCK

NOTE: MAP IS A GENERALIZATION OF PRELIMINARY S.C.S. SOIL SURVEY. SEE TABLE 14 FOR SOIL UNIT DESCRIPTION.

NOTES:
 LOCATIONS FP-001A, FP-003A, FP-007, FP-007, FP-008 AND FP-010 WERE SAMPLED DURING THE SECOND ROUND ONLY.
 TOPOGRAPHY PRODUCED FROM AERIAL PHOTOGRAPHY JAN. 24, 1989.
 CONTOUR INTERVAL = 2 FT.

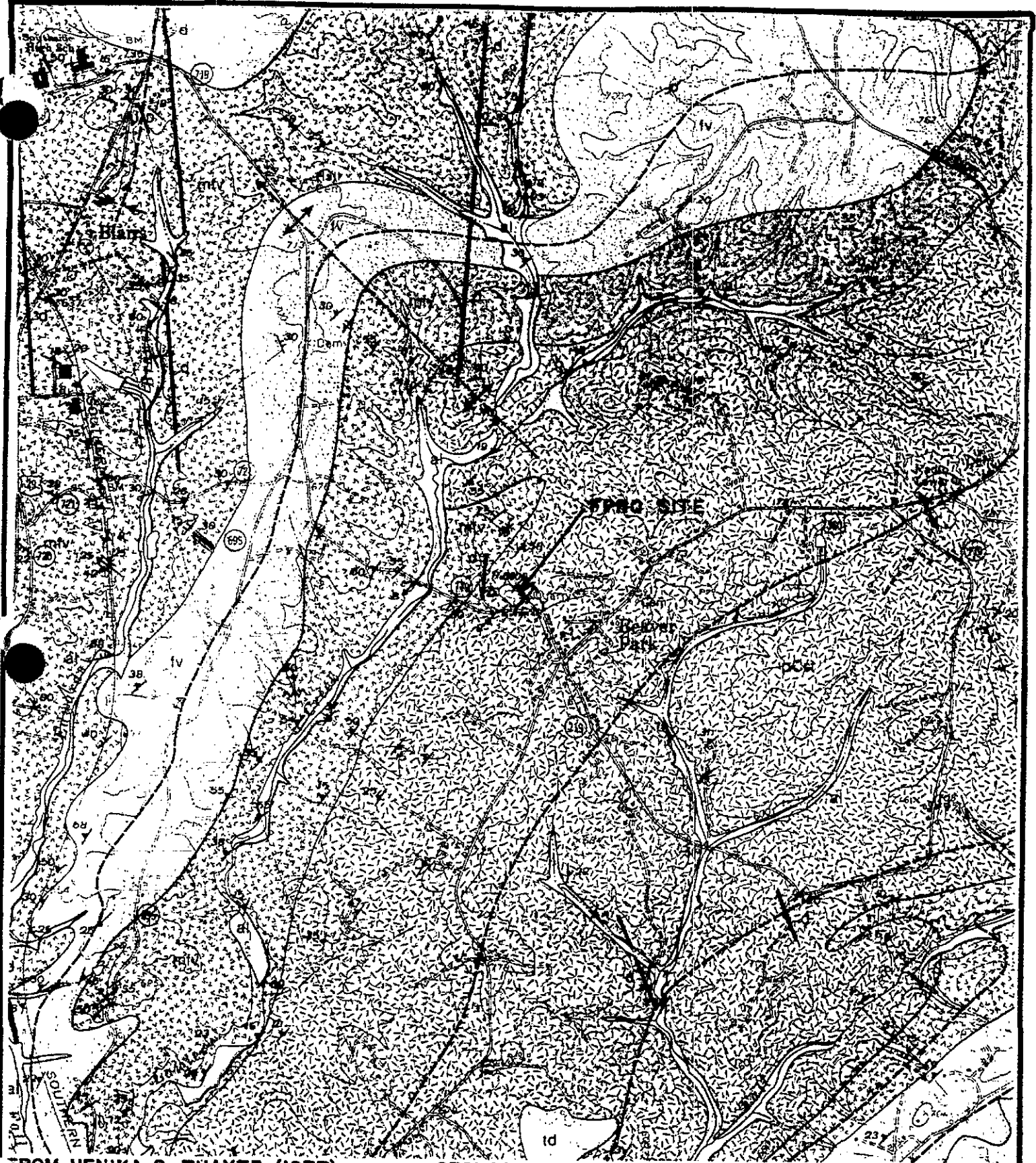


Westinghouse Environmental and Geotechnical Services, Inc.
 RICHMOND, VIRGINIA

PROJECT: FIRST PIEDMONT ROCK QUARRY ROUTE 719 SITE DANVILLE, VA.		TITLE: GENERAL SOILS MAP	
JOB NO. 1079-89-103	DRAWN BY: K.L.F.	CHECKED BY: D.R.F.	SCALE: 1" = 250'
		DATE: 11/9/89	FIGURE NO. 8

AR301315

AR301315



FROM HENIKA & THAYER (1977)

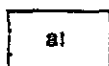
GEOLOGIC MAP

PROJECT
FIRST PIEDMONT ROCK
QUARRY
DANVILLE, VA.

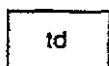


Westinghouse

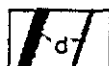
SCALE: 1" = 2000'
JOB NO: 4112-88-904A
FIG. NO: 9



Alluvium: *Silt, sand, and gravel with clay at base.*



Terrace deposits: *Rounded pebbles and cobbles in a clay or sandy clay matrix. Terraces at lower levels contain gray to yellowish-gray and red fine sandy clay.*

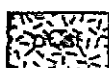


Diabase dikes: *Fine- to medium-grained, dark-gray to black diabase.*



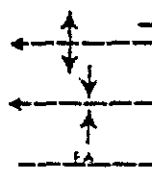
Metamorphosed volcanic-sedimentary rocks: *fv, massive to layered felsic metatuff; includes slaty, schistose, and gneissic lithofacies dependent on metamorphic grade; rare mafic flows (upper part). mgs, mica gneiss and schist.*

mfv, interlayered mafic and felsic metavolcanic rocks with psamittic and pelitic meta-sedimentary rocks. Includes slaty, schistose, and gneissic lithofacies dependent on metamorphic grade (lower part). gn, porphyroblastic biotite gneiss with kyanite-mica schist and sillimanite quartzite.



Shelton Formation: *Massive, lineated gneiss that ranges in composition from quartz monzonite to granite.*

STRUCTURE:



Antiform—trace and direction of plunge

Synform—trace and direction of plunge

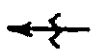
Refolded isocline—trace



STRIKE AND DIP OF MINOR STRIKE-SLIP FAULT. FAULT; U-UPTHROWN SIDE, D-DOWNTHROWN SIDE.



DIRECTION AND ANGLE OF PLUNGE OF MINOR ANTIFORMAL FOLD HINGE.



DIRECTION AND ANGLE OF PLUNGE OF HINGE LINE OF MINOR ASSYMETRIC FOLD SHOWING SHEAR.



STRIKE AND DIP OF SCHISTOSITY.



STRIKE AND DIP OF COMPOSITIONAL LAYERING.



DIRECTION AND ANGLE OF PLUNGE OF INCLINED RODDING.

QUATERNARY SYSTEM

TRIASSIC SYSTEM

PRECAMBRIAN SYSTEM

FROM HENIKA & THAYER (1977)

GEOLOGIC MAP EXPLANATION

PROJECT
FIRST PIEDMONT ROCK
QUARRY
DANVILLE, VA.



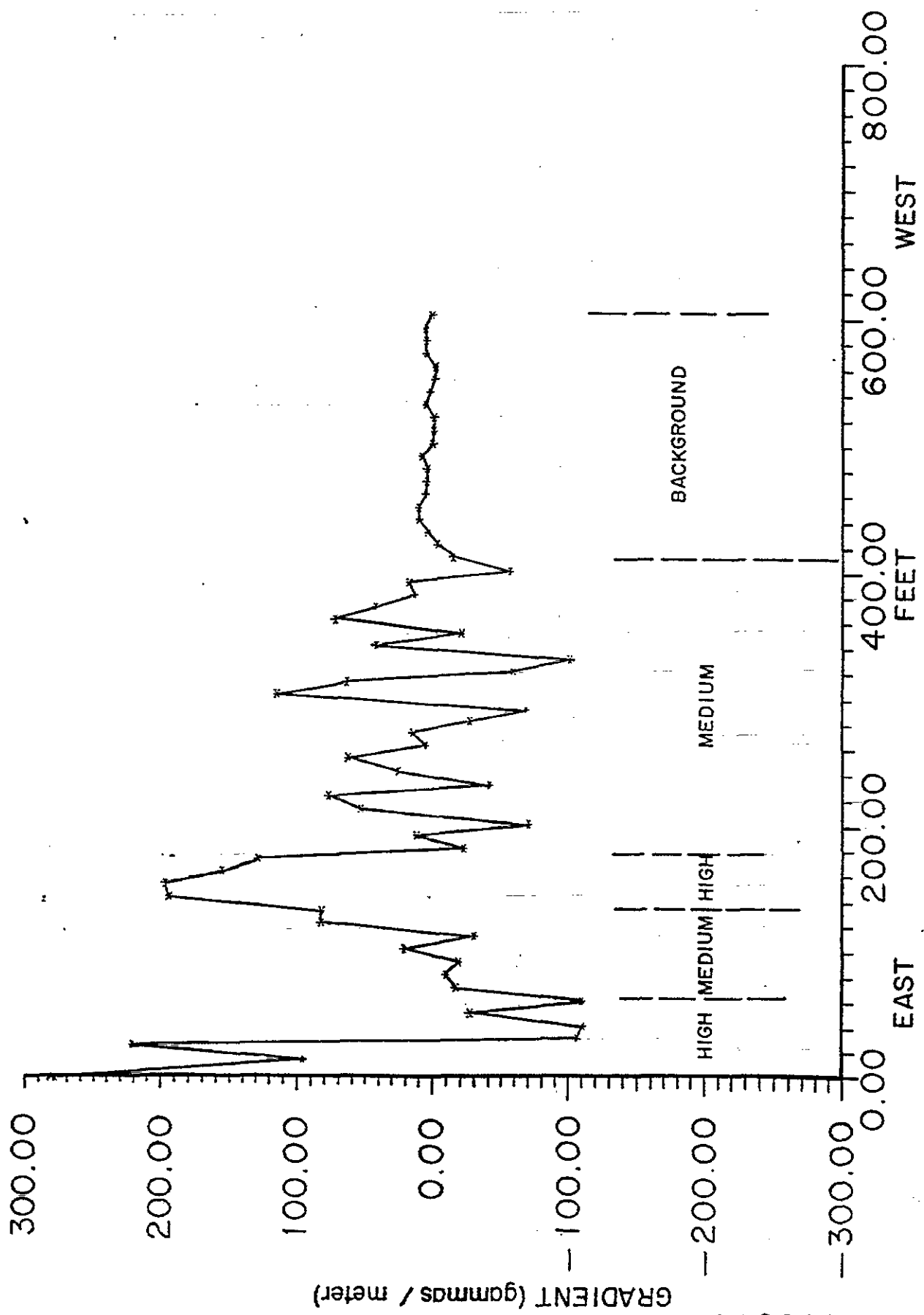
Westinghouse

AR3013-17

SCALE: N/A

JOB NO: 4112-88-904 A

FIG. NO: 9



AR301319

FIG. II MAGNETIC GRADIENT DATA ALONG PROFILE 0

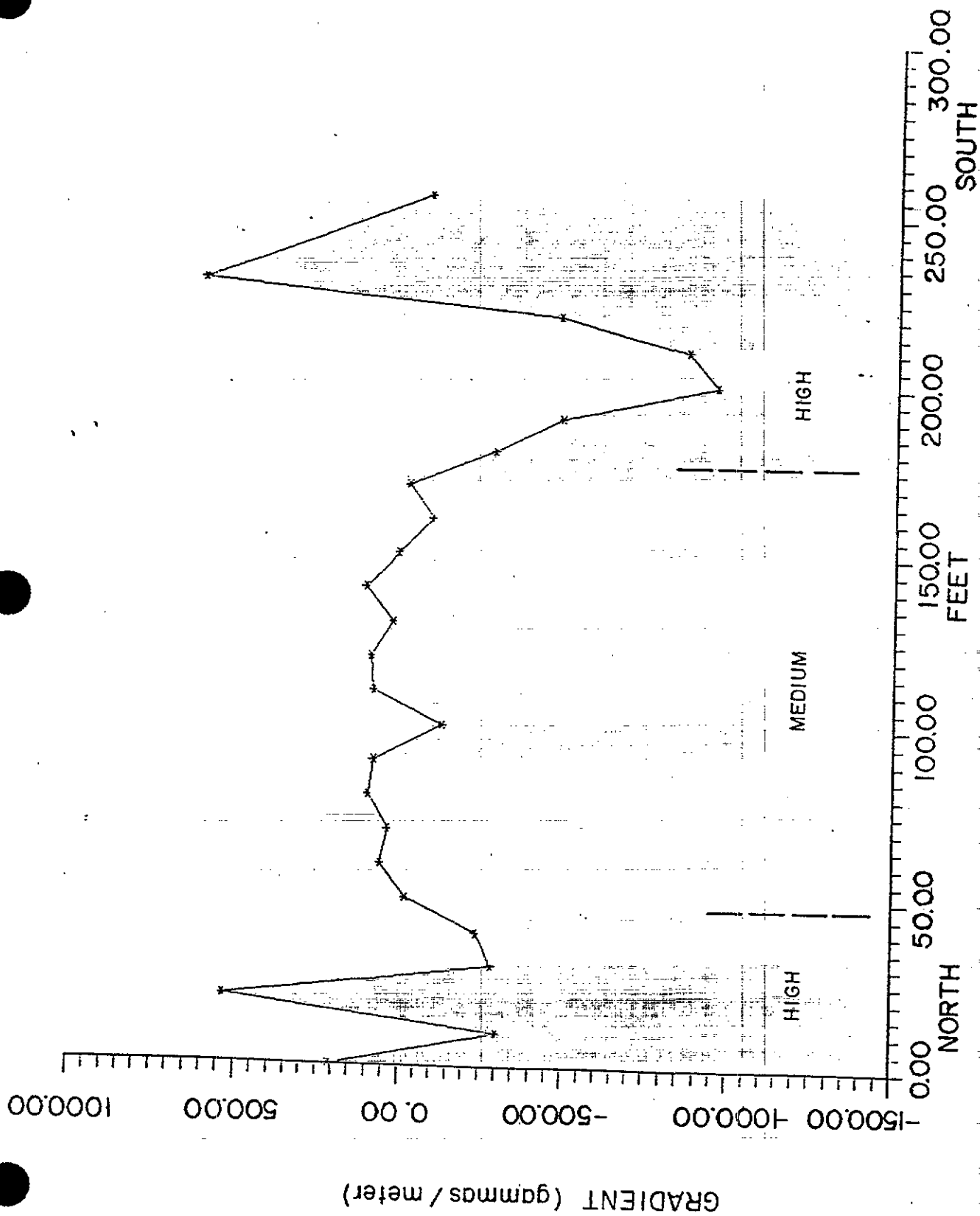


FIG. 12 MAGNETIC GRADIENT DATA ALONG PROFILE 130

AR301320

EXPLANATION

PIEZOMETER

MONITOR WELL: A - SHALLOW WELL
B - DEEP WELL

SOURCE AREA SAMPLING STATION

POTENTIOMETRIC ELEVATION:
(FT. ABOVE M.S.L.)

POTENTIOMETRIC CONTOUR
(FT. ABOVE M.S.L.) DASHED
WHERE INFERRED;
CONTOUR INTERVAL = 5 FT.

SUPPLEMENTAL CONTOUR

GROUNDWATER FLOW DIRECTION

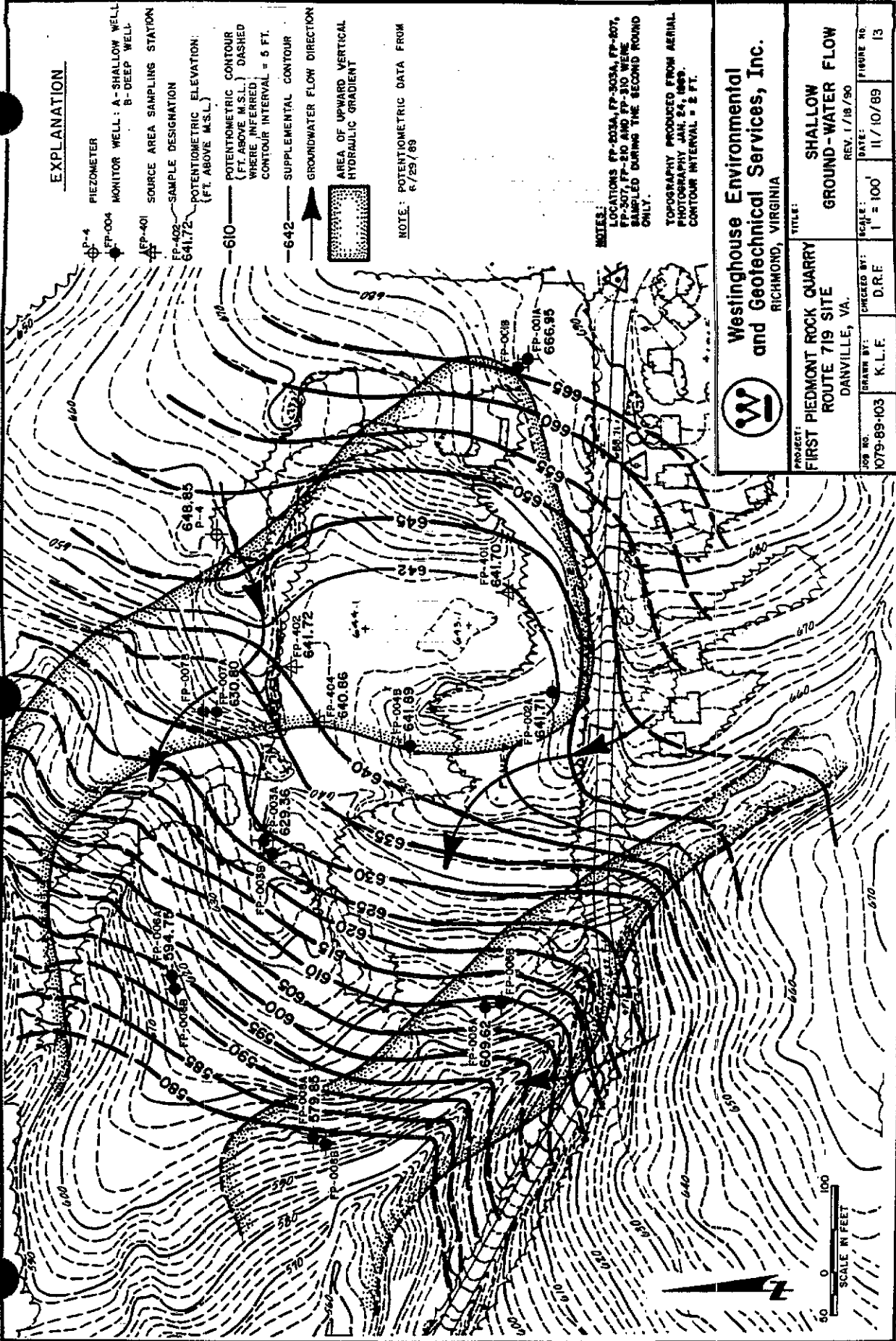


NOTE: POTENTIOMETRIC DATA FROM
6/29/89

NOTES:

LOCATIONS FP-003A, FP-003A, FP-007,
FP-007, FP-010 AND FP-010 WERE
SAMPLED DURING THE SECOND ROUND
ONLY.

TOPOGRAPHY PRODUCED FROM AERIAL
PHOTOGRAPHY JAN. 24, 1989.
CONTOUR INTERVAL = 2 FT.



**Westinghouse Environmental
and Geotechnical Services, Inc.**
RICHMOND, VIRGINIA

PROJECT:	FIRST PIEDMONT ROCK QUARRY ROUTE 719 SITE DANVILLE, VA.	TITLE:	SHALLOW GROUND-WATER FLOW
DRAWN BY:	K.L.F.	CHECKED BY:	D.R.E.
DATE:	11/10/89	SCALE:	1" = 100'
FIGURE NO.	13	REV. 1/18/90	

AR301321

AR301321

EXPLANATION

- PIEZOMETER
- MONITOR WELL: A - SHALLOW WELL
B - DEEP WELL
- SOURCE AREA SAMPLING STATION
- SAMPLE DESIGNATION
- POTENTIOMETRIC ELEVATION
(FT. ABOVE M.S.L.)
- POTENTIOMETRIC CONTOUR
(FT. ABOVE M.S.L.)
- DASHED WHERE INFERRED
- CONTOUR INTERVAL = 5 FT.
- GROUNDWATER FLOW DIRECTION

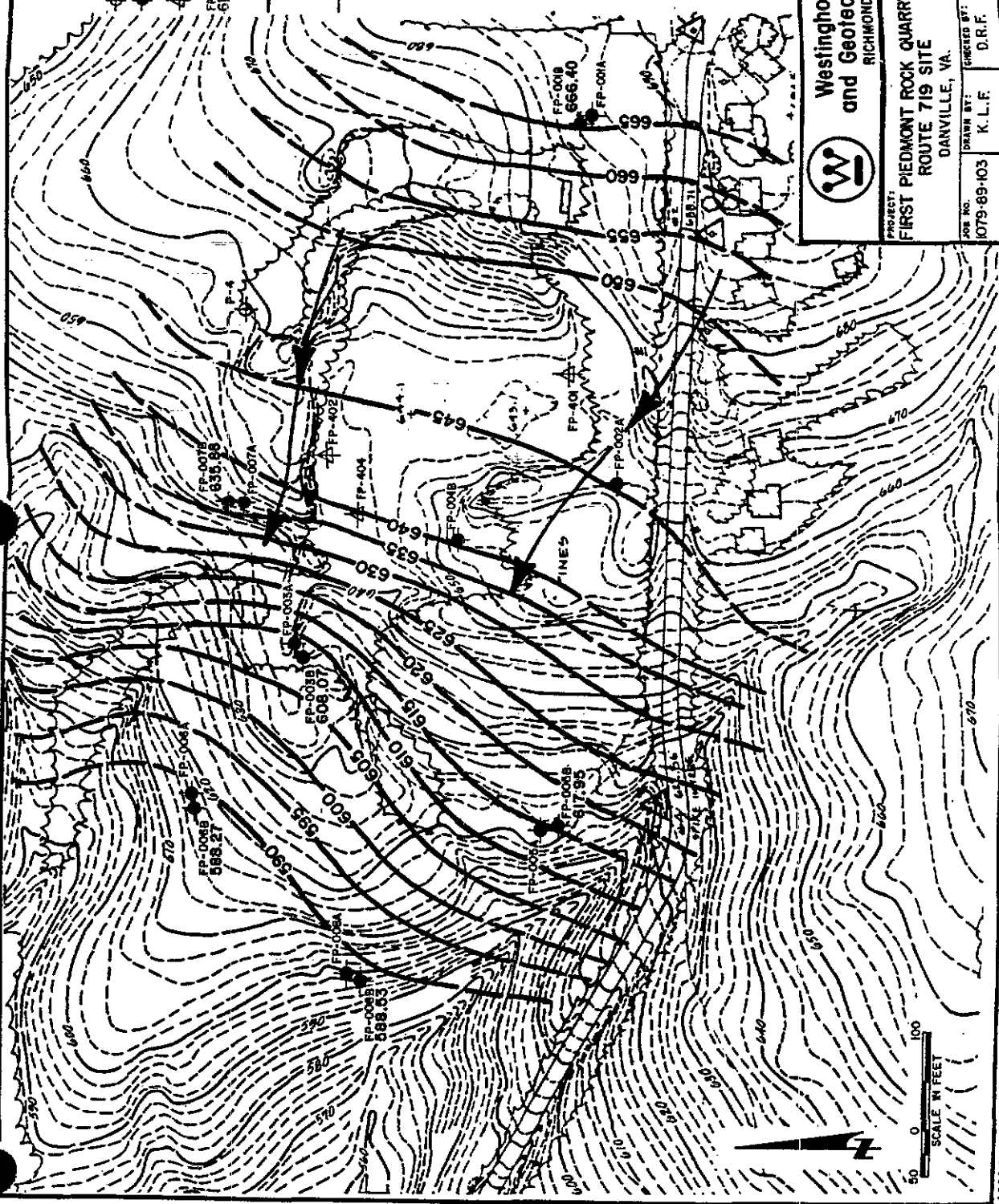
NOTE: POTENTIOMETRIC DATA FROM 6/29/89.

NOTES:
 LOCATIONS FP-001A, FP-002A, FP-007, FP-007, FP-210 AND FP-210 WERE SAMPLED DURING THE SECOND ROUND ONLY.
 TOPOGRAPHY PRODUCED FROM AERIAL PHOTOGRAPHY JAN. 24, 1989. CONTOUR INTERVAL = 5 FT.

Westinghouse Environmental and Geotechnical Services, Inc.
 RICHMOND, VIRGINIA

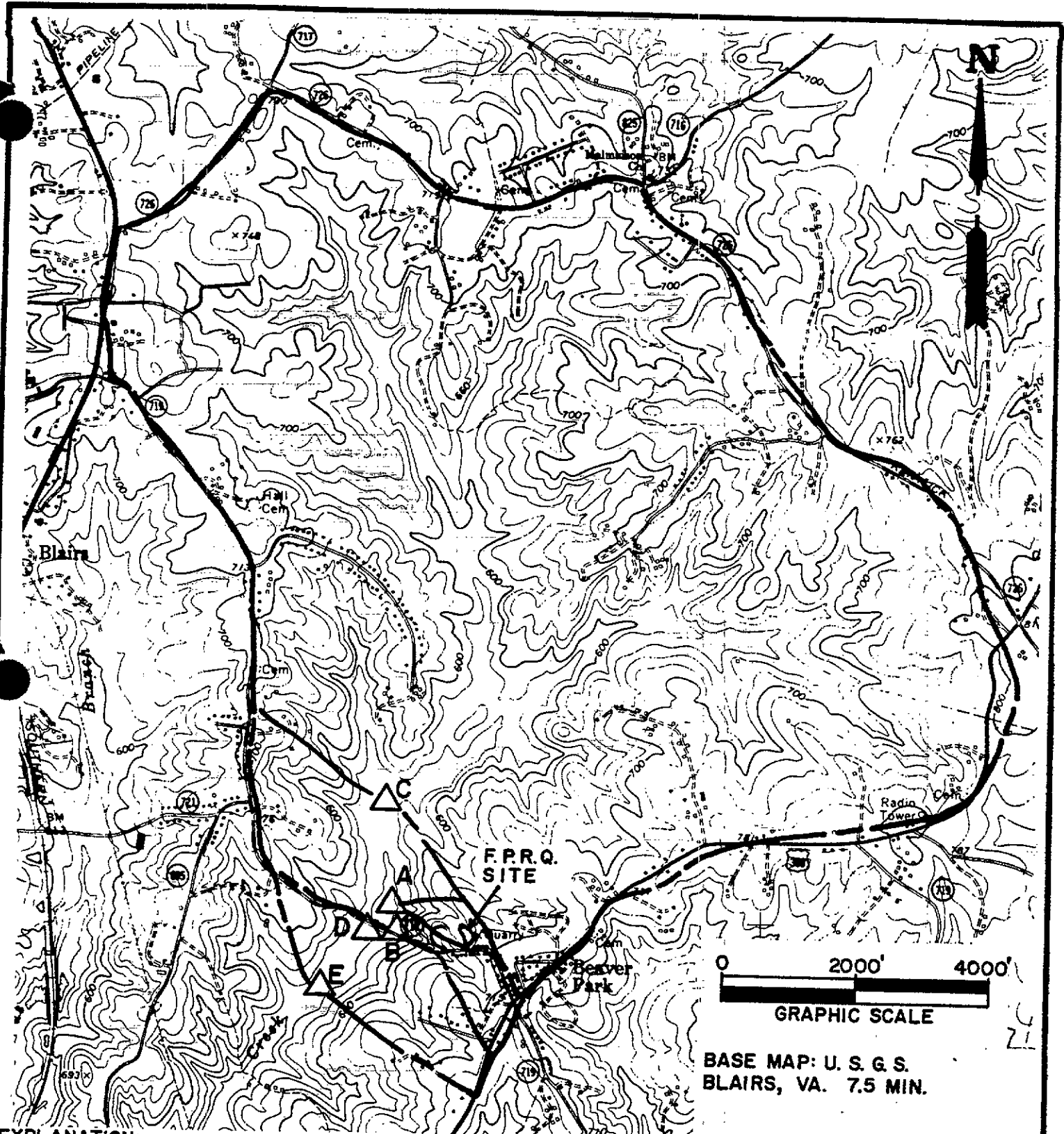
PROJECT:	FIRST PIEDMONT ROCK QUARRY ROUTE 719 SITE DANVILLE, VA.	TITLE:	DEEP GROUND-WATER FLOW
JOB NO.:	1079-89-103	SCALE:	1" = 100'
DRAWN BY:	K. L. F.	CHECKED BY:	D. R. F.
		DATE:	REV. 1/18/90
			11/13/89
			14

AR301322



A & E SUPPLY CO., INC.

AR301322



EXPLANATION:

- △ DRAINAGE BASIN DESIGNATION
- OUTLINE OF DRAINAGE BASIN
- A-NORTHERN
- B-SOUTHERN
- C-UPSTREAM LAWLESS CREEK
- D-LAWLESS CREEK AT 719 BRIDGE
- E-DOWNSTREAM LAWLESS CREEK

SURFACE WATER DRAINAGE BASINS

PROJECT
 FIRST PIEDMONT ROCK
 QUARRY
 DANVILLE, VA.

 **Westinghouse**
 AR301323

SCALE: 1" = 2000'
JOB NO: 4112-88-904 G
FIG. NO: 15

EXPLANATION

- FP-101 SOIL SAMPLING LOCATION
- FP-701 TEST PIT LOCATION
- FP-407 SOURCE AREA SAMPLING LOCATION
- SAMPLE DESIGNATION
- ARSENIC
- BARIIUM
- LEAD
- ZINC

NOTE: CONCENTRATIONS IN mg./kg.
 BLANK INDICATES CONSTITUENT
 NOT DETECTED ABOVE
 QUANTITATION LIMIT.

NOTES:

LOCATIONS FP-203A, FP-203B, FP-207,
 FP-307, FP-210 AND FP-310 WERE
 SAMPLED DURING THE SECOND ROUND
 ONLY.

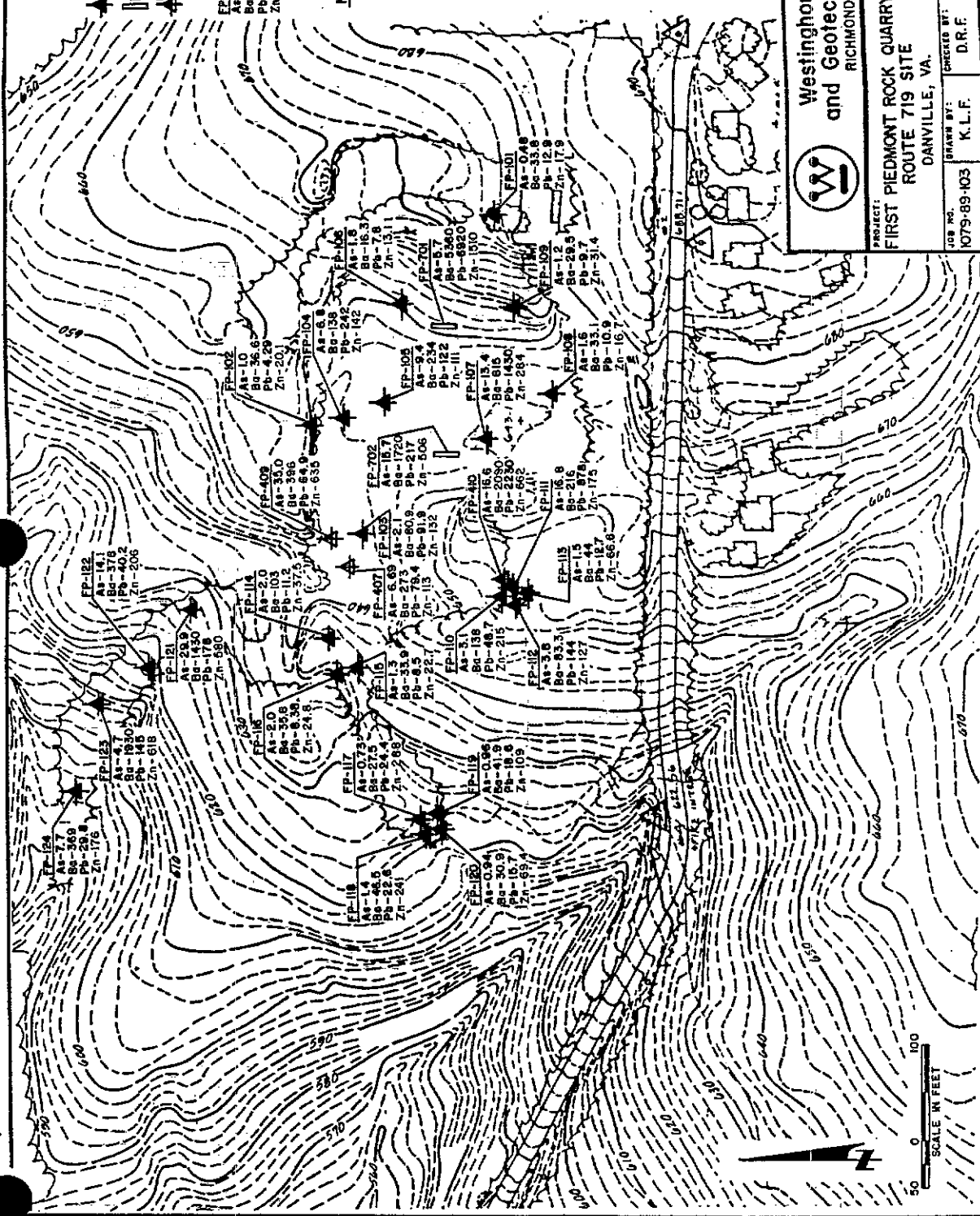
TOPOGRAPHY PRODUCED FROM AERIAL
 PHOTOGRAPHY JAN 24, 1968.
 CONTOUR INTERVAL = 2 FT.



**Westinghouse Environmental
 and Geotechnical Services, Inc.**
 RICHMOND, VIRGINIA

PROJECT:	FIRST PIEDMONT ROCK QUARRY ROUTE 719 SITE DANVILLE, VA.	TITLE:	SELECTED METAL CONCENTRATIONS IN SOIL
JOB NO.	1079-89-103	CHECKED BY:	K.L.F.
DATE:	11/6/89	FIGURE NO.	7 15
SCALE:	1" = 100'	D.R.F.	

AR301324



SCALE: 1" = 100'

SCALE: IN FEET

50 0 100

WESTINGHOUSE

EXPLANATION

- PIEZOMETER
- MONITOR WELL: A - SHALLOW WELL
B - DEEP WELL
- SURFACE WATER AND SEDIMENT SAMPLING STATION
- SURFACE WATER FLOW MEASUREMENT STATION

- SAMPLE DESIGNATION
- FP-212 - ARSENIC
 - AS-051
 - BS-14.6 - BARIUM
 - PS-415
 - Zn-9.5 - LEAD
 - ZINC

NOTE: CONCENTRATIONS IN mg./kg.
BLANK INDICATES CONSTITUENT NOT
DETECTED ABOVE QUANTITATION LIMIT

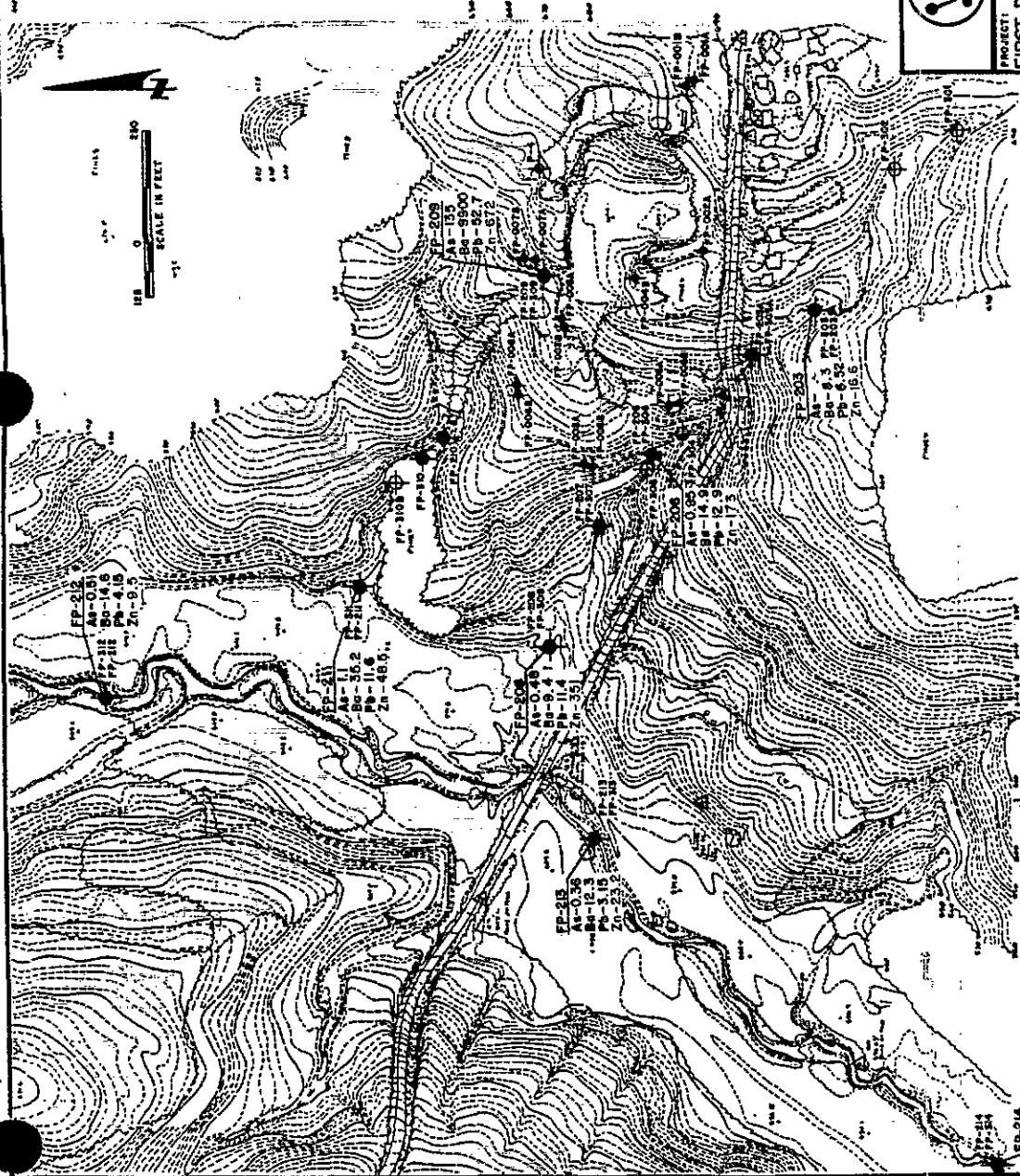
NOTES:
LOCATIONS FP-303A, FP-303A, FP-307,
FP-307, FP-145 AND FP-140 WERE
SAMPLED DURING THE SECOND ROUND
ONLY.

TOPOGRAPHY PRODUCED FROM AERIAL
PHOTOGRAPHY JAN 24, 1969
CONTOUR INTERVAL = 2 FT.



Westinghouse Environmental
and Geotechnical Services, Inc.
RICHMOND, VIRGINIA

PROJECT:	SELECTED
1079-89-103	METAL CONCENTRATIONS
CHANGED BY:	IN SEDIMENTS
D.R.F.	
SCALE:	DATE:
1" = 250'	11/6/89
FIGURE NO.:	17



AR301325

AR301325

EXPLANATION

- PIEZOMETER
- MONITOR WELL: A - SHALLOW WELL
B - DEEP WELL
- SURFACE WATER AND SEDIMENT SAMPLING STATION
- SURFACE WATER FLOW MEASUREMENT STATION
- SAMPLE DESIGNATION
- CONCENTRATION OF TOTAL DISSOLVED SOLIDS (TDS)
IN MG/L.

17P-4
 17P-004
 17P-809
 17P-804
 17P-004
 174

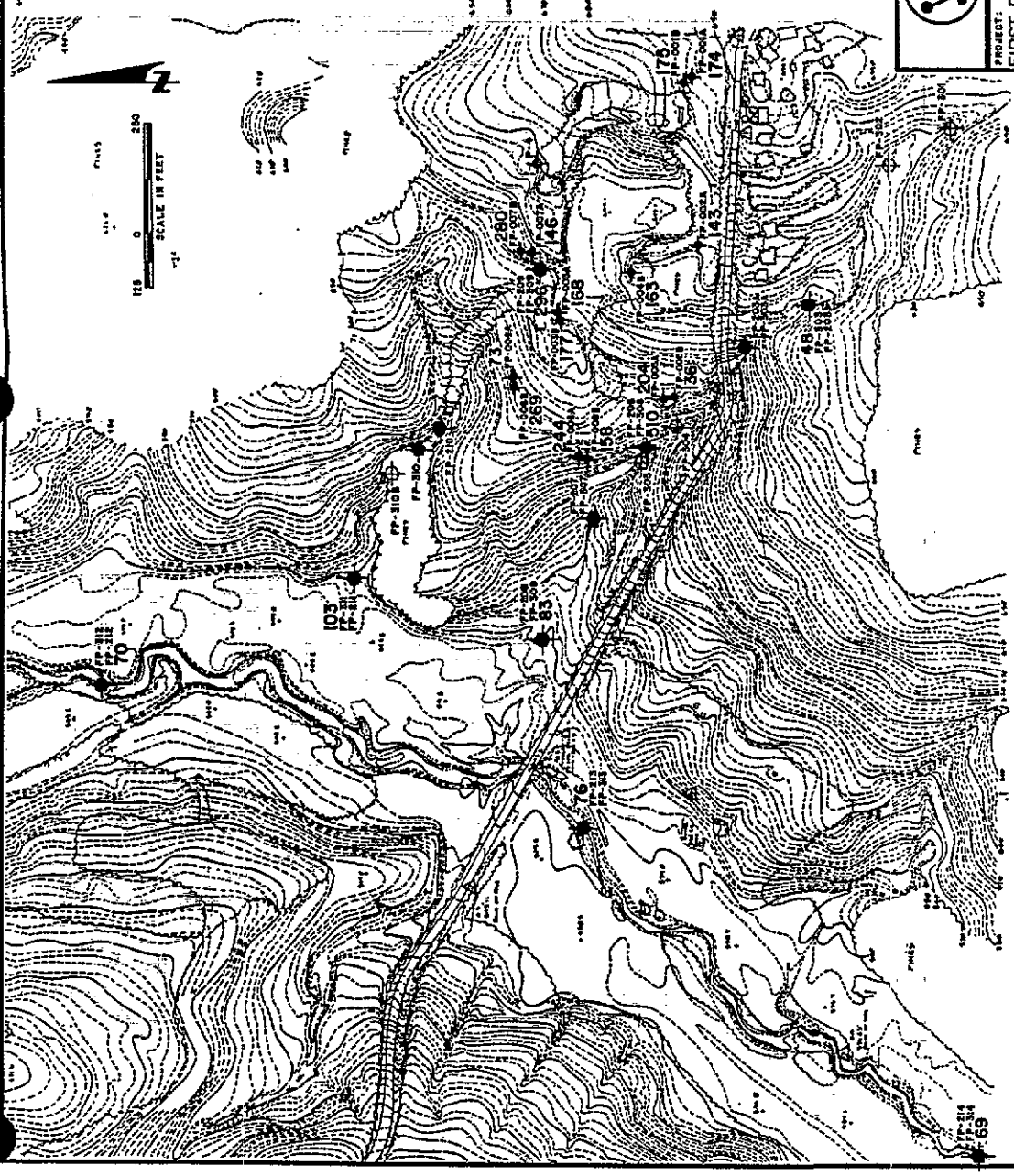
NOTES:
 LOCATIONS FP-303A, FP-303A, FP-307,
 FP-307, FP-310 AND FP-310 WERE
 SAMPLED DURING THE SECOND ROUND
 ONLY.
 TOPOGRAPHY PRODUCED FROM AERIAL
 PHOTOGRAPHY JAN 24, 1989.
 CONTOUR INTERVAL = 5 FT.



**Westinghouse Environmental
 and Geotechnical Services, Inc.**
 RICHMOND, VIRGINIA

PROJECT:		TITLE:	
FIRST PIEDMONT ROCK QUARRY ROUTE 719 SITE DANVILLE, VA.		T.D.S. CONCENTRATIONS IN GROUND WATER AND SURFACE WATER	
JOB NO. 1079-89-103	DRAWN BY: K.L.E.	SCALE: 1" = 250'	DATE: 11/8/89
	CHECKER BY: D.R.F.		FIGURE NO. 18

AR301326



A & S PAPER CO., INC.

AR301326

EXPLANATION

- PIEZOMETER
- MONITOR WELL: A - SHALLOW WELL
B - DEEP WELL
- SURFACE WATER AND SEDIMENT SAMPLING STATION
- SURFACE WATER FLOW MEASUREMENT STATION

SAMPLE DESIGNATION

- ARSENIC
- BARIUM
- LEAD
- ZINC

NOTE: CONCENTRATIONS IN $\mu\text{g/L}$.
BLANK INDICATES CONSTITUENT NOT
DETECTED ABOVE QUANTITATION LIMIT.

NOTES:
LOCATIONS FP-003A, FP-003A, FP-007,
FP-010 AND FP-010 WERE
SAMPLED DURING THE SECOND ROUND
ONLY.

TOPOGRAPHY PRODUCED FROM AERIAL
PHOTOGRAPHY JAN 24, 1989.
CONTOUR INTERVAL = 2 FT.



**Westinghouse Environmental
and Geotechnical Services, Inc.**
RICHMOND, VIRGINIA

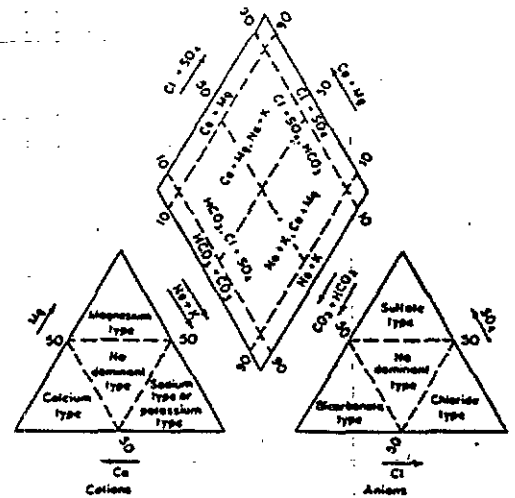
PROJECT: FIRST PIEDMONT ROCK QUARRY ROUTE 719 SITE DANVILLE, VA.		TITLE: TOTAL CONCENTRATIONS FOR SELECTED METALS IN GROUND WATER AND SURFACE WATER	
JOB NO. 1079-89-103	DRAWN BY: K.L.F.	CHECKED BY: D.R.F.	SCALE: 1" = 250'
		DATE: 4/27/89	PROJECT NO. 19

A & S SUPPLY CO., INC.

AR301327

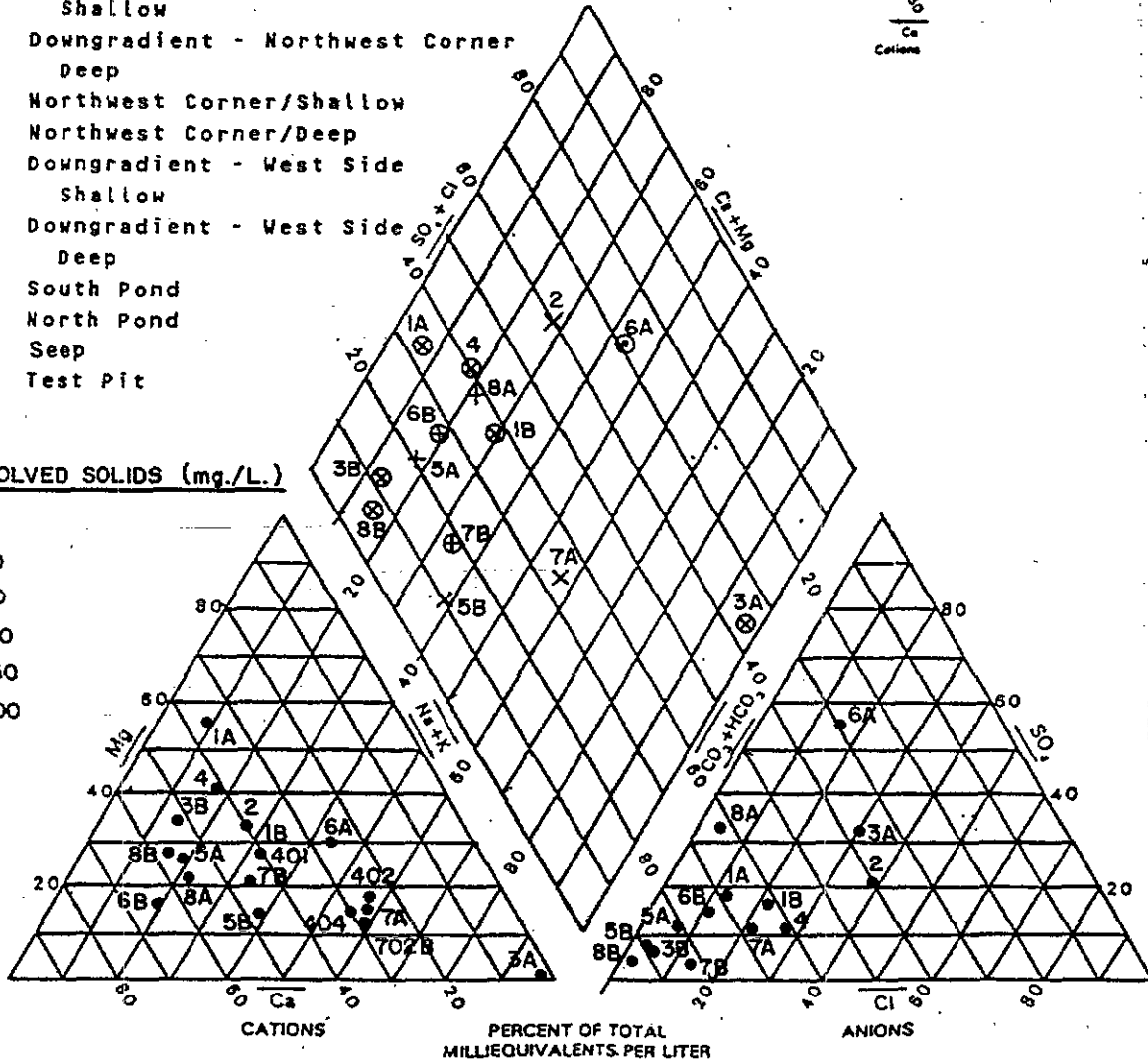
EXPLANATION

Monitor Well #	General Location/Completion
FP-001A	Upgradient/Shallow
FP-001B	Upgradient/Deep
FP-002	Southwest Corner/Shallow
FP-003A	Northwest Corner/Shallow
FP-003B	Northwest Corner/Deep
FP-004	West Side/Deep
FP-005A	Downgradient - Southwest Corner Shallow
FP-005B	Downgradient - Southwest Corner Deep
FP-006A	Downgradient - Northwest Corner Shallow
FP-006B	Downgradient - Northwest Corner Deep
FP-007A	Northwest Corner/Shallow
FP-007B	Northwest Corner/Deep
FP-008A	Downgradient - West Side Shallow
FP-008B	Downgradient - West Side Deep
FP-401	South Pond
FP-402	North Pond
FP-404	Seep
FP-702B	Test Pit



TOTAL DISSOLVED SOLIDS (mg./L.)

- 0-50
- ⊙ 50-100
- × 100-150
- ⊗ 150-200
- + 200-250
- ⊕ 250-300
- * >300



TRILINEAR DIAGRAM OF GROUND WATER AND SOURCE AREA WATER CHEMISTRY

A & E SURV INC. 150675

PROJECT
 FIRST PIEDMONT ROCK QUARRY
 DANVILLE, VA.



Westinghouse

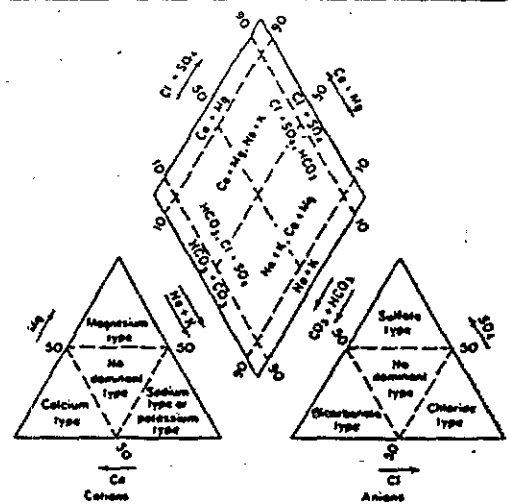
SCALE: AS SHOWN
 JOB NO: 1079-89-103
 FIG. NO: 20

EXPLANATION

Surface Water

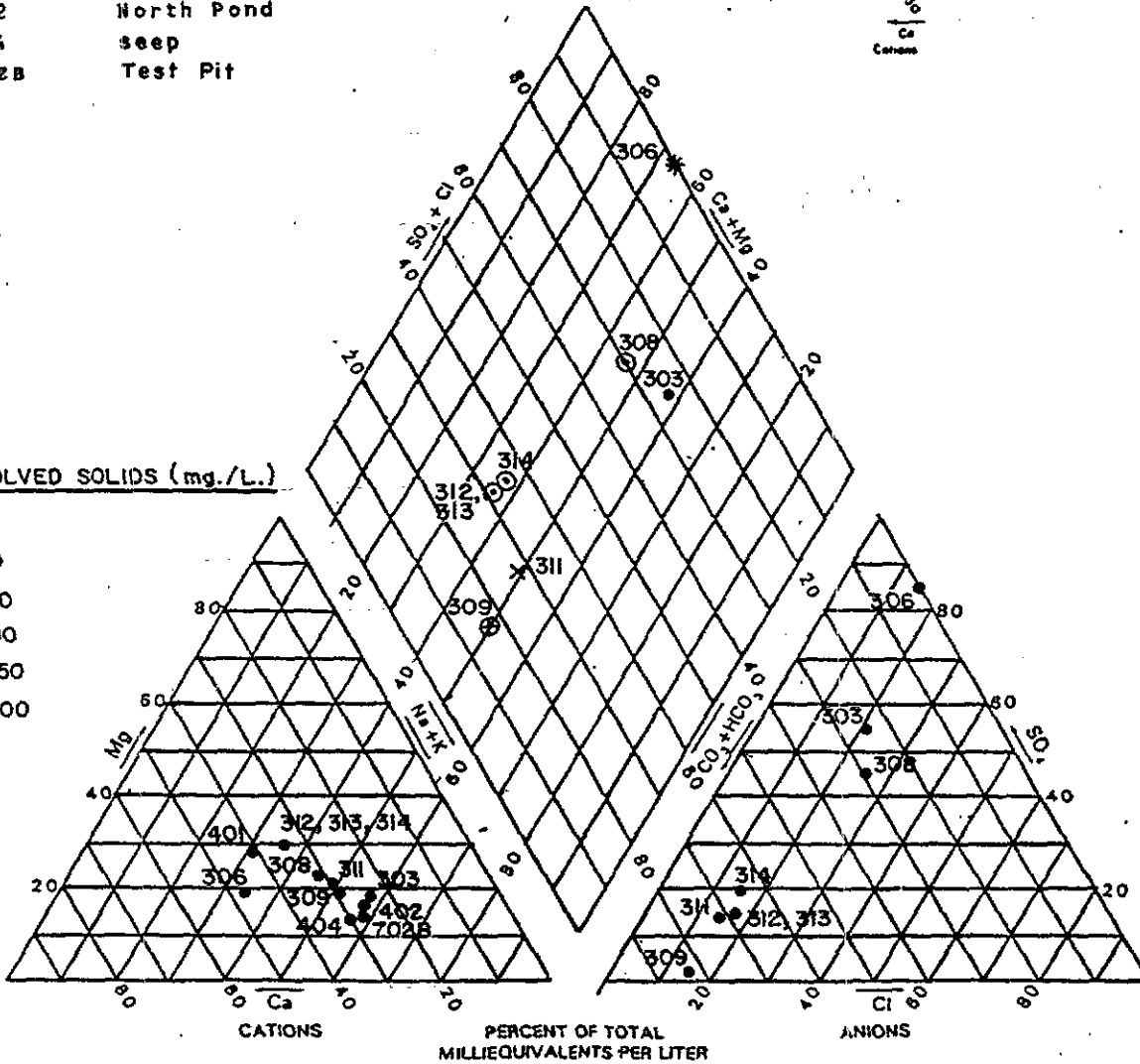
Station # General Location

- FP-303 Upstream-Southern Drainage
- FP-306 Upper Southern Drainage
- FP-308 Downstream Southern Drainage
- FP-309 Upper Northern Drainage
- FP-311 Lower Northern Drainage
- FP-312 Upstream Lawless Creek
- FP-313 Lawless Creek-South of Road
- FP-314 Downstream Lawless Creek
- FP-401 South Pond
- FP-402 North Pond
- FP-404 seep
- FP-702B Test Pit



TOTAL DISSOLVED SOLIDS (mg./L.)

- 0-50
- ⊙ 50-100
- × 100-150
- ⊗ 150-200
- + 200-250
- ⊕ 250-300
- * > 300



TRILINEAR DIAGRAM OF SURFACE WATER AND SOURCE AREA WATER CHEMISTRY

PROJECT
ST. PIEDMONT ROCK QUARRY
DANVILLE, VA.



Westinghouse

SCALE: AS SHOWN
JOB NO: 1079-89-103
FIG. NO: 21