

United States Department of the Interior

FISH AND WILDLIFE SERVICE Pennsylvania Field Office 315 South Allen Street, Suite 322 State College, Pennsylvania 16801-4850

August 12, 2003

Richard T. DeCesar, Ph.D. Malcolm Pirnie, Inc. 7500 Brooktree Drive, Suite 300 Wexford, PA 15090

Dear Mr. DeCesar:

This responds to your letter of July 30, 2003, requesting information about federally listed and proposed endangered and threatened species within the vicinity of the proposed project site located in Canton Township, Washington County, Pennsylvania. The following comments are provided pursuant to the Endangered Species Act of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*) to ensure the protection of endangered and threatened species.

Except for occasional transient species, no federally listed or proposed threatened or endangered species under our jurisdiction are known to occur within the project impact area. Therefore, no biological assessment nor further consultation under the Endangered Species Act are required with the Fish and Wildlife Service. This determination is valid for two years from the date of this letter. If the proposed project has not been fully implemented prior to this, an additional review by this office will be necessary. Also, should project plans change, or if additional information on listed or proposed species becomes available, this determination may be reconsidered. A compilation of certain federal status species in Pennsylvania is enclosed for your information.

This response relates only to endangered or threatened species under our jurisdiction based on an office review of the proposed project's location. No field inspection of the project area has been conducted by this office. Consequently, this letter is not to be construed as addressing potential Service concerns under the Fish and Wildlife Coordination Act or other authorities.

Requests for information regarding State-listed endangered or threatened species should be directed to the Pennsylvania Game Commission (birds and mammals), the Pennsylvania Fish and Boat Commission (fish, reptiles, amphibians and aquatic invertebrates), and the Pennsylvania Department of Conservation and Natural Resources (plants).

Please contact Michael Schmaus of my staff at 814-234-4090 if you have any questions or require further assistance.

Sincerely,

Tund

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David Densmore Supervisor

Enclosure

FEDERALLY LISTED, PROPOSED AND CANDIDATE SPECIES (in Pennsylvania)

Common Name	Scientific Name	<u>Status</u> ¹	Distribution (by County and/or Watershed)
FISHES			
Shortnose sturgeon ²	Acipenser brevirostrum	E	Delaware River & other Atlantic coastal waters
REPTILES			
Bog turtle	Clemmys muhlenbergii	т	Current - Adams, Berks, Bucks, Chester, Cumberland Delaware, Franklin, Lancaster, Lebanon, Lehigh, Monroe, Montgomery, Northampton, Schuylkill, York Historic - Crawford, Mercer, Philadelphia Co.
Eastern massasauga rattlesnake	Sistrurus catenatus catenatus	С	Current - Butler, Crawford, Mercer and Venango Co. Historic - Allegheny and Lawrence Co.
BIRDS			
Bald eagle	Haliaeetus leucocephalus	т	Suitable habitats across the state. Recent nesting in Butler, Cameron, Centre, Chester, Crawford, Dauphin Erie, Forest, Huntingdon, Lancaster, Lebanon, Merce Northumberland, Pike, Tioga, Venango, Warren, Wayne and York Co. Wintering concentrations occu near ice-free sections of rivers, lakes and reservoirs, including the Delaware River.
Piping plover	Charadrius melodus	E	Migratory. No nesting in Pennsylvania since 1950s. Designated critical habitat on Presque Isle, Erie Co.
MAMMALS			
Indiana bat	Myotis sodalis	E	Winter hibernacula: Armstrong, Blair, Lawrence, Luzerne, Mifflin and Somerset Co.
MOLLUSKS			
Dwarf wedgemussel	Alasmidonta heterodon	E	Current - Delaware River (Wayne Co.). Historic - Delaware River watershed (Bucks, Carbon, Chester and Philadelphia Co.); Susquehanna River watershed (Lancaster Co.)
Clubshell mussel	Pleurobema clava	E	French Creek and Allegheny River watersheds (Clarion, Crawford, Erie, Forest, Mercer, Venango an Warren Co.); Shenango River (Ohio River watershed; Mercer and Crawford Co.)
Northern riffleshell	Epioblasma torulosa rangiana	E	French Creek and Allegheny River watersheds (Clarion, Crawford, Erie, Forest, Mercer, Venango an Warren Co.)
PLANTS			
Northeastern bulrush	Scirpus ancistrochaetus	E	Current - Adams, Bedford, Blair, Carbon, Centre, Clinton, Cumberland, Dauphin, Franklin, Huntingdon Lackawanna, Lehigh, Lycoming, Mifflin, Monroe, Perry, Snyder and Union Co. Historic - Northamptor Co.
Small-whorled pogonia	lsotria medeoloides	т	Current - Centre, Chester and Venango Co. Historic Berks, Greene, Monroe, Montgomery and Philadelph Co.

ⁱ E = Endangered, T = Threatened, PE = Proposed Endangered, PT = Proposed Threatened, C = Candidate Revised 2/27/03
 ⁱ Shortnose sturgeon is under the jurisdiction of the National Marine Fisheries Service

U.S. FISH AND WILDLIFE SERVICE 315 SOUTH ALLEN ST., SUITE 322, STATE COLLEGE, PA 16801

FEDERALLY LISTED AND PROPOSED SPECIES THAT <u>NO LONGER OCCUR</u> IN PENNSYLVANIA

COMMON NAME	SCIENTIFIC NAME	STATUS**	FORMER DISTRIBUTION
MAMMALS			
Canada lynx	Lynx canadensis	РТ	north-central PA (Tioga Co.)
Delmarva Peninsula fox squirrel	Sciurus níger cinereus	E	mature forests of southeastern PA (Delaware and Chester Co.)
Eastern cougar	Felis concolor couguar	E	state-wide
Grey wolf	Canis lupus	Ε	state-wide
Mollusks			
Fanshell*	Cyprogenia stegaria	E	Ohio River drainage
Orange pimpleback*	Plethobasus striatus	E	Ohio River drainage
Pink mucket pearly mussel*	Lampsilis abrupta	E	Ohio River drainage
Ring pink mussel*	Obovaria retusa	E	Ohio River drainage
Rough pigtoe*	Pleurobema plenum	E	Ohio River drainage
INSECTS			
American burying beetle	Nicrophorus americanus	Ε	state-wide
Karner blue butterfly	Lycaeides melissa samuelis	E	pine barrens, oak savannas (wild lupine habitat) (Wayne Co.)
Northeastern beach tiger beetle	Cicindela dorsalis dorsalis	т	along large rivers in southeastern PA
PLANTS			
Eastern prairie fringed orchid	Platanthera leucophaea	т	wet prairies, bogs (Crawford Co.)
Sensitive joint-vetch	Aeschynomene virginica	т	freshwater tidal marshes of Delaware river (Delaware and Philadelphia Co.)
Virginia spiraea*	Spiraea virginiana	т	along Youghiogheny River (Fayette Co.)
Smooth coneflower	Echinacea laevigata	E	serpentine barrens (Lancaster Co.)

Revised 10/19/00

It is possible that remnant populations of some of these species (indicated with an *) may still occur in Pennsylvania, however, there have been no confirmed sightings of these species for over 70 years.

** E = Endangered, T = Threatened, PT = Proposed Threatened

The following is a <u>partial</u> list of additional species that no longer occur in Pennsylvania: moose, bison, wolverine, passenger pigeon, Bachman's sparrow, greater prairie-chicken, olive-sided flycatcher, Bewick's wren, eastern tiger salamander, blue pike, butterfly mussel, Diana fritillary butterfly, precious underwing moth, deertoe mussel, marbled underwing moth, cobblestone tiger beetle, mountain clubmoss, crested yellow orchid, red milkweed, American barberry, small white lady's-slipper, etc.

U.S. FISH AND WILDLIFE SERVICE 315 SOUTH ALLEN ST., SUITE 322, STATE COLLEGE, PA 16801

APPENDIX B

FIELD DATA SHEETS

.

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (FRONT)

		(FRO		Reference	Station
STREAM NAME TO	HIERSCREEK	LOCATION (CORP, FAC.	
STATION # 55-12 RI		STREAM CLA			atersned
LATLC	DNG	RIVER-DASIN	flaus		
STORET # 36	ררר	AGENCY			
INVESTIGATORS Ch	ristine Ph	illios			
FORM COMPLETED BY		DATE 10-19-	03 - AM @	REASON FOR SURVEY	
CGP	<u>-</u>			ECO. RISK	HSSESS.
WEATHER CONDITIONS	Now		Past 24 hours	Has there been a heavy rai	n in the last 7 days?
) D main ((heavy rain) (steady rain)		Air Temperature 17.3° C	
	□ showers 25%⊡ %cl	s (intermittent) loud cover car/sunny	0 0 <u>100</u> % 0	Other 3 1/2" Cain	10-15-03
SITE LOCATION/MAP	Draw a map of the si	te and indicate th	e areas sam	pled (or attach a photograp	h)
STREAM CHARACTERIZATION	Stream Subsystem	SS-12		Stream Type Coldwater D-Warmwat	
	Stream Origin Glacial Non-glacial montan Swamp and bog	C Spring-fed	l Corigins	Catchment Area	

Rapid Bioassessment Protocols For Use in Streams and Wadeable Rivers: Periphyton, Benthic Macroinvertebrates, and Fish, Second Edition - Form 1

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (BACK)

				<u>.</u>	haffield Ci	cek 55-14	_
WATERS FEATURI		G Fores	/Pasture Elindustri cultural DOther _	rcial	Local Watershed NPS ONO evidence O'Som Obvious sources Local Watershed Eros None O'Moderate	e potential sources	
RIPARIA VEGETA (18 meter	TION	Indicat Contrees domina	e the dominant type and Desh nt species present Uly	i record the d irubs MUS QN	Canopy Cover	erbaceous US ammourn p	sty 9 onum
INSTREA FEATURI		Estima Sampli Area in Estima	ted Stream Width 3.4 ng Reach Area 4 km² (m²x1000) ted Stream Depth 0.2 Velocity 0.6	<u>40</u> m ^{m²} km² <u>0_</u> m	(Partiy open) (Parti High Water Mark	ly shaded G Shaded m Represented by Stream IRun ह0_%	C'U Spitalun
LARGE V DEBRIS	VOODY	LWD Density	m ² of LWDm	²/km² (LWD/	reach area)	E	
AQUATIC VEGETA	TION	C Roote Float domina	ed emergent 👘 🖸 Ro	peted submerge tached Algae	· .	ng D Free floating	
WATER (QUALITY	Specifie Dissolv pH Turbid	rature <u>13, b</u> "C : Conductance <u>0, 50(</u> ed Oxygen <u>10.89</u> <u>7</u> 9 <u>28</u> 	bbw	Petroleum	ured) urbid O Turbid	
SEDIMEN SUBSTRA		Odors ONOrm Chen Other Oils	nical 🛛 Anaerobic	Hywpet.		Other	
INO		STRATE dd up to 1	COMPONENTS 100%)		ORGANIC SUBSTRATE C (does not necessarily add		
Substrate Type	Diamet	er	% Composition in Sampling Reach	Substrate Type	Characteristic	% Composition in Sampling Area	
Bedrock Boulder	> 256 mm (10")	L5	Detritus	sticks, wood, coarse plant materials (CPOM)	15%	
Cobble	64-256 mm (2.	5"-10")	105	Muck-Mud	black, very fine organic (FPOM)		

 Gravel
 2-64 mm (0.1"-2.5")
 20
 (FPOM)

 Sand
 0.06-2mm (gritty)
 10
 Mari
 grey, shell fragments

 Silt
 0.004-0.06 mm
 Clay
 <0.004 mm (slick)</td>
 PRINARY
 54B JBRATE

 # MUCH REFRACTORY BRICK
 FRIMARY
 54B JBRATE

A-6 Appendix A-1: Habitat Assessment and Physicochemical Characterization Field Data Sheets - Form 1 ALSO RIPRAP SUBSTRATE FROM BRIDGE CONSTRUCTION?

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (FRONT)

STREAM NAME har	tierscreek	LOCATION	molv	COID INC.		
	VERMILE	STREAM CLASS 277 59. mile watershed				
	NG	RIVER BASIN Flows to Ohio River				
STORET # 367		AGENCY				
INVESTIGATORSChr	istine Phil	lips				
FORM COMPLETED BY		DATE 10-19-0 TIME 12:45	3 _ Ø™	REASON FOR SURVEY ECO. RIJK AJSESSMERT		
WEATHER CONDITIONS	□ rain (□ showers 2.5%⊡ %cl	(heavy rain) steady rain) (intermittent) oud cover ar/sunny	hours D D	Has there been a heavy rain in the last 7 days? GYes \Box No Air Temperature 1.3°C Other $2''$ CALM 10~15-03		
SITE LOCATION/MAP	Draw a map of the sit	te and indicate th		pled (or attach a photograph)		
STREAM CHARACTERIZATION	VICW of Stream Subsystem OPerennial Inte Stream Origin Glacial Non-glacial montan Swamp and bog	<u>55-5</u> ermittent D Tida B Spring-fea D Mixture o D Other	1 forigins	AG COLIN 51 (COLM) Stream Type Coldwater Catchment Areakm ²		

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PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (BACK)

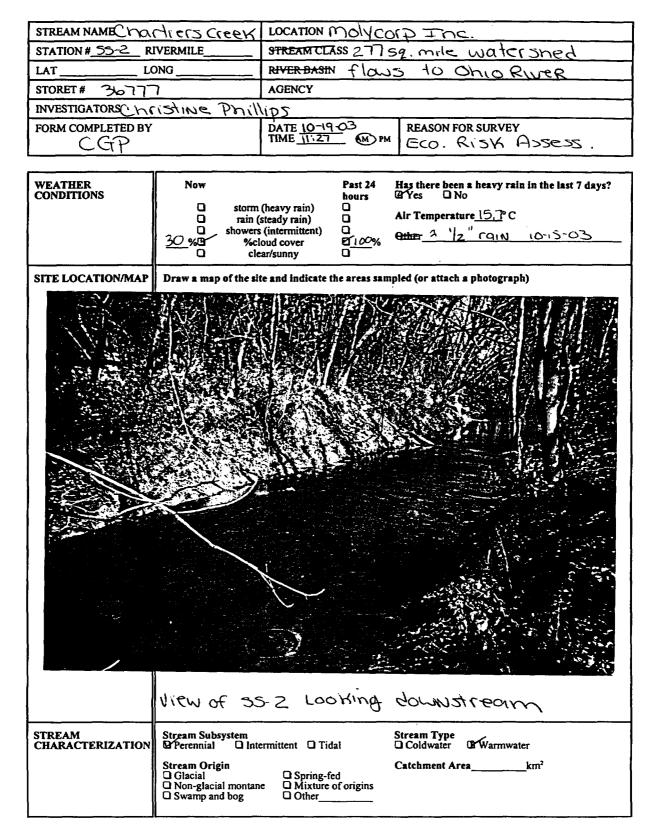
Substrate	Diamet	er % Composition in	Substrate	Characteristic	% Composition in]
INO		TRATE COMPONENTS dd up to 100%)	0	RGANIC SUBSTRATE C (does not necessarily add]
		Other Other Oils Oils Oils Oils Oils Oils Oils Oils		- Looking at stones whi	HOther <u>COAL</u> tAT th are not deeply lersides black in color?	
SEDIMENT/ SUBSTRATE		Odors O'Normal O Sewage	Petroleum	Deposits O Sludge O Sawdust	D Paper fiber, D Sand	
		WQ Instrument Used		Turbidity (if not meas Clear Clightly tu Opaque Stained	rbid ETurbid	
		pH <u>7.50</u> Turbidity <u>68</u>		Slick Sheen Sheen		
		Dissolved Oxygen 10.89	ppm	Water Surface Oils	-	
		Specific Conductance 0.5		D Petroleum 0	l Sewage Chemical Other	
WATER Q	UALITY	Temperature 12.5 "C		Wyter Odors	<u> </u>	1
		Portion of the reach with aqu		⊃_%		
AQUATIC VEGETA1	TION	Indicate the dominant type a Control emergent Floating Algae dominant species present	Rooted submergent Attached Algae	inant species present Rooted floatin	ng 🖸 Free floating	
LARGE W DEBRIS	/OODY	LWDm ² Density of LWD	.m²/km² (LWD/ rea	ich area) NON	<i>1</i> e	
		(at thalweg)		Dam Present Q Yes	0110]
		Surface Velocity 0,5		Channelized & Yes	C No	
		Area in km² (m²x1000) Estimated Stream Depth O.		Morphology Types O Riffle% O Pool%	HKun <u>100</u> %	
		Sampling Reach Area		Proportion of Reach F	Represented by Stream	
FEATURE	2	Estimated Stream Width 6		High Water Mark	•	
INSTREA		Estimated Reach Length 76		Capepy Cover		
VEGETAT (18 meter 1		dominant species present B				varygro
RIPARIA	N	Indicate the dominant type a	nd record the dom	None Moderate	Q Heavy	
FEATURI		Defield/Pasture Defindust Agricultural Office Residential	trial	Obvious sources	ion	
	HED	Predominant Surrounding L		Local Watershed NPS	e potential sources	

Substrate Type	Diameter	% Compos Sampling		Substrate Type	Characteristic	% Composition in Sampling Area
Bedrock				Detritus	sticks, wood, coarse plant materials (CPOM)	20%
Boulder	> 256 mm (10")				materials (CrOM)	2010
Cobble	64-256 mm (2.5"-10")	25	90	Muck-Mud	black, very fine organic	
Gravel	2-64 mm (0.1"-2.5")	20	90		(FPOM)	
Sand	0.06-2mm (gritty)	45	٩o	Marl	grey, shell fragments	
Silt	0.004-0.06 mm	40	٩̈́٥]	[
Clay	< 0.004 mm (slick)]		

A-6

Appendix A-1: Habitat Assessment and Physicochemical Characterization Field Data Sheets - Form 1

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (FRONT)



Rapid Bioassessment Protocols For Use in Streams and Wadeable Rivers: Periphyton, Benthic Macroinvertebrates, and Fish, Second Edition - Form 1

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (BACK)

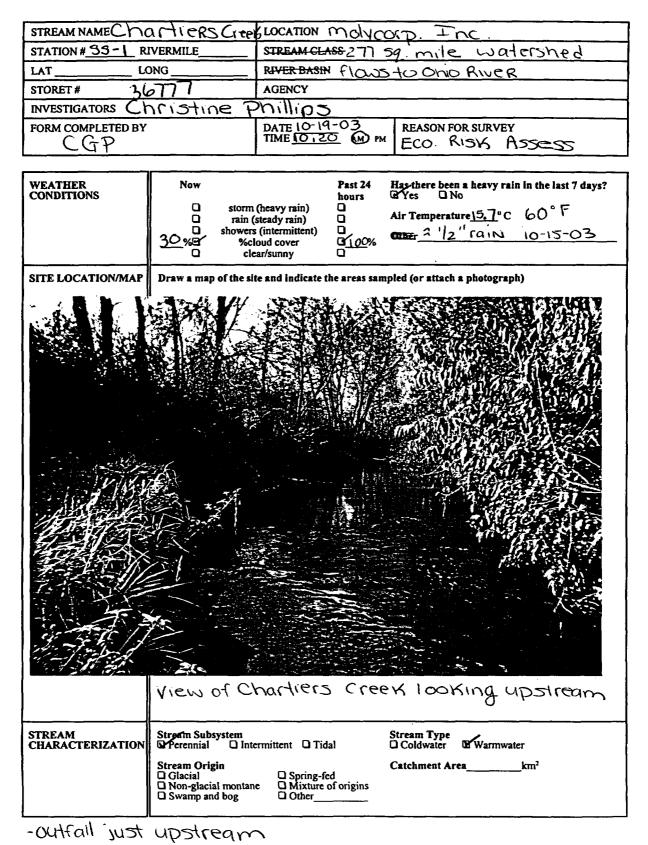
		Chartiers Creek 55.2
WATERSHED FEATURES	Predominant Surrounding Landuse Forest Commercial Field/Pasture Industrial Agricultural Other Residential	Local Watershed NPS Pollution Obvious Sources Local Watershed Erosion Obvious Obvious Heavy
RIPARIAN VEGETATION (18 meter buffer)	Indicate the dominant type and record t Urrees dominant species present BOX Elde	the dominant species present Brasses Brierbaceous er <u>Clearweed, Ash</u> unid Canopy Cover
INSTREAM FEATURES	Estimated Reach Length <u>60</u> m Estimated Stream Width <u>6.81</u> m Sampling Reach Area <u>4</u> m ² Area in km ² (m ² x1000) <u>km²</u> Estimated Stream Depth <u>0.28</u> m Surface Velocity <u>0.28</u> m/sec (at thalweg)	Canopy Cover Partly open Partly shaded Shaded Mus High Water Markm Proportion of Reach Represented by Stream Morphology Types Riffle % TRun 85_% Prool_15_% Channelized Pres Proo Dam Present Pres Proo
LARGE WOODY DEBRIS	LWDm² Density of LWDm²/km² (LV	WD/ reach area)
AQUATIC VEGETATION	Indicate the dominant type and record t Rooted emergent Rooted subr Floating Algae Attached Al dominant species present <u>N</u> Portion of the reach with aquatic vegeta	Igae I Concern I Rooted floating I Free floating
WATER QUALITY	Temperature 11.7 °C Specific Conductance 0.517 ms Dissolved Oxygen 10.52 ppm pH 7.39 Turbidity 22 WQ Instrument Used	G Fishy G Other Water Surface Oils Slick G Sheen G Globs G Flecks None O Other Turbidity (if not measured)
SEDIMENT/ SUBSTRATE	Odors Mormal Sewage Petrole Chemical Anaerobic None Other Oils Moderate P	Deposits
	BSTRATE COMPONENTS I add up to 100%)	ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)

	(should add up to	100%)	(does not necessarily add up to 100%)				
Substrate Type	Diameter	% Composition in Sampling Reach	Substrate Type	Characteristic	% Composition in Sampling Area		
Bedrock			Detritus	sticks, wood, coarse plant	25%		
Boulder	> 256 mm (10")			materials (CPOM)			
Cobble	64-256 mm (2.5"-10")	5°10	Muck-Mud	black, very fine organic			
Gravel	2-64 mm (0.1"-2.5")	50 °lo		(FPOM)			
Sand	0.06-2mm (gritty)	40 °10	Mari	grey, shell fragments			
Silt	0.004-0.06 mm	10 °10]				
Clay	< 0.004 mm (slick)		7				

A-6

Appendix A-1: Habitat Assessment and Physicochemical Characterization Field Data Sheets - Form 1

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (FRONT)



Rapid Bioassessment Protocols For Use in Streams and Wadeable Rivers: Periphyton, Benthic Macroinvertebrates, and Fish, Second Edition - Form 1

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (BACK)

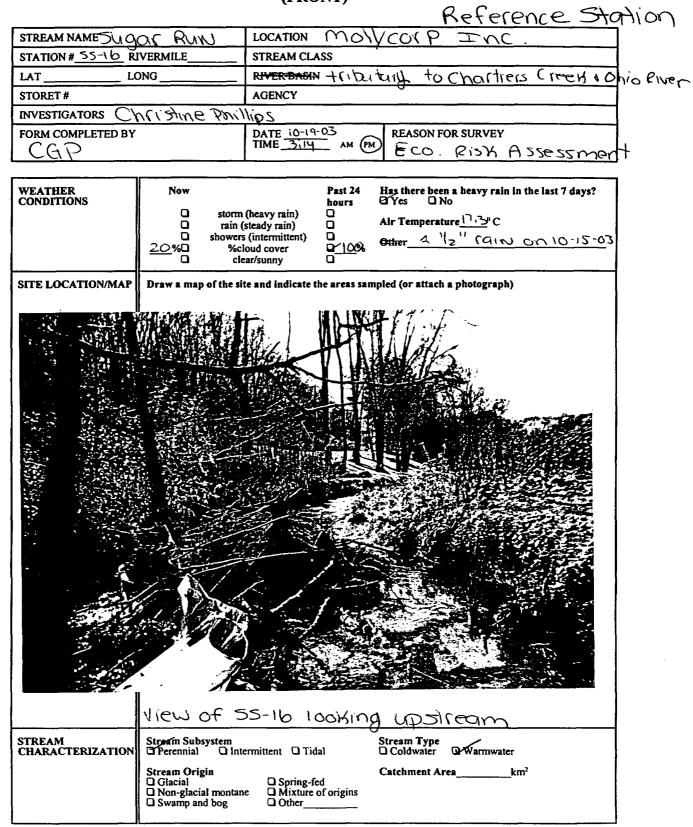
Y	Channiels Cleen JJ-1
Predominant Surrounding Landuse Groest Commercial Field/Pasture Industrial Agricultural Other Residential	Local Watershed NPS Pollution No evidence Some potential sources Obvious sources Local Watershed Erosion None PModerate Heavy
Indicate the dominant type and record the domi D Trees dominant species present BOX elder, b	ant species present IGrasses Prierbaceous Iackwillow, <u>clear</u> weed, unid-graz
Estimated Reach Length <u>61</u> m Estimated Stream Width <u>18 ftm</u> Sampling Reach Area <u>4</u> m ² Area in km ² (m ² x1000) <u>km²</u> Estimated Stream Depth <u>0.30</u> m Surface Velocity <u>0.51</u> m/sec (at thalweg)	Canopy Cover Partly open Partly shaded I Shaded High Water Mark <u>A</u> m Proportion of Reach Represented by Stream Morphology Types <u>55</u> Riffle % CRun <u>55</u> % Channelized IYes No? higto(ically Dam Present IYes QNo
LWDm ² Density of LWDm ² /km ² (LWD/ read	h area)
Control Rooted emergent Control Rooted submergent Control Floating Algae Control Rooted Algae dominant species present Control Rooted Algae	C Rooted floating C Free floating
Temperature <u>11.2</u> °C Specific Conductance <u>0.52</u> 0ms/cm Dissolved Oxygen <u>10 08</u> pp pH <u>6.98</u> Turbidity <u>14</u> WQ Instrument Used	Water Odors Ø Normal/None Sewage Petroleum Chemical I Fishy Other Water Surface Oils Slick Slick Sheen Globs I Slick Sheen Globs Turbidity (if not measured)
Oders	Deposits O Sludge O Sawdust O Paper fiber @ Sand
	□ Forest □ Field/Pasture □ Agricultural □ Agricultural □ Other □ Other □ Desity of LWD LWD □ LWD □ LO □ LU □ LO □ LO □ LU □ LO □ LO □ LU □ LO □ LO □ LU □ LO □ LO □ LO □ LO □ LO □ LO □ LU □ LO □ LU □ LO □ LO □ LU □ LO □ LU □ LO □ LO □ LO □ LU □

INO	INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)			ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)			
Substrate Type	Diameter	% Composition in Sampling Reach	Substrate Type	Characteristic	% Composition in Sampling Area		
Bedrock			Detritus	sticks, wood, coarse plant	30%		
Boulder	> 256 mm (10")			materials (CPOM)	5010		
Cobble	64-256 mm (2.5"-10")	5 °lo	Muck-Mud	black, very fine organic			
Gravel	2-64 mm (0.1"-2.5")	20 %]	(FPOM)			
Sand	0.06-2mm (gritty)	70 %	Marl	grey, shell fragments	······································		
Silt	0.004-0.06 mm	5 °10					
Clay	< 0.004 mm (slick)		1				

A-6

Appendix A-1: Habitat Assessment and Physicochemical Characterization Field Data Sheets - Form 1

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (FRONT)



Rapid Bioassessment Protocols For Use in Streams and Wadeable Rivers: Periphyton, Benthic Macroinvertebrates, and Fish, Second Edition - Form 1

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET

(BACK)

	(BACK)	Sugar Run 55	1-16
WATERSHED FEATURES	Predominant Surrounding Landuse Q'Forest Q Commercial Q Field/Pasture Q Industrial Q Agricultural Q Other Q Residential Q Residential	Local Watershed NPS Pollution Who evidence Some potential sources Obvious sources Local Watershed Erosion None WModerate Heavy	
RIPARIAN VEGETATION (18 meter buffer)	Indicate the dominant type and record the domi Arees D Shrubs dominant species present black cherry	American elm, blackras	perry,
INSTREAM FEATURES	Estimated Reach Length 7.62 m Estimated Stream Width 4.58 m Sampling Reach Area 4 m ² Area in km ² (m ² x1000) km ² Estimated Stream Depth 2.74 m Surface Velocity 0.14 m/sec (at thalweg)	Grasses Green Gree	uwid grase white snaven
LARGE WOODY DEBRIS	LWDm ² Density of LWDm ² /km ² (LWD/ read	charea) See priot O	
AQUATIC VEGETATION	Indicate the dominant type and record the domin Rooted emergent Floating Algae dominant species present Portion of the reach with aquatic vegetation	Rooted floating Free floating	
WATER QUALITY	Temperature 14, 7 "C Specific Conductance 0. 576 ms/cm Dissolved Oxygen 10 84 pH 7.62 Turbidity 71 WQ Instrument Used Horba Watch Guality Checker 4-10	Water Odors Sewage Normal/None Chemical Petroleum Chemical Fishy Other Water Surface Oils Other Slick Sheen Globs None Other Turbidity (if not measured) Order Clear Slightly turbid Order Opaque Stained Other	
SEDIMENT/ SUBSTRATE	Odors Odors ONOrmal Chemical Anaerobic Other Oilsr Oilsr Othesent	Deposits Sludge Sawdust Paper fiber Sand Relict shells Other Looking at stones which are not deeply embedded, are the undersides black in color? Yes No	
		GANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)]
Substrate Diama	ton 9/ Composition in Substanto	Characteristic % Composition in	1

Substrate Diameter % Composition in ubstrate Characteristic % Composition in Sampling Area Type Sampling Reach Туре sticks, wood, coarse plant materials (CPOM) Bedrock Detritus 35% Boulder > 256 mm (10") 55 °io Cobble 64-256 mm (2.5"-10") Muck-Mud black, very fine organic ∦ (FPOM) 20 2-64 mm (0.1"-2.5") 010 Gravel 20 00 Sand Marl 0.06-2mm (gritty) grey, shell fragments 5 010 Silt 0.004-0.06 mm Clay < 0.004 mm (slick)

A-6 Appendix A-1: Habitat Assessment and Physicochemical Characterization Field Data Sheets - Form 1 # much concrete patio debris dumped creek w/ snags of wood debris INTO

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (FRONT)

STREAM NAME SUGAR RUN	LOCATION MONC	OTD Inc
STATION # 55-13 RIVERMILE	STREAM CLASS	
LAT LONG	RIVER BASIN	
STORET #	AGENCY	
INVESTIGATORS Christine 1	Pnillips	
FORM COMPLETED BY CG P	DATE 10-19-03 TIME AM PM	REASON FOR SURVEY ECO. RISK ASSESS.

WEATHER CONDITIONS	Now storm (heavy rain) rain (steady rain) showers (intermittent) <u>25</u> % cloud cover clear/sunny	Past 24Has there been a heavy rain in the last 7 days?hours \Box Yes \Box No \Box Air Temperature 17.3° C \Box \Box Other $2^{\circ}/2^{\circ}$ C C \Box \Box Other $2^{\circ}/2^{\circ}$ C C
SITE LOCATION/MAP	Draw a map of the site and indicate	e the areas sampled (or attach a photograph)
		LOOKING UPSTREAM
STREAM CHARACTERIZATION	Stpeam Subsystem	Stream Type
	Stream Origin C Glacial C Spring Non-glacial montane Mixtur	Catchment Area km ²

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PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (BACK)

SL	905 Run 55-13		
WATERSHED FEATURES	Predominant Surrounding Land Offorest Commerci Offield/Pasture Industrial Agricultural Other Residential	se Local Watershed NPS Pollutio I De No evidence C Some potenti Obvious sources Local Watershed Erosion None De Moderate C He	al sources
RIPARIAN VEGETATION (18 meter buffer)		cord the dominant species present s OGrasses OHErbaceous	m, while snake roo
INSTREAM FEATURES	Estimated Reach Length <u>30.45</u> Estimated Stream Width <u>2.92</u> Sampling Reach Area <u>4</u> Area in km ² (m ² x1000) Estimated Stream Depth <u>0.15</u> Surface Velocity <u>0.38</u> m/se (at thalweg)	M C Partly open C Partly shaded M High Water Markm M ² Proportion of Reach Represent km ² Morphology Types CRiffle 5 % ORun 9 m C Pool%	ed by Stream 5_%
LARGE WOODY DEBRIS	LWDm² Density of LWDm²//	n² (LWD/ reach area)	one
AQUATIC VEGETATION	Rooted emergent D Rooted emergent	ned Algae KnowN	Free floating
WATER QUALITY	Temperature_14_"C Specific Conductance_0.570 Dissolved Oxygen_9.96 pH_7.78 Turbidity_42_ WQ Instrument Used	Water Odors Q-Normal/None Dewage D Petroleum D Chemici G-Fishy D Other Water Surface Oils Slick D Sheen D Globs Q-None D Other Turbidity (if not measured)	
SEDIMENT/ SUBSTRATE	Odors Otors Normal Sewage Chemical Anaerobic Other Oils Absent Slight Moderate	Deposits Petroleum Disludge Sawdust Pa None Relict shells Other Looking at stones which are no embedded, are the undersides i Profuse Yes PNo	per fiber 🖸 Sand t deeply plack in color?
	BSTRATE COMPONENTS add up to 100%)	ORGANIC SUBSTRATE COMPON (does not necessarily add up to 10	

(should add up to 100%)		(does not necessarily add up to 100%)			
Substrate Type	Diameter	% Composition in Sampling Reach	Substrate Type	Characteristic	% Composition in Sampling Area
Bedrock			Detritus	sticks, wood, coarse plant materials (CPOM)	15
Boulder	> 256 mm (10")			matchais (CrOM)	2)
Cobble	64-256 mm (2.5"-10")	70	Muck-Mud	black, very fine organic	
Gravel	2-64 mm (0.1"-2.5")	30 °10]	(FPOM)	
Sand	0.06-2mm (gritty)	5 °lo	Marl	grey, shell fragments	
Silt	0.004-0.06 mm	5 °io		[[
Clay	< 0.004 mm (slick)				

Appendix A-1: Habitat Assessment and Physicochemical Characterization Field Data Sheets - Form 1

A-6

HABITAT ASSESSMENT FIELD DATA SHEET-LOW GRADIENT STREAMS (FRONT)

STREAM NAME CHORIERS Creek	LOCATION MOLYCORD FAC.
STATION # 55-12 RIVERMILE	STREAM CLASS
LAT LONG	RIVER BASIN
STORET # 36777	AGENCY
INVESTIGATORS Christine Ph	illips
FORM COMPLETED BY	TIME 4.58 AM M ECO. RISK ASSESS.

[]	Habitat	Condition Category			
	Parameter	Optimal	Suboptimal	Marginal	Poor
	1. Epifaunal Substrate/ Available Cover	Greater than 50% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).	30-50% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
eacl	score B	20 ~ 19., 18 17 16	715 (14 (13) 12-11)	10 9 8 7 4.6	5 -4 - 3 - 2 - 1 - 0-
Parameters to be evaluated in sampling reach	2. Pool Substrate Characterization	Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mixture of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All mud or clay or sand bottom; little or no root mat; no submerged vegetation.	Hard-pan clay or bedrock; no root mat or vegetation.
ated	score 8	20 19 18 17 16	15 14 13 12 11	10 -9- (8) -7 6	5-413-2 1 0
o be evalui	3. Pool Variability	Even mix of large- shallow, large-deep, small-shallow, small- deep pools present.	Majority of pools large- deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small- shallow or pools absent.
fers	SCORE 6	20 19 18 - 17 16	-13)]4 . 13 12 11	10 : 9 18 7 6	5 4 3 2 1 0
Paramet	4. Sediment Deposition	Little or no enlargement of islands or point bars and less than <20% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 20-50% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 80% of the bottorn changing frequently; pools almost absent due to substantial sediment deposition.
	score S	20 - 19 - 18 - 17 - 16	15 14 13 12 11	10 9 (8) 7 16	5 4 3 2 1 0
	5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
	SCORE 8	20 19 (18) 17 16	15-14-13-12-11-	10 9 8 7 6	5 413.2 10

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A-9

HABITAT ASSESSMENT FIELD DATA SHEET-LOW GRADIENT STREAMS (BACK)

SCORE 14 2021/92/18/27/26 Present, but recent, dredging, (greater than past 20 yr) may be memelized and the stream increase the stre		•••	Churnels creen o.				
6. Channel Ateration Channelization or dredging absent or dred			Condition Category				
S. Channel dredging absent or minutal, stream with normal pattern. present, usually in areas evidence of past channelization, i.e. dredging, greater than past 20/pl may be channelization is not present. attensive: embanthmass and 40 to 80% of stream reach channelized and simpled. back 00% of the stream reach channelized and simpled. back 00% of the stream reach channelized and simpled. back 00% of the st			Optimal	Suboptimal	Marginal	Poor	
The bench in the stream increase the stream is straight line. Channel straight: channelized for a long distance. SCORE 50 20 40 10 10 00 10 00 10 00 10			dredging absent or minimal; stream with	present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not	extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and	gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or	
7. Channel increase the stream length 1 to 2 times longer than if it was in a straight line. (Note - channel braiding is considered normal in considered normal in parameter is not esaily rated in these areas.) increase the stream length 1 to 2 times increase the stream increase		SCORE 14	203-19-18-17-16	BB (E) an an and	10 · 9 · 28 · 7 · 6	8 4 3 3 2 11- 01	
left or right side by facing downstream.or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowedevident but not affecting full plant growth potential to any great extent; more than one- half of the potential plant stubble height remaining.vegetation common; less than one-half of the potential plant stubble height remaining.removed to 5 centimeters or less in average stubble height.SCORE9(LB)Left Bank10876543220SCORE9(RB)Right Bank0098765432010. Riparian Vegetative ZoneWidth of riparian zone activities (i.e., parkingWidth of riparian zone activities have impactedWidth of riparian zone activities have impactedWidth of riparian zone civities have impactedWidth of riparian zone riparian vegetation due	ipling reach		increase the stream length 3 to 4 times longer than if it was in a straight line. (Note - channel braiding is considered normal in coastal plains and other low-lying areas. This parameter is not easily rated in these areas.)	increase the stream length 1 to 2 times longer than if it was in a straight line.	increase the stream length 1 to 2 times longer than if it was in a straight line.	waterway has been channelized for a long distance.	
left or right side by facing downstream.or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowedevident but not affecting full plant growth potential to any great extent; more than one- half of the potential plant stubble height remaining.vegetation common; less than one-half of the potential plant stubble height remaining.removed to 5 centimeters or less in average stubble height.SCORE9(LB)Left Bank10987654220SCORE9(RB)Right Bank1098765422010. Riparian Vegetative ZoneWidth of riparian zone activities (i.e., parkingWidth of riparian zone activities have impactedWidth of riparian zone activities have impactedWidth of riparian vegetation due	am	score 5	20: 19: 18: 17: 16;	/13° HA 113, 127 J1	-10 91 8. · 7. · · 6.	(€) 4 - 1 - 2 - 1 - 0.	
left or right side by facing downstream.or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowedevident but not affecting ful plant growth potential to any great extent; more than one- half of the potential plant stubble height remaining.vegetation common; less than one-half of the potential plant stubble height remaining.removed to 5 centimeters or less in average stubble height.SCORE9(LB)Left Bank1087654220SCORE9(RB)Right Bank093765432010. Riparian Vegetative ZoneWidth of riparian zone activities (i.e., parkingWidth of riparian zone activities have impactedWidth of riparian zone activities have impactedWidth of riparian zone riparian vegetation due	ated broader than	8. Bank Stability (score each bank)	of crosion or bank failure absent or minimal; little potential for future problems. <5% of bank	infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of	60% of bank in reach has areas of erosion; high erosion potential during floods.	areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has	
left or right side by facing downstream.or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowedevident but not affecting ful plant growth potential to any great extent; more than one- half of the potential plant stubble height remaining.vegetation common; less than one-half of the potential plant stubble height remaining.removed to 5 centimeters or less in average stubble height.SCORE9(LB)Left Bank1087654220SCORE9(RB)Right Bank093765432010. Riparian Vegetative ZoneWidth of riparian zone activities (i.e., parkingWidth of riparian zone activities have impactedWidth of riparian zone activities have impactedWidth of riparian zone riparian vegetation due	inter .	SCORE <u>S</u> (LB)	Left Bank 9 10 29.	3 (B) (C) 7 (C) 6 (C)	S. 4 . 3	2 E 0	
left or right side by facing downstream.or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowedevident but not affecting full plant growth potential to any great extent; more than one- half of the potential plant stubble height remaining.vegetation common; less than one-half of the potential plant stubble height remaining.removed to 5 centimeters or less in average stubble height.SCORE9(LB)Left Bank10876543220SCORE9(RB)Right Bank0098765432010. Riparian Vegetative ZoneWidth of riparian zone activities (i.e., parkingWidth of riparian zone activities have impactedWidth of riparian zone activities have impactedWidth of riparian zone civities have impactedWidth of riparian zone riparian vegetation due	be ev	SCORE <u>6</u> (RB)	Right Bank 10-10-9	(8).1147	594 441-3 S		
SCORE <u>4</u> <u>3</u> <u>2</u> 10. Riparian Width of riparian zone Width of riparian zone Width of riparian zone Width of riparian zone 10. Riparian Vegetative Zone Neters; human Vidth of riparian zone Width of riparian zone 10. Riparian Vegetative Zone Vegetatives (i.e., parking Width of riparian zone Width of riparian zone	Parameters to	Protection (score each bank) Note: determine left or right side by facing downstream.	streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	streambank surfaces covered by native vegetation, but one class of plants is not well- represented; disruption evident but not affecting full plant growth potential to any great extent; more than one- half of the potential plant stubble height remaining.	streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.	
10. Riparian Vegetative ZoneWidth of riparian zone >18 meters; human activities (i.e., parkingWidth of riparian zone tities have impactedWidth of riparian zone tities have impactedWidth of riparian zone Width of riparian zone <th< td=""><td></td><td></td><td>Left Bank - 10. 9</td><td>. 8 . 7 . 6</td><td>5 4</td><td>2</td></th<>			Left Bank - 10. 9	. 8 . 7 . 6	5 4	2	
10. Riparian Vegetative Zone>18 meters; human activities (i.e., parking12-18 meters; human activities have impacted12 meters; human activities have impacted<6 meters: little or no riparian vegetation due		SCORE <u>4</u> (RB)	Right Bank		55 5 x 4 x 3	2.5.cf.2.4.0	
bank riparian zone) lawns, or crops) have not impacted zone.		Vegetative Zone Width (score each	>18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not	12-18 meters; human	12 meters; human	<6 meters: little or no	
SCORE 6 (LB) Left Bank 10 - 9 - 1 - 8 7				a that says the in the second s	5-03-5-4- 5-3-5-	and the second states where the second states are the second second second second second second second second s	
SCORE (Q (RB) Right Bank 10.9 ; 8 17 (G 5 4 3 2 2 ; 10.9 ; 0		SCORE (RB)	Right Bank 10 9	8-18-17-1- (G)		274.02 1 220 27	

Total Score 118

HABITAT ASSESSMENT FIELD DATA SHEET-LOW GRADIENT STREAMS (FRONT)

STREAM NAME Charliers Creek	LOCATION MOLYCOID FRC.		
STATION # 55-1 RIVERMILE	STREAM CLASS		
LATLONG	RIVER BASIN		
STORET # 36777	AGENCY		
INVESTIGATORS Christine Pr	cailling J		
FORM COMPLETED BY	DATE 10-19-03 TIME 10:20 AND PM BCO. RISK ASSESS.		

	Habitat	i	Condition	Category	
	Parameter	Optimal	Suboptimal	Marginal	Poor
	1. Epifaunat Substrate/ Available Cover	Greater than 50% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are <u>not</u> new fall and <u>not</u> transient).	30-50% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
-ac	SCORE (O	20 - 19 - 18 - 17 - 16	15 14 13 12 11	10 - 9 - 8 - 75 (.6)	5 4 3 2 1 0
Parameters to be evaluated in sampling reach	2. Pool Substrate Characterization	Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mixture of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All mud or clay or sand bottom; little or no root mat; no submerged vegetation.	Hard-pan clay or bedrock; no root mat or vegetation.
ated	SCORE 6	20 19-18 17 16	15 14 13 12 11	107 -9 - 8 - 7 (6)	5 4 3 2 1 0
o be evalu:	3. Pool Variability	Even mix of large- shallow, large-deep, small-shallow, small- deep pools present.	Majority of pools large- deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small- shallow or pools absent.
ters	SCORE 3	20 19 18 17 16	15 14 13 12 11	10, 9 8 7 6	5 4 3 2 1 0
Paramet	4. Sediment Deposition	Little or no enlargement of islands or point bars and less than <20% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 20-50% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
	SCORE 3	20 19 18 117 16	. 15, 14, 13 12, 11	10. 9. 8 7.6.	5 * A (3) 2 1 0
	5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
	score 10	20 19 (18)17 16	<u>. 51 (4, 13) 12 11</u>	10 1.9 2 8 7 4 6.	5 4 7 1 2 1 1 0

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A-9

HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (BACK) Chartiers Creek 55-1

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······	·····	· · · · · · · · · · · · · · · · · · ·			
	Habitat		Condition	Category	
	Parameter	Optimal	Suboptimal	Marginal	Poor
	6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
	score 2	20 - 19 - 18 - 17 - 16	eis, 14 18 12 11	10 9 2 8 1 7 6	15=4×=3 (2-)41-,0,0
pling reach	7. Channel Sinuosity	The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note - channel braiding is considered normal in coastal plains and other low-lying areas. This parameter is not easily rated in these areas.)	The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.	The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.	Channel straight; waterway has been channelized for a long distance.
a a m	score 2	20, 19, 18, 17, 16,	15 14 15 12 11	10 9 8. 7. 6	5 4 3 2 1 0
Parameters to be evaluated broader than sampling reach	8. Bank Stability (score each bank)	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30- 60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
alu:	SCORE \underline{Z} (LB)	Left Bank 10 9	* 8 * 7 * 6	5 4 3	2 1 0
be e	SCORE 2 (RB)	Right Bank 10 9	8 7 6 1	×.5 × 4 2 3	2 2 1 0
Parameters to b	9. Vegetative Protection (score each bank) Note: determine left or right side by facing downstream.	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well- represented; disruption evident but not affecting full plant growth potential to any great extent; more than one- half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
	SCORE 2 (LB)			S. S. 4	
	SCORE <u>(RB</u>)	Right Bank 102.92	8 7 7 6 5 6	5 4 3	(2) == [0
	10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6- 12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters: little or no riparian vegetation due to human activities.
	SCORE (LB)			- 5 - 4 - 3	2 14 (1) 10
	SCORE 5 (RB)	Right Bank (10,1,9)	8	(5) 4 4 3 5	2 1 0
	54				

Total Score <u>54</u>

HABITAT ASSESSMENT FIELD DATA SHEET-LOW GRADIENT STREAMS (FRONT)

STREAM NAME Chartiers Crae	KLOCATION MOLYC	LOID, Inc
STATION # 55-2_ RIVERMILE	STREAM CLASS	, , , , , , , , , , , , , , , , , , , ,
LAT LONG	RIVER BASIN	
STORET # 3677	AGENCY	
INVESTIGATORS Christine Pr	IVIII 105	
FORM COMPLETED BY	DATE 10-19-03 TIME 11.28 AM PM	REASON FOR SURVEY ECO. RISK ASSEDS

	Habitat Parameter	Condition Category				
	FRERMEICE	Optimal	Suboptimal	Marginal	Poor	
	1. Epifaunal Substrate/ Available Cover	Greater than 50% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are <u>not</u> new fall and <u>not</u> transient).	30-50% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat; lack of habitat is obvious; substrate unstable or lacking.	
Leac	SCORE 3	20 - 19 - 18 - 17 - 16	15 14 13 12 12	10 9 8 76	5 -4 (3) 2-1 0	
Parameters to be evaluated in sampling reach	2. Pool Substrate Characterization	Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mixture of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All mud or clay or sand bottom; little or no root mat; no submerged vegetation.	Hard-pan clay or bedrock; no root mat or vegetation.	
ated	SCORE 7	20 19 18 17 16	15 14 - 13 12 11-	10 9 8 7 6	5. 4 3. 2 1. 0	
o be evalu:	3. Pool Variability	Even mix of large- shallow, large-deep, small-shallow, small- deep pools present.	Majority of pools large- deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small- shallow or pools absent.	
ters	SCORE 2	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	3 4 3 2 1 0	
Paramet	4. Sediment Deposition	Little or no enlargement of islands or point bars and less than <20% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 20-50% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 80% of the bottorn changing frequently; pools almost absent due to substantial sediment deposition.	
	score 2	20 19 18 17 16	15, 14 13 12 11	10 9 8 7 6	5-4 3 2 1-0	
	5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.	
	SCORE 18	20 19 (18) 17 -16	<u>15 14 13 12 11</u>	10 9 8 7 6	5,4-3-12 1:0	

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A-9

HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (BACK)

		Chartlep Creek 53-			
	Habitat	·	Condition	Category	
l	Parameter	Optimal	Suboptimal	Marginal	Poor
	6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
	SCORE 13	20 19 78 17 116	NIS214- (13)12-11.	10 9 8 7 5	3 74 3 2 in 0
pling reach	7. Channel Sinuosity	The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note - channel braiding is considered normal in coastal plains and other low-lying areas. This parameter is not easily rated in these areas.)	The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.	The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.	Channel straight; waterway has been channelized for a long distance.
E	SCORE 4	20 19 18 417 16	15 14 15 12 11	10-9-8-7-6	5 (4) 3 2 1 0
Parameters to be evaluated broader than sampling reach	8. Bank Stability (score each bank)	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30- 60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
Valu	SCORE <u>2</u> (LB)	Left Bank 10 9	2.8 √-,7 √- 6 √.	5.43.365	23 i 0
be e	SCORE 2 (RB)	Right Bank 10 9	8 8 2 7 8 7 16 K	5-357 4 7.2 3 7 5	2 2
Parameters to	9. Vegetative Protection (score each bank) Note: determine left or right side by facing downstream.	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well- represented; disruption evident but not affecting full plant growth potential to any great extent; more than one- half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
	SCORE $\frac{2}{2}$ (LB)			15 4 31	
	SCORE 2_(RB)	Right Bank 2010 209-20	3 7 7 6	4. 1 . 3 . 2	
	10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6- 12 meters; human activitics have impacted zone a great deal.	Width of riparian zone <6 meters: little or no riparian vegetation due to human activities.
	SCORE <u> </u> (LB)	Left Bank 1 10 9 ;			
	SCORE (RB)	Right Bank 10 9	8 7. 6	S 4 3 7	2 2 CD 0

Total Score 59

HABITAT ASSESSMENT FIELD DATA SHEET-LOW GRADIENT STREAMS (FRONT)

STREAM NAME CHARTIERS CLERK	LOCATION MOLYCORD FRC.
STATION # 55-5_RIVERMILE	STREAM CLASS
LAT LONG	RIVER BASIN
STORET # 3677	AGENCY
INVESTIGATORS Christine Phil	lidz
FORM COMPLETED BY	TIME 12:45 AM (PM) ECO RUNVEY
CGP	TIME 12:45 AM (PMA) ECO. RISK ASSESS

	Habitat Parameter		Condition	Category	
	Farameter	Optimal	Suboptimal	Marginal	Poor
	1. Epifaunal Substrate/ Available Cover	Greater than 50% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).	30-50% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
eacl	SCORE	20 . 19 18 . 17. 16.	13 14 13 12 11	10 9 8 7 7 6	5-4-3-2-1-0-
Parameters to be evaluated in sampling reach	2. Pool Substrate Characterization	Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mixture of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All mud or clay or sand bottom; little or no root mat; no submerged vegetation.	Hard-pan clay or bedrock; no root mat or vegetation.
ated	score 7	20, 19, 18, 17, 16	13 14 13 12 11	-10 -9 - 8 (7) - 6	5, 4, 3, 2, 1, 0
to be evalu	3. Pool Variability	Even mix of large- shallow, large-deep, small-shallow, small- deep pools present.	Majority of pools large- deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small- shallow or pools absent.
ters	SCORE	-20 19 18 17 16	15 14. 13 12 11	10- 9, 8 7 8	5.4.3.2.11.0
Paramet	4. Sediment Deposition	Little or no enlargement of islands or point bars and less than <20% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 20-50% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
	score 5	20 19 18 17 16	15 14 13 12 LL	10 9/2 8 7.56.	(5) 41 3 2 1 0
	5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
	SCORE 18	20	15, 14, 13, 12, 11,	109 8.17.6.	5.4.3.2.1-0

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A-9

HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (BACK)

		Chartiersc	rcek 55		
	Habitat Parameter		Condition	Category	r
		Optimal	Suboptimal	Marginal	Poor
	6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reac channelized and disrupted. Instream habitat greatly altered of removed entirely.
	SCORE 13	20 19 18 - 17 16	ASLAN (13) 22 JUL	610 9 8 8 6	35-14-3+2iin
pling reach	7. Channel Sinuosity	The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note - channel braiding is considered normal in coastal plains and other low-lying areas. This parameter is not easily rated in these areas.)	The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.	The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.	Channel straight; waterway has been channelized for a long distance.
Eas	score Z	20 19 18 17 16	15 14 13 12 11	10 9 8 7. 6.	5 4 3 2 1
Parameters to be evaluated broader than sampling reach	8. Bank Stability (score each bank)	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30- 60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing 60-100% of bank has erosional scars.
/alus	SCORE 5 (LB)	Left Bank 3 10 9 2		· ③ · 4 · · 3 · ·	2
De e	SCORE <u>5</u> (RB)	Right Bank 30. 9	<u> 5.78- 7 6</u>	:(S) = 4= 132 :	
Parameters to	9. Vegetative Protection (score each bank) Note: determine left or right side by facing downstream.	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well- represented; disruption evident but not affecting full plant growth potential to any great extent; more than one- half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambar vegetation is very high vegetation has been removed to 5 centimeters or less in average stubble height.
	SCORE (LB)	Left Bank 10. *9	8 7. 6	5 . 4 3	
	SCORE 1 (RB)	Right Bank 107193	8. (7)	5 4 3 3	2 1 2
	10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6- 12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters: little or no riparian vegetation due to human activities.
	SCORE	Left Bank :: 10 - 9	- 8 + (¢7 * ,+ 6 · · ·		2
	SCORE <u>4</u> (RB)	Right Bank 10. 9	8 7 6	s t∈(A) , s	2 3 1 10

HABITAT ASSESSMENT FIELD D	Reference ATA SHEET—LOW GRADIENT STREAMS (FRONT)	e Statii
STREAM NAME SUGAR RUN	LOCATION MOLYCORD FIRE.	
STATION # 55-16 RIVERMILE	STREAM CLASS	
LAT LONG	RIVER BASIN	
STORET #	AGENCY	
INVESTIGATORS Christine Phi		
FORM COMPLETED BY	TIME 3114 AM CO ECOLOGICAL ASSESS SIL	iey

	Habitat Parameter		Condition	Category	
	Farancier	Optimal	Suboptimal	Marginal	Poor
-	1. Epifaunal Substrate/ Available Cover	Greater than 50% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).	30-50% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
encl	SCORE 6	20 - 19 - 18 - 17 - 16	15 14 13 12~11	10 9 8 8 7 6	5 4 . 3 2 1 0
Parameters to be evaluated in sampling reach	2. Pool Substrate Characterization	Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mixture of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All mud or clay or sand bottom; little or no root mat; no submerged vegetation.	Hard-pan clay or bedrock; no root mat or vegetation.
Inted	SCORE 7	20 19 18 17 16	15 14 13 12 11	10 19 3 8 0 6	5, 4 3, 12, 1 0
o be evalus	3. Pool Variability	Even mix of large- shallow, large-deep, small-shallow, small- deep pools present.	Majority of pools large- deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small- shallow or pools absent.
ters	SCORE 2	20 19 18 17 16	15 Pi4 13 12 11	10 9 8 7 6	5 4 3 2 1 0
Paramet	4. Sediment Deposition	Little or no enlargement of islands or point bars and less than <20% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 20-50% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
	score 👸	20 19 18 17 16	15 [4] 13 12 4	10 . 9 . 8 7 6	5.4.3.2.1.0
	5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or niffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
	SCORE 18	20 19 18 17 16	, 15^{1 1}14 (13) 12 (11)	109.8.7.6	5.4.3.2.1+0

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A-9

HABITAT ASSESSMENT FIELD DATA SHEET-LOW GRADIENT STREAMS (BACK)

	Habitat		Condition	Category SUGAS	RUN 155-16
	Parameter	Optimal	Suboptimal	Marginal	Poor
	6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
	SCORE 16	20:219 - 18 - 17 (16	¥15 £145 £19 £ 12 = 11 -	10 - 9 - 8 - 7 - 56	5 4 3 2 2 1 1 0
pling reach	7. Channel Sinuosity	The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note - channel braiding is considered normal in coastal plains and other low-lying areas. This parameter is not easily rated in these areas.)	The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.	The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.	Channel straight; waterway has been channelized for a long distance.
sam	score 7	20 - 19 - 18 - 17 - 16,	15 14: 11 12 11	10 9 - 8 (7) 6.	15-4-3 2-1-0
Parameters to be evaluated broader than sampling reach	8. Bank Stability (score each bank)	Banks stable; evidence of crosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30- 60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
'alus	SCORE (LB)	Left Bank	- 18 L 5 7 . 6 A		1 2 (ī) oļi
be e	SCORE (RB)	Right Bank to 10 . 9	7	11.5.0+.4.1.1933	2.2. O 0
Parameters to 1	9. Vegetative Protection (score each bank) Note: determine left or right side by facing downstream.	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well- represented; disruption evident but not affecting full plant growth potential to any great extent; more than one- half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
	SCORE (LB)				2 0 0
	SCORE (RB)	Right Bank 10, 9	8.1.76	5.4.1.3	27 (1) (2)
	10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6- 12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters: little or no riparian vegetation due to human activities.
	SCORE 8 (LB)	Left Bank : 10 - 9	1 3 - 7 - 3 - 6 - 4	4.5	2
	SCORE (RB)	Right Bank 10.9	12.84 ÷ 7.65	, ∩-5 (

Total Score 70

HABITAT ASSESSMENT FIELD DATA SHEET-LOW GRADIENT STREAMS (FRONT)

STREAM NAME SUGAR RUN	LOCATION MONCORD, Inc.
STATION #_55-13_RIVERMILE	STREAM CLASS
LATLONG	RIVER BASIN
STORET #	AGENCY
INVESTIGATORS Christine Ph	$i \parallel i p z$
FORM COMPLETED BY	TIME AM PM ECOLOGICAL RISK ASSESS.

	Habitat Parameter		Condition	Category	.]
	rarameter	Optimal	Suboptimal	Marginal	Poor
	1. Epifaunal Substrate/ Available Cover	Greater than 50% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are <u>not</u> new fall and <u>not</u> transient).	30-50% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
reac	SCORE	20:+19:+18:-17 16	15 14 13 12 (11)	≦109· ≈ 8 § 7* , 6*	5-4,3.2.1.0
Parameters to be evaluated in sampling reach	2. Pool Substrate Characterization	Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mixture of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All mud or clay or sand bottom; little or no root mat; no submerged vegetation.	Hard-pan clay or bedrock; no root mat or vegetation.
ated	SCORE	20 19 18 17 16	15 14 13 12 (11)	10 9. 8 7 6	5 4 3 2 1 0
o be evalua	3. Pool Variability	Even mix of large- shallow, large-deep, small-shallow, small- deep pools present.	Majority of pools large- deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small- shallow or pools absent.
ters	score 3	20 19 18 17 -16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
Parame	4. Sediment Deposition	Little or no enlargement of islands or point bars and less than <20% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 20-50% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
	score 10	20 19 18 17, 16	15 14 13 12 -11	(10) 9 3 8 17. 6.	-5 - 4 - 3 - 2 - 1 - 0
	5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
	score 16	20. 19 - 18 - 17 (16)	15 14 13 12 11	10 - 9 18 - 71 - 6	5 4 3 2 1 0

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HABITAT ASSESSMENT FIELD DATA SHEET-LOW GRADIENT STREAMS (BACK) Sugar Run 55-13

	Habitat Parameter		Condition	Category	
		Optimal	Suboptimal	Marginal	Poor
	6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
	SCORE 16	20. 19-18 -17 (16	155714-301212 111	10 - 974, 8*7 77 - 6	45 41 3 2 41-40
oling reach	7. Channel Sinuosity	The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note - channel braiding is considered normal in coastal plains and other low-lying areas. This parameter is not easily rated in these areas.)	The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.	The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.	Channel straight; waterway has been channelized for a long distance.
sam	score 10	20-19-18-17-16	司557162112312371	10 9. 8 4 7 76	5, 4=-3 2 -91 -0
Parameters to be evaluated broader than sampling reach	8. Bank Stability (score each bank)	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30- 60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
a la	SCORE 6 (LB)	Left Bank 10-19	848 F.T. 6. 6.	5 4 3	27. 1 0.)
pe ei	SCORE 6 (RB)	Right Bank 35:10 9	-19: 19: 60 s	275 \$\$ 4 \$ 13; F	2
Parameters to b	9. Vegetative Protection (score each bank) Note: determine left or right side by facing downstream.	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well- represented; disruption evident but not affecting full plant growth potential to any great extent; more than one- half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
	SCORE 6 (LB)	Left Bank 10 .9	2. 8 <u>, 7</u> . O		
	SCORE <u>(</u> (RB)	Right Bank + 107.9	×8	5.5.4	2 1 0
	10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6- 12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters: little or no riparian vegetation due to human activities.
	SCORE $\frac{q}{(LB)}$	Left Bank = 10 ()	8 - 7 - 6 - 4	3.4 (4 (1))	2
	SCORE (RB)	Right Bank 10.9		- es ik 4 1 3	3.2. 1. 50

Total Score 116

APPENDIX C

Ecological Checklist and Site Photographs

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CHECKLIST FOR ECOLOGICAL ASSESSMENT/SAMPLING

Introduction

The checklist that follows provides guidance in making observations for an ecological assessment. It is not intended for limited or emergency response actions (e.g., removal of a few drums) or for purely industrial settings with no discharges. The checklist is a screening tool for preliminary site evaluation and may also be useful in planning more extensive site investigations. It must be completed as thoroughly as time allows. The results of the checklist will serve as a starting point for the collection of appropriate biological data to be used in developing a response action. It is recognized that certain questions in this checklist are not universally applicable and that site-specific conditions will influence interpretation. Therefore, a site synopsis is requested to facilitate final review of the checklist by a trained ecologist.

Checklist

11.

The checklist has been divided into sections that correspond to data collection and ecosystem types. These sections are:

- 1. Site Description
 - IA. Summary of Observations and Site Setting
 - Terrestrial Habitat Checklist
 - IIA. Wooded
 - IIB. Shrub/Scrub
 - IIC. Open Field
 - IID. Miscellaneous
- III. Aquatic Habitat Checklist Non-Flowing Systems
- IV. Aquatic Habitat Checklist Flowing Systems
- V. Wetlands Habitat Checklist

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CHECKLIST FOR ECOLOGICAL ASSESSMENT/SAMPLING

I. SITE DESCRIPTION

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1.	Site Name:	Molycorp, Inc.
	Location:	300 Caldwell Avenue, Washington PA
	County: Washing	gton City: <u>Canton Twp.</u> State: <u>Pennsylvania</u>
2 .	Latitude: <u>40 deg</u>	I. 10 min. 11.69 sec N. Longitude: 80 deg. 16 min. 36.49 W sec.
3.	What is the app	roximate area of the site? <u>73 acres.</u>
4.	Is this the first s available.	site visit? yesX_ no If no, attach trip report of previous site visit(s), if
	Date(s) of previo	ous site visit(s):
	October 19-20, 2 September 17, 2	•
5.	Please attach to	the checklist USGS topographic map(s) of the site, if available.
	See site location	n map, Figure 1.
6.		er site photographs available? X yes no tach any available photo(s) to the site map at the conclusion of this section.
	See aerial site n	nap, Figure 2

See habitat/land use map, Figure 3.

7.	The land use on the site is:	The land area surrounding the site is: within a 1.25 mile radius
	% Urban	% Urban
	% Rural	<u>38</u> % Rural (schools, churches, hospitals, commercial)
	% Residential	<u>50</u> % Residential
	<u>30</u> % Industrial (X former heavy)	% Industrial (X light X heavy)
	% Agricultural	% Agricultural
	(Crops:)	(Crops:)
	% Recreational	% Recreational
	(Describe: note if it is a park, etc.)	(Describe: note if it is a park, etc.)
	% Undisturbed	% Undisturbed
	% open grassy areas, or wooded	% open space, wooded areas or pasture
	las any movement of soil taken place at the site kely cause of this disturbance.	? X yes no. If yes, please identify the most
	Agricultural UseXHea	vy EquipmentMining
	XNatural EventsEro	sionOther

Please describe:

Radiologically-impacted soils and slags have been excavated and relocated or removed from the site. Coal-tar impacted soil and/or sediments have been excavated and stored in one or more Coal Tar Ponds on site (Figure 4). Soil was excavated from Area 7B to reconstruct a containment dike around the South Coal Tar Pond.

9. Do any potentially sensitive environmental areas exist adjacent to or in proximity to the site, e.g., Federal and State parks, National and State monuments, wetlands, prairie potholes? Remember, floodplains and wetlands are not always obvious; do not answer "no" without confirming information.

Portions of the site are located within the 100 yr floodplain of Chartiers Creek and Sugar Run. Several herbaceous, scrub/shrub and lowland floodplain wetlands are located within the floodplains (Figures 3, 5; Appendix D for ACRT, Inc.'s 1996 Wetland Delineation Map). None of the wetlands were identified by PADEP's PNDI, PAGC, PAFBC or USFWS as exceptional value wetlands (Appendix B).

Please provide the source(s) of information used to identify these sensitive areas, and indicate their general location on the site map.

Sources of information include USGS topographic map (Figure 1), aerial photograph (Figure 2), habitat/land use map (Figure 3), benthic sampling locations and tar-impacted soil and sediment map (Figure 4), National Wetlands Inventory and 100 yr Floodplain map (Figure 5), and soil survey map (Figure 6), and site visits conducted on September 17, 2003 and October 19-20, 2003

10. What type of facility is located at the site?

Chemical	X Former Manufacturing (now vacant)	Mixing	Waste Disposal
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Other (specify)_____

11. What are the suspected contaminants of concern at the site? If known, what are the maximum concentration levels?

Sediment CPECs may include metals, PAHs, VOCs, and the radionucleotides: thorium, uranium and radium

Soil CPECs include metals, PAHs, VOCs, and the radionucleotides: thorium, uranium and radium Surface water and groundwater CPECs may include metals, PAHs and VOCs

12. Check any potential routes of offsite migration of contaminants observed at the site:

Swales	Depressions	Drainage Ditches	
X Runoff	Windblown particules	Vehicular traffic	
Other (specify)			

13. If known, what is the approximate depth to the water table?

- 14. Is the direction of surface runoff apparent from site observations? X yes no If yes, to which of the following does the surface runoff discharge? Indicate all that apply.
 - X Surface Water X Groundwater Sewer Collection Impoundment
- 15. Is there a navigable waterbody or tributary to a navigable waterbody? X yes no

Chartiers Creek enters Molycorp from the southeast and crosses the property to run along the western property line. Sugar Run enters Molycorp from the west and joins with Chartiers Creek in the southeast corner of the site. Chartiers Creek flows to the northeast and discharges directly into the Ohio River (Figures 2-4).

 Is there a waterbody anywhere on or in the vicinity of the site? If yes, also complete Section III: Aquatic Habitat Checklist – Non-Flowing Systems and/or Section IV: Aquatic Habitat Checklist – Flowing Systems. X yes (approximate distance: see below)

no

wetlands – present on site. Chartiers Creek and Sugar Run bisect the property.

17. Is there evidence of flooding? X yes no. Wetlands and floodplains are not always obvious; do not answer "no" without confirming information. If yes, complete Section V: Wetland Habitat Checklist.

Portions of the site are located within the 100 yr floodplain of Chartiers Creek and Sugar Run. Several wetland areas are located within the study area (see Figures 2, 3, 5).

18. If a field guide was used to aid any of the identifications, please provide a reference. Also, estimate the time spent identifying fauna. (Use a blank sheet if additional space is needed for text).

See list of references attached to end of checklist. Approximately 12-14 hours was spent identifying flora and fauna during the site visit.

19. Are there any threatened and/or endangered species (plant or animal) known to inhabit the area of the site? yes <u>X</u> no. If yes, you are required to verify this information with the US Fish and Wildlife Service. If species' identities are known, please list them next.

Verified occurrences of threatened and/or endangered species have not been identified at the site or within the study area, based on the following information: (1) database searches by the U.S. Fish and Wildlife Service (USFWS), Pennsylvania Natural Diversity Inventory (PNDI), Pennsylvania Fish and Boat Commission (PFBC), and Pennsylvania Game Commission (PGC) – see correspondence in Appendix B; (2) literature review; and (3) limited biological surveys of the study area during the site visits. Record weather conditions at the time this checklist was prepared.

DATE: September 17, 2003

Temperature (°F): 78

Wind (direction/speed): unknown

Cloud Cover: 30%

Normal Daily High Temperature (°F): 73

Precipitation (rain, snow): none

DATE: October 19, 2003

Temperature (°F): high 63

Wind (direction/speed): <u>NE 5-10</u>

Cloud Cover: 20%

Normal Daily High Temperature (°F): 65

Precipitation (rain, snow): none

IA. SUMMARY OF OBSERVATIONS AND SITE SETTING

- 1. All of the main plant buildings were demolished in 2002 with only the guard building and truck scales remaining in place. One to two temporary work trailers have provided support for remedial activities.
- 2. Presently, refractory bricks are found throughout the course of Chartiers Creek and portions of Sugar Run. Significant quantities of coal tar (from the former Hazel-Atlas Glass Manufacturing Plant) were observed seeping from the banks and within the stream channel of Chartiers Creek. Smaller chunks of weathered coal tar observed throughout the stream channel of Chartiers Creek. Residents along northside of Sugar Run have disposed of yard debris, tires and concrete slabs into stream channel.
- 3. Refractory bricks and other colored glass were observed on the slope of the Area 4 Tylerdale Connecting Railroad, possibly containing low-level radioactive material in colored glass.
- 4. Area 5 contains the South Coal Tar Pond and former North Coal Tar Pond. Tar from North Tar Pond excavated and put in South Coal Tar Pond, filled in with slag.
- 5. Scrub/shrub wetland habitat in Area 7A had surface water near bend in access road with slight oil sheen.
- 6. The areas of ecological concern identified during the site visit include coal tar impacted soils and sediments, coal tar ponds and the presence of a slight sheen to the standing water in Area 7a. There were no visual signs of diseased or distressed vegetation identified during the site visit. No federal state-listed endangered or threatened species or other species of concern or habitats of concern were identified on or in the vicinity of the site. No exceptional value wetlands were identified on or in the vicinity of the site.

Completed by: Christine G. Phillips 66 Altadena Drive, Pittsburgh, PA 15228 412-341-7307

Additional Preparers:

Site Manager:

Date: <u>March 5, 2004</u>

II. TERRESTRIAL HABITAT CHECKLIST

IIA. WOODED

1. Are there any wooded areas at the site? X yes no. If no, go to Section IIB: Shrub/Scrub.

Wooded areas are present within the study area and adjacent to the study area.

2. What percentage or area of the site is wooded? (≈46%, 33.40 acres). Indicate the wooded area on the site map, which is attached to a copy of this checklist. Please identify what information was used to determine the wooded area of the site.

See habitat/land use map, Figure 3.

3. What is the dominant type of vegetation in the wooded area? (Circle one: Evergreen/<u>Deciduous</u>/Mixed). Provide a photograph, if available.

<u>Dominant plant, if known</u>: Black cherry (*Prunus serotina*), sugar maple (*Acer saccharurm*) red maple (*Acer rubrum*), slippery elm (*Ulmus rubra*), American elm (*Ulmus Americana*), and box elder (*Acer Negundo*).

4. What is the predominant size of the trees at the site? Use diameter at breast height.

0-6 inches X_6-12 inches 12 inches

5. Specify type of understory present, if known. Provide a photograph, if available.

Common understory plants include: multiflora rose (*Rosa multiflora*), blackberry (*Rubus allegheniensis*), black raspberry (*Rubus occidentalis*), box elder (*Acer negundo*), red-osier dogwood (*Cornus sericea*), red-willow dogwood (*Cornus ammoum*), white snakeroot (*Eupatorium rugosum*), field garlic (*Alliaria petiolata*), Canada goldenrod (*Solidago Canadensis*) and wingstem (*Verbesina alternifolia*).

IIB. SHRUB/SCRUB

- 1. Is shrub/scrub vegetation present at the site? X yes no. If no, go to Section IIC: Open Field.
- 2. What percentage of the site is covered by scrub/shrub vegetation? (≈ 9.2%, 6.77 acres). Indicate the area of shrub/scrub on the site map. Please identify what information was used to determine this area.

See habitat/land use map, Figure 3.

3. What is the dominant type of scrub/shrub vegetation, if known? Provide a photograph, if available.

Common scrub/shrub vegetation includes blackberry, black raspberry, red-willow dogwood, and red-osier dogwood.

4.	What is the approximate average height of the scrub/shrub vegetation?

0-2 feet X 2 - 5 feet >5 feet

5. Based on site observations, how dense is the scrub/shrub vegetation?

Dense <u>X</u> Patchy Sparse

IIC. OPEN FIELD

1. Are there open (bare, barren) field areas present at the site? X yes no. If yes, identify and describe the type below.

Prairie/plains Savannah <u>X</u> Old Field <u>X</u> Other (specify) <u>mowed field,</u> former manufacturing areas, and herbaceous openings in scrub-shrub and forested areas

2. What percentage of the site is open field? (≈13.1%; 9.59 acres). Indicate the open fields on the site map.

See habitat/land use map, Figure 3.

3. What is/are the dominant plant(s)? Provide a photograph, if available.

Common plants include: multiflora rose (*Rosa multiflora*), blackberry (*Rubus allegheniensis*), black raspberry (*Rubus occidentalis*), white snakeroot (*Eupatorium rugosum*), field garlic (*Alliaria petiolata*), Canada goldenrod (*Solidago Canadensis*) and wingstem (*Verbesina alternifolia*).

- 4. What is the approximate average height of the dominant plant? <u>2-3 feet</u>
- 5. Describe the vegetation cover: _ Dense Sparse <u>X</u> Patchy

IID. MISCELLANEOUS

- 1. Are other types of terrestrial habitats present at the site, other than woods, scrub/shrub, and open field? yes \underline{X} no. If yes, identify and describe them below.
- 2. Describe the terrestrial miscellaneous habitat(s) and identify these area(s) on the site map.
- 3. What observations, if any, were made at the site regarding the presence and/or absence of insects, fish, birds, mammals, etc.?

Mammals: Observed chipmunk, squirrel, and white-tailed deer, and groundhog burrows, and raccoon tracks.

Birds: American robin, belted kingfisher, Canada geese, great blue heron, killdeer, red-winged blackbird, starling.

Amphibians: Frog (Rana sp.)

4. Review the questions in Section 1 to determine if any additional habitat checklists should be completed for this site.

III. AQUATIC HABITAT CHECKLIST – NON-FLOWING SYSTEMS

Note: Aquatic systems are often associated with wetland habitats. Please refer to Section V, Wetland Habitat Checklist.

1.	What type of open-water, non-flowing system is present at the site?		
	Natural (pond, lake) Artificially created (lagoon, reservoir, canal, impoundment)		
2.	If known, what is the na	me(s) of the waterbody(ie	s) on or adjacent to the site?
	Not Applicable		
3.	If a waterbody is presen	it, what are its known use:	s (e.g., recreation, navigation, etc.)?
4.	What is the approximate	e size of the waterbody(ie:	s)?
5.	ls any aquatic vegetation present, if known.	on present? yes no	o. If yes, please identify the type of vegetation
	Emergent	Submergent	Floating
6.	If known, what is the dep	pth of the water?	
7.	What is the general com	position of the substrate?	Check all that apply.
	Bedrock	Sand (coarse)	Muck (fine/black)
	Boulder (>10 in)	Silt (fine)	Debris
	Cobble (2.5-10 in)	Marl (shells)	Detritus
	Gravel (0.1-2.5 in)	Clay (slick)	Concrete
	Other (specify)		
8.	What is the source of the	e water in the waterbody?	
	River/Stream/Creek	Groundwater	Other (specify)
	Industrial discharge	Surface Runoff	

- 9. Is there a discharge from the site to the waterbody? yes no. If yes, please describe this discharge and its path.
- 10. Is there a discharge from the waterbody? yes no. If yes, and the information is available, identify from the list below the environment into which the waterbody discharges.

River/Stream/Creek	onsite	offsite	Distance
Groundwater	onsite	offsite	
Wetland	onsite	offsite	Distance
Impoundment	onsite	offsite	

11. Identify any field measurements and observations of water quality that were made. For those parameters for which data were collected, provide the measurement and the units of measure below:

 Area	

_____ Depth (average)

Temperature (depth of the water at which the reading was taken)

_____ pH

_____ Dissolved oxygen

____ Salinity

_____ Turbidity (clear, slightly turbid, opaque) (Secchi disk depth _____-)

____Other

- 12. Describe observed color and area of coloration.
- 13. Mark the open-water, non-flowing system on the site map attached to this checklist.
- 14. What observations, if any, were made at the waterbody regarding the presence and/or absence of benthic macroinvertebrates, fish, birds, mammals, etc

IV. AQUATIC HABITAT CHECKLIST – FLOWING SYSTEMS

Note: Aquatic systems are often associated with wetland habitats. Please refer to Section V, Wetland Habitat Checklist.

1. What type(s) of flowing water system(s) is (are) present at the site?

River	X Stream	Creek
Dry Wash	Arroyo	Brook
Artificially-created	Intermittent Stream	Channeling
(ditch, etc.)	Other (specify)	

- 2. If known, what is the name of the waterbody? Chartiers Creek and Sugar Run (Figure 4).
- 3. For natural systems, are there any indicators of physical alteration (e.g., channeling, debris, etc.)? X yes no. If yes, please describe indicators that were observed.

Historically, portions of Chartiers Creek have been impacted from channelization, the deposition of refractory brick and some slag into and adjacent to the channel. Portions of the floodplain of Chartiers Creek have been built up with various materials (2-22 ft thick) including slag, refractory brick and mixed natural sediments. The Hazel-Atlas Glass Manufacturing Plant used the former Tylerdale Connecting Railroad line to dump refractory brick into Chartiers Creek and Sugar Run. Presently, refractory brick are found throughout the course of Chartiers Creek and portions of Sugar Run. Significant quantities of coal tar (from the former Hazel-Atlas MGP) were observed seeping from the banks and within the stream channel of Chartiers Creek (Figure 4).

4. What is the general composition of the substrate? Check all that apply?

Bedrock	X Sand (coarse)	Muck (fine/black)
Boulder (>10 in)	X_Silt (fine)	X Debris (refractory brick)
<u>X</u> Cobble (2.5-10 in)	Marl (shells)	_Detritus
<u>X</u> Gravel (0.1-2.5 in)	Clay (slick)	Concrete
Other (specify)		.

5. What is the condition of the bank (e.g., height, slope, extent of vegetative cover)?

Banks of Chartiers Creek are generally sparsely vegetated or absent of vegetation, with some areas having moderate to accelerated erosion.

6. Is the system influenced by tides? yes <u>X</u> no. What information was used to make this determination?

Site is located in non-tidal area.

7. Is the flow intermittent? __yes _X_no. If yes, please note the information that was used in making this determination.

Flow is perennial in Chartiers Creek and Sugar Run.

8. Is there a discharge from the site to the waterbody? X yes no. If yes, please describe the discharge and its path.

Diffuse groundwater discharges to Chartiers Creek and Sugar Run. Two outfalls discharge to Chartiers Creek (Figure 4).

- 9. Is there a discharge from the waterbody? yes \underline{X} no. If yes, and the information is available, please identify what the waterbody discharges to and whether the discharge is onsite or offsite.
- 10. Identify any field measurements and observations of water quality that were made. For those parameters for which data were collected, provide the measurement and the units of measure in the appropriate space below.
 - <u>9 22</u> Width (feet)
 - <u>0.5 3.5</u> Depth (feet)
 - <u>0.5 2 ft/sec</u> Velocity (specify units): <u>ft/sec</u>
 - 11.2 -14.7 °C Temperature (depth of the water at which the reading was taken: (8-18 inches)
 - <u>6.98 7.79</u> pH (SU)
 - <u>9.96 10.89</u> Dissolved oxygen ppm
 - <u>NA</u> Salinity
 - 14 71 NTU Turbidity
 - 0.517-0.576 Conductivity mS/cm

11. Describe observed color and area of coloration.

Color of water in Chartiers Creek and Sugar Run was turbid.

12. Is any aquatic vegetation present? X yes no. If yes, please identify the type of vegetation present, if known.

Emergent (in ditch) Submergent Floating

Only attached algae observed in Chartiers Creek.

13. Mark the flowing water system on the attached site map.

See habitat/land use map (Figure 3) and benthic sampling station map (Figure 4).

14. What observations were made at the waterbody regarding the presence and/or absence of benthic macroinvertebrates, fish, birds, mammals, etc.?

Raccoon tracks and deer tracks observed along Chartiers Creek and Sugar Run banks. Belted kingfisher, great blue heron, crayfish, leech, caddisflies, mayflies, snails, fantail darters and minnows.

V. WETLAND HABITAT CHECKLIST

1. Based on observations and/or available information, are designated or known wetlands definitely present at the site?

X yes no Wetlands are present on the site (Figures 3, 5)

Please note the sources of observations and information used (e.g., USGS Topographic Maps, National Wetland Inventory, Federal or State Agency, etc.) to make this determination.

Sources of information include previous wetland delineation report (Appendix D), USGS topographic map (Figure 1), aerial photograph (Figure 2), habitat/land use map (Figure 3), benthic sampling locations and tar-impacted soil and sediment map (Figure 4), National Wetlands Inventory and 100 yr Floodplain map (Figure 5), and soil survey map (Figure 6), and site visits conducted on September 17, 2003 and October 19-20, 2003.

A wetland delineation was not performed as part of this site characterization. However, general observations of wetland habitat were noted and approximate locations noted on Figures 3, 5. Approximately 7.87 acres of potential jurisdictional wetlands were visually identified during the site visit. ACRT, Inc. completed a wetland delineation in 1996 on approximately 28.8 acres of the site, which consisted of Area 3, Area 5 and Area 7A (south of Sugar Run) (ICF 1997). ACRT, Inc. identified 3.25 acres of wetlands including scrub/shrub, lowland floodplain woods and wet meadows (see Appendix D) for wetland delineation map).

2. Based on the location of the site (e.g., along a waterbody, in a floodplain) and site conditions (e.g., standing water; dark, wet soils; mud cracks; debris line; water marks), are wetland habitats suspected?

X yes no. If yes, proceed with the remainder of the wetland habitat identification checklist.

3. What type(s) of vegetation are present in the wetland?

Submergent	X Emergent
X Scrub/Shrub	X Wooded
Other (specify)	

4. Provide a general description of the vegetation present in and around the wetland (height, color, etc.). Provide a photograph of the known or suspected wetlands, if available.

Dominant canopy species in the lowland floodplain woods include box elder (*Acer negundo*), red ash (*Fraxinus pennsylvanica*) and American elm (*Ulmus americana*). The under story is dominated by garlic mustard (*Alliaria petiolata*), and moneywort (*Lysimachia nummularia*).

Area 5 and 7A: Mixed forested and scrub/shrub wetland habitat dominant vegetation consists of redwillow dogwood (*Cornus ammoum*), moneywort, willow herb (*Epilobium ciliatum*) and unidentified sedges (*Carex sp.*)

Area 8: Scrub/Shrub wetland habitat vegetation consisted of red-willow dogwood, swamp milkweed (Asclepias purpurascens), willow-herb, cattail, arrow-leaf tear thumb (Polygonum sagittatum) and

unidentified sedges. Common herbaceous wetland habitat included purple-leaved willow-herb (Epilobium coloratum), red-osier dogwood (Cornus sericea) and purple stemmed aster (Aster puniceus). 5. Is standing water present? X yes no. If yes, is the water: X Fresh Brackish What is the approximate area of the water (square feet)? Please complete questions 4, 11, and 12 in Checklist III – Aquatic Habit – Non-Flowing Systems 6. Is there evidence of flooding at the site? What observations were noted? Buttressing X Water marks Mud cracks X Debris line X Other: inundation, soil saturation 7. If known, what is the source of the water in the wetland? X Stream/River/Creek/Lake/Pond X Groundwater X Flooding X Surface Runoff 8. Is there a discharge from the site to a known or suspected wetland? yes \underline{X} no. If yes, please describe. None observed. 9. Is there a discharge from the wetland? yes X no. If yes, to what waterbody is discharge released? None observed. Surface Stream/River Lake/Pond Marine Groundwater 10. If a soil sample was collected, describe the appearance of the soil in the wetland area. Circle or write in the best response: Color (blue/gray, brown, black, mottled): Surface soils are dark brown 10YR3/1 and 10YR 3/2 with mottles Water content (dry, wet, saturated/unsaturated): Surface soils are saturated to inundated 11. Mark the observed wetland area(s) on the attached map). See habitat/land use map, Figures 3, 5.

Wildlife observations in wetlands:

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White-tailed deer and raccoon tracks, great blue heron, belted kingfisher, red-winged blackbirds, crayfish burrows, and frog.



Photo 1. Areas 1 and 2: Overview of former main process plant, looking west.



Photo 2. Area 4: View of upland old field by former Tylerdale Connecting railroad, looking northwest

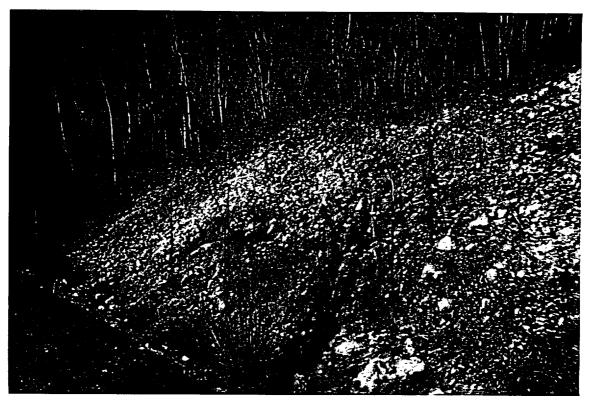


Photo 3. Area 4: View of southside of railroad right-of-way where some low level radioactive material in the form of colored glass and/or refracting brick used or produced by the Hazel-Atlas Glass of refractory was deposited on hillside.



Photo 4. Area 5: View of former North Tar Pond, *Phragmites* and *Typha* stand looking northwest.



Photo 5. Area 5: View of tar impacted area between gravel access road and I-70, looking northeast.



Photo 6. Area 5: View of lowland floodplain between South Tar Pond and Chartiers Creek, looking east to I-70.



Photo 7. Area 5: View of South Tar Pond looking southwest.



Photo 8. Area 7A: View of wooded wetland area on southside of bend in service road. Slight oil sheen observed on water surface.



Photo 9. Area 7A: View of successional woods from service road near the former Old Foundation, looking north.



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Photo 10. Area 7A: View of depressional area near former Old Foundation, looking northwest. Coal tar seep excavated here.



Photo 11. Area 7A: View of mid-successional scrub-shrub/old field located west of Old Foundation, looking northwest.



Photo 12. Area 7A: View of successional wood, looking east toward Sugar Run.



Photo 13. Area 7B: View of upland old field, looking south, near former gas wells.



Photo 14. Area 7B. View of scrub/shrub wetland, looking north.



Photo 15. Area 8: View of herbaceous wetland meadow located near intersection of Caldwell and Weirick Avenues, looking northwest.



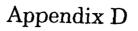
Photo 16. Area 8: View of scrub/shrub wetland area along west side of Chartiers Creek.



Photo 17. Area 8: View of upland old field and site of former house trailer.



Photo 18. Area 8: View of upland successional woods looking east, downhill toward Chartiers Creek.



ACRT, Inc. 1996 Wetland Delineation Map

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03/15/2004

WETLANDS DELINEATION REPORT

MOLYCORP SITE 28.8 ACRES

WASHINGTON, PENNSYLVANIA

Prepared for

IT Corporation 2790 Mosside Boulevard Monroeville, Pennsylvania 15146 412-372-7701

Prepared by

ACRT, Inc. 2545 Bailey Road P.O. Box 401 Cuyahoga Falls, Ohio 44221 800-622-2562



September 1996 with December 1996 revisions

Project #962236

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ACKNOWLEDGMENTS

ACRT is grateful for assistance from Bill Stanhope and Mark Weisberg of IT Corporation.

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STATEMENT OF CERTIFICATION

The analyses, opinions, and conclusions in this report are limited only by the reported assumptions and are based entirely on ACRT's unbiased, professional judgment. ACRT's compensation is not in any way contingent on any action or event resulting from this study. Neither ACRT nor any ACRT employee has any vested interest in the property examined in this study.

EXPIRATION DATES FOR WETLANDS DELINEATION REPORTS

This wetlands delineation report is valid for a period of five years from the time it is issued. Refer to U.S. Army Corps of Engineers Regulatory Guidance Letter # 94-1 (May 23, 1994).

DETERMINATION OF WETLANDS JURISDICTION

Final determination of wetlands jurisdiction in the State of Pennsylvania is made by the U.S. Army Corps of Engineers. Wetlands delineations and related wetlands studies are not considered officially valid until approved by this agency. ACRT, Inc. is not responsible for any decisions made based on wetlands delineations or assessments that have not been validated by this agency.



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TABLE OF CONTENTS

Acknowledgments
Statement of Certification iii
Expiration Dates for Wetlands Delineation Reports iii
Determination of Wetlands Jurisdiction
List of Attachments
INTRODUCTION
SITE DESCRIPTION
AGENCY RESOURCE INFORMATION
SITE ECOLOGY
METHODOLOGY
DISTURBED SITES
RESULTS AND CONCLUSIONS
ATTACHMENTS



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Page iv

LIST OF ATTACHMENTS

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Attac	hment Page
А.	Location of Washington County, Pennsylvania
B.	Approximate Location of Site on Highway Map of Pennsylvania
C.	Location of Site on USGS 7.5-minute (Topographic) Map (West Washington Quadrangle)
D.	Location of Site on NWI Map (West Washington Quadrangle)
E.	Location of Site on Washington County Soil Survey Map
F.	Description of Soil Types Found on Site (from Seibert, et al. 1983) 15
G.	List of Hydric Soils, Washington County, Pennsylvania
H.	Supplemental List of Non-Hydric Soil Map Units with Hydric Components, Washington County, Pennsylvania
I.	Map of Major Plant Communities and Location and Direction of View of Photographs
J.	Map of Soils
К.	Description of Soil Types Found on Site
L.	Map of Field Sampling Points and Derived Wetlands Boundaries, with Wetlands Areas in Acres
M.	Field Sampling Date
N.	Data Summary Table
О.	Definition of Wetlands Vegetation Indicator Status
Ρ.	Field Data Sheets (Soils/Hydrology and Vegetation Analysis)
Q.	Photographs
R.	References
S.	Profiles of ACRT Scientists

1. INTRODUCTION

1.20

A. Project Location

The 28.8-acre site is located in Washington County near Caldwell Avenue and Interstate 70 in Washington, Pennsylvania (Attachments A and B).

B. Extent to which work will involve fill or disturbance to any jurisdictional wetland(s) based on client's plans Wetlands fill requirements have not yet been determined. When this information is known, the Pennsylvania Department of Environmental Protection will be notified regarding permitting.

C. Location of site on USGS quadrangle map The site is shown on the West Washington quadrangle of the United States Geological Survey (USGS) 7.5-minute series (topographic) map (Attachment C).

- 2. SITE DESCRIPTION
- A. General topographic relief of the project site and surrounding landscape The landscape is gently rolling to steep, with elevations ranging from near 1,015 feet along Chartiers Creek and Sugar Run to 1,128 feet on a hilltop in the southwest corner of the site.

B. Description of any floodplain, streams, or water bodies located on or near the site Chartiers Creek and Sugar Run flow through the site. Sugar Run flows into Chartiers Creek which flows north and east after it leaves the site, eventually entering the Ohio River just west of Pittsburgh.

C. Description of any pre-project artificial alterations such as impoundments, erosion outwash areas, drainage works, or other similar features Molycorp, Incorporated owns and operates a ferroalloys plant in Washington, Pennsylvania. This facility is comprised of approximately 55 acres of land, of which the manufacturing operations occur on approximately 20 acres. The wetlands delineation survey focuses on approximately 30 acres of the site, and is not inclusive of the area where manufacturing operations occur. This 30-acre portion of the site was acquired by Molycorp in 1975 from Brockway Glass Company (BGC) and Tylerdale Connecting Railroad Company (TCRC). BGC and TCRC were responsible for most of the current site conditions in the 30-acre area. Ownership of these parcels changed hands several times prior to Molycorp's acquisition of the property. An impoundment containing tar is located in the southeastern corner of the site. The impoundment was constructed in 1985, for management of the tars in a controlled and centralized environment. The impoundment was later covered with soil and vegetated. Currently, the tar impoundment area is a mixture of upland old field and successional wetlands. In some areas of the impoundment, tar is visible at the surface.

Areas of fill and an existing roadbed are found near Chartiers Creek and Sugar Run. This has likely restricted the drainage for Wetland B, causing water to pond during wet periods.

3. AGENCY RESOURCE INFORMATION

A. National Wetlands Inventory (NWI) Map

The NWI map (West Washington quadrangle) showing the area is found in Attachment D. The tar impoundment area is classified as a palustrine, unconsolidated bottom, semipermanently flooded, diked/impounded wetlands system (code PUBFh). Just north of the tar pit is a palustrine, emergent, persistent, seasonally flooded wetlands system (code PEM1C). A palustrine, unconsolidated bottom, permanently flooded, diked/impounded wetlands system (code PUBHh) is located at the top of the hill in the southwest property corner. Chartiers Creek is classified as a riverine, lower perennial, unconsolidated bottom, permanently flooded wetlands system (code R2UBH).

B. Description of any or all ecological classification information available for the site The original vegetation on the property was probably a mixture of upland and lowland woods, depending on local soil and drainage conditions.

C. Washington County soils map

The site is on sheet 52 of the Soil Survey of Greene and Washington Counties, Pennsylvania (Seibert, *et al.*, 1983). See Attachment E. The soil types mapped for the property are:

CaD	• .	Culleoka silt loam, 15 to 25 percent slopes
DoB		Dormont silt loam, 3 to 8 percent slopes*
DoC	-	Dormont silt loam, 8 to 15 percent slopes*
DiD	-	Dormont-Culleoka silt loams, 15 to 25 percent slopes
DtF	-	Dormont-Culleoka silt loams, 25 to 50 percent slopes
Nw	-	Newark silt loam*
Us	-	Urban land

- Non-hydric soil with hydric inclusions

The soil descriptions by Seibert, et al. (1983) for these types are found in Attachment F. [Note: This site was surveyed carefully for hydric soils during the wetlands delineation and a detailed soil map was prepared. This is discussed in paragraph 4B.]



<u>Wet Meadows.</u> Wetlands D, E, F, G, and H can be classified as wet meadow (Photographs 3, 4, and 5, Attachment Q). These are small, isolated wetlands created or enhanced by excavation, soil compaction, and/or rutting. Common species include *Asclepias incarnata* (swamp milkweed, OBL), Juncus effusus (soft rush, FACW+), *Scirpus validus* (soft stem bulrush, OBL), S. atrovirens (green bulrush, OBL), S. cyperinus (wool grass, FACW+), Typha sp. (cattail, OBL), and Alisma plantago-aquatica (water plantain, OBL).

<u>Scrub/shrub Wetlands.</u> Wetlands A and B are scrub/shrub wetlands (Photograph 2, Attachment Q). Common shrubby species include *Cornus amomum* (silky dogwood, FACW), *Viburnum recognitum* (northern arrow-wood, FACW-), and *Spiraea* sp. (meadowsweet). Herbaceous species are present and similar to what occurs in the marshes and wet meadows, but are more scattered due to the dense shrub cover.

Lowland Floodplain Woods. Wetland C is a lowland woods located on the floodplain of Sugar Run and Chartiers Creek (Photograph 2, Attachment Q). Frequent, but brief inundation occurs here. Common species are limited to Acer negundo (box elder, FAC+), Acer saccharinum (silver maple, FACW), Cornus amomum (silky dogwood, FACW), and Lysimachia nummularia (moneywort, OBL).

B. Description of hydric soils and their extent based on soils map and field data (shown on simple soil map)

No hydric soils are identified on the soil survey map of the site. Newark silt loam can have hydric inclusions. Most areas of Newark silt loam on the site were found to meet hydric soils criteria. The extent of this hydric soil and the location of other soils are shown on the map in Attachment J and described in Attachment K.

C. Description and explanation of any unusual plant assemblages, soil types, disturbed, modified, or filled areas

As previously discussed, several companies owned portions of the site prior to Molycorp's acquisition. Subsequently, much of the site was disturbed through the placement of various fill materials and the construction of several access roads. Areas of fill and several access roads are found on the site. The portions of the site near Caldwell Avenue are primarily utilized for current plant activities and consist of industrial buildings surrounded by asphalt. As discussed, the tar impoundment near Interstate 70 has been covered with soil. The impoundment area currently contains a mixture of upland old field and wet meadow vegetation. Areas of fill, disturbed soils, and a former excavation site were also observed on the hill top in the southwestern corner of the site.

Wetlands at the site have either resulted from or been affected by previous disturbance. Fill materials form the southern boundary of Wetland A and have reduced the size of the Sugar Run floodplain. The placement of fill materials along the edges of Wetlands B and C has restricted drainage and caused these areas to expand hydrologically. Wetland D appears to be the remnant of a drainage ditch within a more recently disturbed area.



Wetland E is a wet meadow which has formed within the fill over the tar impoundment. Wetlands F, G, and H are wet meadow pockets resulting from disturbances associated with previous excavation activities.

5. METHODOLOGY

A. Detailed description of sampling procedures used to evaluate the site ACRT performed this delineation using criteria and guidance in the 1989 Federal Manual for Identifying and Delineating Jurisdictional Wetlands (Federal Interagency Committee for Wetland Delineation, 1989).

Soil, hydrology, and vegetation are used to identify jurisdictional wetlands. Field sampling took place on August 20, 1996. Preliminary planning and reconnaissance of maps were performed prior to starting field work. Quantitative samples of soils, hydrology, and vegetation were taken at 22 locations.

The soils on the site were sampled during the delineation. Conditions were deemed hydric when the criteria of the National Technical Committee for Hydric Soils (1991) were met.

The hydrology of the site was also characterized during this study. The degree of soil saturation and inundation was recorded for each general plant community and soil type. Field indicators were examined at specific sample stations. Wetlands designations were assigned based on depth of water table, soil type, and hydrologic indicators as described by the 1989 Manual.

Vegetation was quantitatively sampled to document the wetlands delineation. At each sample location, the percent cover of trees and shrubs was visually estimated within a 5 meter by 5 meter quadrat. Percent cover of herbaceous plants was visually estimated in a 1 meter by 1 meter area. Percent dominance of each species in each stratum was recorded in the field. Data were entered into a computer and a total dominance measure calculated for each stratum. Species that comprised 20 percent of the total dominance measure for the stratum were classified as dominant. The number of dominant species from all strata combined that were obligate (OBL), facultative-wet (FACW), or facultative (FAC) was determined for each sample. This number was divided by the number of all dominant plants to determine the percentage of dominant wetlands plants. Wetlands criteria were met when the percentage of dominant wetlands plants exceeded 50 percent. Wetlands indicator status was assigned based on Reed (1988).

Attachment K shows all vegetation, soil, and hydrology sampling locations.

B. Information submitted for each sample point in the field

- i. Quadrat size used to estimate the areal cover of all dominant species for each stratum of vegetation was as follows:
 - Herbaceous vegetation 1×1 meter plot Shrubs - 5×5 meter plot Trees - 5×5 meter plot

The total dominance measure (TDM) per canopy and the dominant species were tabulated and calculated for each quadrat.

- ii. Dominant plant species were identified to species (using scientific names) and their wetlands indicator status was listed according to Reed (1988).
- Soil samples were taken at 12 to 18 inches. The depth from the surface the soil sample was taken and the hue, value, and chroma of the sample were described.
 A soils map and descriptions of soils are in Attachments F and G. Soils data sheets for each sample site are in Attachment N.
- C. Explanation/justification of any deviations in methodology described by the Federal Manual for Identifying and Delineating Jurisdictional Wetlands (1989) Not applicable.

D. Baseline map corresponding to the wetlands delineation including all field survey transects, labeled sampling point locations (corresponding with data sheets), location/direction of view of site photographs and derived wetlands boundary
 Attachment L shows all vegetation sampling locations in relation to all identified wetlands.
 A detailed summary sheet organized by sample number and all field data sheets are in Attachments N and P.

Photographs were taken during the field surveys to show the landscape and overall plant community composition. See Attachment Q for photographs and Attachment I for a map showing location and direction of view of the photographs.

E. Description of adjacent parcels of wetlands or non-wetlands parcels to support wetlands determination

The site is located in a portion of Canton Township, Washington County, Pennsylvania which is zoned for industrial activity. Surrounding land use in the immediate vicinity of the site is a mixture of industrial use and undeveloped land.



6. DISTURBED SITES

A. Description of any of the three parameters (vegetation, soils, and hydrology) that were disturbed or modified on the site

As previously discussed, several companies owned portions of the site prior to Molycorp's acquisition. Subsequently, much of the site was disturbed through the placement of various fill materials and the construction of several access roads. Areas of fill and several access roads are found on the site. The portions of the site near Caldwell Avenue are primarily utilized for current plant activities and consist of industrial buildings surrounded by asphalt. As discussed, the tar impoundment near Interstate 70 has been covered with soil. The impoundment area currently contains a mixture of upland old field and wet meadow vegetation. Areas of fill, disturbed soils, and a former excavation site were also observed on the hill top in the southwestern corner of the site.

Wetlands at the site have either resulted from or been affected by previous disturbance. Fill materials form the southern boundary of Wetland A and have reduced the size of the Sugar Run floodplain. The placement of fill materials along the edges of Wetlands B and C has restricted drainage and caused these areas to expand hydrologically. Wetland D appears to be the remnant of a drainage ditch within a more recently disturbed area. Wetland E is a wet meadow which has formed within the fill over the tar impoundment. Wetlands F, G, and H are wet meadow pockets resulting from disturbances associated with previous excavation activities.

- B. Description of any necessary techniques used to further study the site if any one or more of the wetlands indicator parameters is missing due to disturbance/modification Not applicable.
- 7. RESULTS AND CONCLUSIONS
- A. Notation of acreage of identified jurisdictional wetlands based upon the on-site delineation

Wetlands	Acreage
wenands	Acteage
A	0.503
В	1.315
С	0.869
D	0.059
E	0.377
F	0.090
G	0.034
Н	.0.006
Total	3.253

Jurisdictional Wetlands

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- B. Description of how acreage was calculated
 Wetlands areas were surveyed using a Trimble Pro XL global positioning system (GPS).
 Wetlands acreages were calculated using AutoCAD, a computer assisted design (CAD) program.
- C. Discussion of any unusual problems or difficulties encountered in the field which may have affected the wetlands boundary delineation Not applicable.
- D. Identification and explanation (or justification) for any impact any problem areas may have on the delineation result

ACRT believes that all jurisdictional wetlands on this site were identified.



ATTACHMENTS

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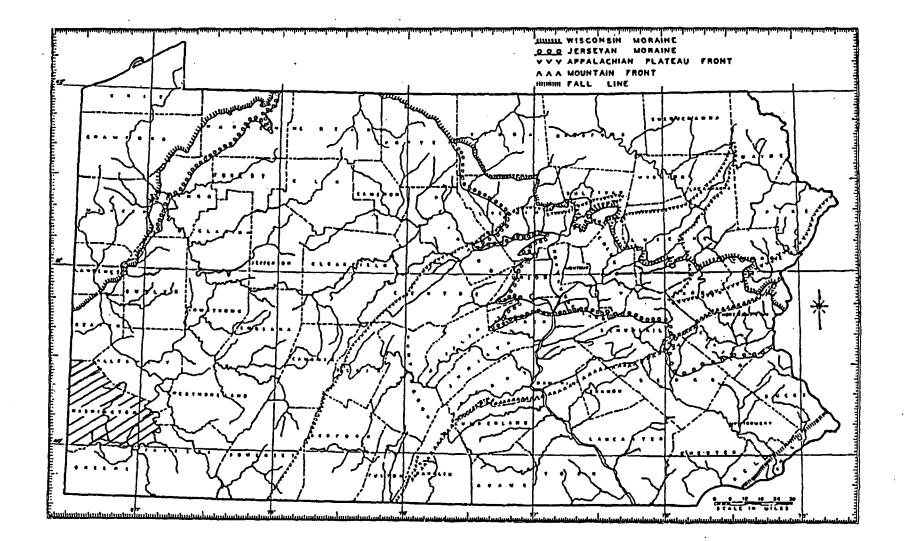
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Page 9



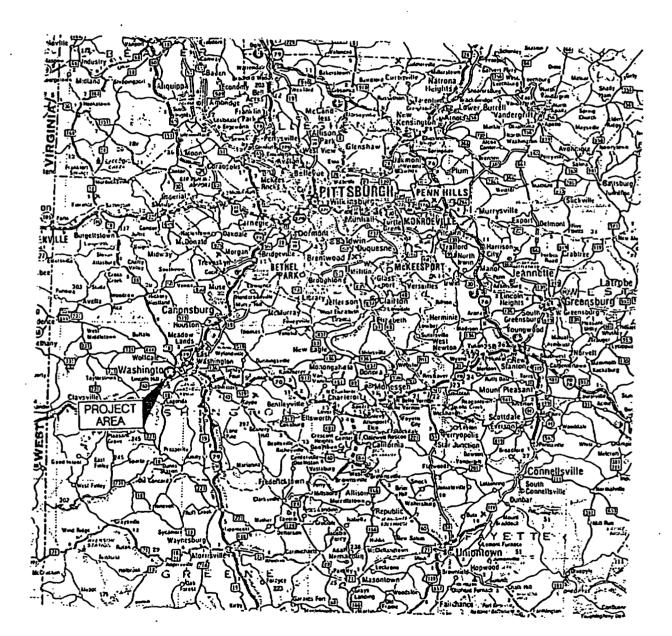
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Attachment B.

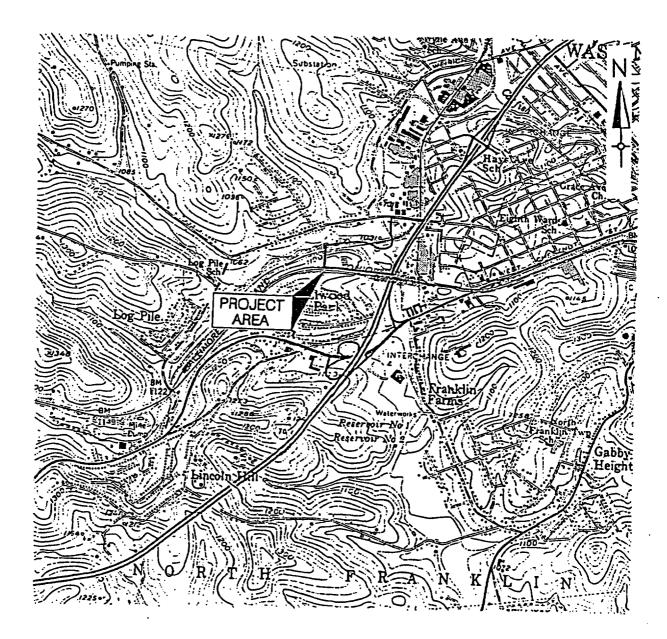
Approximate Location of Site on Highway Map of Pennyslvania



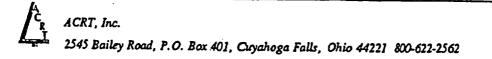
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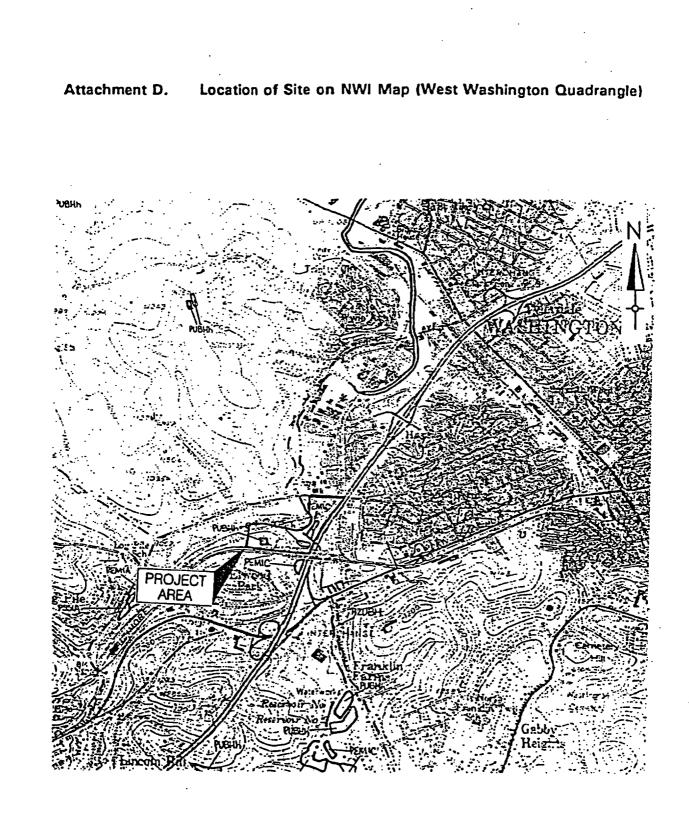
Attachment C.

Location of Site on USGS 7.5-minute (Topographic) Map (West Washington Quadrangle)



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SCALE: 1INCH = 2,000 FEET

Attachment E.



SCALE: 1 INCH = 1,320 FEET

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Attachment F.

Description of Soil Types Found on Site (from Seibert, et al. 1983)

CaB—Culleoka silt loam, 3 to 8 percent slopes. CaC—Culleoka silt loam, 8 to 15 percent slopes. CaD—Culleoka silt loam, 15 to 25 percent slopes.

These soils are moderately deep and well drained. The areas are on uplands and range from about 2 to 50 acres. Slopes range from 100 to 600 feet in length.

Typically, the surface layer of these soils is dark brown silt loam about 11 inches thick. The subsoil is yellowish brown and is about 14 inches thick. The upper 10 inches is light silty clay loam, and the lower 4 inches is shaly heavy silt loam. The substratum is yellowish brown very shaly silt loam about 3 inches thick. Shale bedrock is at a depth of 28 inches.

Included with these soils in mapping are a few small areas of Dormont, Guernsey, Brooke, Dekalb, and Weikert soils. Also included are small areas of a soil that is similar to these Culleoka soils but that is more than 40 inches deep to bedrock. Included soils make up about 25 percent of each unit.

The permeability of these Culleoka soils is moderately rapid, and the available water capacity is moderate. Runoff is medium on units CaB and CaC and rapid on unit CaD. Reaction in unlimed areas is medium acid or strongly acid in the surface layer and subsoil. The hazard of erosion is moderate on unit CaB, severe on unit CaC, and very severe on unit CaD.

Areas of these soils are used for cultivated crops, for hay and pasture, for woodland, and for community development. Most areas of units CaB and CaC are used for cultivated crops or hay. Most of unit CaD is used for hay and pasture.

All areas of these soils are generally suitable for cultivated crops, but those of units CaB and CaC are better suited. Contour stripcropping, minimum tillage, grassed waterways, diversions, and cover crops help to reduce runoff and control erosion. Growing cover crops, returning crop residue to the soil, and using grasses and legumes in the cropping system help maintain the organic matter content and tilth of the soils.

The soils are well suited to pasture. The prevention of overgrazing is a major pasture management concern. Proper stocking rates to maintain key plant species, rotating of pastures, and periodically applying nutrients are major pasture management practices.

The soils are suitable for trees, and the potential for woodland is high. Machine planting is practical in larger areas. Livestock graze many areas of woodland on these soils, hindering the establishment and growth of young trees. The hazard of erosion and the slope in unit CaD limit the use of equipment on these soils. Constructing roads on the contour of these more sloping areas helps to control erosion during timber harvesting. CaB-Culleoka silt loarn, 3 to 8 percent slopes.

CaC-Ceulleoka silt loam, 8 to 15 percent slopes.

CaD—Culleoka silt loam, 15 to 25 percent slopes. (continued) The depth to bedrock limits the use of these soils for community development, especially for onsite waste disposal. Slope in the areas of units CaC and CaD is an additional limitation for community development.

The capability subclass is lle for unit CaB, Ille for unit CaC, and IVe for unit CaD; the woodland ordination symbol is 20 for units CaB and CaC, and 2r for unit CaD.

DoB-Dormont silt loam, 3 to 8 percent slopes. DoC-Dormont silt loam, 8 to 15 percent slopes. DoD-Dormont silt loam, 15 to 25 percent slopes. These soils are deep and moderately well drained. Slopes are 100 to 500 feet long. The areas are on uplands and range from about 2 to 150 acres. Typically, the surface and subsurface layers of these soils are dark brown silt loam and have a combined thickness of 12 inches. The subsoil is 42 inches thick. The upper 15 inches is yellowish brown silt loam and silty clay loam. The lower 27 inches is mottled, yellowish brown silty clay loam and channery silty clay loam. The substratum is mottled, brown silty clay to a depth of 78 inches.

Included with these soils in mapping are small areas of Culleoka, Guernsey, Library, and Weikert soils. Also included are soils that are similar to these Dormont soils but that are more poorly drained or shallower to bedrock. Included soils make up about 20 to 25 percent of each unit.

The permeability of these Dormont soils is slow to moderately slow, and the available water capacity is high. Runoff ranges from medium on unit DoB to rapid on units DoC and DoD. Reaction in unlimed areas is very strongly acid to medium acid to a depth of about 25 inches and is strongly acid to medium acid at a depth of more than 25 inches. A seasonal high water table is at a depth of 18 to 36 inches. The hazard of erosion is moderate on unit DoB and severe on units DoC and DoD.

These soils are used for cultivated crops, for hay and pasture, for woodland, and for community development. Many of the areas of unit DoB are used for crops; most of the acreage of units DoC and DoD is used for pasture or woodland.

Most areas of these soils are suited to cultivated crops, but the areas of unit DoB are better suited. Contour stripcropping and using minimum tillage, grassed waterways, cover crops and hay in the crop rotation help to reduce runoff and control erosion. Subsurface drains are needed in some areas to drain wet spots. Growing cover crops, returning crop residue to the soil, and using grasses and legumes in the cropping system help to maintain the organic matter content and tilth of the soils.

These soils are well suited to pasture. The prevention of overgrazing is a major pasture management concern.



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DoB-Dormont silt loam, 3 to 8 percent slopes. DoC-Dormont silt loam, 8 to 15 percent slopes. DoD-Dormont silt loam, 15 to 25 percent slopes. (continued)

The use of proper stocking rates to maintain key plant species, pasture rotation, and periodic applications of nutrients are the main management practices. Restricted grazing and keeping equipment off the soils during the wet seasons help prevent compaction of the surface layer.

The soils are suitable for trees, and the potential for woodland is high. Machine planting is practical in larger areas, but slope limits the use of equipment on unit DoD. Constructing roads on the contour of such areas helps to control erosion during timber harvesting. Livestock graze many areas of woodland on these soils, hindering the establishment of young trees.

The seasonal high water table and slow to moderately slow permeability limit these soils for community development, especially for onsite waste disposal. Slope is an additional limitation on unit DoD, and low strength is a hazard for roads and foundations.

The capability subclass is IIe for unit DoB, Ille for unit DoC, and IVe for unit DoD; the woodland ordination symbol is 20 for units DoB and DoC, and 2r for unit DoD.

DtD—Dormont-Culleoka silt loams, 15 to 25 percent slopes. This complex consists of moderately steep, deep and moderately deep, moderately well / drained and well drained soils on uplands. Slopes are 100 to 600 feet long. The areas range from 5 to 400 acres. Dormont soils make up about 55 percent of this unit, Culleoka soils about 40 percent, other soils about 5 percent. The soils are so intermingled that it was not practical to map them separately.

Typically, the surface and subsurface layers of the Dormont soils are dark brown silt loam and have a combined thickness of about 12 inches. The subsoil is 42 inches thick. The upper 15 inches is yellowish brown silt loam and silty clay loam. The lower 27 inches is mottled, yellowish brown silty clay loam and channery silty clay loam. The substratum is mottled, brown silty clay to a depth of 78 inches.

Typically, the surface layer of the Culleoka soils is dark brown silt loam about 11 inches thick. The subsoil is yellowish and is about 14 inches thick. The upper 10 inches is light silty clay loam, and the lower 4 inches is shaly heavy silt loam. The substratum is yellowish brown very shaly silt loam about 3 inches thick. Shale bedrock is at a depth of 28 inches.

Included with these soils in mapping are small areas of Brooke, Weikeri, Guernsey, and Library soils. Also included are soils similar to these Dormont soils but that are more poorly drained or shallower to bedrock.

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DtD-Dormont-Culleoka silt loams, 15 to 25 percent slopes.(continued)

These Dormont soils have moderately slow permeability and high available water capacity. Runoff is rapid, and the hazard of erosion is very severe. Reaction in unlimed areas of the Dormont soils is very strongly acid to medium acid to a depth of about 25 inches and strongly acid or medium acid at a depth of more than 25 inches. A seasonal high water table is at a depth of 18 to 36 inches.

The Culleoka soils have moderately rapid permeability and moderate available water capacity. Runoff is rapid, and the hazard of erosion is very severe. Reaction in unlimed areas of the Culleoka soils is medium acid or strongly acid to a depth of about 25 inches.

Most areas of this unit are used for hay and pasture or are in woodland and brushland. A few areas are used for cultivated crops.

These soils are suited to cultivated crops. Contour stripcropping and using minimum tillage, grassed waterways, cover crops, and hay in the crop rotation help to reduce runoff and control erosion. Subsurface drains are needed in some areas of the Dormont soils to drain wet spots. Growing cover crops, returning crop residue to the soil, and using grasses and legumes in the cropping system help to maintain the organic matter content and tilth of the soils.

These soils are suited to pasture. The prevention of overgrazing is a pasture management concern. The main management practices are using proper stocking rates to maintain key plant species, pasture rotation, and using periodic applications of nutrients. Restricted grazing and keeping equipment off the soils during the wet season help to prevent compaction of the surface layer.

The soils are suitable for trees, and the potential for woodland is high. Machine planting is practical in larger areas. The hazard of erosion and the slope limit the use of equipment on these soils. Constructing roads on the contour helps to control erosion during timber harvesting. Livestock graze many areas of woodland on these soils, hindering the establishment and growth of young trees.

Slope, the seasonal high water table in the Dormont soils, and the depth to bedrock in the Culleoka soils are the main limitations for community development, especially for onsite waste disposal. Low strength in the Dormont soils is a hazard for roads and foundations. The capability subclass is IVe; the woodland ordination

sumbol is 2r.



ACRT, Inc. 2545 Bailey Road, P.O. Bax 401, Cuyahoga Falls, Ohio 44221 800-622-2562 DtF-Dormont-Culleoka silt loams, 25 to 50 percent slopes. This unit consists of steep and very steep, deep and moderately deep, well drained and moderately well drained soils on uplands. Slopes are 100 to 800 feet long. Dormont soils make up about 55 percent of this unit, Culleoka soils about 40 percent, and other soils about 5 percent. The areas range from about 5 to 800 acres. The soils are so intermingled that it was not practical to map them separately.

Typically, the surface and subsurface layers of the Dormont soils are dark brown silt loam and have a combined thickness of about 12 inches. The subsoil is 42 inches thick. The upper 15 inches is yellowish brown silt loam and silty clay loarn. The lower 27 inches is mottled, yellowish brown silty clay loam and channery silty clay loarn. The substratum is mottled, brown silty clay to a depth of 78 inches.

Typically, the surface layer of the Culleoka soils is dark brown silt loam about 11 inches thick. The subsoil is yellowish brown and is about 14 inches thick. The upper 10 inches is light silty clay loam, and the lower 4 inches is shaly heavy silt loam. The substratum is yellowish brown very shaly silt loam about 3 inches thick. Shale bedrock is at a depth of 28 inches.

Included with this soil in mapping are small areas of Guernsey, Weikert, and Upshur soils. Also included are areas of soils similar to these Dormont soils but that are more poorly drained and areas of soils that are similar to these Culleoka soils but that are deeper to bedrock. Some areas of the Dormont and Culleoka soils have slopes of more than 50 percent.

These Dormont soils have moderately slow permeability and high available water capacity. Runoff is rapid, and the hazard of erosion is very severe. Reaction in unlimed areas of the Dormont soils is very strongly acid to medium acid to a depth of about 25 inches and strongly acid or medium acid at a depth of more than 25 inches. A seasonal high water table is a depth of 18 to 36 inches.

The Culleoka soils have moderately rapid permeability and moderate available water capacity. Runoff is rapid, and the hazard of erosion is very severe. Reaction in unlimed areas of the Culleoka soils is medium acid or strongly acid to a depth of about 25 inches.

Most areas of these soils are used for pasture or are in woodland and brushland.

Slope and the hazard of erosion make these soils unsuitable for cultivated crops and poorly suited to pasture. The prevention of overgrazing is a major pasture management concern.

These soils are well suited to trees, and the potential for woodland is high. Slope limits the use of equipment, however, and makes machine planting impractical. Constructing roads on the contour helps to control erosion during timber harvesting. Livestock graze many areas of woodland on these soils, hindering the establishment and growth of young trees. DtF-Dormont-Culleoka silt loams, 25 to 50 percent slopes. (continued)

Slope, the seasonal high water table in the Dormont soils, and the depth to bedrock in the Culleoka soils are the main limitations for community development, especially for onsite waste disposal. Low strength in the Dormont soils is a hazard for roads and foundations. The capability subclass is VIIe; the woodland ordination symbol is 2r.

Nw-Newark sllt loam. This soil is nearly level, deep, and somewhat poorly drained. Slopes are 50 to 300 feet long. The areas range from about 5 to 70 acres.

Typically, the surface layer is dark yellowish brown silt loam about 10 inches thick. The subsoil is yellowish brown and mottled, light brownish gray silty clay loam 29 inches thick. The substratum is mottled, light brownish gray and brown loam to a depth of 60 inches.

Included with this soil in mapping are areas of Huntington soils and Fluvaquents. Included soils make up about 25 percent of this unit.

The permeability of this Newark soil is moderate, and the available water capacity is high. Runoff is very slow. Reaction in unlimed areas is medium acid or slightly acid in the surface layer and subsoil. A seasonal high water table is at a depth of 6 to 18 inches. The hazard of erosion is slight.

Most areas of this soil are in hay, pasture, woodland, or brushland. A few areas are used for cultivated crops or community development.

This soil is suited to cultivated crops. Subsurface drains are needed in some areas to drain wet spots. Growing cover crops, returning crop residue to the soil, and using grasses and legumes in the cropping system help to maintain the organic matter content and tilth of the soil.

The soil is well suited to pasture. The prevention of overgrazing is a major pasture management concern. The suitable management practices include using proper stocking rates to maintain key plant species, rotating pastures, and periodically applying nutrients. Livestock need protection from occasional flooding of some areas of this soil.

The soil is well suited to trees, and the potential for woodland is very high. Machine planting is practical on larger areas, but the seasonal high water table limits the use of equipment.

The hazard of flooding and the seasonal high water table are the main limitations of the soil for community development.

The capability subclass is IIw; the woodland ordination symbol is 1w.

ACRT, Inc. 2545 Bailey Road, P.O. Box 401, Cuyahoga Falls, Ohio 44221 800-622-2562 Us-Urban land. This unit consists of areas where more than 85 percent of the surface is covered by asphalt, concrete, buildings, and other impervious surfaces. Examples are parking lots, shopping centers, and industrial parks. These areas are mainly along the Monongahela River and near larger cities and towns. The areas range from 2 to 400 acres.

Examination and identification of soils or materials in this unit are impractical. Onsite investigation is needed to determine the suitabilities and potentials for any use.

This unit is not assigned a capability subclass or woodland ordination symbol.

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Attachment G.

t G. List of Hydric Soils, Washington County, Pennsylvania

Symbol	Soil Name
Ру	Purdy silt loam

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Series and

Attachment H.

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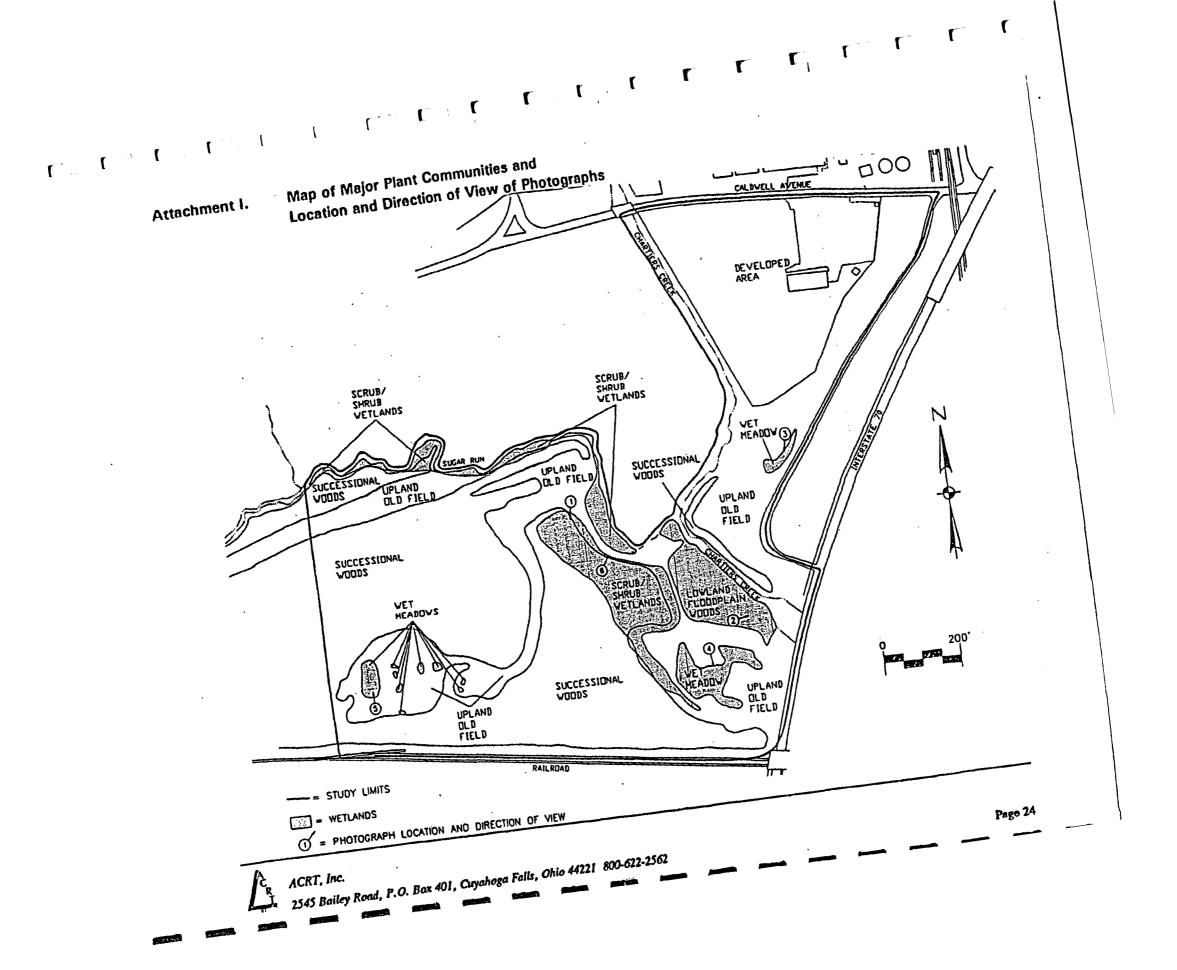
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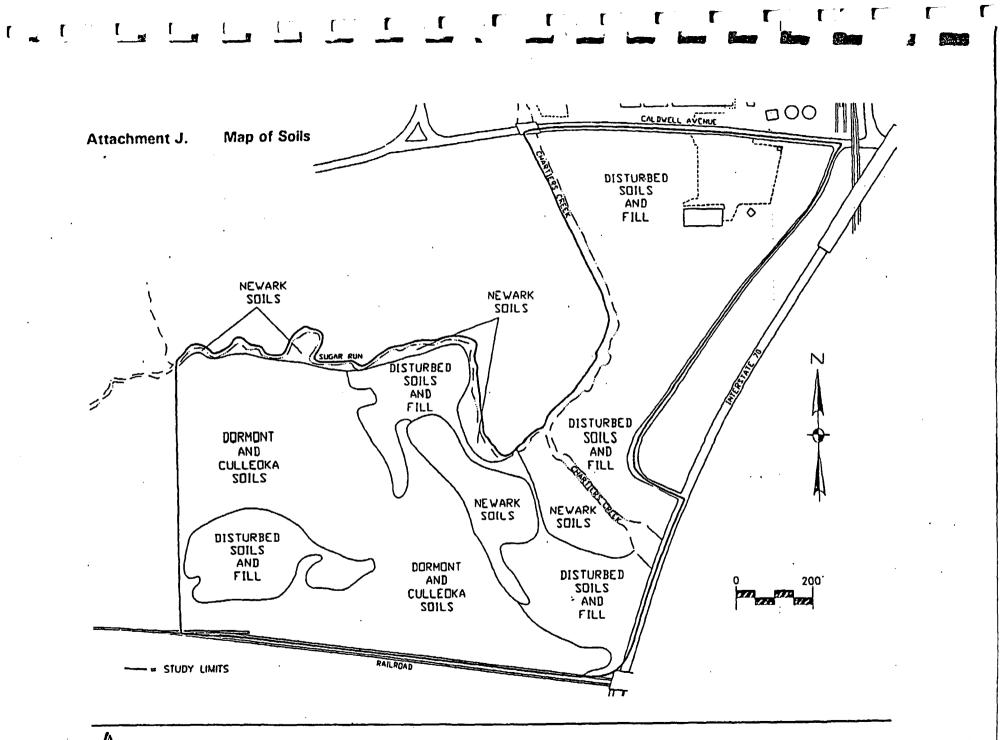
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Supplemental List of Non-Hydric Soil Map Units with Hydric Components, Washington County, Pennsylvania

Symbol	Soil Name	Location Notes
DoB	Dormont silt loam, 3 to 8 percent slopes	Depressions, swales
DoC	Dormont silt loam, 8 to 15 percent slopes	Depressions, swales
Du	Dumps, mine	Depressions
Fa	Fluvaquents, loamy	Bottom lands
GdA	Glenford silt loam, 0 to 3 percent slopes	Depressions, drainageways
GdB ·	Glenford silt loam, 3 to 8 percent slopes	Depressions, drainageways
GdC	Glenford silt loam, 8 to 15 percent slopes	depressions, drainageways
GeB	Guernsey silt loam, 3 to 8 percent slopes	depressions, drainageways
GeC	Guernsey silt loam, 8 to 15 percent slopes	Depressions, drainageways
Hu	Huntington silt loam	Bottom lands
LbA	Library silty clay loam, 0 to 3 percent slopes	Low flats, depressions
LbB	Library silty clay loam, 3 to 8 percents slopes	Low flats, depressions
LPC	Library silty clay loam, 8 to 15 percent slopes	Drainageways, depressions
Nw	Newark silt loam	Bottom lands
UdB	Udorthents, smoothed, gently sloping	Depressions, drainageways
CPD	Udorthents, smoothed, moderately steep	Depressions, drainageways
UkB	Udorthents, strip mine, gently sloping	Depressions, drainageways
UkD	Udorthents, strip mine, moderately steep	Depressions, drainageways
WeB	Weikert-Culleoka complex, 3 to 8 percent slopes	Seepy areas
WeC	Weikert-Culleoka complex, 8 to 15 percent slopes	Seepy areas
WeD	Weikert-Culleoka complex, 15 to 25 percent slopes	Seepy areas
w	Water	6000





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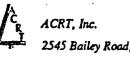
Attachment K. Description of Soil Types Found on Site

Non-hydric soils

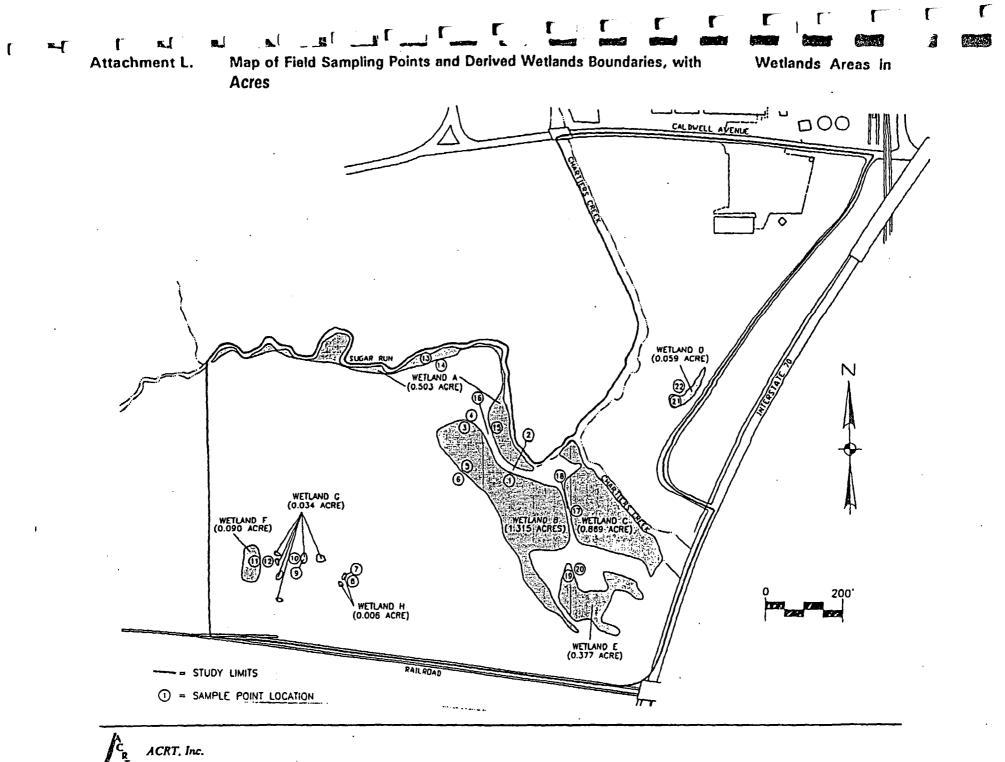
Dormont and Culleoka Soils. The undisturbed uplands and steep slopes are covered by an association of Dormont and Culleoka soils. These are deep, moderately well drained and well drained soils that occur on uplands. Dormont and Culleoka soils formed in residuum of weathered shale, siltstone, and limestone.

Newark Soils. Newark soils occur in association with Chartiers Creek and Sugar Run. These are deep and somewhat poorly drained. Newark soils can have hydric inclusions, and most of these soils on the site meet the hydric soils criteria used to identify jurisdictional wetlands.

Disturbed Soils and Fill. A large portion of the site is covered by disturbed soils and fill and has been utilized for industrial purposes by previous land owners and Molycorp for many years. A significant portion of the hill top area, mainly the steeply sloped sides, have not been affected by industrial activities. Previous land owners placed fill debris consisting of relocated soils, slags, industrial and structural debris primarily in the area of Sugar Run.



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Attachment M. Field Sampling Date

August 20, 1996 Wetlands Delineation Field Work and GPS Boundary Survey

Atta	chment
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STATES.

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N. Data Summary Table

Sample Number	Hydric Soil	Wetlands Hydrology	Percent Wetlands Vegetation	Wetlands	Comments
1	Yes	Yes	100	Yes	Scrub/Shrub Wetlands (Wetland B)
2	No	No	33	No	Upland Old Field
3	Yes	Yes	100	Yes	Scrub/Shrub Wetlands (Wetland B)
4	No	No	17	No	Upland old field
5	Yes	Yes	100	Yes	Scrub/Shrub Wetlands (Wetland B)
6	No	No	33	No	Successional Woods
7.	No (Disturbed)	Yes	100	Yes	Wet Meadow (Wetland H)
8	No	No	50	No	Upland old field
9	Yes	Yes	100	Yes	Wet Meadow (Wetland G)
10	No	No	50	No	Upland Old Field
11	No (Disturbed)	Yes	100	Yes	Wet Meadow (Wetland F)
12	No	No	33	No	Upland Old Field
13	Yes	Yes	100	Yes	Scrub/Shrub Wetlands (Wetland A)
14	No	No	25	No	Successional Woods
15	Yes	Yes	100	Yes	Scrub/Shrub Wetlands (Wetland A)
16	No	No	0	No	Upland Old Field
17	Үсс	Yes	100	Yes	Lowland Floodplain Woods (Wetland C)
18	No	No	25	No	Upland Old Field
19	No	Yes	100	Yes	Wet Meadow (Wetland E)
20	No	No	33	No	Upland Old Field
21	No .	Yes	100	Yes	Wet Meadow (Wetland D)
22	No	No	0	No.	Upland Old Field

ACRT, Inc.

Attachment O. Definition of Wetlands Vegetation Indicator Status **

Obligate Wetlands (OBL) = Occur almost always (estimated probability is greater than 99%) under natural conditions in wetlands.

Facultative Wetlands (FACW) = Usually occur in wetlands (estimated probability 67% - 99%), but occasionally found in non-wetlands.

Facultative (FAC) = Equally likely to occur in wetlands or non-wetlands (estimated probability 34% - 66%).

Facultative Upland (FACU) = Usually occur in non-wetlands (estimated probability 67% - 99%), but occasionally found in wetlands (estimated probability 1% - 33%).

Obligate Upland (UPL) = Occur in wetlands in another region, but occur almost always (estimated probability > 99%) under natural conditions in non-wetlands in the region specified. If a species does not occur in wetlands in any region, it is not on the National List.

Species for which little or no information was available to base an indicator status were assigned a no indicator (NI) status. An asterisk (*) after the indicator status indicates that the indicator status was based on limited ecological information.

The wetlands indicator categories should not be equated to degrees of wetness. Many obligate wetlands species occur in permanently or semipermanently flooded wetlands, but a number of obligates also occur and some are restricted to wetlands that are only temporarily or seasonally flooded. The facultative upland species include a diverse collection of plants that range from weedy species adapted to exist in a number of environmentally stressful or disturbed sites (including wetlands) to species in which a portion of the gene pool (an ecotype) always occurs in wetlands. Both the weedy and ecotype representatives of the facultative upland category occur in seasonally and semipermanently flooded wetlands.

ADDENDUM: ACRT uses two additional status indicators when a plant cannot be identified. The status of Probable Non-Wetlands Indicator (PNI) is used for unidentified plants that are growing on non-hydric soils in an assemblage of upland plants. The status of Probable Wetlands Indicator (PWI) is used for unidentified species that are likely to be hydrophytic based on the surrounding soil and hydrology conditions.

^{**} From: National List of Plant Species That Occur in Wetlands: Pennsylvania, May 1988. United States Fish and Wildlife Service in Cooperation with the National and Regional Interagency Review Panels. Available from the U.S. Department of Commerce, National Technical Information Service, Springfield, VA 22161.

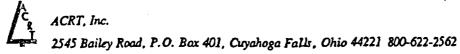


ATTACHMENT P.

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11

FIELD DATA SHEETS (SOILS/HYDROLOGY AND VEGETATION ANALYSIS)



WETLANDS DELINEATION: VEGETATION ANALYSIS ACRT Client: IT CORP ORATION ACRT Project No: 962236						
She: MOLYCC	RP SITE, 28.8 A	CRES	, WASHING	TON, PENN	ISYLVAN	
	eld Investiga llection Date			LL		
Herb Stratum D	ominance Leve		19%	Dománout		
Species	Indic	% Dom	Dominant	Dominant Wetlands	Indic	
CYPERUS SP EPILOBIUM COLORATUM	PWI FACW+	10				
LYSIMACHIA NUMMULARIA			Yes	Yes		
PHALARIS ARUNDINACEA	FACW		Yes	Yes		
Shrub Stratum D	ominance Level		5%	- -		
Species	Indic	% Dom	Dominant	Dominant Wetlands	Indic	
CORNUS AMOMUM	FACW	30	Yes	Yes		

Summary Information for Sample 1 Total Number of Dominant Species: 3 Total Number of Dominant Wetlands Indicator Species: 3

Percent Dominant Species that are Wetlands Species: 100.0% This Analysis indicates Wetlands Conditions

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Comments:

SCRUB/SHRUB WETLANDS (WETLAND B)

Page 32 ACRT, Inc., 2545 Bailey Road, P.O. Box 401, Cuyahoga Falls, Ohio 44221 800-622-2562

	DS DELINEATION: SOIL ACRT Client: IT CO ACRT Project N ORP SITE, 28.8 ACRES,	DRPORATION No: 962236	•
SAMPLE: 1	Field Investigator: Date:	M. JOHNSON 08/20/96	
Do normal environmental conditi	ons exist at the plant co	munity? Yes	
Have vegetation, soil, and/or h	ydrology been significant	ly disturbed? Yes	
Comments: FILL AT EDG	E OF WETLANDS HAS IN	CREASED HYDROLOGY	
<u>SOIL</u> :			
Series: NEWARK SIL	T LOAM Subgrou	ıp:	
Is Soil on Hydric Soil List?	No	Hydric Inclusions?	Yes
Is Soll a Histosol?	No	Histic Epipedon Present?	No
Is Soil Hottled?	No	Is Soil Gleyed?	No
Matrix Colors: 10 YR 3/2	Mottle Colors:	Per	cent:
Other Hydric Soil Indicators:	NONE		
Is Hydric Soil Criterion Met?	Yes		
Rationale: SOMEWHAT	POORLY DRAINED SOIL	PROFILE; HYDRIC INCLU	SION
HYDROLOGY:	· · · · · · · · · · · · · · · · · · ·		
Is ground surface inundated?	No Surface	water depth? N/A	
Is soil saturated? NO	Depth to free standing w	ater in pit/soil probe ho	le: > 18*
Other Indicators:			
Water Harks: Yes	Wetlands Drainag	-	
Drift Lines: NO	Korphological Ad		
Sediment Deposits: Yes	Blackened Leaves		
Surface Scoured Area: Yes	Buttressed Trun	s: No	
Is Wetlands Hydrology Criterion	Ket? Yes		
Rationale: SECONDARY	HYDROLOGICAL INDICA	TORS	
JURISDICTIONAL DETERMIN	ATION:		
Analysis of Vegetation:	SCRUB/SHRUB WETLA	NDS (WETLAND B)	•••
Is this sample a wetlands?	Yes	:	
Rationale: HYDRIC SOIL	S, WETLANDS HYDROI	OGY, AND HYDROPHY	TIC VEGETATION

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ACRT, Inc. 2545 Bailey Road, P.O. Box 401, Cuyahoga Falls, Ohio 44221 800-622-2562

Site: M		Client:	IT C oject	ORPORATIONO: 962236	N	-
Sample # 2	Field Inv Collectio			T. CRANDA 20/96	LL	
Herb Stratum	Dominanc	e Leve		18%		
Species		Indic	% Dom	Dominant	Dominant Wetlands	Indic
AMBROSIA ARTEMISII	FOLIA	FACU	10	<u></u>		
CORONILLA VARIA		UPL	-			
MELILOTUS ALBA		FACU-		Yes		
RUMEX CRISPUS		FACU		¥		
SAPONARIA OFFICINA VERBESINA ALTERNIF		FACU- FAC	20 10	Yes		
Shrub Stratum	Dominance	e Leve	-	1%	Dest.	
Species		Indic	% Dom	Dominant	Dominant Wetlands	Indic
CORNUS AMOMUM		FACW	5	Ye,s	Yes	

Percent Dominant Species that are Wetlands Species: 33.3% This Analysis indicates Non-Wetlands Conditions

Comments:

UPLAND OLD FIELD

Page 34 ACRT, Inc., 2545 Bailey Road, P.O. Box 401, Cuyahoga Falls, Ohio 44221 800-622-2562

	ACRT Client: IT (ACRT Project YCORP SITE, 28.8 ACRE	No: 962236 S, WASHINGTON, PENNS	
SAMPLE: 2	Fleld Investigator: Oate:	M. JOHNSON 08/20/96	
Do normal environmental con	ditions exist at the plant of	community? Yes	
Have vegetation, soil, and/	or hydrology been significar	tly disturbed? Yes	
Comments: OLD ROA		•	
<u>SOIL</u> :		#	
Series: DISTURB	ED SOILS Subgr	oup:	
Is Soll on Hydric Soil List	n N/A	Hydric Inclusions?	N/A
Is Soil a Histosol?	No	Histic Epipedon Present?	No
Is Soil Hottled?	No	Is Soil Gleyed?	No
Matrix Colors: 10 YR 4/3	Hottle Colors	:: Per	cent:
Other Hydric Soil Indicator:	NONE		
Is Hydric Soil Criterion Mei	.1 No		
-	HROMA GREATER THAN 2		
HYDROLOGY:			
Is ground surface inundated?	No Surfa	ce water depth? N/A	
Is soil saturated? No		water in pit/soil probe hol	le: > 18'
Other Indicators:		•	
Water Harks: No) Vetlands Drain	age Patterns: NO	
Drift Lines: No	D Horphological	Adaptations: NO	
Sediment Deposits: No	0 81ackened Leav		
Surface Scoured Area: No	D Buttressed Tru	nks: No	
Is Wetlands Hydrology Criter	ion Met? NO		
Rationale: NO HYDR	DLOGICAL INDICATORS		
JURISDICTIONAL DETER	<u>MINATION:</u>		
Analysis of Vegetation:	UPLAND OLD FIELD		
Is this sample a wetlands?	No		
Rationale: NON-HYD VEGETATI		CE OF WETLANDS HYDR	OLOGY, AND UPLAND

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ACRT, Inc.

2545 Bailey Road, P.O. Box 401, Cuyahoga Falls, Ohio 44221 800-622-2562

WETLANDS DELINEATION: VEGETATION ANALYSIS ACRT Client: IT CORPORATION ACRT Project No: 962236 Site: MOLYCORP SITE, 28.6 ACRES, WASHINGTON, PENNSYLVANIA

Sample # 3	Field Investigator T. CRANDALL Collection Date 08/20/96					
Herb Stratum	Dominance	e Leve		20%	Dominant	
Species		Indic	% Dom	Dominant	Dominant Wetlands	Indic
PHALARIS ARUNDINACEA SCIRPUS VALIDUS		FACW OBL	90 10	Yes	Yes	<u></u>
Shrub Stratum	Dominance	e Level		10%	Da	
Species	-	Indic	% Dom	Dominant	Dominant Wetlands	Indic
CORNUS AMOMUM SALIX SP		FACW PWI	25 25	Yes Yes	Yes Yes	

Summary Information for Sample 3

Total Number of Dominant Species: 3 Total Number of Dominant Wetlands Indicator Species: 3

Percent Dominant Species that are Wetlands Species: 100.0% This Analysis indicates Wetlands Conditions

Comments:

SCRUB/SHRUB WETLANDS (WETLAND B)

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		ACRT Client: IT CC ACRT Project N		
SAMPLE: 3		Field Investigator: Date:	M. JOHNSON .08/20/96	
Do normal enviro	inmental condition	is exist at the plant com	munity? Yes	
Have vegetation,	soil, and/or hyd	Irology been significantl	y disturbed? Yes	
Comments:	FILLING AROU	ND EDGES OF WETLAN	ID HAS INCREASED HYD	ROLOGY
<u>SOIL</u> :				
Series:	NEWARK SILT	LOAM Subgrou	p:	
Is Soil on Hydri	c Soil List?	No	Hydric Inclusions?	Yes
Is Soil a Histos	017	No	Histic Epipedon Present?	No
ls Soil Mottled?		No	ls Soil Gleyed?	No
Matrix Colors:	10 YR 3/1	Mottle Colors:	Perc	ent:
Other Hydric Soi	I Indicators:	NONE		
ls Hydric Soil C	riterion Het?	Yes		
Rationale:	SOMEWHAT PO	OORLY DRAINED SOIL F	PROFILE; HYDRIC INCLU	SION
HYDROLOGY:				************************
is ground surface	e inundated?	No Surface	water depth? N/A	
Is soil saturated	n Yes	Depth to free standing w	ater in pit/soil probe hol	e: 10*
Other Indicators:	1			
Vater Marks:	No	Wetlands Drainag		
Drift Lines:	No	Horphological Ad		
Sediment Deposits		Blackened Leaves		
Surface Scoured #	irea: YOS	Buttressed Trunk	s: No	
Is Wetlands Hydro	logy Criterion M	et? Yes		
Rationale:	OBVIOUS HYDF	OLOGICAL INDICATOR	'S	
JURISDICTION	AL DETERMINA	TION:		
Analysis of Veget	ation:	SCRUB/SHRUB WETLA	NDS (WETLAND B)	, .
Is this sample a	wetlands?	Yes		
Rationale:	HYDRIC SOILS	, WETLANDS HYDROL	OGY, AND HYDROPHY	TIC VEGETATION

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> ACRT, Inc. 2545 Bailey Road, P.O. Box 401, Cuyahoga Falls, Ohio 44221 800-622-2562

	WETLANDS DELINEATION: VEGETATION ANALYSIS
	ACRT Client: IT CORPORATION
	ACRT Project No: 952236
Site:	MOLYCORP SITE, 28.8 ACRES, WASHINGTON, PENNSYLVANIA

Sample # 4	,	Field	Investigat	tor T.	CRANDALL
•	,	Collect	tion Date	08/20/	'96

Herb Stratum	Dominance Leve		20%	D . 1 . 4	
Species	Indic	% Dom	Dominant	Dominant Wetlands	Indic
CORONILLA VARIA	UPL	50	Yes		
DAUCUS CAROTA	UPL	20	Yes		
LOTUS CORNICULATUS	FACU-	20	Yes		
OENOTHERA BIENNIS	FACU-	10			
Shrub Stratum	Dominance Level	= (5%		
		%		Dominant	
Species	Indic	Dom	Dominant	Wetlands	Indic
LONICERA TATARICA	FACU	10	Yes		
RUBUS OCCIDENTALIS	UPL	10	Yes		
ULMUS RUBRA	FAC-	10	Yes	Yes	

Summary Information for Sample 4

Total Number of Dominant Species: 6 Total Number of Dominant Wetlands Indicator Species: 1

Percent Dominant Species that are Wetlands Species: 16.7% This Analysis indicates Non-Wetlands Conditions

Comments:

UPLAND OLD FIELD

Page 38 ACRT, Inc., 2545 Bailey Road, P.O. Box 401, Cuyahoga Falls, Ohio 44221 800-622-2562

		ACRT Client: IT CC ACRT Project N		
SAMPLE: 4	*******	Field Investigator: Date:	M. JOHNSON 08/20/95	
Do normal enviro	nmental condition	ns exist at the plant com	munity? Yes	
Have vegetation,	soil, and/or hyd	drology been significantl	y disturbed? Yes	
Comments:	FILL AND DIST	TURBED SOILS		
<u>SOIL</u> :		*****		*************
Series:		OILS Subgrou		
ls Soil on Hydrid	: Soil List?	N/A	Hydric Inclusions?	N/A
ls Soil a Histosc	17	No	Histic Epipedon Present?	No
Is Soil Mottled?		No	Is Soil Gleyed?	No
Matrix Colors:		Mottle Colors:	Perc	ent:
Other Hydric Soil	Indicators:	NONE		
ls Hydric Soil Cr	iterion Net?	No		
Rationale:	FILL WITH PRE	DOMINATELY NON-HYE	DRIC COLORS	
HYDROLOGY:				
is ground surface	inundated?	No Surface	water depth? N/A	
Is soil saturated	7 No	Depth to free standing w	ater in pit/soil probe hol	e: > 18°
Other Indicators:				
Water Marks:	No	Wetlands Drainag		
Drift Lines:	No	Norphological Ad		
Sediment Deposits Surface Scoured A		Blackened Leaves Buttressed Trunk		
ls Vetlands Hydro	logy Criterion H	et? NO		
Rationale:	NO HYDROLOG	SICAL INDICATORS		
JURISDICTION	AL DETERMINA			····
Analysis of Veget	ation:	UPLAND OLD FIELD	•	
is this sample a	etlands?	No		
	NON-HYDRIC VEGETATION	SOILS, NO EVIDENCE	OF WETLANDS HYDRO	DLOGY, AND UPLAND

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C_R ACRT, Inc. 2545 Bailey Road, P.O. Box 401, Cuyahoga Falls, Ohio 44221 800-622-2562

	ACRT	Client: CRT Pro	IT C	VEGETATIC ORPORATIC No: 962236	N	
Site: MOLY	JORP SITE,	28.8 AL	JHE5	, WASHING	IUN, PENN	STLVAN
Sample#5	Field Inve Collection	estiga Date	tor 08/3	T. CRANDA 20/96	LL	
Herb Stratum	Dominance	Leve		17%	Dominant	
Species		Indic	% Dom	Dominant		Indic
IMPATIENS CAPENSIS LYSIMACHIA NUMMULARIA TYPHA LATIFOLIA		FACW FACW- OBL	50 25 10		Yes Yes	
Shrub Stratum	Dominance	Level	l = : %	15%	Dominant	
Species		Indic	Dom	Dominant	Wetlands	Indic
CORNUS AMOMUM		FACW	75	Yes	Yes	

Summary Information for Sample 5 Total Number of Dominant Species: 3 Total Number of Dominant Wetlands Indicator Species: 3

Percent Dominant Species that are Wetlands Species: 100.0% This Analysis indicates Wetlands Conditions

Comments:

SCRUB/SHRUB WETLANDS (WETLAND B)

ACRT, Inc., 2545 Bailey Road, P.O. Box 401, Cuyahoga Falls, Ohio 44221 800-622-2562 Page 40

	A	INEATION: SOIL CRT Client: IT CC ACRT Project N TE, 28.6 ACRES,	RPORATION	
SAMPLE: 5	Field Date:	Investigator:	M. JOHNS 08/20/96	ON
Do normal environmental	conditions exis	st at the plant con	munity? Yes	3
Have vegetation, soil,	and/or hydrology	/ been significant]	y disturbed?	Yes
Comments: FILLIN	IG AROUND EL	DGES OF WETLAN	IDS HAS INCR	REASED HYDROLOGY
<u>SOIL</u> :				
Series: NEWA	RK SILT LOAM	Subgrou	p:	
Is Soil on Hydric Soil L	.ist? No		Hydric Inclusi	ions? Yes
ls Soil a Histosol?	No		Histic Epipedo	on Present? NO
Is Soil Hottled?	No		Is Soil Gleyed	i? No
Hatrix Colors: 10 YR	4/1	Nottle Colors:		Percent:
Other Hydric Soil Indica	tors: NON	E		
Is Hydric Soil Criterion	Met? Yes			
Rationale: SOME	WHAT POORLY	DRAINED SOIL	PROFILE; HYDI	RIC INCLUSION
HYDROLOGY:	******	********		**************************************
ls ground surface inunda	ted? No	Surface	water depth?	N/A
Is soil saturated?	NO Depth	to free standing w	ater in pit/soi	11 probe hole: > 18"
Other Indicators:				
Water Harks:	No	Wetlands Drainag	e Patterns:	Yes
Drift Lines:	No	Morphological Ad	aptations:	No
Sediment Deposits:	No	Blackened Leaves	:	No
Surface Scoured Area:	Yes	Buttressed Trunk	S:	No
is Wetlands Hydrology Cri	iterion Het?	Yes		· .
Rationale: SECON	IDARY HYDRO	LOGICAL INDICA	TORS	
JURISDICTIONAL DET	ERMINATION			
Analysis of Vegetation:	SCRL	IB/SHRUB WETLA	NDS (WETLAN	ND BJ
Is this sample a wetlands	s? Yes			
Rationale: HYDRI	C SOILS, WET	LANDS HYDROL	OGY, AND H	YDROPHYTIC VEGETATION

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Site: MOLYCORP			No: 962236 , WASHING		SYLVA
	Investiga tion Date			LL	
Herb Stratum Domir	ance Leve] = (%	18%	Dominant	
Species	Indic		Dominant		
AGERATINA ALTISSIMA GLECHOMA HEDERACEA OXALIS EUROPAEA VERBESINA ALTERNIFOLIA VIOLA PAPILIONACEA	FACU- FACU FACU FAC FAC	10 50	Yes	Yes	
Shrub Stratum Domin	ance Level	= 9 %	9%	Dominant	
Species	Indic	Dom	Dominant	Wetlands	Indic
LONICERA TATARICA RUBUS ALLEGHENIENSIS ULMUS RUBRA	FACU FACU- FAC-	10	Yes Yes Yes	Yes	
free Stratum Domin	ance Level	=] %	6%	Dominant	
Species	Indic		Dominant		Indic
JUGLANS NIGRA PRUNUS SEROTINA	FACU FACU	30 50	Yes Yes		

WETLANDS DELINEATION: VEGETATION ANALYSIS ACRT Client: IT CORPORATION ACRT Project No: 962236 Site: MOLYCORP SITE, 28.8 ACRES, WASHINGTON, PENNSYLVANIA

Summary Information for Sample 6 Total Number of Dominant Species: 6 Total Number of Dominant Wetlands Indicator Species: 2

Percent Dominant Species that are Wetlands Species: 33.3% This Analysis indicates Non-Wetlands Conditions

Comments: SUCCESSIONAL WOODS

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	ACRT Client: IT C ACRT Project	L AND HYDROLOGY AN CORPORATION No: 962236 5, WASHINGTON, PENN	
SAMPLE: 6	Field Investigator: Date:	M. JOHNSON 08/20/96	
Do normal environmental condit		ommunity? Yes	
Have vegetation, soil, and/or			
Comments:			
<u>S01L:</u>	••••••••••••••••••		***************************************
	CULLEOKA SILT LOAMS	Subgroup:	
Is Soil on Hydric Soil List?	No	Hydric Inclusions?	No
ls Soil a Histosol7	No	Histic Epipedon Present	? No
ls Soil Hottled?	No	Is Soil Gleyed?	No
Matrix Colors: 10 YR 4/4	Mottle Colors	i: Pe	rcent:
Other Hydric Soil Indicators:	NONE		
Is Hydric Soil Criterion Met?	No		
Rationale: WELL DRAIN	IED SOIL PROFILE		
HYDROLOGY:	************************		
Is ground surface inundated?	NO Surfa	ce water depth? N/A	
Is soil saturated? No	Depth to free standing	water in pit/soil probe h	ole: > 18"
Other Indicators:			
Water Harks: NO		nage Patterns: No	
Drift Lines: NO	Korphological		
Sediment Deposits: NO Surface Scoured Area: NO	Blackened Leav Buttressed Tru		
Is Wetlands Hydrology Criterio			
Rationale: NO HYDROL	OGICAL INDICATORS		
JURISDICTIONAL DETERMI	NATION:		
Analysis of Vegetation:	SUCCESSIONAL WO	ODS	
Is this sample a wetlands?	No		
Rationale: NON-HYDR. VEGETATIO		CE OF WETLANDS HYD	ROLOGY, AND UPLAND

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WETLANDS DELINEATION: VEGETATION ANALYSIS ACRT Client: IT CORPORATION ACRT Project No: 962236 Site: MOLYCORP SITE, 28.8 ACRES, WASHINGTON, PENNSYLVANIA

Sample # 7 Field Investigator T. CRANDALL Collection Date 08/20/96

Herb Stratum	Dominance Level	Dominant			
Species	Indic	Dom	Dominant	Wetlands	Indic
CAREX SP TYPHA LATIFOLIA	PWI OBL	10 40	Yes Yes	Yes Yes	

Summary Information for Sample 7

Total Number of Dominant Species: 2 Total Number of Dominant Wetlands Indicator Species: 2

Percent Dominant Species that are Wetlands Species: 100.0% This Analysis indicates Wetlands Conditions

Comments:

WET MEADOW (WETLAND H)

ACRT, Inc., 2545 Bailey Road, P.O. Box 401, Cuyahoga Falls, Ohio 44221 800-622-2562 Page 44

WETLANDS DELINEATION: SOIL AND HYDROLOGY ANALYSIS ACRT Client: IT CORPORATION ACRT Project No: 962236 Site: MOLYCORP SITE, 28.8 ACRES, WASHINGTON, PENNSYLVANIA M. JOHNSON SAMPLE: 7 Field Investigator: 08/20/96 Date: Do normal environmental conditions exist at the plant community? Yes Have vegetation, soil, and/or hydrology been significantly disturbed? Yes RECENTLY DISTURBED HILLSIDE CUT; WETLANDS IS IN SMALL DEPRESSION Comments: SOIL: Series: DISTURBED SOILS Subgroup: N/A Hydric Inclusions? Is Soil on Hydric Soil List? N/A Histic Epipedon Present? NO Is Soil a Histosol7 No Is Soil Gleyed? No Is Soil Kottled? No Matrix Colors: DISTURBED SHALE AND SUBSOIL Mottle Colors: Percent: Other Hydric Soil Indicators: NONE Is Hydric Soil Criterion Met? No APPARENT NON-HYDRIC SOIL COLORS Rationale: HYDROLOGY: 2' Yes Surface water depth? Is ground surface inundated? Depth to free standing water in pit/soil probe hole: N/A Is soil saturated? Yes Other Indicators: No Water Marks: No Vetlands Drainage Patterns: Drift Lines: No Horphological Adaptations: No Blackened Leaves: No Sediment Deposits: Yes Surface Scoured Area: Buttressed Trunks: No Yes Is Vetlands Hydrology Criterion Het? Yes OBVIOUS HYDROLOGICAL INDICATORS Rationale: JURISDICTIONAL DETERMINATION: Analysis of Vegetation: WET MEADOW (WETLAND H) Is this sample a wetlands? Yes DISTURBED SOILS, WETLANDS HYDROLOGY, AND HYDROPHYTIC VEGETATION Rationale: WETLANDS DELINEATION: SOIL AND HYDROLOGY ANALYSIS

C ACRT, Inc. 2 2545 Bailey Road, P.O. Box 401, Cuyahoga Falls, Ohio 44221 800-622-2562

WETLANDS DELINEATION: VEGETATION ANALYSIS ACRT Client: IT CORPORATION ACRT Project No: 962236 Site: MOLYCORP SITE, 28.8 ACRES, WASHINGTON, PENNSYLVANIA

Sample # 8

Field Investigator T. CRANDALL Collection Date 08/20/96

Herb Stratum

Species

Dominance Level = 15% % Dominant Indic Dom Dominant Wetlands Indic

ACHILLEA MILLEFOLIUM DIPSACUS SYLVESTRIS	FACU FACU-	10		
EUTHAMIA GRAMINIFOLIA TUSSILAGO FARFARA	FAC	25 35	Yes Yes	Yes

Summary Information for Sample 8 Total Number of Dominant Species: 2 Total Number of Dominant Wetlands Indicator Species: 1

Percent Dominant Species that are Wetlands Species: 50.0% This Analysis indicates Non-Wetlands Conditions

Comments:

UPLAND OLD FIELD

Page 46 ACRT, Inc., 2545 Bailey Road, P.O. Box 401, Cuyahoga Falls, Ohio 44221 800-622-2562

ACRT Client: IT CORPORATION ACRT Project No: 962236 Site: MOLYCORP SITE, 28.8 ACRES, WASHINGTON, PENNSYLVANIA

SAMPLE: I	3		Field Date:	Investigator:		SON		
Do normal envir	onmental	conditi	ions exist	at the plant co	mmunity? N	0		
Have vegetation	, soil, a	and/or t	nydrology	been significant	ly disturbed?	Yes		
Connents:	RECE	NTLY D	ISTURBE	D HILLSIDE CL	/ T			
<u>SOIL</u> :			*********					
Serles:	DISTU	RBED	SOILS	Subgra	iu p :			
Is Soil on Hydr	ic Soil L	.ist?	N/A		Hydric Inclu	sions?	N/A	
Is Soil a Histo	sol?		No		Histic Epipe	don Present?	No	
Is Soil Mottled	?		No		Is Soil Gley	ed?	No	
Matrix Colors: Percen		RBED S	SHALE AI	ND SUBSOIL	Nottle Color	*\$:		
Other Hydric Soi	11 Indica	tors:	NONE					
Is Hydric Soil (Criterion	Net?	No					
Rationale:	APPAR	ENT N	ON-HYDF	RIC SOIL COLO				
HYDROLOGY:							***	
Is ground surfac	e inunda	ted?	No	Surface	e water depth?	N/A		
Is soil saturate	:d?	No	Depth to	o free standing	water in pit/s	oil probe hol	e: > 18"	
Other Indicators	:							
Vater Marks:		No		Vetlands Draina	ge Patterns:	No		
Drift Lines:		No		Morphological A	-	• •		
Sediment Deposit	5:	No		Blackened Leave		No		
Surface Scoured		No		Buttressed Trun	ks:	No		
ls Vetlands Hydr	ology Cri	iterion	Het?	No				
Rationale:	NO HY	DROLC	GICAL II	DICATORS				
JURISDICTION	IAL DET	ERMIN	ATION:			***********		
Analysis of Vege	tation:		UPLAN	D OLD FIELD				
ls this sample a	wetlands	:7	No					
Rationale:	NON-H FACUL			, NO EVIDE D VEGETATIO		NETLANDS	HYDROLOGY,	AND

ACRT, Inc.

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Sample # 9 Field Investigator T. CRANDALL Collection Date 08/20/96

Herb Stratum	Dominance Leve				
Species	Indic	љ Dom	Dominant	Dominant Wetlands Indic	
ASCLEPIAS INCARNATA	08L	10		<u></u>	
SCIRPUS ATROVIRENS	OBL	50	Yes	Yes	
SCIRPUS VALIDUS	OBL	15			
TYPHA LATIFOLIA	OBL	10			

Summary Information for Sample 9

Total Number of Dominant Species: 1 Total Number of Dominant Wetlands Indicator Species: 1

Percent Dominant Species that are Wetlands Species: 100.0% This Analysis indicates Wetlands Conditions 1

Comments:

WET MEADOW (WETLAND G)

Page 48 ACRT, Inc., 2545 Bailey Road, P.O. Box 401, Cuyahoga Falls, Ohio 44221 800-622-2562

		S DELINEATION: SOIL ACRT Client: IT CC ACRT Project N	RPORATION	
SAMPLE: 9	MOLYCU	RP SITE, 28.8 ACRES, Field Investigator: Date:	M. JOHNSON 08/20/96	
			• •	
		ns exist at the plant com		
Have vegetation, soil,	and/or hy	drology been significantl	y disturbed? Ye	S
Comments: FILL	AND DIST	TURBED SOILS		
<u>SOIL</u> :				
Series: DIST	URBED SO	OILS Subgrou	p:	
Is Soil on Hydric Soil	List?	N/A	Hydric Inclusions	n N/A
Is Soll a Histosol?		No	Histic Epipedon P	resent? NO
Is Soil Hottled?	-	Yes	Is Soil Gleyed?	No
Matrix Colors: 10 Y	7 5/1	Nottle Colors:	10 YR 5/6	Percent: 10
Other Hydric Soil India	ators:	NONE		
Js Hydric Soll Criteric	on Ket?	Yes		
Rationale: MATH	RIX CHRO	MA OF 1 WITH MOTTLE		
HYDROLOGY:	*======			
Is ground surface inunc	lated?	No Surface	water depth? A	1/A
ls soil saturated?	No	Depth to free standing w	ater in pit/soil p	robe hole: > 18"
Other Indicators:				
Water Marks:	Yes	Wetlands Drainag	e Patterns:	Yes
Drift Lines:	No	Horphological Ad		No
Sediment Deposits:	No	Blackened Leaves		Yes
Surface Scoured Area:	Yes	Buttressed Trunk	S:	No
Is Wetlands Hydrology C	riterion N	et? Yes		
Rationale: SECC	NDARY H	YDROLOGICAL INDICA	TORS	
JURISDICTIONAL DE	TERMINA	TION:		
Analysis of Vegetation:		WET MEADOW (WETL	AND GJ	
Is this sample a wetlan	ds?	Yes		
Rationale: HYDI	RIC SOILS	, WETLANDS HYDROI	LOGY, AND HYD	ROPHYTIC VEGETATION

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Sample # 10 Field Investigator T. CRANDALL Collection Date 08/20/96

Herb Stratum

Species

Dominance Level = 19% % Dominant Indic Dom Dominant Wetlands Indic ANODOCTA ADTENTETTEOL TA FACH 10

AMORUSIA ARIEMISIIFULIA	FACU	10		
DIPSACUS SYLVESTRIS	FACU-	10		
EUTHAMIA GRAMINIFOLIA	FAC	20	Yes	Yes
MELILOTUS ALBA	FACU-	45	Yes	
SOLIDAGO CANADENSIS	FACU	10		

Summary Information for Sample 10 Total Number of Dominant Species: 2 Total Number of Dominant Wetlands Indicator Species: 1

Percent Dominant Species that are Wetlands Species: 50.0% This Analysis indicates Non-Wetlands Conditions

Comments:

UPLAND OLD FIELD

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		DELINEATION: SOIL AL ACRT Client: IT COR ACRT Project No: AP SITE, 28.8 ACRES, W	PORATION 962236	
SAMPLE: 10)	Field Investigator: Date:	M. JOHNSON 08/20/96	
Do normal enviro	nmental condition	s exist at the plant commu	inity? Yes	
Have vegetation,	soil, and/or hyd	rology been significantly	disturbed? Yes	
Comments:	FILL AND DIST	URBED SOILS		
<u>SOIL</u> :				************************************
Series:	DISTURBED SC	DILS Subgroup:		
Is Soil on Hydric	: Soil List?	N/A . н	ydric Inclusions?	N/A
Is Soil a Histoso	517.	<i>No</i> . н	istic Epipedon Present?	No
is Soil Mottled?		Yes I	s Soil Gleyed?	No
Matrix Colors: Percent:	FILL AND DIST	URBED SOILS	lattle Colors:	
Other Hydric Soil	Indicators:	NONE	•	
Is Hydric Soil Cr	iterion Het?	No		
Rationale:	APPARENT NO	N-HYDRIC SOIL COLORS		
HYDROLOGY:				
Is ground surface	inundated?	No Surface w	ater depth? N/A	
Is soil saturated	ז No	Depth to free standing wat	er in pit/soil probe hold	e: > 18*
Other Indicators:				
Water Marks:	No	Vetlands Drainage		
Drift Lines:	No : No	Horphological Adap Blackened Leaves:	otations: NO NO	
Sediment Deposits Surface Scoured An		Buttressed Trunks:		
Is Vetlands Hydro	logy Criterion He			
Rationale:	NO HYDROLOG	ICAL INDICATORS		
JURISDICTION	L DETERMINA	-		
Analysis of Vegeta	stion:	UPLAND OLD FIELD		
Is this sample a w	ret1ands7	No		
	NON-HYDRIC S VEGETATION	Soils, NO EVIDENCE C	OF WETLANDS HYDRO	DLOGY, AND UPLAND

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Sample # 11

Field Investigator T. CRANDALL Collection Date 08/20/96

Herb Stratum

Species

Dominance Level = 19% % Dominant Indic Dom Dominant Wetlands Indic

				<u> </u>
ASCLEPIAS INCARNATA	OBL	40	Yes	Yes
SCIRPUS ATROVIRENS	OBL	15		
TYPHA LATIFOLIA	OBL	40	Yes	Yes

Summary Information for Sample 11

Total Number of Dominant Species: 2

Total Number of Dominant Wetlands Indicator Species: 2

Percent Dominant Species that are Wetlands Species: 100.0% This Analysis indicates Wetlands Conditions

Comments:

WET MEADOW (WETLAND F)

Page 52 ACRT, Inc., 2545 Bailey Road, P.O. Box 401, Cuyahoga Falls, Ohio 44221 800-622-2562

	She MOLY	ACRT Proje	CORPORATION ct No: 962236 ES, WASHINGTON, PENNSYLVANIA	
SAMPLE:	11	Field Investigator: Date:		
Do normal env	vironmental condi	tions exist at the plant	community? Yes	
		hydrology been signific		
Comments:		DISTURBED SOILS		
SOIL:				
Serles:	DISTURBEL) SOILS Sub	group:	
is Soil on Hy	dric Soil List?	N/A	Hydric Inclusions? N/A	
s Soil a His	tosol7	No	Histic Epipedon Present? NO	
s Soll Mottl	ed?	No	Is Soil Gleyed? No	
atrix Colors Perc		ISTURBED SOILS	Hottle Colors:	
ther Hydric :	Soil Indicators:	NONE		
s Hydric Soil	Criterion Het?	No		
ationale:	APPARENT	NON-HYDRIC SOIL CO.	LORS	
YDROLOGY:	***************	******		
s ground suri	face inundated?	No Surt	face water depth? N/A	
s soll satura	nted? No	Depth to free standi	ng water in pit/soil probe hole: > 18"	
3 3011 386014	ors:			
ther Indicate		•	inage Patterns: Yes	
<u>ther Indicate</u> ater Marks:	No	Na-ahalaataa	1 Advetations: No	
ther Indicato Ster Marks: Sift Lines:	No	• -	1 Adaptations: NO aves: NO	
ther <u>Indicato</u> ater Marks: rift Lines: ediment Depos	No sits: No	Horphologica Blackened Le Buttressed T	aves: No	
<u>ther Indicato</u> ater Marks: rift Lines: adiment Depos urface Scoure	No sits: No	Blackened Le Buttressed T	aves: No	
<u>ther Indicato</u> ater Marks: rift Lines: adiment Depos urface Scoure	No sits: No ed Area: Yes ydrology Criteria	Blackened Le Buttressed T	aves: No runks: No	
ther Indicato ater Marks: rift Lines: ediment Depos urface Scoure s Wetlands Hy ationale:	No sits: No ed Area: Yes ydrology Criteria	Blackened Le Buttressed T n Met? Yes Y HYDROLOGICAL IND	aves: No runks: No	
ther Indicate ater Marks: rift Lines: ediment Depos urface Scoure s Vetlands Hy ationale: <u>URISDICTI</u>	No sits: No ed Area: Yes rdrology Criteria SECONDAR ONAL DETERMI	Blackened Le Buttressed T n Met? Yes Y HYDROLOGICAL IND	aves: No runks: No ICATORS	

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Page 53

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Sample # 12 Field Investigator T. CRANDALL Collection Date 08/20/96

Herb Stratum	Dominance Leve	Dominant		
Species	Indic	Dom	Dominant	Wetlands Indic
DAUCUS CAROTA	<u></u>	15	·····	
DIPSACUS SYLVESTRIS	FACU-	20	Yes	
EUTHAMIA GRAMINIFOLIA	FAC	20	Yes	Yes
SOLIDAGO CANADENSIS	FACU	40	Yes	

Summary Information for Sample 12

Total Number of Dominant Species: 3 Total Number of Dominant Wetlands Indicator Species: 1

Percent Dominant Species that are Wetlands Species: 33.3% This Analysis indicates Non-Wetlands Conditions

Comments:

UPLAND OLD FIELD

Page 54 ACRT, Inc., 2545 Bailey Road, P.O. Box 401, Cuyahoga Falls, Ohio 44221 800-622-2562

	WE	TLANDS	ACRT Client: IT C		LYSIS
	Site: M	DLYCO	ACRT Project RP SITE, 28.8 ACRES	, WASHINGTON, PENNS	YLVANIA
SAMPLE:	12		field Investigator: Date:	M. JOHNSON 08/20/96	······································
Do normal env	(ronmenta) c	ondition	is exist at the plant co	ommunity? Yes	
			Irology been significant		
Connents:			URBED SOILS	-	

<u>SOIL</u> : Series:	DISTUR		DILS Subgra	- 040	
Is Soil on Hy			N/A	Hydric Inclusions?	N/A
•		36:	•	Histic Epipedon Present?	
Is Soil a Hist			No		
Is Soil Mottle			No	Is Soil Gleyed?	No
Matrix Colors: Perce		ID DIST	URBED SOILS	Mottle Colors:	
Other Hydric S	ioil Indicat	ors:	NONE		
Is Hydric Soil	Criterion i	Het?	No		
Rationale:	APPARE		N-HYDRIC SOIL COLC	DRS	
HYDROLOGY:					
Is ground surf	ace inundate	ed?	No Surfac	e water depth? N/A	
ls soil satura	ted?	No	Depth to free standing	water in pit/soil probe ho	le: > 18*
<u> Dther Indicato</u>	<u>rs</u> :				
Vater Karks:		No	Vetlands Drain	-	
Drift Lines:		No	Morphological /		
Sediment Oepos		No	Blackened Leave		
Surface Scoure	O AFEA:	No	Buttressed Tru	nks: NO	
ls Vetlands Hy					
Rationale:	NO HYD	ROLOG	ICAL INDICATORS		
JURISDICTI	ONAL DETE	RMINA	TION:		
malysis of Ve	getation:		UPLAND OLD FIELD		
ls this sample	a wetlands?	,	No		
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Sample # 13	e # 13 Field Investigator T. CRANDALL Collection Date 08/20/96					
Herb Stratum	Dominance	Leve		19%		
Species		Indic	% Dom	Dominant	Dominant Wetlands	Indic
CONVOLVULUS ARVENSIS IMPATIENS CAPENSIS PILEA PUMILA VERBESINA ALTERNIFOLI		UPL FACW FACW FAC	10 25 20 40	Yes Yes Yes	Yes Yes Yes	
Shrub Stratum	Dominance	Level	-	5%	D . 1	
Species		Indic	% Dom	Dominant	Dominant Wetlands	Indic
CORNUS AMOMUM		FACW	75	Yes	Yes	

Summary Information for Sample 13

Total Number of Dominant Species: 4 Total Number of Dominant Wetlands Indicator Species: 4

Percent Dominant Species that are Wetlands Species: 100.0% This Analysis indicates Wetlands Conditions

Comments:

SCRUB/SHRUB WETLANDS (WETLAND A)

Page 56 ACRT, Inc., 2545 Bailey Road, P.O. Box 401, Cuyahoga Falls, Ohio 44221 800-622-2562

w		LINEATION: SOIL ACRT Client: IT CC ACRT Project N		LYSIS
Site: I		SITE, 28.8 ACRES,	WASHINGTON, PENNS	YLVANIA
SAMPLE: 13	Fie Dat	ld Investigator:	M. JOHNSON 08/20/96	
Do normal environmental	conditions ex	ist at the plant con	munity? Yes	
Have vegetation, soil,	and/or hydrold	gy been significantl	y disturbed? NO	
Conments:				
SOIL:				
	RK SILT LOA	M Subgrou	D:	
Is Soll on Hydric Soll		-	Hydric Inclusions?	Yes
Is Soll a Histosol?	Na		Histic Epipedon Present?	No
Is Soil Mottled?	Na		Is Soil Gleyed?	No
		Nottle Colors:	-	cent:
Hatrix Colors: 10 YR	•		reit	.Ent:
Other Hydric Soil Indica		NE		
Is Hydric Soil Criterio				
	WHAT POOR	LY DRAINED SOIL I	PROFILE; HYDRIC INCLU	SION
HYDROLOGY:				
Is ground surface inunda			water depth? N/A	
Is soll saturated?	NO Dept	h to free standing w	ater in pit/soil probe hol	le: > 18*
Other Indicators:				
Water Marks: Drift Lines:	No Yes	Vetlands Draimag Norphological Ad		
Sediment Deposits:	Yes	Blackened Leaves		
Surface Scoured Area:	Yes	Buttressed Trunk	A 4 .	
Is Wetlands Hydrology Cr	iterion Het?	Yes		
Rationale: SECO	NDARY HYDR	OLOGICAL INDICA	TORS	
JURISDICTIONAL DE	TERMINATIO	<u>N</u> :		
Analysis of Vegetation:	sc	RUB/SHRUB WETLA	NDS (WETLAND A)	
Is this sample a wetland	s? Ye:	•		
Rationale: HYDR	IC SOILS, W	ETLANDS HYDRO	LOGY, AND HYDROPHY	TIC VEGETATION

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R ACRT, Inc. L 2545 Bailey Road, P.O. Box 401, Cuyahoga Falls, Ohio 44221 800-622-2562

Sample # 14 Field Investigator T. CRANDALL Collection Date 08/20/96

Herb Stratum Dominance Level = 9% Dominant % Species Indic Dom Dominant Wetlands Indic ALLIARIA PETIOLATA FACU-20 Yes **VERBESINA ALTERNIFOLIA** FAC 25 Yes Yes Shrub Stratum Dominance Level = 17% Ľ Dominant Species Indic Dom Dominant Wetlands Indic LONICERA TATARICA FACU 10 PRUNUS SEROTINA FACU 50 Yes

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Yes

Summary Information for Sample 14

Total Number of Dominant Species: 4 Total Number of Dominant Wetlands Indicator Species: 1

Percent Dominant Species that are Wetlands Species: 25.0% This Analysis indicates Non-Wetlands Conditions

Comments: SUCCESSIONAL WOODS

PYRUS MALUS

		ACRT Client: IT CO ACRT Project N	AND HYDROLOGY ANAL RPORATION 0: 962236 WASHINGTON, PENNSY	
SAMPLE: 14	************	Field Investigator: Date:	M. JOHNSON 08/20/96	
Do normal environ	mmental condition	ns exist at the plant com	munity? Yes	
Have vegetation,	soil, and/or hyd	drology been significantl	y disturbed? Yes	
Comments:	FILL AND DIST	URBED SOILS		
<u>SOIL</u> :		····	, , , , , , , , , , , , , , , , , , ,	
Series:	DISTURBED SO	DILS Subgrou	p:	
Is Soil on Hydric	: Soil List7	N/A	Hydric Inclusions?	N/A
Is Soil a Histosc	517	No	Histic Epipedon Present?	No
Is Soil Nottled?		No	Is Soil Gleyed?	No
Matrix Colors:	10 YR 5/3	Mottle Colors:	Perc	ent:
Other Hydric Soil	Indicators:	NONE		
Is Hydric Soil Cr	iterion Met?	No		
Rationale:	MATRIX CHRO	MA GREATER THAN 2		
HYDROLOGY :		······································		
Is ground surface	inundated?	No Surface	water depth? N/A	
Is soil saturated	n No	Depth to free standing w	ater in pit/soll probe hol	e: > 18'
Other Indicators:				
Vater Marks: Drift Lines:	No No	Vetlands Drainag Korphological Ac	ge Patterns: NO Saptations: NO	
Sediment Deposits	• •	Blackened Leaves		
Surface Scoured A		Buttressed Trunk		
Is Wetlands Hydro	logy Criterion M	et? No		
Rationale:	NO HYDROLOG	GICAL INDICATORS		
JURISDICTION	AL DETERMINA	TION:		
Analysis of Veget	ation:	SUCCESSIONAL WOO	DS	
Is this sample a	wetlands?	No		
	NON-HYDRIC VEGETATION	SOILS, NO EVIDENCE	OF WETLANDS HYDRU	DLOGY, AND UPLAND

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Sample # 15	15 Field Investigator T. CRANDALL Collection Date 08/20/96					
Herb Stratum	Dominance	e Leve		20%	Destant	
Species		Indic	% Dom	Dominant	Dominant Wetlands	Indic
DIPSACUS SYLVESTRIS IMPATIENS CAPENSIS PHALARIS ARUNDINACEA VERBESINA ALTERNIFOLI	A	FACU- FACW FACW FAC	10 50 30 10	Yes Yes	Yes Yes	
Shrub Stratum	Dominance	Leve	1 = 7	7%	Dominant	
Species		Indic		Dominant		Indic
CORNUS AMOMUM		FACW	35	Yes	Yes	

Summary Information for Sample 15

Total Number of Dominant Species: 3 Total Number of Dominant Wetlands Indicator Species: 3

Percent Dominant Species that are Wetlands Species: 100.0% This Analysis indicates Wetlands Conditions

Comments:

SCRUB/SHRUB WETLANDS (WETLAND A)

Page 60 ACRT, Inc., 2545 Bailey Road, P.O. Box 401, Cuyahoga Falls, Ohio 44221 800-622-2562

	•	S DELINEATION: SOIL ACRT Client: IT CC ACRT Project N DRP SITE, 28.8 ACRES,	DRPORATION lo: 962236	
SAMPLE:	15	Field Investigator: Date:	M. JOHNSON 08/20/96	
Do normal env	ironmental condition	ons exist at the plant com		
		drology been significantl		
Comments:				
<u>501L</u> :	•••••••••		*************************	
Series:	NEWARK SILT	LOAM Subgrou	p:	
ls Soil on Hyd	dric Soil List?	No	Hydric Inclusions?	Yes
ls Soil a Hist	tosol?	No	Histic Epipedon Present?	No
ls Soil Mottle	ed?	No	Is Soil Gleyed?	No
Matrix Colors:	10 YR 3/2	Mottle Colors:	Per	cent:
Other Hydric S	oil Indicators:	NONE		
Is Hydric Soil	Criterion Met?	Yes		
Rationale:	SOMEWHAT P	OORLY DRAINED SOIL F	PROFILE; SMALL HYDRIC	INCLUSION
HYDROLOGY:		************************************		
Is ground surf	ace inundated?	No Surface	water depth? N/A	
Is soil satura	ted? No	Depth to free standing w	ater in pit/soil probe ho	le: > 18"
Other Indicator	<u>rs</u> :			
Water Marks:	No	Wetlands Drainag		
Drift Lines:	No No	Horphological Ad	•	
Sediment Deposi Surface Scoured		Blackened Leaves Buttressed Trunk		
ls Wetlands Hyd	drology Criterion P	let? Yes		
Rationale:	SECONDARY H	YDROLOGICAL INDICAT	TORS	
JURISDICTIC	DNAL DETERMINA	TION:		
Analysis of Veg	getation:	SCRUB/SHRUB WETLA	NDS (WETLAND A)	• • • • • • •
Is this sample	a wetlands7	Yes		
Rationale:	HYDRIC SOILS	S, WETLANDS HYDROL	OGY, AND HYDROPHY	TIC VEGETATION

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> C_R ACRT, Inc. 2545 Bailey Road, P.O. Box 401, Cuyahoga Falls, Ohio 44221 800-622-2562

Sample # 16

APOCYNUM CANNABINUM

DACTYLIS GLOMERATA

MELILOTUS OFFICINALIS

VERBESINA ALTERNIFOLIA

CORONILLA VARIA

DAUCUS CAROTA

Field Investigator T. CRANDALL Collection Date 08/20/96

Herb Stratum

Species

Dominance Level = 21% Dominant % Indic Dom Dominant Wetlands Indic FACU ACHILLEA MILLEFOLIUM 10 FACU 10 UPL 30 Yes 10 FACU

Yes

10

30

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Summary Information for Sample 16

Total Number of Dominant Species: 2 Total Number of Dominant Wetlands Indicator Species: None

UPL

FAC

FACU-

Percent Dominant Species that are Wetlands Species: 0.0% This Analysis indicates Non-Wetlands Conditions

Comments:

UPLAND OLD FIELD

Page 62 ACRT, Inc., 2545 Bailey Road, P.O. Box 401, Cuyahoga Falls, Ohio 44221 800-622-2562

		ACRT Client: IT ACRT Project	DIL AND HYDROLOGY ANA CORPORATION 1 No: 962236	
	Site: MOLYC	ORP SITE, 28.8 ACR	ES, WASHINGTON, PENNS	YLVANIA
SAMPLE:	16	Field Investigator: Date:	M. JOHNSON 08/20/96	
Do normal envir	onmental condit	ions exist at the plant	community? Yes	
Have vegetation	, soll, and/or	hydrology been significa	antly disturbed? Yes	
Comments:	OLD ROADE	BED; FILL AND DISTUR	BED SOILS	
SOIL:	******			
Series:	DISTURBED	SOILS Subg	roup:	
ls Soll on Hydr	ic Soil List?	N/A	Hydric Inclusions?	N/A
-		•	-	
Is Soil a Histo		No	Histic Epipedon Present?	
Is Soll Mottled	7	No	Is Soil Gleyed?	No
Matrix Colors:		Mottle Color	rs: Perc	cent:
Other Hydric So	il Indicators:	NONE		
Is Hydric Soil (Criterion Met?	No		
Rationale:	APPARENT N	ION-HYDRIC SOIL COL	ORS	
HYDROLOGY:	**************			
	ce inundated?	No Surf	ace water depth? N/A	
ls ground surfac	•			e: > <i>18'</i>
ls ground surface Is soil saturate	ed? No		ace water depth? N/A ng water in pit/soi} probe hoł	e: > 18'
ls ground surface Is soil saturate Other Indicators	ed? No	Depth to free standir	ng water in pit/soil probe hol	e: > 18'
ls ground surface Is soil saturate	ed? No	Depth to free standir Vetlands Dra		e: > 18'
ls ground surfac Is soil saturate <u>Other Indicators</u> Water Harks:	ed? No s: No No	Depth to free standir Vetlands Dra	ng water in pit/soil probe hol inage Patterns: NO 1 Adaptations: NO	e: > 18'
ls ground surfac Is soil saturate <u>Other Indicators</u> Vater Marks: Drift Lines:	ed? No E: No No SS: No	Depth to free standir Vetlands Dra Korphologica	ng water in pit/soil probe hol inage Patterns: NO I Adaptations: NO aves: NO	e: > 18'
ls ground surfac Is soil saturate <u>Other Indicators</u> Water Marks: Drift Lines: Sediment Deposit	ed? No E: No No S: No Area: No	Depth to free standir Vetlands Dra Korphologica Blackened Lea Buttressed Ti	ng water in pit/soil probe hol inage Patterns: NO I Adaptations: NO aves: NO	e: > 18'
ls ground surfac Is soil saturate <u>Other Indicators</u> Water Marks: Drift Lines: Sediment Deposit Surface Scoured	ed? No E: No No S: No Area: No rology Criterion	Depth to free standir Vetlands Dra Korphologica Blackened Lea Buttressed Ti	ng water in pit/soil probe hol inage Patterns: NO I Adaptations: NO aves: NO runks: NO	
ls ground surfac Is soil saturate <u>Other Indicators</u> Water Marks: Drift Lines: Sediment Deposit Surface Scoured Is Vetlands Hydr	ed? No E: No No SS: No Area: No rology Criterion NO HYDROLO	Depth to free standir Vetlands Dra Korphologica Blackened Le Buttressed Tr Met? No OGICAL INDICATORS	ng water in pit/soil probe hol inage Patterns: NO I Adaptations: NO aves: NO	
Is ground surface Is soil saturate Other Indicators Water Marks: Drift Lines: Sediment Deposit Surface Scoured Is Vetlands Hydr Rationale: JURISDICTION	ed? No E: No No Area: No rology Criterion NO HYDROLO	Depth to free standir Vetlands Dra Korphologica Blackened Le Buttressed Tr Met? No OGICAL INDICATORS	ng water in pit/soil probe hol inage Patterns: NO l Adaptations: NO aves: NO runks: NO	
Is ground surface Is soil saturate Other Indicators Water Marks: Drift Lines: Sediment Deposit Surface Scoured Is Vetlands Hydr Rationale: JURISDICTION	ed? No E: No No Area: No rology Criterion NO HYDROLO NAL DETERMI etation:	Depth to free standin Vetlands Dra Korphologica Blackened Le Buttressed Tr Met? No OGICAL INDICATORS	ng water in pit/soil probe hol inage Patterns: NO l Adaptations: NO aves: NO runks: NO	
Is ground surface Is soil saturate Other Indicators Water Marks: Drift Lines: Sediment Deposit Surface Scoured Is Vetlands Hydr Rationale: JURISDICTION Analysis of Vege	ed? No E: No No Area: No rology Criterion NO HYDROLO NAL DETERMI Etation: a wetlands?	Depth to free standin Vetlands Dra Korphologica Blackened Lea Buttressed Th Met? No OGICAL INDICATORS <u>NATION</u> : UPLAND OLD FIELD No C SOILS, NO EVIDEN	ng water in pit/soil probe hol inage Patterns: NO l Adaptations: NO aves: NO runks: NO	

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Sample # 17		Field Investigator T. CRANDALL Collection Date 08/20/96								
Herb Stratum	Dominance	e Leve	= %	13%	Dominant					
Species		Indic		Dominant		Indic				
IMPATIENS CAPENSIS LYSIMACHIA NUMMULARIA	L	FACW FACW-	_	Yes Yes	Yes Yes					
Shrub Stratum Species	Dominance		%	7% Dominant	Dominant Wetlands	Indic				
CORNUS AMOMUM ULMUS AMERICANA	······	FACW FACW-	25 10	Yes Yes	Yes Yes					
Tree Stratum	Dominance	e Level	= :	17%	Dominant					
Species		Indic		Dominant		Indic				
ACER NEGUNDO ACER SACCHARINUM	· · · · · · · · · · · · · · · · · · ·	FAC+ FACW	35 50	Yes Yes	Yes Yes					

Summary Information for Sample 17

Total Number of Dominant Species: 6 Total Number of Dominant Wetlands Indicator Species: 6

Percent Dominant Species that are Wetlands Species: 100.0% This Analysis indicates Wetlands Conditions

Comments:

LOWLAND FLOODPLAIN WOODS (WETLAND C)

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	A	CRT Client: IT CC ACRT Project N		
SAMPLE: 17	Field Date	d Investigator:	M. JOHNSON 08/20/96	······
Do normal environmental	conditions exi	st at the plant con	munity? Yes	
Have vegetation, soil,	and/or hydrolog	y been significantl	y disturbed? No	
Comments:				
SOIL:				
		f fuba-a		
•	WRK SILT LOAN	f Subgrou		
Is Soil on Hydric Soil	List? No		Hydric Inclusions?	Yes
Is Soil a Histosol?	No		Histic Epipedon Pres	sent? No
Is Soil Hottled?	No		Is Soil Gleyed?	No
Matrix Colors: 10 YR	4/1	Mottle Colors:		Percent:
Other Hydric Soil Indica	ators: NOM	IE		
ls Hydric Soil Criterio	n Ket? Yes			
-		Y DRAINED SOIL I	PROFILE; HYDRIC IN	ICLUSION
HYDROLOGY:				
Is ground surface inunda	ited? No	Surface	water depth? N/A	· .
	•		ater in pit/soil prob	
Other Indicators:				
Vater Marks:	No	Vetlands Drainag	e Patterns: Ye	25
Drift Lines:	No	Norphological Ad	·	
Sediment Deposits:	Yes	Blackened Leaves		
Surface Scoured Area:	Yes	Buttressed Trunk	.s: No)
Is Vetlands Hydrology Cr		Yes	TOB6	
Rationale: SECO		LOGICAL INDICA	· URS	******
JURISDICTIONAL DE	TERMINATION	•		
Analysis of Vegetation:	LOW	LAND FLOODPLA	N WOODS (WETLAI	VD CJ
is this sample a wetland	ls7 Yes			
Rationale: HYDR	IC SOILS, WE	TLANDS HYDROI	OGY, AND HYDRO	OPHYTIC VEGETATION

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•						Per	insy Iva	nia Fis	h and h	lildlif	e Data	8ase 🛛									
				1	LIST C:								· Type L	ist							
		`						Tech.													
									ington												
								2	6 SEP 1	1996											
Species	•	Feedi	ng Bet	navior									Land l	lse/Cover	Туре						
mmon Name	*Stat	. Herb	Omn 1	Carn	Urban															Wetlnd	Barr
	•	•					Orchd			Shrub			Conif		Stream		Reserv	Bay		Non-For	
			•		(10's)	(21)	(22)	(23)	(31)	(32)	(33)	(41)	(42)	(43)	(51)	(52)	(53)	(54)	(61)	(62) .	(70'
															~	v					
dtom, Brindled	· Y			X											X	X					
•																					
	•																				
ttleenska Timbon	Y			x		x	X			X	x	X	X	x							
ttlesnake, Timber	•			~																	
ittern, American	T			X											X	X	X	X	X	X	
obwhite, Northern	H		X			X			X	X	X	X	X	X	l				X		
oot, American	V		X			X									x	X	X	X	x	X.	
rossbill, Red	W		X				X					X	X	X					X		
ickcissel	W		X		X	X	X		X	X	X										
uck, Ruddy	W		X												, X	X	x			X	
agle, Bald	Ε			X		X						X	X	X	X	X	X		X	X	
gret, Cattle	W			X		X		X	X	X	X	X	X	x	X	X	X	X	X	X	
alcon, Peregrine	E			X	X	X			X	X	X			X					X	X	
lycatcher, Yellow-bellied	T		X									X	X	x	v		~	•	X •	~	
adwa 11	W	*	X			X			X.				X	v	X	·X	X	X	×	X	
oshawk, Northern	V			X		· X		X	X			X	X	X	x	x	x	x	^	x	
rebe, Pied-billed	V			X					v	v	v	v			^	~	^	^		~	
rosbeak, Blue	V V		X	v	*	×			× Y	× Y	× Y	X								x	
arrier, Northern	U T			X	X	X			^	~	^	x	x	x	Y	Y	Y	¥	Y	x	
eron, Yellow-crowned Night	י ע			x	x	x			x			^	~	^	~	~	~	~	~	. ^	
ighthawk, Common	F			x	x	~			^			Y	x	X	X	X	x	X	Y	x	
sprey Wl. Common Barn	L 11			Ŷ	x	x	x	x				x	x	x	^	~	^	^	x	x	
wl. Common Barn wl. Northern Saw-whet	ม			x	0	x	~	n				x	x	x			,		x	~	
W), Northern Saw-Met	F			x		x		·	x	x	x	~	n.	~				x	~	x	•
Pintail, Northern	พ		x	n		x			x		~				X	x	x	x		x	•

* Status Codes: E - Endangered; T - Threatened.

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ned. Candidate Classifications: U - At Risk; V - Rare; H - Undetermined Status; Y = Unspecified.

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				LIST C:			Tech.					type t	. 151							
									County						•					
								6 SEP												
Spec les		Feeding B	ehavior									Land I	Jse/Cover	r Type						
ommon Name	. *Stat.	Herb Omn	i Carn.	. Urban	Agric	Agric	Agric	Range	Range	Range:.	Forest	Forest	Forest.	. Water.	Water	Water.	Water	Wet Ind	Wetlnd	Barren
	•						Feed		Shrub			Conif				Reserv	Bay		Non-For	
	•			(10's)	(21)	(22)	(23)	(31)	(32)	. (33)	(41)	(42)	(43)	(51)	(52)	(53)	(54)	(61)	(62)	(70's)
andpiper, Upland	т	X		x	x			X			x	x	x							
nipe, Common	U	X			X	X		X	X	X	X	X	X					X	X	X
parrow, Henslow's	ນ	X			X			X											X	
anager, Summer	v	X				X					X		X					X		
eal, Green-winged	v	X			X			X			X	X	X	X	X	X	X	X	X	X
ern, Black	Ε		x											X	X	X			X	
hrush, Swainson's	v	X		X							X	X	X					X		
igeon. American	H	X			X						X	X	x	. X	X	X	X	X	X	
						·														
leasel, Least	ж		x	x	X			X	X		x	X	x	x				x	X	
														i j						
Mussel, Pink Mucket Pearly	E	X												X						

* Status Codes: E - Endangered; T - Threatened.

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Candidate Classifications: U = At Risk; V = Rare; H = Undetermined Status; Y = Unspecified.

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3200-FM-DWW0018 Rev. 3/96

COMMONWEALTH OF PENNSYLVANIA DEPARTMENT OF ENVIRONMENTAL PROTECTION BUREAU OF DAMS, WATERWAYS AND WETLANDS

For Department Us	e Only
PNDI Search - Computer	Map
Reviewer NZ 295	
Date (0/9 /94 Phone No.	

SUPPLEMENT NO. 1 PENNSYLVANIA NATURAL DIVERSITY INVENTORY SEARCH FORM

- A. This Supplement No. 1 provides the site information necessary to perform a computer search for species of special concern listed under the Endangered Species Act of 1973, the Wild Resources Conservation Act, the Pennsylvania Fish and Boat Code or the Wildlife Code. Records regarding species of special concern are maintained in a computer data base called the "Pennsylvania Natural Diversity Inventory" (PNDI).
- 8. Complete the information below and mail to the appropriate regional office or the delegated County Conservation District (SEE REVERSE SIDE FOR LIST OF OFFICES AND ADDRESSES).
- C. This Supplement No. 1 will be returned to you with information relevant to your project concerning species of special concern. Include it and any correspondence received from the agencies below, with your submission of a Chapter 105 Permit Application for a Water Obstruction and Encroachment Permit and/or a Dam Permit and/or a General Permit Registration.
- D. The information in PNDI is routinely updated. Results of this PNDI search are valid for one year.

PRC	DJECT LOCATION:	NAME: Bill Stanhope / IT Corp.
	Washington County	ADDRESS: 2790 Mosside Blud.
	County '	Moncoeville, PA 15146
	Canton Township	
	Township and/or Municipality	PHONE (8:00 AM TO 4:00 PM): (412) 372-7701
	· · · · ·	· · · · · · · · · · · · · · · · · · ·
1) N	Name of the United States Geological Survey (U.S.G Washington West PA	5.5.) 7 Minute Quadrangle Map where project is located: 2) Project size (in acres) <u><°-25</u> .
3)	one-tenth) from the lower right corner of the f	er on the U.S.G.S. Quad map by measuring in inches (to nearest ull U.S.G.S. Quadrangle map.
	 North (Up) <u>7.4</u> inches West (to the left) <u>3.7</u> inches 	8.4 w N: 6.3*
	west (to the left) 3 7 inches	2 C W: 3.1"
	• West (to the left) menes	N 6.3" (example, not to scale)
4)	Attach an 85" x 11" photocopy (DO NOT RE identifies the project location and outlines the	EDUCE) of the section of the U.S.G.S. Quadrangle Map which
	FOR DEP/	ARTMENT USE ONLY
¢ ∑¥	No known record of habitats for species of speci	al concern has been identified in the area designated above.
ם`	No impact to species of special concern. (PNDI st	aff personon). initials date
۵	Potential impact to species of special concern. N matter will be provided by:	Written recommendations on measures necessary to resolve this
	D Dept. of Conservation & Natural Resources	Mr. Andrew L. Shiels D. Mr. Denver A. McDowell PA Fish & Boat Commission PA Game Commission
	Bureau of Forestry/FAS P.O. Box 8552	450 Robinson Lane 2001 Elmerton Ave.
	Harrisburg, PA 17105-8552 717-787-3444	Bellefonte, PA 16823 Harrisburg, PA 17110-9797 814-359-5113 717-783-8743
		Element Occurrence Code
	PNDI Interpretation Requested	

APPENDIX D

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ECORADIOLOGICAL CALCULATION BRIEFS



By <u>Doug Bowen</u>	Date <u>9/6/96</u> Subject	Molycorp, Inc.Aquatic Dose Rate Model	Sheet No. <u>1</u>	_ of _	_5
Chkd. By SD	Date 9/12/96		Proj. No. 768592.0	3.00.00.0	0

Purpose:

The purpose of the following is to estimate the dose rate (in units of rads/day) received by either the pup fish (primary organism) or the heron (secondary organism) to thorium contamination in their aqatic environment. The total dose rate for both internal and external exposure to thorium must be below 1 rad/day. These calculations were completed by using an existing spreadsheet model that utilized a method outlined in Baker & Soldat, 1992. A model for both internal and external exposure to thorium were included.

The radiological data for thorium was taken from Appendix K of Molycorp, 1995. The maximum concentration of thorium-232 in pCi/L was found and recorded. Any other data relevent to thorium from the same well and sampling date was recorded as well. For this case, a maximum concentration of 1.38 + 0.39 pCi/L for thorium-232 for well i.d. # MW25, sample date 7/28/94, was used. In the same well and same sampling date, thorium-228 was also reported at a concentration of 1.04 + 0.50 pCi/L. Both Th-228 and Th-232 was used in the spreadsheet model to provide a overall estimate due to the thorium contamination. It should be noted that Th-228 originates as a decay daughter of Th-232. The daughter, Th-228, was included as a conservative estimation to Th-232 exposure since it is produced by the radioactive decay of Th-232. The maximum concentration of Th-232 in sediment was 0.86 pCi/g (+/- 0.18 pCi/g) from Sediment Sample SS7A on page 2 of the Radiological Sediment Data in Appenidix K of the Molycorp document.

The following methodology shows how the concentration data for thorium is applied to the spreadsheet model to produce an estimate of the dose rate to both a primary organism (a fish with a 2 cm effective radius) and the secondary organism (a great blue heron with a mass of 2.39 kg and a 10 cm effective radius) consuming the primary organism. The methodology presented below is approached from a general standpoint and applies to a combination of radionuclides in the aquatic environment. This is done since thorium-232 is not the only radionuclide being considered. The Molycorp surface water data includes a daughter of Th-232, Th-228. The model for external/internal dose rates presented by Baker & Soldat can be applied to any number or variation of radionuclides present.

For these calculations it is assumed that all of the alpha radiation is internally absorbed within the organism and that the Th-232 and its daughters are uniformly distributed throughout the organism's interior. Also, the model assumes that the geometry of the fish and heron was approximated by a sphere. The dose rate calculated is assumed to be only for the organism's exposure to thorium. It was assumed for this model that the fish had an effective radius of 2 cm. The heron is assumed to receive all of its internal exposure to Th-232 and its daughters by eating contaminated fish. The heron is assumed to have an effective radius of 10 cm and a body weight of 2.39 kg.

The total dose rates calculated by the Baker & Soldat model are summarized below.

Internal Dose Rate Model									
Organism	Radionuclide	Dose Rate (Rad/Day)							
Fish (Primary Organism)	Th-228 and Th-232	5.88E-05							
Heron (Secondary Organism)	Th-228 and Th-232	5.30E-07							



By Doug Bowen Date 9/6/96 Subject Molycorp, Inc. Aquatic Dose Rate Model ______ Sheet No. _2__ of

Proj. No. 768592.03.00.00.00

Chkd. By <u>SD</u> Date <u>9/12/96</u>

	External Dose Rate Model										
Organism	Model	Exposure Fraction	Radionuclide	Dose Rate (Rad/Day)							
Fish	Immersion	1.0	Th-232								
Fish	Sediment	0.5	Th-232	5.96E-05							
Heron	Immersion	0.0	Th-232								
Heron	Sediment	0.5	Th-232	1.34E-06							

Please refer to the spreadsheet models for these results.

References:

Baker, D.A., and Soldat, J.K., 1992, Methods for Estimating Doses to Organisms from Radioactive Materials Released into the Aquatic Environment, DOE-AC06-76RLO, pp. 1-21.

Molycorp, Inc., Site Characterization Report for License Termination of the Washington, PA Facility, Volume 2 of 3, January, 1995, . Foster Wheeler Environmental Corporation.

Perry, Robert H., Perry's Chemical Engineers' Handbook, 1984, 6th edition, Mc Graw-Hill, Inc., New York, New York, pp. 3-96 - 3-96.

U.S. Department of Energy, 1994, Hanford Site Risk Assessment Methodology (HSRAM), "Ecological Dose and Exposure Calculations," DOE/RL-91-45, Review Draft, pp. E12-E18.

Methodology:

Aquatic Internal Dose

The total daily doses to a primary organism are estimated as the sum of doses (based on a weighted gamma energy from radioactive decay for specific radionuclides) received from all internal and external exposure to all radioactive contaminants in the environment in which the organisms reside.

The total internal total-body dose rate (rad/day) to an organism exposed to N radionuclides is given by equation 1:

$$R_{c} = \sum_{i=1}^{N} b_{ic} \cdot E_{ic}$$

where: R_=Internal total-body dose rate of organism c (rad/day),

b_{ic}=Specific body burden of nuclide i in organism c (Ci/kg),

Eic=Effective energy absorbed for radionuclide i per unit activity in organism c (kg-rad/Ci-day) (See below:)

 $E_{ic} = \varepsilon_{ic}$ (MeV/dis) x 5.12E04

where: $\varepsilon_{i,t}$ = the effective radionuclide energy for diameter of aquatic organism for nuclide i in organism c. The proportionality



By <u>Doug Bowen</u> Date <u>9/6/96</u> Subject <u>Molycorp, Inc.Aquatic Dose Rate Model</u> Sheet No. <u>3</u> of <u>5</u> Chkd. By <u>SD</u> Date <u>9/12/96</u> Proj. No. <u>768592,03.00.00.00</u>

constant, 5.14E4, is defined on page 3 of Baker & Soldat, 1992.

The specific body burden of nuclide i in organism c (Ci/kg) for the primary organism is given by:

 $b_{i,e} = C_{i,e} \times BF_{i,e} \times CF_{i,e}$

$$R_{c} = \sum_{i=1}^{N} E_{ic} \cdot C_{ic} \cdot BF_{ic} \cdot CF_{ic}$$

where: $R_c =$ Internal total-body dose rate of organism c (rad/day)

 $b_{i,e}$ = specific body burden of nuclide i in organism c (Ci/kg)

 $C_{i,c}$ = concentration of radionuclide i in water to which organism c is exposed (Ci/L)

 BF_i = bioaccumulation factor for nuclide i and organism c (m³/kg)

CF = conversion factor (0.001 L/m³).

The spreadsheet labeled "Internal Fish and Heron Example" has two parts. The first part is labeled "Internal Fish Dose as Primary Organism." This spreadsheet is clearly labeled with headers and performs the following calculation:

where everything is defined above. R_e is calculated in rad/day and rad/yr in the spreadsheet.

The heron, as the secondary organism, consumes the fish and thus receives an exposure internally due to the uptake of radionuclides in fish. The internal dose rate received by the heron is given by equation 2:

$$R_{c} = \frac{\sum_{i=1}^{N} b_{i} \cdot U_{c} \cdot f_{1_{i}} \cdot E_{ic} \cdot B_{ic}}{M_{c}}$$

where: $R_c =$ Internal total-body dose rate of secondary organism c (rad/day)

 $U_c =$ intake rate of primary organism by secondary organism c (kg/d),

 $M_c = mass of secondary organism c (kg)$

b; = body burden of primary organism (Ci/kg),

 $f_{i,e}$ = fraction of radionuclide initially retained in total body of secondary organism (unitless)

 $E_{i,s} =$ defined previously

 B_{ic} = effective decay constant of radionuclide i in the secondary organism (day) defined below as equation 3:

$$B_{ic} = \frac{(1 \exp(-\lambda_{ic} \cdot T_e))}{\lambda_{ic}}$$

where equation 4 defines the effective decay contant in the secondary organism:

$$\lambda_{ic} = (\lambda_b + \lambda_r) day^{-1}$$

The parameter $\lambda_b = \ln(2)/T_b$ where $\lambda_b = biological$ decay constant of radionuclide and T_b is the biological half-life of the radionuclide in the organism, and $\lambda_r = \ln(2)/T_r$, where $\lambda_r = radiological$ decay constant of radionuclide and T_r is the radiological half-life of the radionuclide in the organism. The variable T_r is defined as the exposure time or period of exposure which is assumed to be 365 days



By Doug Bowen	Date <u>9/6/96</u>	Subject Molycorp	<u>Inc.Aquatic</u>	Dose Rate	Model.	Sheet No		of	5
Chkd. By SD	Date 9/12/96					Proj. No. 768	592.03.00	00.00	

(Baker and Soldat, 1992).

The second section of the spreadsheet labeled "Internal Fish and Heron Example" calculates the internal dose rate to a heron due to consumption of a fish containing radioactive material. The headers for the spreadsheet are clearly labeled with the appropriate units as well.

Aquatic External Dose:

The primary organism resides in the water continuously. They can be exposed externally from immersion in water contaminated with radionuclides and from contaminated river bottom sediments. It can be assumed that primary organisms (fish) have an immersion fraction of 1.0 and a sediment exposure fraction of 0.5. Secondary organisms can be exposed externally from immersion in the water, and/or exposure to river bottom or shoreline sediments. Therefore, the external exposure to the secondary organism is weighted by the fraction of the time it is exposed to these pathways. For the heron, the immersion exposure fraction is zero and the sediment exposure fraction is 0.5. Immersion and sediment dose rate factors are used to calculate external dose rates. The following equation was used to calculate the dose rate from immersion in water (equation 5):

$$R_{c} = \sum_{i=1}^{N} C_{ic} \cdot DF_{im} \cdot F_{exp} \cdot CF$$

where: $R_c = dose rate (rad/day)$ from immersion in the water,

 $C_{i,e}$ = concentration of radionuclide i in water to which the organism c is exposed (Ci/L),

 $DF_{im,i}$ = immersion dose rate factor for radionuclide i (rad-m¹/Ci-day),

 F_{exp} = exposure fraction (unitless),

CF = conversion factor (0.001 in units of L/m³).

The next part of aquatic external exposure is that due to sediment. The following equation defines the external dose rate due to sediment exposure.

$$R_{c} = F_{sed} \cdot F_{ruf} \cdot F_{exp} \cdot \sum_{i=1}^{N} C_{ic} \cdot DF_{gnd} \cdot \frac{(1 - \exp(-\lambda_{i} \cdot T_{s}))}{\lambda_{i}}$$

where: R_{e} = dose rate (rad/day) from sediment exposure in the water,

 F_{sed} = sediment deposition transfer factor, 0.07 Ci m⁻² d⁻¹ Ci⁻¹ m³

F_{ruf} = geometry roughness factor (unitless)

 Df_{gnd} = ground irradiation dose factor for nuclide, rad d⁻¹ Ci⁻¹ m

 $T_s =$ time sediment is exposed to contaminated water, d.

 C_{is} = concentration of radionuclide i in water to which the organism c is exposed (Ci/m³),

 λ = radiological decay contstant, d⁻¹

 F_{exp} = exposure fraction (unitless),

The external dose due to sediment and immersion are simply multiplied by their associated immersion or sediment exposure fraction to by the external dose rate calculated for immersion or sediment. Summing up each component will estimate the total external dose due to water immersion or sediment exposure to the fish and heron. The spreadsheet model calculates these parameters automatically.

C C COR	PORATION		
By Doug Bowen	Date <u>9/6/96</u> Subject <u>Molycorp. Inc.Aquatic Dose Rate Model.</u>	Sheet No5 of;	5
Chkd. By <u>SD</u>	Date 9/12/96	Proj. No. 768592.03.00.00.00	

Total Internal/External Dose:

INTERNATIONAL TECHNOLOGY

The total dose rate received by either the fish or heron is simply the sum of the external and internal components. For example, if a fish receives 0.1 rad/day of internal exposure and 0.05 rad/day of external exposure, the total dose rate the fish receives is 0.1 + 0.05 = 0.15 rad/day.

Unit Conversions:

Data retrieved from the Molycorp documentation with respect to thoriurn water and soil concentrations required some units manipulations so that they were compatible with the spreadsheet model. Water well concentrations of thorium were reported in units of pCi/L and needed to be converted to Ci/m³ to be inserted into the model. A cell in the spreadsheet was created to take the concentrations in units of pCi/L and convert them to Ci/m³ with the following formula:

 $\# Ci/m3 = (\# pCi/L) \times (1000 L/m^3) \times (1/1.0E12 pCi/Ci) = 1.0E-09 pCi/L.$

Sediment concentrations were reported in units of pCi/g and needed to be converted to Ci/m3, as well. The following formula was necessary for the sediment conversion:

Ci/m³ = (# pCi/g) x (1000 g/kg) x (126 lb/ft³) x (16.02 kg/m³ / lb/ft³) x (1/1.0E12 pCi/Ci) =2.019E-06 Ci/m³

where:

126 lb/ft³ = density of wet sand/gravel (sediment) taken from Perry, 1984, Table 3-118; pg. 3-95. 16.02 kg/m³ per lb/ft³ = conversion from lb/ft³ to kg/m³ given by Perry, 1984, Table 3-118, pg. 3-96.

Example Calculations:

Please see the IT Calculation Brief, "NTS-UGTA Eco Risk Fish/Heron Dose Model, 12/1/95, Project #: 764027.02.03.00.00 for example calculations that verify example calculations in Baker & Soldat, 1992.

Originated by Douglas Bowen Checked by Sean Dundon Date Molycorp, Inc. 768592.03.00.00.00

9/6/96 Date:____9/12/96_____ Page 1 of 4

Estimation of Internal and External Radiation Doses to the House Mouse at the Molycorp, Inc. Washington, PA Faciltiy.

Purpose:

The intent of this effort is to estimate the internal and external radiation doses to a house mouse that is continuously exposed to thorium-232. The calculated dose rates will be compared to the International Atomic Energy Agency maximum allowable dose rate of 1 rad/day. This represents the threshold where slight effects from radiation doses may become apparent in the house mouse. A spreadsheet was used in the calculational model. The methodology presented below describes the parameters used in the spreadsheet model. The spreadsheet models used assumes a maximum Th-232 concentration in soil/slag at the Molycorp site of 1,530 pCi/g (+/- 80 pCi/g) from Appendix J, Table J-2. This concentration was from Thorium Pile, Unit #2, Sample # TP-4-01, Depth 3.0-4.5 feet.

Discussion:

The house mouse will not receive any external dose due to the presence of Th-232. This is due to the fact that Th-232 does not emit gamma radiation via radioactive decay. Th-232's primary mode of radioactive decay is through the emission of an alpha particle with an energy of 4.0 MeV. Alpha particles do not penetrate the house mouse's skin to contribute to an internal dose. The alpha particles will, however, contribute to an internal dose. Th-232's long half-life will result in a reduced internal exposure due to the fact that the decay constant for Th-232 is relatively large (approximately 7.14E-11 decays per second. Th-232 does not significantly expose the house mouse found at the Molycorp, Inc Washington, PA facility to a significant dose rate (i.e. > 1 rad/day), externally or internally. The dose rate calculated for the house mouse based on the Molycorp data shows a total interal/external dose rate of 2.66E-06 rad/day which is far below the limit of 1.0 rad/day.

Assumptions:

For this model, it was assumed that the geometry of the house mouse could be approximated by a sphere to simplify the calculation. The entire activity of the radionuclide is assumed to be present at the center of the organism. The house mouse residing in the location of the Th-232 contamination is assumed to receive its internal radiation exposure from its diet of plants and ingestion of soil. This model is valid primarily for those radionuclides that emit gamma radiation, while Th-232 emits only alpha particles during radioactive decay. However, Baker & Soldat, 1992, provide data on the parameter, E_i (valid specifically for gamma emitting nuclides and nuclides that emit high energy alpha particles), for Th-232 which is the effective absorbed energy based upon the amount of energy the organism with a certain effective radius absorbs within its body or organ. The effective absorbed energy for the house mouse is constant for a house mouse with an assumed radius of 10 cm and lower. This is due to the fact that all of the alpha particle's energy is absorbed within the organism.

References:

Baker, D.A., and J.K. Soldat, 1992.Methods for Estimating Doses to OrganismsOriginated by Douglas Bowen09/06/96Page 2 of 4Checked by Sean DundonDate: 9/12/96Molycorp, Inc. 768592.03.00.00.00Date: 9/12/96

from Radioactive Materials Released into the Aquatic Environment, PNL-8150, Pacific Northwest Laboratory, Richland, Washington, pp. 16-20.

Baes, III, C.F., R.D. Sharp, A.L. Sjoreen, and R.W. Shor, 1984, "A Review and Analysis of Parameters for Assessing Transport of Environmentally Released Radionuclides through Agriculture," ORNL-5786, Oak Ridge National Laboratory, Oak Ridge, Tennessee, pp. 10-11.

U.S. Department of Energy, 1994, Hanford Site Risk Assessment Methodology (HSRAM), "Ecological Dose and Exposure Calculations", DOE/RL-91-45, Review Draft, pp. E-1 - E-9.

United States Department of Health, Education and Welfare, 1970, Radiological Health Handbook, Bureau of Radiological Health and Training Institute, Rockville, Maryland, pp. 70-86.

International Technology Corp., Checkprints

Methodology:

The basic methodology is summarized below. A detailed description of the methodology used to compute the internal and external radiation doses can be found in HSRAM (pages E-1 - E-9). Different methodologies exist for calculating external and internal radiation doses to the house mouse and will be presented below separately. For all calculations the house mouse will assume an effective radius of 2 centimeters. The house mouse is also assumed to have a body weight of 0.016 kg for these calculations.

Internal Total-body Dose Rate:

The following equation defines the internal dose rate to the pocket mouse in rad/day:

$$R_{internal} = \sum_{i}^{H} \frac{(CS_{i} \cdot PS_{i} \cdot WW \cdot Qv \cdot FI \cdot EF \cdot ED \cdot FR \cdot B_{i} \cdot E_{i})}{(BW \cdot AT)}$$

where:

 CS_i = the concentration of radionuclide, i, in the soil (Ci/kg), PS_i = the soil-to-plant conversion factor specific to radionuclide, i, and chemical form in the soil (Baes et al. 1984 and Table E-3, HSRAM),

WW = the conversion from plant dry weight to wet weight, equal 0.32 (Table E-2 HSRAM),

QV = the ingestion rate of soil into the mouse (Kg/day), given as 0.0067 (Table E-2 HSRAM),

FI = the fraction ingested form contaminated source (unitless), given as 1.0 (Table E-2 HSRAM),

BF = the exposure frequency (day/yr), equal to 365 (Table E-2 HSRAM),

BD = the exposure duration (years), equal to 1.0 (Table E-2Originated by Douglas Bowen09/06/96Page 3 of 4Checked bySean DundonDate: ____9/12/96_____Molycorp, Inc. 768592.03.00.00.00Date: _____9/12/96_____

HSRAM),

FR = the fraction of the radionuclide retained in the mouse (unitless) which is radioisotope specific (Baker and Soldat, 1992),

B_i = the sum of removal factor for nuclide i (day), equal to:

$$B_{i} = \frac{(1 - \exp(-\lambda_{i} \cdot T_{c}))}{\lambda_{i}}$$
 Eq. 1

where: $\lambda_i = \lambda_b + \lambda_r$.

 λ_r = the radiological decay constant (day⁻¹) defined as ln(2)/T_r where T_r is the half-life of the radioisotope in days (Baker and Soldat, 1992). For Th-232, T_r=5.11e12 day,

 λ_b = the biological removal constant (day⁻¹) defined as ln(2)/T_b where T_b is the biological half-life after ingestion of a radioisotope in days (Baker and Soldat, 1992),

 λ_i = the effective decay constant for radioisotope i (day¹). E_i = the effective energy absorbed constant for radionuclide, i

(Kg-rad-Ci¹-day¹), equal to (Eq. E-4, HSRAM):

 $E_{,}=5.12\cdot10^{4}\cdot\epsilon_{,}$

where: ε_i = the radionuclide energy for a particular diameter of mouse (MeV/dis) (Baker and Soldat, 1992). For thorium, ε = 4.1 MeV/Dis

BW = the body weight of the mouse (Kg) equal to 0.016 (Assumed),

AT = the averaging time equal to 365 days ((Table E-2, HSRAM))

R_i = the internal total-body dose rate (rad/day) (Eq. E-1, HSRAM).

External Total-body Dose Rate:

Although the external dose rate model is presented below and in the spreadsheet model, it is not considered significant for the case of Th-232 contamination due to the fact that Th-232 is strictly an alpha emitting isotope. The model, below, is based upon exposure to gamma emitting radioisotopes.

The following relationship defines the external dose rate (rad/day) to a mouse exposed to certain radionuclides:

Originated by Douglas Bowen Checked by Sean Dundon Molycorp, Inc. 768592.03.00.00.00 09/06/96 Date: 9/12/96 Page 4 of 4

 $D=2.12\cdot\sum_{i=1}^{N}\cdot\frac{E_i\cdot C_i}{\rho}$

Eq. 2

where:

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 E_i = the average gamma-ray energy emitted by the radioisotope per disintegration (MeV). This value is the sum of probabilities per decay multiplied by the energy of the emitted gamma-ray (checkprints, D. Bowen). For thorium-232, there are no gamma emitted. Therefore, this term is zero.

 C_i = the concentration of the radionuclide (μ Ci/cm³), ρ = the density of the soil (grams/cm³) assumed as 1.5. D = the external dose rate (rad/day) (Eq. E-7, HSRAM).

Sample # 18	Field Inves Collection	tiga: Date	tor 08/2	T. CRANDA 20/96	ALL			
Herb Stratum	Dominance	Level		3%	Dominant			
Species	I	ndic	% Dom	Dominant	Dominant Wetlands	Indic		
ALLIARIA PETIOLATA MELILOTUS ALBA		ACU- ACU-	20 10	Yes Yes				
SOLIDAGO CANADENSIS	F	ACU	15	Yes				
Shrub Stratum	Dominance	Level	=] %	1%	Dominant			
Species	I	ndic		Dominant		Indic		
ACER NEGUNDO	· F	AC+	55	Yes	Yes			

Summary Information for Sample 18

Total Number of Dominant Species: 4 Total Number of Dominant Wetlands Indicator Species: 1

Percent Dominant Species that are Wetlands Species: 25.0% This Analysis indicates Non-Wetlands Conditions

Comments:

UPLAND OLD FIELD

Page 66 ACRT, Inc., 2545 Bailey Road, P.O. Box 401, Cuyahoga Falls, Ohio 44221 800-622-2562

WETLANDS DELINEATION: SOIL AND HYDROLOGY ANALYSIS ACRT Client: IT CORPORATION ACRT Project No: 962236 Site: MOLYCORP SITE, 28.8 ACRES, WASHINGTON, PENNSYLVANIA						
SAMPLE: 18		Field Investigator: Date:	M. JOHNSON 08/20/96			
Do normal environm	ental condition	s exist at the plant co	onmunity? Yes			
Have vegetation, s	oil, and/or hyd	rology been significant	tly disturbed? Yes			
Comments: C	OLD ROADBEL)				
SOIL:						
Series: [DISTURBED SC	DILS Subgro	sup:			
Is Soil on Hydric	Soil List?	N/A	Hydric Inclusions?	N/A		
Is Soil a Histosol	?	No	Histic Epipedon Present?	No		
Is Soil Mottled?		No	Is Soil Gleyed?	No		
Natrix Colors:		Mottle Colors	: Perc	ent:		
Other Hydric Soil	Indicators:	NONE				
Is Hydric Soil Crit	terion Met?	No				
Rationale: A	VPPARENT NO	N-HYDRIC DISTURBEL	O SOILS AND FILL			
HYDROLOGY:		***==*****************				
Is ground surface	inundated?	No Surfac	e water depth? N/A			
Is soil saturated?	No	Depth to free standing	water in pit/soil probe hol	e: > 18*		
Other Indicators:						
Water Marks:	No No	Vetlands Drain Morphologica]				
Drift Lines: Sediment Deposits:	No No	Blackened Leav				
Surface Scoured Art		Buttressed Tru				
ls Wetlands Hydrold	ogy Criterion M	et? NO				
Rationale: A	IO HYDROLOG	SICAL INDICATORS				
JURISDICTIONAL	L DETERMINA	<u>T10N</u> :		· · · · ·		
Analysis of Vegetal	tion:	UPLAND OLD FIELD				
is this sample a w	etlands?	No				
	XON-HYDRIC EGETATION	SOILS, NO EVIDENC	CE OF WETLANDS HYDRO	DLOGY, AND UPLAND		

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Field Investigator T. CRANDALL Collection Date 08/20/96

Herb Stratum	Dominance Leve] = [16%	.		
Species	Indic	% Dom	Dominant	Dominant Wetlands	Indic	
EPILOBIUM COLORATUM	FACW+	20	Yes	Yes		
SCIRPUS ATROVIRENS	OBL	25	Yes	Yes		
TYPHA LATIFOLIA	OBL	35	Yes	Yes		

Summary Information for Sample 19

Total Number of Dominant Species: 3 Total Number of Dominant Wetlands Indicator Species: 3

Percent Dominant Species that are Wetlands Species: 100.0% This Analysis indicates Wetlands Conditions

Comments:

Samp7e # 19

WET MEADOW (WETLAND E)

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WETLANDS DELINEATION: SOIL AND HYDROLOGY ANALYSIS						
		ACRT Client: IT C	ORPORATION			
ACRT Project No: 962236 Site: MOLYCORP SITE, 28.8 ACRES, WASHINGTON, PENNSYLVANIA						
SAMPLE:	19	Field Investigator: Date:	M. JOHNSON 08/20/96			
Do normal en	vironmental condit	ions exist at the plant c	ommunity? Yes			
Kave vegetati	ion, soi), and/or i	hydrology been significant	tly disturbed? Yes			
Comments:	FILL OVER C	OLD TAR PIT				
SOIL:			### <u>########</u> #########################			
Series:	DISTURBED	SOILS Subgro	oup:			
is Soil on Hy	dric Soil List?	N/A	Hydric Inclusions?	N/A		
ls Soil a His	itoso)?	No	Histic Epipedon Present?			
Is Soll Mottl	ed?	No	Is Soil Gleyed?	No		
Matrix Colors	:	Mottle Colors	: Perc	ent:		
Other Hydric	Soil Indicators:	NONE		•		
Is Hydric Soi	1 Criterion Net?	No				
Rationale:	APPARENT N	ON-HYDRIC DISTURBED	SOILS AND FILL			
HYDROLOGY			********			
Is ground sur	face inundated?	No Surfac	e water depth? N/A			
Is soil satur	ated? No	Depth to free standing	water in pit/soil probe hol	e: > 18"		
Other Indicate	<u>ors</u> :					
Water Marks:	No	Vetlands Drain	•			
Drift Lines: Sediment Depo:	NO sits: NO	Korphological A Blackened Leave	•			
Surface Scouri		Buttressed True				
	ydrology Criterion					
Rationale:		HYDROLOGICAL INDIC	ATOPS			
	IONAL DETERMIN					
Analysis of Ve	egetation:	WET MEADOW (WET	LAND EJ			
Is this sample	e a wetlands?	Yes				
Rationale:	NON-HYDRIC VEGETATION		NETLANDS HYDROLOGY	, AND HYDROPHYTIC		

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Field Investigator T. CRANDALL Collection Date 08/20/96

Herb Stratum	Dominance Leve	e] = *	20%	Dominant		
Species	Indi	: Dom	Dominant		Indic	
DAUCUS CAROTA DIPSACUS SYLVESTRIS EUTHAMIA GRAMINIFOLIA LOTUS CORNICULATUS MELILOTUS ALBA	UPL FACU- FAC FAC FACU- FACU-	20 - 20	Yes Yes Yes Yes	Yes		

Summary Information for Sample 20

Total Number of Dominant Species: 3 Total Number of Dominant Wetlands Indicator Species: 1

Percent Dominant Species that are Wetlands Species: 33.3% This Analysis indicates Non-Wetlands Conditions

Comments:

Page 70

Sample # 20

UPLAND OLD FIELD

WETLANDS DELINEATION: SOIL AND HYDROLOGY ANALYSIS ACRT Client: IT CORPORATION ACRT Project No: 962236 Site: MOLYCORP SITE, 28.8 ACRES, WASHINGTON, PENNSYLVANIA							
SAMPLE: 20	Field Investigator: Date:	M. JOHNSON 08/20/96					
Do normal environmental conditio	ns exist at the plant commu	nity? Yes					
Have vegetation, soil, and/or hy	drology been significantly	disturbed? Yes					
Comments: FILL OVER OL							
<u>SOIL</u> :			******				
Series: DISTURBED S	OILS Subgroup:						
Is Soil on Hydric Soil List?	<i>N/A</i> н	ydric Inclusions?	N/A				
Is Soil a Histosol?	<i>No</i> н	istic Epipedon Present?	No				
Is Soil Mottled?	No I	s Soil Gleyed?	No				
Hatrix Colors:	Mottle Colors:	Perc	ent:				
Other Hydric Soil Indicators:	NONE						
Is Hydric Soil Criterion Met?	No						
Rationale: APPARENT NO	N-HYDRIC DISTURBED S	DILS AND FILL					
HYDROLOGY:		· · · · · · · · · · · · · · · · · · ·					
Is ground surface inundated?	No Surface w	ater depth? N/A					
Is soil saturated? NO	Depth to free standing wat	er in pit/soil probe hol	e: > 18"				
Other Indicators:			•				
Water Harks: NO	Wetlands Drainage						
Drift Lines: NO	Korphological Adas	tations: NO NO					
Sediment Deposits: NO Surface Scoured Area: NO	Blackened Leaves: Buttressed Trunks:						
		NO					
Is Vetlands Hydrology Criterion I	let? No						
Rationale: NO HYDROLO	GICAL INDICATORS						
JURISDICTIONAL DETERMIN	TION:						
Analysis of Vegetation:	UPLAND OLD FIELD						
Is this sample a wetlands?	No						
Rationale: NON-HYDRIC UPLAND VEGE	DISTURBED SOILS, NO E TATION	VIDENCE OF WETLAN	DS HYDROLOGY, AND				

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Page 71

WETLANDS DELINEATION: VEGETATION ANALYSIS ACRT Client: IT CORPORATION ACRT Project No: 962236 Site: MOLYCORP SITE, 28.8 ACRES, WASHINGTON, PENNSYLVANIA

Sample # 21	Field Investigator T. CRANDALL Collection Date 08/20/96							
Herb Stratum	Dominance Lev	el = %	18%	Dominant				
Species	Indic Dom Dominant Wetlands Indic							
CYPERUS SP TYPHA ANGUSTIFOLIA TYPHA LATIFOLIA	PWI OBL OBL	10 30 50	Yes Yes	Yes Yes				

Summary Information for Sample 21 Total Number of Dominant Species: 2 Total Number of Dominant Wetlands Indicator Species: 2

Percent Dominant Species that are Wetlands Species: 100.0% This Analysis indicates Wetlands Conditions

Comments:

WET MEADOW (WETLAND D)

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WETLANDS DELINEATION: SOIL AND HYDROLOGY ANALYSIS ACRT Client: IT CORPORATION ACRT Project No: 962236 Site: MOLYCORP SITE, 28.8 ACRES, WASHINGTON, PENNSYLVANIA SAMPLE: 21 M. JOHNSON Field Investigator: 08/20/96 Date: Do normal environmental conditions exist at the plant community? Yes Have vegetation, soil, and/or hydrology been significantly disturbed? Yes Comments: DRAINAGEWAY SOIL: Series: URBAN LAND Subgroup: Hydric Inclusions? No Is Soil on Hydric Soil List? No Is Soil a Histosol? No Histic Epipedon Present? NO No is Soil Mottled? No Is Soil Gleyed? Kottle Colors: Percent: Matrix Colors: NONE Other Hydric Soil Indicators: Is Hydric Soil Criterion Het? No APPARENT NON-HYDRIC DISTURBED SOILS AND FILL Rationale: **HYDROLOGY:** N/A No Surface water depth? Is ground surface inundated? Is soil saturated? No Depth to free standing water in pit/soil probe hole: > 18'Other Indicators: Water Warks: No **Vetlands Drainage Patterns:** Yes **Drift Lines:** No **Korphological Adaptations:** No No Sediment Deposits: No Blackened Leaves: No Surface Scoured Area: Yes Buttressed Trunks: Yes Is Vetlands Hydrology Criterion Met? SECONDARY HYDROLOGICAL INDICATORS IN DRAINAGEWAY Rationale: JURISDICTIONAL DETERMINATION: Analysis of Vegetation: WET MEADOW (WETLAND D) Is this sample a wetlands? Yes DISTURBED SOILS, WETLANDS HYDROLOGY, AND HYDROPHYTIC VEGETATION Rationale:

WETLANDS DELINEATION: VEGETATION ANALYSIS ACRT Client: IT CORPORATION ACRT Project No: 962236 Site: MOLYCORP SITE, 28.8 ACRES, WASHINGTON, PENNSYLVANIA

Sample # 22	Field Investigator T. CRANDALL Collection Date 08/20/96						
Herb Stratum	Dominanc	e Leve] = ⊻	16%	Dominant		
Species		Indic	Dom	Dominant			
MELILOTUS ALBA		FACU-	20	Yes			
PHLEUM PRATENSE		FACU	- 40	Yes			
TRIFOLIUM PRATENSE		FACU-	20	Yes			

Summary Information for Sample 22

Total Number of Dominant Species: 3 Total Number of Dominant Wetlands Indicator Species: None

Percent Dominant Species that are Wetlands Species: 0.0% This Analysis indicates Non-Wetlands Conditions

Comments:

UPLAND OLD FIELD

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WETLANDS DELINEATION: SOIL AND HYDROLOGY ANALYSIS ACRT Client: IT CORPORATION ACRT Project No: 962236 Site: MOLYCORP SITE, 28.8 ACRES, WASHINGTON, PENNSYLVANIA										
SAMPLE: 2	22	Field Investigator: Date:	M. JOHNSON 08/20/96	······································						
Do normal environmental conditions exist at the plant community? Yes										
Have vegetation, soil, and/or hydrology been significantly disturbed? Yes										
Comments:	DISTURBED S	OILS AND FILL								
<u>SOIL</u> :				** **********************************						
Series:	URBAN LAND	Subgroup:								
ls Soil on Hydr	ic Soil List?	No	Hydric Inclusions?	No .						
Is Soil a Histo	sol ?	No	Histic Epipedon Present?	No						
Is Soil Nottled	?	No	Is Soil Gleyed?	No						
Natrix Colors:		Hottle Colors	: Per	cent:						
Other Hydric Soi	1] Indicators:	NONE								
·ls Hydric Soil (Criterion Ket?	No								
Rationale:	APPARENT NO	N-HYDRIC DISTURBE	D SOILS AND FILL							
HYDROLOGY:		••••••								
Is ground surfac	e inundated?	No Surfac	ce water depth? N/A							
Is soil saturate	ed? No	Depth to free standing	water in pit/soil probe ho	le: > 18"						
Other Indicators	<u>i</u> :									
Water Marks:	No	Vetlands Drain	•							
.Drift Lines:	No No	Korphological		•						
Sediment Deposit Surface Scoured		Blackened Leav Buttressed Tru								
SUITALE SCOUFED		BULLTESSEU ITU								
ls Vetlands Hydrology Criterion Het? NO										
Rationale: NO HYDROLOGICAL INDICATORS										
JURISDICTION	NAL DETERMINA	TION:								
Analysis of Yege	station:	UPLAND OLD FIELD	• •							
Is this sample a	wetlands?	No								
Rationale:	DISTURBED S VEGETATION	OILS, NO EVIDENCI	E OF WETLANDS HYDRO	DLOGY, AND UPLAND						

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Page 75

ATTACHMENT Q.

Photographs

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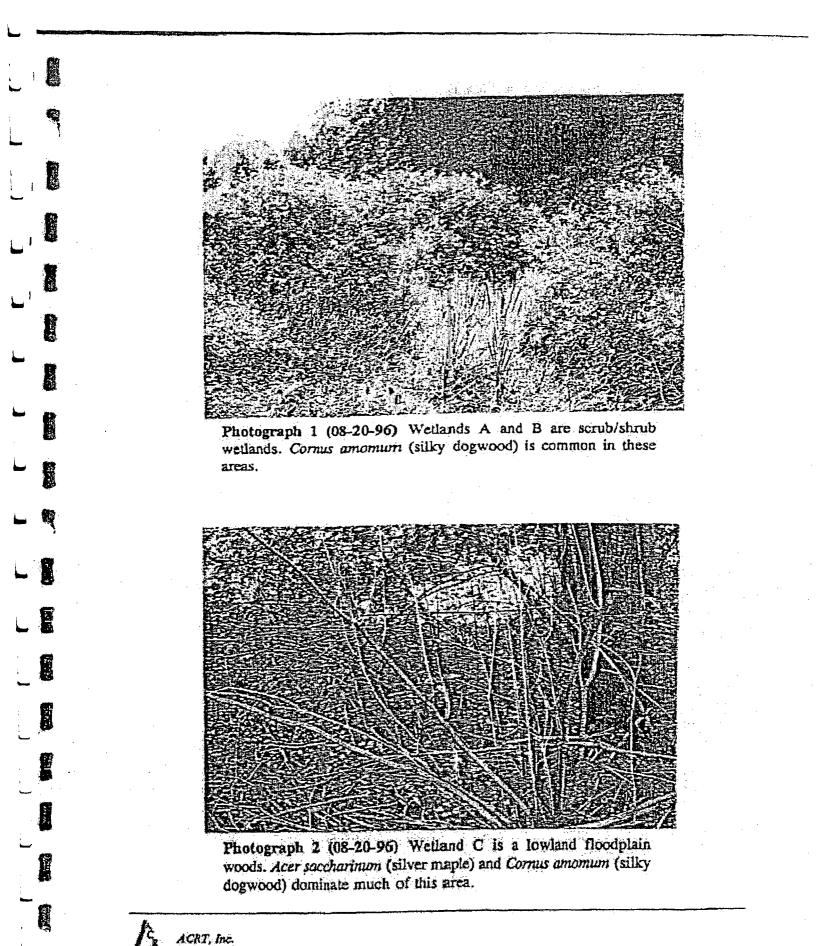
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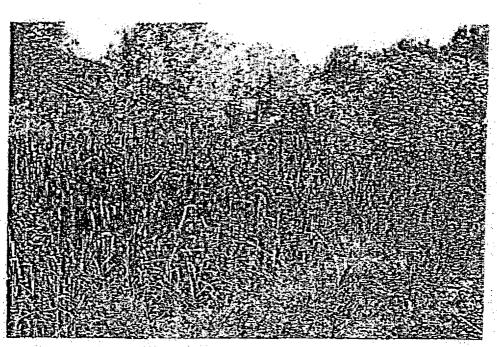
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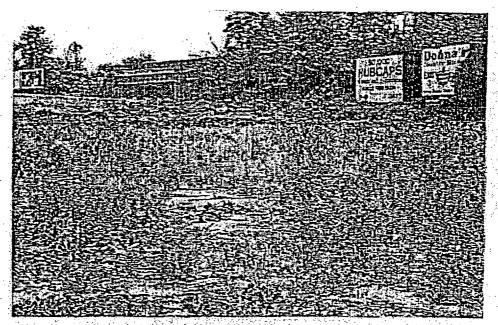


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Page 77



Photograph 3 (08-20-96) Wetland D is associated with a drainageway along an access road and is dominated by Typha sp. (cattail).



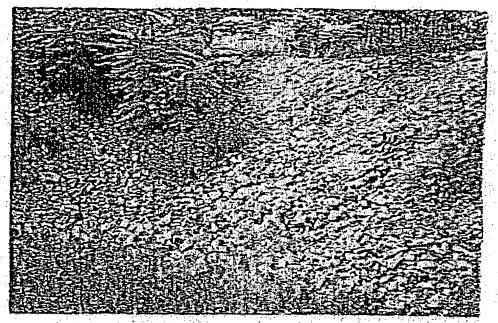
Photograph 4 (08-20-96) Wetland E is a wet meadow that has formed over the fill in the tar impoundment. Limited exposed areas of tar are visible in the foreground of this picture.

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ACRT, Inc.

Photograph 5 (08-20-96) Asclepias incarnata (swamp milkweed) is common throughout Wetlands F, G, and H. These are wet meadows that have formed in disturbed areas.



Photograph 6 (08-20-96) Various industrial and structural debris were used as fill by former land owners, as depicted by this photograph. This photo shows an old railroad bed, which is located on the site.

2545 Bailey Read, P.O. Bar 401, Cuyahoga Falls, Ohio 44221 800-622-2562

Page 79

Attachment R. References

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- Federal Interagency Committee for Wetland Delineation. 1989. Federal Manual for Identifying and Delineating Jurisdictional Wetlands. U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service, and U.S.D.A. Soil Conservation Service, Washington. Cooperative technical publication. 76 pp. plus appendices.
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ATTACHMENT S. PROFILES OF ACRT SCIENTISTS

Profiles of the following ACRT, Inc. personnel are attached:

Jay Abercrombie, Ph.D., Entomologist, Project Coordinator Karen M.Wise, M.S., Wetlands Biologist, Project Manager Todd A. Crandall, M.En., Wetlands Biologist

Michael D. Johnson, M.A., Biologist/Vertebrate Zoologist Kenneth John Christen sen, Conservationist/GPS Specialist

Address:	ACRT, Inc.
	2545 Bailey Road
	P.O. Box 401
	Cuyahoga Falls, Ohio 44221
Phone:	800-622-2562

JAY ABERCROMBIE, Ph.D., Entomologist: Dr. Abercrombie is senior vice president of Ecological Services for ACRT, Inc. He manages and coordinates the biological and ecological projects at ACRT. Dr. Abercrombie has expertise in the ecology, taxonomy, and morphology of aquatic insects and other invertebrates of streams and wetlands. Dr. Abercrombie holds a bachelor's degree in biology from the University of Akron and a doctorate in entomology from Cornell University.

KAREN M. WISE, M.S., Wetlands Biologist: Ms. Wise specializes in freshwater wetlands ecology, particularly constructed wetlands for wastewater treatment. She is the manager for projects involving wetlands restoration, mitigation, and monitoring. Ms. Wise also specializes in wetlands permitting and is experienced in streamlining the regulatory compliance process. She has a bachelor's degree in biology from Wheeling Jesuit College and a master's degree from the Ohio State University in natural resources.

TODD A. CRANDALL, M.En., Wetlands Biologist: An environmental scientist specializing in plant identification, Mr. Crandall directs vegetation data collection for wetlands assessments and delineations. He also prepares and implements wetlands restoration and mitigation plans. He is certified for wetlands studies by the U.S. Army Wetlands Delineator Certification Program. Mr. Crandall has a bachelor's degree from Hiram College in biology and a master's degree from Miami University in environmental science.

MICHAEL D. JOHNSON, M.A., Biologist/Vertebrate Zoologist: As a member of ACRT's Ecological Services Department, Mr. Johnson specializes in fish, mammal, and macroinvertebrate studies. He has a bachelor's degree in biology, with emphasis in vertebrate zoology, and a master's degree in general science, both from Kent State University.





Profiles of ACRT Scientists (CONTINUED)

KENNETH JOHN CHRISTENSEN, Conservationist/GPS Specialist: Mr. Christensen performs ecological surveys for transportation projects and other studies. His focus is the field analysis of vertebrate populations, especially amphibians and reptiles. He also excels in plant identification and wetlands identification. Mr. Christensen is responsible for managing the GPS mapping operations of the Ecological Services and urban forestry groups at ACRT. He has a bachelor's degree in conservation from Kent State University.

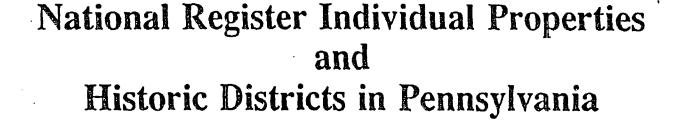
APPENDIX B

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NATIONAL REGISTER OF INDIVIDUAL PROPERTIES AND HISTORIC DISTRICTS IN PENNSYLVANIA



Pennsylvania Historical & Museum Commission Bureau for Historic Preservation P.O. Box 1026 Harrisburg, Pennsylvania 17108-1026 (717) 783-8946 T T T T

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County Codes

	001	Adams	035	Clinton	069	Lackawanna	103	Pike
	003	Allegheny	037	Columbia	071	Lancaster	105	Potter
	005	Armstrong	039	Crawford	073	Lawrence	107	Schuylkill
	007	Beaver	041	Cumberland	075	Lebanon	109	Snyder
	009	Bedford	043	Dauphin	077	Lehigh	111	Somerset
	011	Berks	045	Delaware	079	Luzerne	113	Sullivan
	013	Blair	047	Elk	081	Lycoming	115	Susquehanna
•	015	Bradford	049	Erie	083	McKean	117	Tioga
	017	Bucks	051	Fayette	085	Mercer	119	Union
	019	Butler	053	Forest	087	Mifflin	121	Venango
	021	Cambria	055	Franklin	089	Monroe	123	Warren
	023	Cameron	057	Fulton	091	Montgomery	125	Washington
1	025	Carbon	059	Greene	093	Montour	127	Wayne
•	027	Centre	061	Huntingdon	095	Northampton	129	Westmoreland
•	029	Chester	063	Indiana	097	Northumerland	131	Wyoming
	031	Clarion	065	Jefferson	099	Perry	133	York
	033	Clearfield	067	Juniata	101	Philadelphia		

PENNSYLVANIA HISTORICAL & MUSEUM COMMISSION 06/28/96 PAGE REPORT NO. 01 47 BUREAU OF HISTORIC PRESERVATION NATIONAL REGISTER/INDIVIDUAL PROPERTIES AND DISTRICTS IN PA. NRF019A ADDRESS HISTORIC NAME DATE LISTED KEY NUM CO. MUNICIPALITY BUFFALO PRESBYTERIAN CHURCH RT. 192. W OF LEWISBURG 01/30/76 000830 119 BUFFALO TWP R D 1, US RT. 15 RT. 44, W OF ALLEHWOOD 11/14/91 096469 LEWISBURG ARHORY 119 EAST BUFFALO TWP CRIFFEY, BENJAHIN HOUSE 09/13/78 000828 119 GREG TWP LR59005, SW OF HILLHONT HILLHONT RED BRIDCE 02/08/80 050654 119 HARTLEY TWP HALFWAY LAKE DAM (R.D. WINTER SP.) R.B. WINTER STATE PARK 05/11/07 000070 119 HARTLY TWP LR59024, 1/2MI S.E. OFF RT, 15 434 MARKET STREET 06/18/75 000822 05/14/79 000829 SLIFER HOUSE 119 KELLY TWP CHAMDERLIN IRON FRONT BUILDING 1 119 LEWISBURG PACKWOOD HOUSE - AMERICAN HOTEL READING RAILROAD FREIGHT STATION 10 MARKET STREET 09/20/78 000831 119 LEWISBURG ST. LOUIS & S. FIFTH STS 01/22/92 092734 119 LEWISBURG NORTH 4TH ST 02/08/80 050855 08/06/79 000826 HASSENPLUG BRIDGE 119 MIFFLINBURG HEISS, WILLIAM A. HOUSE AND BUGGY SHOP MIFFLINBURG HISTORIC DISTRICT 523 GREEN STREET 119 MIFFLINBURG 04/10/00 000824 ŔŤ.45 119 MIFFLINBURG NEW BERLIN PRESBYTERIAN CHURCH VINC STREET & HIGH STREET 10/26/72 000823 119 NEW BERLIN 11/09/72 000825 MARKET & VINE STREETS 119 NEW BERLIN OLD UNION COUNTY COUNTHOUSE 1376 02/08/80 086600 119 W BUFFALO TWP HAYES BRIDGE FACTORY COVERED BRIDCE 1629, W OF WHITE DEER 02/08/80 050856 1 119 WHITE DEER TWP 16 1588 .5 MILE SOUTH OF L.R. 60052 11/13/66 001206 121 CHERRY TREE TWP DRAKE OIL WELL BRIDGE IN CHERRYTREE TOWNSHIP L.R. 60052 OVER OIL CREEK 06/22/88 000028 121 CHERRYTREE TWP L.R. 60010 OVER SCRUBGRASS CREEK BRIDGE IN CLINTON TOWNSHIP 06/22/88 000029 121 CLINTON TWP L.R. 60007 OVER SCRUBCRASS CREEK 06/22/88 000430 WITHERUP BRIDGE 121 CLINTON TWP OFF RT. 227 NEAR LR60049 1409 ELK STREET PITHOLE CITY, SITE OF DALE, SAHUEL F. HOHE 03/20/73 001207 121 CORNPLANTER TWP 12/04/75 001205 121 FRANKLIN FRANKLIN HISTORIC DISTRICT PARTS OF WARDS 1 AND 2 01/26/84 064348 121 FRANKLIN 1205 LIDERTY ST & COR. OF 12TH ST 04/20/78 001203 121 FRANKLIN PLUMER INLOCK NATIONAL TRANSIT DUILDING 206 SENECA STREET 09/13/78 001204 121 OIL CITY 121 OIL *CITY OIL CITY ARHORY C. 2ND & STATE STS. 05/09/91 096490 OIL CITY U.S. POST OFFICE 270 SENECA STREET 121 OIL *CITY 09/15/77 001202 121 PLEASANTVILLE ALLEGHENY BAPTIST CHURCH RT. 27, MAIN STREET 12/15/78 001201 121 PRESIDENT TWP PITHOLE STONE ARCH L. R. 60046 OVER PITHOLE CREEK 06/22/88 000112 121 ROCKLAND TWP INDIAN GOD ROCK PETROCLYPH 05/14/84 064449 121 ROCKLAND TWP ROCKLAND FURNACE HEAR ROCKLAND STA, OH T480 09/06/91 096850 1 15 123 BROKEN STRAW TWP S SIDE OLD AT.6, IAVINE AT.62, 1-1/2HI S OF RUSSELL IRVINE UNITED PRESBYTERIAN CHURCH 08/27/76 001198 123 PINE GROVE TWP IRVINE, GUY C. HOUSE 09/13/78 001199 HAZELTINE, A. J. HOUSE 123 WARREN 710 PÉNNSYLVANIA AVE, WEST 11/21/76 001200 123 WARREN JEFFERSON, J.P. HOUSE 119 MARKET STREET 05/09/85 067779 10/10/75 001197 123 WARREN STRUTHERS LIBRARY BUILDING JAD & LIBERTY STREET 123 WARREN WARREN ARMORY 330 HICKORY. ST. 05/09/91 096475 WARREN COUNTY COURTHOUSE 123 WARREN MARKET STREET & FOURTH STREET 04/18/77 001196 123 WARREN WETMORE HOUSE 210 4TH AVE 04/28/75 001195 - 1 6 125 AMWELL TWP BAILEY COVERED BRIDGE 06/22/79 050859 125 AMWELL TWP LITTLE, MOSES TAVERH MARTIN'S HILL COVERED DRIDGE 02/16/96 096954 125 AMWELL TWP TJ23, W OF DISSELL 06/22/79 050881 125 BLAINE TWP SAWHILL COVERED BRIDGE 1426, SW OF TAYLORSTOWN 06/22/79 050868 125 BLAINE TWP TAYLORSTOWN HISTORIC DISTRICT HAIN ST. 09/05/85 050897 "S" BRIDCE 125 BUFFALO TWP U.S. RT. 40, 6MI W OF WASHINGTON INTERSECTION US 40 & TR-474 04/04/75 001177 02/16/96 096956 CALDWELL, JAMES TAVERH OLD MAIN, CALIFORNIA STATECOLLEGE 125 BUFFALO TWP 125 CALIFORNIA CALIFORNIA STATE COLLEGE 05/02/74 001185 125 CALIFORNIA PENNSYLVANIA RAILROAD PASSENGER STATION WATER & WOOD STREETS 06/19/79 001181 125 CANONSBURG CANONSBURG ARMORY W. COLLECE & N. CENTRAL AVES. HAWTHORNE ST AT BLUFF ST 12/22/89 096479 125 CANONSBURG HAWTHORNE SCHOOL 05/08/86 082515

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	· · · · ·	PENNSYLVANIA HISTORICAL &	HUSEUM COMMISSION	06/28/96 PAGE 48
	REPORT NO. 01	BUREAU OF HISTORIC HATIONAL REGISTER/INDIVIDUAL PROPERT	PRESERVATION IES AND DISTRICTS IN PA.	NRF019A
	CO. HUNICIPALITY	HISTORIC HAME	ADDRESS D/	ATE LISTED KEY NUM
	125 CENTERVILLE 125 CENTERVILLE IMP	WELSH/EMERY HOUSE DORSEY, JOSEPH HOUSE	113 CHERRY AVENUE RT.40, IMI E. OF CENTERVILLE	03/07/95 087085 1 11/19/74 001188 1
	125 CENTERVILLE TWP 125 CENTERVILLE TWP	HARRISON HOUSE MALDEN INN	RT. 40 EAST, MALDEN PLACE	12/30/74 001182 1 01/24/74 001186 1
	125 CHARLEROI 125 CHARLEROI/HONESSEN	CHARLEROI UNITED STATES POST OFFICE CHARLEROI-HONESSEN BRIDGE	638 FALLOWFIELD AVE LR247 OVER HONONGAHELA RIVER	01/04/90 094455 1 06/22/88 000398 1
	125 CLAYSVILLE	MONTGOMERY HOUSE	WEST MAIN ST. T48LO, W OF WEST MIDDLETOWN STATION	10/25/74 001163 1 1 06/22/79 050869 1
	125 CROSS CREEK/INDEPENDENCE	PSWILSON'S MILL COVERED BRIDGE E MEADOWCROFT ROCK SHELTER		11/21/78 001176 1
	125 DEEMSTOWN 125 DONEGAL TWP	KINDER'S MILL DERROW, MARGARET HOUSE	LR 62194, 3MI S. OF JCT WITH LR62018 WEST MAIN STREET	10/16/88 082510 1 11/05/74 001189 1
	125 DONECAL TWP 125 DONORA	MAYS, BLANEY COVERED BRIDGE CEMENT CITY HISTORIC DISTRICT	1423, SE OF WEST ALEXANDRER WALMUT, CHESTNUT, MODISETTE, IDA STS. LR143, OVER MONONGAHELA RIVER	06/22/79 050874 1
	125 DONORA/ROSTRAVER TWP	WEBSTER-DONORA BRIDGE REGESTER LOG HOUSE	LR143, OVER MONONGAHELA RIVER LR62176 (R.D. #1)	06/22/68 000399 1 10/16/74 001179 1
	125 E BETHLEHEH THP 125 E FINLEY THP	BROWHLEE, SCOTT COVERED BRIDGE	T414, HE OF EAST FINLEY	06/22/79-050876 1
	125 E FINLEY TWP 125 E FINLEY TWP	PLANT'S COVERED BRIDGE SPROWL'S COVERED BRIDGE	1408, W OF EAST FINLEY 1450, SW OF EAST FINLEY	06/22/79 050863 1 06/22/79 050862 1
	125 E WASHINGTON	EAST WASHINGTON HISTORIC DISTRICT DEVEL'S DEM, MCCLURG COVERED BRIDGE	CHESTNUT, WHEELING, BEAU, PENN, NORTH, T346, N OF PARIS	F 11/15/84 050895 1 06/22/79 050865 1
	125 HANOVER TWP 125 HANOVER TWP	JACKSON'S WILL COVERED BRIDGE	1853, S OF BOYD	06/22/79 050872 1
	125 HANOVER TVP 125 HANOVER TVP	LYLE COVERED BRIDGE RALSTON FREEMAN COVERED_BRIDGE	1500 OVER RACCOON CREEK, SE OF FIVE P T352, NW OF BOYD	06/22/79 050864 1
	125 INDEPENDENCE TWP 125 MARIANNA	MANCHESTER, ISAAG HOUSE MARIANNA HISTORIC DISTRICT	RT.231, 1/2HI N OF RT.844 , TEN MILE CREEK, BEESON AVE. HILL, 6TH	05/21/75 001180 1
	125 MOHONGAHELA	ACHESON, EDWARD G. HOUSE	900 MAIN STREET 711 W_ MAIN ST.	05/11/76 001194 1 06/02/93 001103 1
	125 MONONGANELA 125 MORRIS TWP	LONGWELL, DAVID, HOUSE DAY ÇOVERED BRIDGE	TJJ9, E OF SPARTA	06/22/79 050880 1
	125 N BETHLEHEN TVP 125 N BETHLEHEN TVP	HILL'S TAVERN LEATHERMAN COVERED BRIDGE	RT.4Ó(NATIONAL ROAD), SCENERY HILL T449, NY OF COKESBURG	11/19/74 001191 1 06/22/79 050861 1
	125 N BETHLEHEM TWP 125 N FRANKLIN TWP	RINCLAND TAVERN LEHOYNE CREMATORIUM	MAIN ST., SCENERY HILL S. MAIN ST. (LR62161) @ HILLSVIEW SAN	02/16/96 096959 1
	125 N FRANKLIN TWP	TRINITY HALL	RT.10(PARK AVE.), 1MI S OF WASHINGTON	09/27/76 001174 1
	125 N STRABANE TWP 125 NOTTINGHAM TWP	BROWHLEE, SAMUEL HOUSE EBENEZER CHURCH COVERED BRIDGE	AT. 517, BOX 66 (RD 2) OFE L967032, MINGO GREEK COUNTY PARK	11/07/76 001192 1 06/22/79 050882 1
	125 NOTTINGHAM TWP 125 PLEASANT TWP	HEHRY COVERED BRIDGE KREPP'S COVERED BRIDGE	T822, E OF HENRY T799, S OF CHERRY VALLEY	06/22/79 050860 1 06/22/79 050879 1
	125 SOMERSET TWP 125 SOMERSET TWP	HUFFHAN DISTILLERY & CHOPPING HILL WRIGHT, CERL COVERED BRIDGE	LR62155, 2 HILES NORTH OF RT. 917 T802, S OF US70L, NE OF VANCEVILLE	11/12/92 097610 i 06/22/79 050878 i
	125 SOUTH STRABANE TWP 125 UNION TWP	MARTIN FARMSTEAD Dusmal House	PA 136, 2 HI. W OF TOWN OF EIGHTY-FOU LR69174 NEAR GILMORE ROAD	R 07/21/95 102374 1
	125 UNION TWP 125 W ALEXANDER	MINCO PRESBYTERIAN CHURCH AND CHURCHYARD	RT. 68 & MINGO CHURCH RD.	02/24/75 001187 1 11/12/92 097612 1
	125 W BETHLEHAM TWP	WEST ALEXANDER HISTORIC DISTRICT HUGHES COVERED BRIDGE	MAIN ST., HIGHLAND AVE., N.LIBERTY ST. OFF LR62082 Nº OF TEN HILE	03/07/85 050898 1 06/22/79 050858 1
	125 W BETHLEHEM TWP 125 W FINLEY TWP	ULERY MILL CRAWFORD COVERED BRIDGE	LR62078 NEAR LR67053 LR62007, S OF GOUD INTENT	04/20/78 001173 1
	125 W FINLEY TWP 125 W FINLEY TWP	DAMLEY COVERED BRIDGE	T379, N OF GOOD INTENT	06/22/79 050877 1 06/22/79 050873 1
	125 W FINLEY TWP 125 W FINLEY TWP	MILLER, LONGDON L. COVEREDBRIDGE	T314, NY OF KIMMINS SCHOOL T414, S OF LIBERTY	06/22/79 050867 1 06/22/79 050866 1
	125 W MIDDLETOWN	WYIT SPROWLS COVERED BRIDGE WEST MIDDLETOWN HISTORIC DISTRICT	T360, H OF WEST FINLEY	06/22/79 050875 1 08/08/85 050899 1
	125 WASHINGTON 125 WASHINGTON	ADMINISTRATION BLDG., WASHINGTON & JEFFE BRADFORD, DAVID HOUSE	WASHINGTON & JEFFERSON COLLEGE CAMPUS 175 SOUTH MAIN STREET	08/16/77 001170 1 07/16/73 001193 1
	125 WASHINGTON 125 WASHINGTON	LEMOYNE, DR. JULIUS HOUSE MAURER, DR. JOSEPH HOUSE	49 E. MAIDEN ST.	10/25/73 001184 1
	125 WASHINGTON 125 WASHINGTON	PENNSYLVANIA RAILROAD FREIGHT STATION SACKVILLE HOUSE	97 WEST WHEELING ST 111 WASHINGTON ST.	12/30/93 089490 1 07/21/95 097185 1
	125 WASHINGTON	WASHINGTON ARHORY	309 EAST WHEELING ST. 76 W. MAIDEN ST,	11/21/76 001175 1 05/09/91 096442 1
	125 WASHINGTON 125 WASHINGTON	WASHINGTON COUNTY COURTHOUSE Washington county jail	SOUTH MAIN ST. CHERRY STREET	07/30/74 001172 1 07/30/74 001171 1
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APPENDIX C

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THREATENED AND ENDANGERED SPECIES INFORMATION



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COMMONWEALTH OF PENNSYLVANIA

PENNSYLVANIA GAME COMMISSION

2001 ELMERTON AVENUE HARRISBURG, PA 17110-9797

ADMINISTRATIVE BUREAUS:					
PROCUREMENT DIVISION	717-787-6594				
LICENSE DIVISION	717.797 2004				
PERSONNEL DIVISION	717.787 7876				
WILDLIFE MANAGEMENT	717.787.6530				
INFORMATION & EDUCATION	717.787.6700				
LAW ENFORCEMENT	717.787.5740				
LAND MANAGEMENT	717.787.6910				
HEAL ESTATE DIVISION					
MANAGEMENT INFORMATION					
SYSTEMS					

October 2, 1996

Mr. William Stanhope IT Corporation 2790 Mosside Blvd. Monroeville, PA 15146-2792

Dear Mr. Stanhope:

In response to your request for information services, we are providing the enclosed printouts from the Pennsylvania Fish and Wildlife Data Base.

We have no record of threatened or endangered species occurring on or near your project area.

Additional comments concerning this data search are included on the following page.

Very truly yours,

CU PB2

Calvin W. DuBrock, Director Bureau of Wildlife Management Pennsylvania Game Commission

Encl. CWD:sp

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Pennsylvania Fish and Wildlife Data Base LIST A: Endangered and Threatened Species ** Int. Tech. Corp, Washington Co. ** Washington West Quadrangle 26 SEP 1996

Note: The purpose of the following list is to identify endangered or threatened species which occur or are likely to occur on a designated site. We have record of the following species occurring in or near your project area. Their occurrence may depend on season, habitat type, and individual movements or migration patterns. Field surveys may be required to determine whether these species exist on your project area.

Species ID Common Name...... Scientific Name.....

ZERO Records Listed

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1 T 1. Cat Secon 4 STEELS 網 Pennsylvania Fish and Wildlife Data Base LIST B: Potencial Special Concern Species (Includes Accidental and Migrant Species) ** Int. Tech. Corp, Washington Co. ** Washington County 26 SEP 1996 Note: The purpose of the following list is to identify endangered, threatened, and special concern species which may potentially occur within a designated area. This list includes species which may exist on your project area as well as migrating and accidental species. This information is based on records of these animals inhabiting specific habitat types within Washington County. ... No. of Status..... Species Listed PA / Fed Endangered 2 PA Endangered 3 Fed Endangered 1 PA Threatened 4 **Candidate Species** 24

Total Species Listed:

34

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Pennsylvania Fish and Wildlife Data Base LIST B: Potential Special Concern Species (Includes Accidental and Migrant Species) ** Int. Tech. Corp. Washngton Co. ** Washington County 26 SEP 1996

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Common Name..... Scientific Name..... ... Status.. ... Status Haliacetus leucocephalus PA / Fed Endangered Eagle, Bald Palco peregrinus PA / Fed Endangered A Falcon, Peregrine ... PA Endangered E Osprey Pandion haliaetus Owl, Short-eared Asio flammeus PA Endangered E E Tern, Black Chlidonias niger PA Endangered ...

Mussel, Pink Mucket Pearly Lampsilis abrupta Fed Endangered

Bittern, American Botaurus lentiginosus PA Threatened Т Flycatcher, Yellow-bellied Empidonax flaviventris PA Threatened Т Т Heron, Yellow-crowned Night Nycticorax violaceus PA Threatened Т Sandpiper, Upland Bartramia longicauda PA Threatened

Harrier, Northern Circus cyaneus Candidate - At Risk U Owl, Common Bam Tyto aiba Candidate - At Risk U Snipe, Common Gallinago gallinago Candidate - At Risk U Sparrow, Henslow's Ammodramus henslowii Candidate - At Risk U

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Coot, American Fulica americana Candidate - Rare v Goshawk, Northern Accipiter gentilis Candidate - Rare v Grebe, Pied-billed Podilymbus podiceps Candidate - Rare v Grosbeak, Blue Guiraca caerulea Candidate - Rare v fanager, Summer Piranga rubra Candidate - Rare v feal, Green-winged Anas crecca Candidate - Rare ٧

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Thrush. Swainson's Catharus ustulatus Candidate - Rare V

Colinus virginianus Candidate - Undeterm W Bobwhite, Northern Crossbill, Red Loxia curvirostra Candidate - Undeterm W Dickcissel Spiza americana Candidate - Undeterm W Duck, Ruddy Candidate - Undeterm W Oxyura jamaicensis Egret, Cattle Bubulcus ibis ibis Candidate - Undeterm W Gadwall Anas strepera Candidate - Undeterm W Nighthawk, Common Chordeiles minor Candidate - Undeterm W Owl, Northern Saw-whet Aegolius acadicus Candidate - Undeterm W Pintail, Northern Candidate - Undeterm Anas acuta' W

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	Pennsylvania Fish and Wildlife Data Base LIST B: Potential Special Concern Species (Includes Assidental and Missant Species)											

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(Includes Accidental and Migrant Species) ** Int. Tech. Corp, Washington Co. ** Washington County 26 SEP 1996

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Common Name	Scientific Name	Status	tus
Wigeon, American Weasel, Least	Anas americana Mustela nivalis	Candidate - Undeter Candidate - Undeterm	rm W W
		•••	

Madtom, Brindled	Noturus miurus	Candidate Species
Rattlesnake, Timber	Crotalus horridus	Candidate Species

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Pennsylvania Fish and Wildlife Data Base LIST C: Potential Special Concern Species Land Use/Cover Type List ** Int. Tech. Corp. Washington Co. ** Washington County 26 SEP 1996

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Land Use/Cover Type	No. Species
Urban Land	9
Agricultural Land - Cropland/Pasture	22
Agricultural Land - Orchards/Vineyards/Nurseries	6
Agricultural Land - Confined Feeding Operations	3
Rangeland - Kerbaceous	16
Rangeland - Shrub/Brush	10
Rangeland - Mixed	9
Forest Land - Deciduous	19
Forest Land - Evergreen	18
Forest Land - Mixed	19
Water - Streams/Rivers/Canals	16
Hater - Lakes	14
Water - Reservoirs	13
Water - Estuaries	11
Wetland - Forested	20
Wetland - Nonforested	20
Barren Land	5

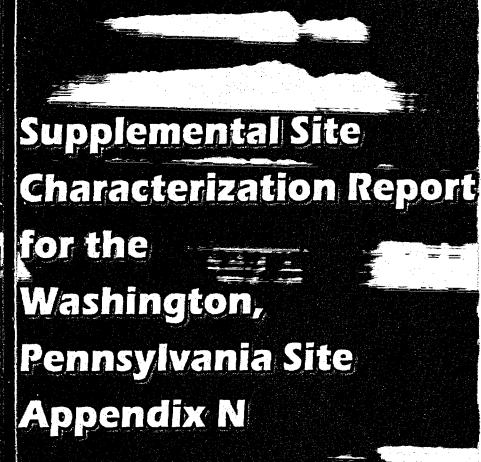
				LIST C:	Potent	ial Sp	cial C Tech. Was	oncern Corp, hington	Specie Washng Count	ton Co.	se/Cove	r Type I	List							
Species		Feeding Be	ehavior					26 SEP	TAAO			Land I	Use/Covei	г Туре						
Common Name	. *Stat.	. Herb Onn i	l Carn.	. Urban (10's)	Crops	Agric Orchd (22)	Feed	Herb	Shrub			Forest Conif (42)		. Water. Stream (51)	Lake	Water. Reserv (53)			Non-For	Barren (70's)
Madtom, Brindled	Y		x											x	X _.					
Rattlesnake, Timber	Ŷ		x		x	x			x	x	x	x	x	·						
Bittern, American	т		x											x	x	x	x	x	x	
Bobwhite, Northern	W	x	~		X			X	x	X	X	X	x		~	~		x	~	
Coot, American	v	X			X									i x	X	x	x	x	x	
Crossbill, Red	W	X				X					X	X	x					x		
Dickcissel	H	X		X	X	X		X	X	X										
Duck, Ruddy	W	X												X	Х	x			X	
Eagle, Bald	£		X		X						X	X	X	, x	X	X		X	X	
Egret, Cattle	W		X		X		X	x	X	x	x	X	X	X	X	x	X	X	X	
Falcon, Peregrine	ε		X	x	x			X	X	X			x					X	X	x
Flycatcher, Yellow-bellied	т	· X									X	X	x					x		
Gadwa I I	Ж	X			X			X				X		X	X	X	x	x	x	
Goshawk, Northern	Ņ		X		X		X	X			X	X	x					x		
Grebe, Pied-billed	ν		X											x	X	X	x		X	
Grosbeak, Blue	v	X						X	X	X	X									
Harrier, Northern	U		X	X	X			X	X	X									x	x
Heron, Yellow-crowned Night	T		X		X						X	X	x	X	X	X	X	X	X	
Nighthawk, Common	H		X	X	X			X												
Dsprey	E		X	X							X	X	x	X	X	X	x	x	x	
wl, Common Barn	ប		X	X	X	X	X				X	x	x					x	x	
Dwl, Northern Saw-whet	W		X		X						X	x	X			•		X		
Owl, Short-eared	Ε		X		X			X	X	X							x		x	X
Pintail, Northern	ĸ	X			X			X						x	x	x	x		x	~

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distants.

A-101-120

Autom



<u>Molycorp</u>

Radiological MDC's and Survey

Instrument QA/QC Data

MALCOLM PIRNIE

April 2004 4812001

Memorandum

MALCOLM	
PIRNIE	

1603 Carmody Court, Suite 403 Sewickley, PA 15143 (724) 934-4387 (724) 934-4332 (fax)

То:	Supplemental Site Characterization Report Appendix N	Date: April 30, 2004
Сору:	File	
From:	Evonne Pacinda	
Re:	Radiological MDCs	

Note on MDC (Minimum Detection Concentration) Limits

Regarding: Paragon Laboratories Lab Contact: Lance Steere, Sr. Project Manager

Malcolm Pirnie requested a MDC level of 1 pCi/g (picocurie per gram) for all analytical reports for Th-232, U-238 and Ra-226.

Paragon Laboratories has reported they achieved the goal of an MDC level below 1 pCi/g for Th-232 and Ra-226. For U-234/238 the MDC goal was achieved approximately two thirds of the time. In most instances where the MDC goal was not met the reported value for U-234/238 was ten times the achieved MDC.

Observations were based on an examination by Paragon of between 80 and 100 individual sample reports (or EDDs) for the Molycorp, Washington project.

Enercon Services, Inc

Daily Instrument Check Log for Model 19 MicroR Meter

9/23/03 through 10/31/03

Form HPM/M-2-5-1 Daily Check Log for Ludlum Model 19 µR Meter

	· • • • • •		7		LC137
	nent Model:	19		Source S/N:	C. 137 Tera 03-95 2465
	ment S/N:	182671		Source DPM:	N/A
	tor Model:	N/A	1	Radiation Detected:	Gamma
	ctor S/N:	N/A		Acceptable Range: (Refer to ESC/HPM/M-2-1-1)	Blegd Z-4 mRin
Calibr	ation Due:	12-25-03]		Sewer 148-222 me
Date	Background µR/hr	Gross Source µR/hr	Net Source µR/hr	Technician	Comments
9.23-03	3	200	197	Florender	
9-24-03	4	210	کادن	Revender	
9-25-63	3	180	רר:	Ravender	
9-26-03	3	185	182	Flavenchr	
9-29-03	ٽ	185	i 6 Z	Rovender	
°1-30-+3	ન	200	196	Ravender	
10-1-03	4	190	186	Designatur	
10-2-02	4	200	196	STSilvic	
10-3-03	4	180	۲۲ ا	Rati	
10-7-03	4	190	186	AtSilvio	
10-5-7-03	4	200	197	OTSolvio	
10-8-03	4	200	197	DTS loio	
10-9-03	4	200	197	Distrio	
10-10-03	4	200	197	prochico	
10-13-03	4	190	186	426	
10-14-03	4	140	186	etsitres	
10-15-02	4	190	186	STSilvis	
10-16-03	4	190	184	2TS fino	·
10-17-03	4	190	186	ITSchico	
10-20-03	4	200	196	GTSilvio	
10-21-03	4	200	196	STSOVO	·
10-22-0.3	4	200	196	STSilvio	
10-23-03	4	200	196	STSilvio STSilvio	
10-24-03	4	200	186	STSchoro	
Comments:				<u>,</u>	<u> </u>
Prepared By:				GTSilvio	Date: 10-24-03

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Form HPM/M-2-5-1 Daily Check Log for Ludium Model 19 μR Meter

Instrum	ent Model:	19		Source S/N:	CS 137 03-4524
Instrur	nent S/N:	182671		Source DPM:	N/A
Detect	or Model:	N/A		Radiation Detected:	Gamma
Detec	tor S/N:	N/A		Acceptable Range:	BKg 2-4 wR/h
Calibra	tion Due:	12-25-03		(Refer to ESC/HPM/M-2-1-1)	Soures 148-222ug
Date	Background µR/hr	Gross Source µR/hr	Net Source µR/br	Technician	Comments
				STSilvio	
10-27-03	4	200	196	XIJouro	
10.28-03	4	200	190	STS, frie STS, frie STS, frie STS, frie	
10:29-03	4	200	196	AJSilveo	
10:30:03	4	200	196	Mischow	
10-31-03	4	200	196	ATSILVio	
13:03	<u> </u>	200	184	pto to	
11-6-25	4	200	196	Front	Alex cellibration
10-03	À	200	196	Clark	Net for Washingt
11-10-0)	3	20	217	Stark	Sil
11-11-03	4	180	176	Black	nulli
11-12-03	4	220	210	PL	1130/01
413-03	4	220	216		
				· · · · · · · · · · · · · · · · · · ·	
					·
					· · · · · · · · · · · · · · · · · · ·
Comments:					
Prepared By:					Date:
					Date:

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Enercon Services, Inc

Daily Instrument Check Log for Model 12 with 44-9 Pancake Probe

9/23/03 through 10/31/03

DAILY INSTRUMENT CHECK LOG RADIATION MONITOR INSTRUMENTS

Instrument Type / SN: M-12 / 4452.1

Technician:

Probe Type / SN: 44-9 / 085 702

Cal. Date: 5-29-03 Cal. Due Date: 5-29-04

Source Type / #: Tc-99/ 5045-12

Source Activity: <u>4370 dpm</u>

-	Date	Cal. Check Sat/Unsat	Batt. Check Sat/Unsat	BKG Check: cpm	BKG Sat/unsat	Source Check: cpm	Source Sat/UnSat	Technician Signature	Remarks or Comments Adjustments, Corrective Actions, etc.
	9-23-03	SAT	SAT	60	SAT	470	SIT	PL	
1	9-24-03	847	SAT	70	SAT	480	CAT	DEL	
	9-25-03	SAT	SAT	80	SAT	470	SAT	PL	
-	9-26-03	SAT	547	_(60	SAT	500	SAT	ALL	
	9-29-03	SAT	SAT	70	SAT	480	SIT	And.	
	°1-30-43	SAT	SAT	(dÚ)	SAT	460	5:47	Lab	
	(6-(-03	SAT	TAD	60	SAT	460	SAT	Land	
-9	10-2-03	SAT	SAT	60	SAT	460	SAT	ST Sifires.	
	14-3-43	507	SAT	60	SAT	480	SAT	4L	
	10-6-03	SAT	SAT	60	SAT	480	SAT	STSilvio	
	10-7-03	SAT	SAT	60	SAT	480	SAT	OTSIVia	
	10-8-03	SAT	SAT	60	SAT	480	SAT	Steduio	
	10-4-03	SAT	SAT	60	SAT	480	SAT	STSilve	
	10-10-03	SAT	SAT	60	SAT	480	SAT	GTSJuro	
	10-13-03	SAT	SAT	סך	SAT	460	SAT	ILL	
	10-14-05		SAT	70	SAT	460	SAT	ATSilves	

Response Check Criteria:

mean: <u>70 cpm</u> upper: <u>84 cpm</u> lower: <u>56 cpm</u> +20% -20% Background (BKG) -Source -

mean: <u>468.5cpm</u> upper: <u>562.2 cpm</u> lower: <u>374.8 cpm</u> -20% +20%

DAILY INSTRUMENT CHECK LOG RADIATION MONITOR INSTRUMENTS

Instrument Type / SN: <u>4-12 / 44521</u>

Probe Type / SN: <u>-14-9 / 065702</u>

Cal. Date: 5-29-03 Cal. Due Date: 5-29-04

Technician:

Source Type / #: Tc-99/ 5047-03

Source Activity: 4370 dpm

_	Date	Cal. Check Sat/Unsat	Batt. Check Sat/Unsat	BKG Check: cpm	BKG Sat/unsat	Source Check: cpm	Source Sat/UnSat	Technician Signature	Remarks or Comments Adjustments, Corrective Actions, etc.
	10-15-03	SAT	SAT	60	SAT	480	SAT	OTSilvio	
L	10-16-03	SAT	SAT	60	SAT	480	SAT	STSdoro	
,	10-17-03	SAT	SAT	60	SAT	480	SAT	STSILio	
-	10-20-03	SAT	SAT	60	SAT	480	SAT	STSilvio	
i	10-21-03	SAT	SAT	60	SAT	180	SAT	StSchico	
	10-22-03	SAT	SAT	60	SAT	480	SAT	ATSilvio	
63	10-23-03	SAT	SAT	60	SAT	480	SAT	STS lvio	WATER-Broker
-9	10-24-03	SAT	SAT	60	SAT	480	SAT	STSilvio	Fixed
	10-27-03	SAT	SAT	60	GAT	480	6AT	ATSINO	
	10-28-03	SAT	SAT	60	SAT	480	SAT	STSlow	
	10-29.03	SAT	SAT	60	SAT	480	SAT	ATSilvio	
	10-30-03	SAT	SAT	70	SAT	460	SAT	GTSbro	
	10-31-03	SAT	SAT	70	GAT	460	SAT	- Strikico	
	11-3-03	SAT	SAT	70	SAT	910	SAT	tant	(Rest Sit
	11-6-03	SAT	509	60	SAT	470	SAT	L.	(Jest 2 mit
	11-7-03	TAT	DAT	60	SAT	440	SAT	Hel	Rues North
<u> </u>				<u></u>				0	(Jun 164
,	Response	Check Cr	iteria:					•	(Uniloy

Background (BKG) - mean: <u>70 cpm</u> upper: <u> $\mathcal{E} \mathcal{Y}$ cpm</u> lower: <u> $\mathcal{56}$ cpm</u> +20% -20%

1301

Source -

mean: <u>465.5 cpm</u> upper : <u>562.2 cpm</u> lower : <u>374.8 cpm</u> +20% -20%

Enercon Services, Inc

Daily Instrument Check Log for Model 2221 with 44-10 Probe used to count soil samples

9/24/03 through 10/31/03

Form HPM/M-2-6-1 Daily Check Log for Ludlum Model 2221 with 44-10 Detector

$\begin{array}{ c c c c c c c c c c c c c c c c c c c$
$\begin{array}{c c c c c c c c c c c c c c c c c c c $
$\begin{array}{c c c c c c c c c c c c c c c c c c c $
Calibration Due:178-04Refer to ESC/HPM/M-2-1-1)Source Local ISC/HPM/M-2-1-1)Background Count RateCount RateCount RateCount RateCount RateCommentsG-24-031877.6173.45%171.57%-1JG-24-031877.6173.45%171.57%-1JJG-24-031875.4174227172351.6JJ-G-26-032078 11802161761845.7JG-26-031658.0180099178441.0J-8.110-1-031647.3181576175845.7J10-1-031649.7180266178646.3RtTSilurioH8.010-2-031649.7180266178640.3RtTSilurioH7.510-2-031646.917727617569.1RtTSilurioH7.910-2-03193391767.23+++-10-2-03193391767.23+++-10-2-03178971708411789.7DTSilurioH7.910-7-03193391767.23+1.610-7-03178971708411789.7DTSilurioH7.910-7-03183111787661875.5RTSilurioH7.410-70-032078316<7893
Calibration Due: $1.26.24$ Net Source Source Count Rate Count Rate Comments $4.24-03$ 18776 173457 17576.4 $4.24-03$ 18776 173457 17576.4 $4.24-03$ 18776 174271 172351.6 $4.24-03$ 18776.4 174271 172351.6 $4.24-03$ 1875.4 174271 172351.6 $4.24-03$ $4.757.4$ 1.74271 172351.6 $4.24-03$ $4.757.4$ 1.74271 172351.6 $4.24-03$ $4.757.4$ 1.74271 172351.6 $4.24-03$ $4.757.4$ 1.74271 172351.6 $4.24-03$ $4.757.4$ 1.74271 172351.6 $4.24-03$ $4.757.6$ $4.24-03$ 1.74271 172351.6 $4.24-03$ $4.757.6$
DateCount RateCount RateCount RateTechnicianComments $4-24-03$ 18776 173457 171576.4 1726.4 1726.4 1726.4 1726.4 1726.4 $9-25-03$ 1875.4 174227 172351.6 1726.4 1726.4 1726.4 1726.4 1726.4 $9-26-03$ 20751 180216 179137.4 1726.4 1726.4 1726.4 1726.4 1726.4 $9-26-03$ 20751 180216 179137.4 1726.4 1726.4 1726.4 1726.4 178.0 $9-26-03$ 1155.0 120099 179141.0 17276.4 1767.4 116.3 8.1 $10-1-03$ 1647.3 184535 193192.7 116.3 11642.3 184535 193192.7 $10-2-03$ 1649.7 180266 178666.3 2175.6 11620 116200 $10-2-03$ 1716.7 168991 1612743 2175.6 1175.6 $10-2-03$ 174339 176723 175609.1 2175.6 117.9 $10-7-03$ 19339 176723 175706 1831.1 2175.6 17.9 $10-9-03$ 17897 170841 1789.7 2075.6 17.4 $10-10-03$ 20783 167893 2078.3 2078.3 175.6 $10-10-03$ 20783 1678.5 2175.6 117.4 $10-176.5$ 18788 1795.56 1878.5 2175.6 116.0 $10-174.5$ 18488 1708.5 21
4.24-03 18776 173456 171576.4 1726.4 1726.4 1726.4 17271 $7.25.03$ 1875.4 174227 172351.6 176.4 -7.8 $9.26-03$ 20721 180216 170137.4 9726.6 -7.8 $9.24-03$ 1730.1 181576 179845.7 9726.6 -8.1 $9.24-03$ 1130.1 181576 179845.7 9726.6 -8.1 $9.24-03$ 1658.0 120099 18941.0 -8.1 $9.26-03$ 1658.0 120099 18941.0 -8.1 101.03 16472.3 124026 178646.3 21756.6 102.3 1649.7 126026 178646.3 21756.6 102.3 1649.7 12626.6 $17866.6.3$ 21756.6 102.3 1649.7 12626.6 $1786.69.1$ 21756.6 102.3 1649.7 12626.6 $1786.69.1$ 21756.6 102.3 1649.7 12626.6 $1786.69.1$ $21756.60.6$ 102.3 1646.9 177276.6 $1756.91.6$ $21756.60.6$ 107.03 1783.9 1767.23 $47756.60.7$ $21756.60.6$ 109.03 1789.7 170841 1789.7 20756.6 109.03 1789.7 170841 1789.7 20756.6 $1010-03$ 2078.3 1678.93 2078.3 2078.3 $1010-03$ 2078.3 1678.93 2078.3 2075.6 $1010-03$ 1295.56 1878.5
9.25-03 1875.4 17227 172351.6 172351.6 17250 -7.8 9.26-03 2078 1 180216 179137.4 17250 -8.0 9.26-03 1730.1 181576 179845.7 17200 -8.1 9.26-03 1658.0 180099 178441.0 1.6 -8.1 9.26-03 1658.0 180099 18441.0 1.6 8.1 10-10-3 1642.3 184035 193192.7 1. 8.3 10-2-03 1649.7 180266 1786160.3 2175150 1. 8.0 10-2-03 1649.7 180266 1786160.3 2175150 1.7.5 10-2-03 1649.7 180266 1786160.3 2175150 1.7.5 10-2-03 1716.7 168991 1672743 2155100 1.7.5 10-2-03 1933.9 176723 4747973 2155100 1.7.9 10-2-03 1933.9 176723 4747973 2155100 1.7.9 10-2-03 1939.7 170841 1789.7 2155100 1.7.6 10-2
9-26-03 2078 1 180216 170137.4 1.201 ".8.0 9-26-03 2078 1 180216 179875.7
4-26-03 20181 180216 110151.1 4 6.1 9-24-03 1730.1 181576 171845.7 6.1 -8.1 9-26-03 1658.0 180099 18441.0 1.6 -8.1 9-26-03 1658.0 180099 18441.0 1.6 8.1 10-1-03 1642.3 184535 143192.7 1.6 8.3 10-2-03 1649.7 180266 178616.3 2175100 1.80 10-3-03 1716.7 168991 1612743 2075.100 1.7.5 10-6-03 1666.9 177276 175609.1 175100 1.7.9 10-7-03 1933.9 176723 175109.1 2075.100 1.9 10-7-03 1933.9 176723 175109.1 2075.100 1.9 10-9-03 1831.1 178766 1831.1 2075.100 1.9 10-9-03 17897 170841 1789.7 2075.100 1.9 10-9-03 20783 167893 2078.3 2078.3 2078.5 27.4 10-10-03 20783
9-24-03 1730.1 181576 174845.7 9.1 -8.1 9-30-03 1658.0 120099 178441.0 1 -8.1 10-1-03 1642.3 124835 143192.7 1 8.3 10-2-03 1649.7 120266 178616.3 2175100 1 8.3 10-2-03 1649.7 120266 178616.3 2175100 1 8.0 10-3-03 1716.7 168991 1672743 BTSibro 1 7.5 10-6-03 1666.9 177276 175691 2155100 1 7.9 10-7-03 19339 176723 175109.1 2155100 1 7.9 10-8-03 18311 178766 1831.1 2175100 1 7.9 10-9-03 17897 170841 1789.7 2075100 1 7.6 10-10-03 20783 167893 2078.3 2078.3 2078.3 2078.3 2078.3 2078.3 2078.3 2078.3 2078.3 2078.3 2078.3 2078.3 2078.3 2078.5 2075100 1<
10-1-03 1642.3 184835 143192.7 1 1 8.3 10-2-03 1649.7 180266 178616.3 2775100 1 8.0 10-3-03 1716.7 168991 1612743 875100 7.5 10-6-03 1666.9 177276 17569.1 875100 7.5 10-6-03 1666.9 177276 17569.1 875100 1 7.9 10-7-03 19339 176723 +747915 875100 1 7.9 10-8-03 18311 178766 1831.1 875100 1 7.9 10-9-03 17897 170841 1789.7 875100 1 7.6 10-9-03 20783 167893 2078.3 875100 1 7.6 10-10-03 20783 167893 2078.3 875100 1 8.0 10-13-05 18785 179556 1878.5 875100 1 8.0 10-13-05 18488 170853 1848.8 975100 1 8.0 10-14-05 18488 170853
10-2-03 1649.7 186266 178616.3 АТЗІнсо 180 10-3-03 1716.7 168991 1672743 BTS, bro 17.5 10-6-03 1666.9 177276 175609.1 АТЗІнся 1.9 10-6-03 1666.9 177276 175609.1 АТЗІнся 1.9 10-6-03 1666.9 177276 175609.1 АТЗІнся 1.9 10-7-03 1933.9 1767.23 47478751 УТЅво 51 1.9 10-8-03 1831.1 178766 1831.1 УТЅво 51 1.9 10-9-03 17897 170841 1789.7 УТЅво 11 1.9 10-9-03 20783 167893 2078.3 УТЅво 11 7.4 10-10-03 20783 167893 2078.3 УТЅво 11 7.4 10-13-05 18783 1795.56 1878.3 УТЅво 11 8.0 10-13-05 18783 1795.56 1878.3 УТЅво 11 8.0 10-14-03 18488 1708.53 1848.8 УТЅво 11 7.6
10-2-03 1649.7 182266 178616.3 ATSilino 10.0 10-3-03 1716.7 168991 167274.3 DTSibro 17.5 10-6-03 1666.9 177276 175609.1 ATSilino 17.9 10-7-03 1933.9 1767.23 +74787.1 ATSilino 17.9 10-7-03 1933.9 1767.23 +74787.1 ATSilino 17.9 10-8-03 18311 178766 1831.1 ATSilino 17.9 10-9-03 17897 170841 1789.7 DTSilino 17.9 10-9-03 20783 167893 2078.3 ATSilino 17.4 10-10-03 20783 167893 2078.3 DTSilino 17.4 10-13-05 18783 179556 1878.3 DTSilino 11 8.0 10-13-05 18783 179556 1878.3 DTSilino 11 8.0 10-14-03 18488 170853 1848.8 20752 17.6
10-3-03 1716.7 168991 1672743 BTS, bro "7.5 10-6-03 1666.9 177276 175609.1 175609.1 175600 "7.9 10-7-03 19339 176723 +7478751 155600 5"7.8 10-8-03 18311 178766 1831.1 275600 "7.9 10-9-03 17897 170841 1789.7 2075600 "7.6 10-10-03 20783 167893 2078.3 2078, 175600 "7.4 10-13-05 18783 179556 1878, 3 2078, 1848.8 2075, 18.0 10-14-03 18488 170853 1848.8 2075, 18
10603 1666.9 177276 175609.1 MTShing "7.9 10-7-03 19339 176723 +747851 MTShing "7.8 10-8-03 18311 178766 1831.1 MTSilvio "7.9 10-9-03 17897 170841 1789.7 DTSilvio "7.6 10-10-03 20783 167893 20783 OTSilvio "7.4 10-13-05 18783 179556 1878.3 STShino "8.0 10-14-05 18488 170853 1848.8 STSliva "7.6
10-7-03 19339 176723 +7478951 DTS low "7.8 10-8-03 18311 178766 1831.1 DTS low "7.9 10-9-03 17897 170841 1789.7 DTS low "7.6 10-10-03 20783 167893 2078.3 DTS line "7.4 10-13-05 18783 179556 1878.3 DTS line "7.4 10-13-05 18783 179556 1878.3 DTS line "8.0 10-14-03 18488 170853 1848.8 DTS line "7.6
10-8-03 18311 178766 1831.1 STSilvio 11 7.9 10-9-03 17897 170841 1789.7 STSilvio 17.6 10-9-03 20783 167893 2078.3 STSilvio 11 7.4 10-10-03 20783 167893 2078.3 STSilvio 11 8.0 10-13-05 18783 179556 1878.3 STSilvio 11 8.0 10-14-03 18488 170853 1848.8 STSilvio 11 7.6
10-9-03 17897 170841 1789.7 DTSilino "7.6 10-10-03 20783 167893 2078.3 DTSilino "7.4 10-13-03 18783 179556 1878.3 DTSilino "8.0 10-14-03 18488 170853 1848.8 DTSilino "7.6
10-10-03 20783 167893 20783 OTShico "7.4 10-13-03 18783 179556 1878,3 OTShico "8,0 10-14-03 18488 170853 1848.8 SOTShico "7.6
10-13-05 18783 179556 1878,3 DT-Sfines 11 8,0 10-14-03 18488 170853 1848.8 Strader 11 7.6
10-14-03 18488 170853 1848.8 2075 los 11 7.6
10-15-03 16534 115181 1653,4 DTSlues 7.8
10-16-03 17013 181/22 1701-3 STSchio 11 8.0
10-1703 19006 177915 1900.6 STStrep 11 7,9
10-20-03 17909 180479 1790,9 STSilvino 11 8,0
10-21-03 16921 182496 1692,1 STSchio "8.1
10-22-03 16128 183472 1612.8 STSilvio "8,2
10-23-03 15848 170346 1584.8 DTSilvid "7.6
10-27-03 25813 184603 2581.3 STSilveo "8.1 Comments:
Prepared By: Date:
OTStore 10-27-03
Reviewed By: Date:
Page

Form HPM/M-2-6-1 Daily Check Log for Ludlum Model 2221 with 44-10 Detector

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11-3-03	19318	171525	+9-51,8-	- Honolott Strie	7,7
10-31-03	16452	175994	1645,2	SITSdrio	" 7.8
10-30-03		182405	1712,5	STSilvio	" 3.1
10-29-03		168894	1671.9	STSilvio STSilvio	" 7,5
10-28-03	15872	184154	1587,2	STSilvio	% Eff 8.2
Date	Background Count Rate	Gross Source Count Rate	Net Source Count Rate	Technician	Comments
Calibra	tion Due:	128-04	j 		Sours 136126 76 204
	tor S/N:	074581		Acceptable Range: (Refer to ESC/HPM/M-2-1-1)	BKg - 1676 - 25 75
	or Model:	44-10		Radiation Detected:	gamma
	nent S/N:	178100		Source DPM:	N/A
	ent Model:	2221	1	Source S/N:	Cs 137/03-45 24

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Daily Minimum Detectable Concentration (MDC) and Count Time Calculation

Model 2221 with 44-10 Probe used to count soil samples

9/24/03 through 11/03/03

Form HPM/M-2-2-1 Daily Static MDC and Count Time Calculation

Instrup	nent Serial Numbe	r: 178100		Cal. Due	(-28-04		
Dete	ctor Serial Number	C 014581		[·] Cal. Due:	1-28-04		
]	Radiation Detected						
E _i (Inst	rument Efficiency):	(cpd)	$3 + 3.29 \sqrt{B_r \cdot t_s \cdot (1 + \frac{t_s}{t_b})}$ $MDC_{static} = A$			
'E _s (Source Efficiency):	(-)	MDC =	~~~~ V	1 _b	
Etor	(Total Efficiency)	:	(cpd)	static	$t_s \cdot E_u$	A	
A (A	Active Probe Area)	:	(cm^2)	11	$I_s \cdot E_u$	² 100	
		<u></u>	()	J [······································	100	
		1	t,	B _r	t,	MDC _{static}	
		В	background	background	sample	min. detectable	
	D	background	count time	count rate	count time	concentration	
	date	(counts)	(min)	(cpm)	(min)	$(dpm/100cm^{2})$	
1	9-24-03	16776	10	1877-6	1	+30+. + 12	
2	9-25-03	18754	10	1875.4	· 1	1340.6	
3	9-26-63	20761	10	2078-1	1	1393.3	
- 4	9.21.03	1301	10	173011	1	1263.7	
5	9-30-03	16580	10.	1658.0	i	1237.2	
6	10-1-03	16423	14	1641.3	1	1216.3	
7[10-2-05	/6487	10	1649.7		1241.8	
8[10-3-03	17167	10	ר, ארן	l l	1308.1	
9[10-6-03	1666.9	10.	1666.9	1	12561	
10	10-7-03	.1933.9	10	.075466 1933.9	1	(354.4	
- 11	10-0.55	-* ++++++ 16311	2	1831.1	(1316.3	
12	10-9-03	17897	<u></u> 0	1784.7	<u>I</u>	1326.7	
13	10-10-03	20783	10	2076.3	(1448.7	
14	10-13-03	18783	10	1878-3		1324-8	
15	10-14-03	18488	10	1848.8	1	1348.5	
169	1-1-1-03-15	16534	10	1653.4	<u> </u>	1258.9	
17	10-16-03	17013	10	1701,3	1	1260.9	
18	10-17-03	19006	10	1900,6	/	1332.6	
	10-20-03	17909	10	1790,9		1293.7	
	10-21-03	16921	10	1692.1		1249.8	
21	10-22-03	16128	10	1692.8		1212.8	
22	10-23-03	15848	10	1584.8		1287.4	
	10-24-03	17768	10	1776.8		1296.7	
	10-27-03	25813	10	2581.3	1	1542.9	
	10-28-03	15812	10	1587,2	1	1210.6	
C	Comments:						
P	repared By:		OTT	thico	Date: /0・スターの	P	
<u> </u>	and Day					<u> </u>	
IR	leviewed By:			Į.	Date:	Í	

Notes:

1. $E_{tot} = E_i \times E_s$.

2. Source Efficiency (E_s) is also refered to as Contamination Source Efficiency or Surface Efficiency.

3. E_s is equal to 0.25 for all alpha emissions and beta emissions with maximum energy between 0.15 and 0.4 Mev. For maximum beta energies > 0.4 MeV, E_s is equal to 0.5.

Form HPM/M-2-2-1 Daily Static MDC and Count Time Calculation

	4	nent Serial Number ctor Serial Number		ا 22 و	Cal. Due: 1-28-04 Cal. Due: 1-28-04				
~		Radiation Detected							
•	1	rument Efficiency) Source Efficiency)		(cpd) (-)	$MDC_{static} =$	$\cdot t_s \cdot (1 + \frac{t_s}{t_b})$			
	E _{tot}	(Total Efficiency):		(cpd)	static A				
-	A (A	Active Probe Area):		(cm ²)	$MDC_{static} = \frac{3 + 3.29\sqrt{B_r \cdot t_s \cdot (1 + \frac{t_s}{t_b})}}{t_s \cdot E_{tot} \cdot \frac{A}{100}}$				
			В	t _b background	B, background	t, sample	MDC _{static} min. detectable		
		D	background	count time	count rate	count time	concentration		
		date	(counts)	(min)	(cpm)	(min)	$(dpm/100cm^2)$		
-	1	10-29-03	15872	10	1587,2		1257.9		
	2	10-30-03	17125	10	1712,5		1257.3		
•	3	10-31-03	16452	10	1645.2		1255.8		
-	4	11-3-03	19578	10	1951.8	·	(367.6		
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	F	Reviewed By:				Date:			
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Notes:

1. $E_{tot} = E_i \times E_s$.

2. Source Efficiency (E_s) is also refered to as Contamination Source Efficiency or Surface Efficiency.

3. E_s is equal to 0.25 for all alpha emissions and beta emissions with maximum energy between 0.15 and 0.4 Mev. For maximum beta energies > 0.4 MeV, E_s is equal to 0.5.

Enercon Services, Inc Daily Instrument Check Logs for Model 2929 Response Check for Alpha and Beta-Gamma

9/23/03 through 11/03/03

Form HPM/M-2-7-1 Daily Check Log for Ludlum Model 2929 with a 43-10-1 Detector

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Inst	ument Model:	2929			Source S/N:	5053-03	0-12-03	۲	
	strument S/N:	142645	l I	dom · s	ource Amount	11600	4370		
the second se	etector Model:	43-10-1			tion Detected:	Alpha	Beta		
	Detector S/N:	the second s			eptable Range:	711011	913-1369		
Ca	libration Due:	5-20-64		Backgroun	d Count Time:	/0	10-1061	· · · · · · · · · · · · · · · · · · ·	
	Background	Background	Gross a	Gross B		Net β			
	Count Rate	Count Rate	Source	Source	Net a Source				
	Alpha	Beta	Count Rate	Count Rate	Count Rate	Count Rate			
Date	(cpm)	(cpm)	(cpm)	(cpm)	(cpm)	(cpm)	Technician	Comments	
9-22-03	0	57.3	4002	j105	4002	1047.7		A= 339 B= 239	
9-23-03	0	5.2	4020	1133	4020	1076.8		9341 B . 246	
9-24-03	0	59:3	4037	1148	4037	1088.7	GW	9: 0:40:342B-: 249	
9-25-03	0	58.6	4138	1138	4138	1079.4		A. 0.35 B. 247	
9-26-0)	Q	60.0	3817	1158	3817	1098		X= D.32 B=, 251	
9-29-03	0	54.9	3850	1216	3850	161.1		X: 0.32 B= .265	
9-30-03	ø	58.2	4022	//28	4022	1069.8		9-0.34 B= 244	
10-1-03	Ŷ	53.3	3973	1157	3973	1107.7	R	a .337 \$- ,253	
0-2-03	Ø	56.5	3968	1089	3968	1032.5		×. 336 \$236	
10-3-03	Ø.	58.3	3992	160	3992	1/01.7		a.338 7252	
10-6-63	Ø	53.8	3950	1157	3950	1/06.2		× ,334 P. ,252	
10-7-63	d	57.4	4050	1158	4050	1(00.6		x 1343 3-1251	
10-8-03	Ø	56.8	4027	1206	4027	1149.2		a 341 \$ 1262	
	MAC	11	1			ł			
$\square O$	10.2.	1 Ret	wined.	to Du	RATEK (was a	Center		
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Form HPM/M-2-7-1 Daily Check Log for Ludlum Model 2929 with a 43-10-1 Detector

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	Instr	ument Model:	2929	} [· ·	Source S/N:	505303	5047-03	1		
	the second s	strument S/N:	180845		dam s	ource Amount		4370			
		tector Model:	43-10-1		the second s	tion Detected:	Alpha	Beta			
		Detector S/N:	204833		Acce	ptable Range:		922-1383			
	Cal	libration Due:	9-24-07			d Count Time:	10	10			
		Background	Background	Gross a	Gross B		Net β				
]	Count Rate	Count Rate	Source	Source	Net a Source	Source				
1	4	Alpha	Beta	Count Rate	Count Rate	Count Rate	Count Rate				
	Date	(cpm)	(cpm)	(срт)	(cpm)	(cpm)	(срт)	Technician	a eff	P Commen	ts
	10-9-03	01	60.5	4213	120	4212,9	1159.5	,\$175	357	1265	
1	6-10-63	0.2	59.3	4227	1156	4226.8	1096.7	9755	,355	,250_	
12	0-13-43	6.0	<u></u>	4324	1157_	4324	1099.4	Z	.366	1257.	
	0-14-03	0.1	63.3	4361_	160	4360.9	1096.7	gors	.369	1244	
- 11-i-	0-15-03	0.7	53.9	4317	1224	4316.8	1170.1	SITS	.365	.267	
	0-16.03	0-3	_61.7	4167	10 till	41667	1044.3	2575	,353	.2.39	
1ª	0-17-03	0,1	61.9	4270	1225	4269.9	1163,1	ATS	361	126k	
	0-20-03	0,0	65.0	4299	1308	4299	1143	STFS	364	-261	
	20103	0,2	595	42.94	1126	4293.8	1066.5	ens	363	,244	
	642.03	0.1	60.9	4341	1193	4340.9	1132,1	275	367	,259	
	6-23-03	0.0	58.6_	4199	1129	4199	1070.1	275	355	144	
	024-03	0,0	56.5	4222	1132	4222	1075,5	.8173	,357	.246	
┉╢┙	0.7-07	-0,0-	74.4	4395	10,52,6	4395	100,0	\$175-	-872	.208 915	····
	10-27-03	0.0	74.4	4395	1202	4395	1127.6	275	1372	.158	
	10:29:05	0.2	57-3	4300	1156		1096,7	ØTS	364	150	
	10-2903		عا فآن	4271	1174	H271	1118.4	215	.361	,2:55	
	10-30-03	0,0	55.4	4195	1123	4195	1067.6	215	تو،کند.	,244	
	10-51-03	0,2	5605	4235	1254	4234.8		915	,358	.274	
	17-3-03	Gi	63,0	4221	1178	42209	1133.2	275	357	.254	
	IL-LAG-	0.1	63.4	4277	1185	4276.9	1121.6	32	.362	.257	and the second s
	1-10-63	0.1	67.1	4205	1173	4204.9	1105.9	<u> </u>	.352	.253	
	11-11-43	0.2	61.3	4194	1146	4193.8	1084.7	3	255	.248	
_ (F	11-12-03.	01	65.5	4284	1193	4283.9	These	36	1 263	,258	
	11-13-63	0.(64.5	436Z	1190	4361.4	1125.5	\overline{P}	,370		
	11-2-1-13	0.1	62.6	42.60	1145	42829	1132.2	72	1363	-254	
(h=	11-25-03	0.0	62.5	4269	1145	4269	1062.7	7	, 345 .362 1357	,248	
	1426-55	T <u>Go</u>	57.8	4212	1215		1/57.2	172		.265	
נן	Prepared B	y:				Date:	<u></u>		(est	5 Gritie	is do not
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Daily Instrument Check Logs for Model 2929

Response Check for Beta-Gamma

10/09/03 through 10/31/03

Instrument Type/SN: 2929 / 180845	Technician:
Probe Type/SN: <u>43.10 / 204833</u>	Sourc
Cal. Date: <u>424-03</u> Cal. Due Date: <u>4-24-04</u>	Sourc

Source Type/#: Tc-99 / 5047-03

Source Activity: <u>4370</u> dpm

	Date	Cal. Check Sat/Unsat	Battery Check Sat/Unsat	BKG Check: cpm	BKG Sat/Unsat	Source Check cpm	Source Sat/Unsat	Technician Signature	Remarks or Comments, Adjustments, Corrective Actions, etc.
	10-9-03	SAT	NIA.	60.5	SAT	1220	SAT	STS	% EFF 26.5
	10-10-03	SAT		54.3	SAT	1156	SAT	ers	25,0
	10-17-03	SAT		57.4	SAT	1157	SAT	Landen	25.2
	10-14-03	SAT		63.3	SAT	1160	SAT	STSchoro	24.4
	10-15-08	SAT		53.9	SAT	1224	SAT	ATShio	26.7
	10-16-03	SAT		64,700	SAT	1106	SAT	STSAvio	23,9
	10-17-03	SAT		61.9	SAT	1225	SAT	DTSilvio	26,6
	10-20-00	SAT		65.0	SAT-	1208	SAT	Stodie	26.1
	10-21-03	SAT		59.5	SAT	1126	SAT	STStrio	24.4
	10-22-03	SAT		40.9	SAT	1193	SAT	STShis	25.9
{	10-23-03	SAT		58.6	SAT	1129	SAT	ATSilino	24.4
[10-2403	SAT		56.5	SAT	1132	SAT	STSILow	24.6
[10-27-03	SAT		74.4	SAT	1185	SAT	STSilvio	25,8
ſ	10-28-03	SAT		59.3	SAT	1156	SAT	Distrio	250
ſ	10298	SAT		55,6	SAT	0174	SAT	ST5lico	25.5
· [10-30-03	SAT		55.4	SAT	1123	SAT	DTSchoo	24.4
Į	10-21-01	SAT	9	565	SAT	1254	SAT	STShiro	27.4

Response Check Criteria:

Background (BKG):	mean: <u>59.3</u> cpm	upper: $\frac{71.1}{+20\%}$ cpm	lower: <u>47.4</u> cpm -20%
Source:	mean: <u>//53</u> cpm	upper: $\frac{1383}{+20\%}$ cpm	lower: <u>972</u> cpm -20%

waan eft: 25 %

Instrument Type/SN: <u>2929 / 180845</u> Probe Type/SN: <u>43-10 / 204633</u>

Technician: ____

Source Type/#: Th-230 / 5053-03

Cal. Date: 9-24-03 Cal. Due Date: 9-24-04

Source Activity: 11800 dpm

Date	Cal. Check Sat/Unsat	Battery Check Sat/Unsat	BKG Check: cpm	BKG Sat/Unsat	Source Check cprn	Source Sat/Unsat	Technician Signature	Remarks or Comments, Adjustments, Corrective Actions, etc.
16-9-03	SAT	NIA	0,1	SAT	4213	SAT	ST3	% EFF 35.7
10-10-13	SOT		0.2	SAT	4227	SAT	RITSA	35.8
10-13-03	SAT		0.0	SAT	4324	SAT	franden	36.6
10-14-03	SAT		0.2	SAT	4361	SAT	ATSilvico	36.7
10-15-03	SAT		0.2	SAT	4317	SAT	STSilvio	36.5
10-16-03	SAT		0,3	SAT	4167	SAT	975 doio	35.3
10-17-05			Orl	SAT	4270	SAT	95TS dues	36.1
10-20-03			010	SAT	4299	SAT	Dischio	36.4
10-21-03			0.2	SAT	4294	SAT	STSchiro	36.3
10-22.03	SAT		0.1	SAT	4341	SAT	GTSilvio	36.7
10-23-03			0,0	SAT	4199	≲ AT	StSilvio	35.5
10-2403	SAT		0.0	SAT	4222	SAT	STStow	35.7
10:27:03	SAT		0.0	SAT	4395	SAT	ATSilvio	37,2
102603			0,2	SAT	4300	SAT	GTSchro	36.4
	SAT		0,0	SAT	4271	SAT	Stischort	36,1
10-30-21	SAT		0,0	SAT	4195	SAT	STSelvo	35.5
10-31-05	SAT	V	0,2	SAT	4235	CAT	GTShow	35.8

Response Check Criteria:

Background (BKG): mean: 0.12 cpm upper: 0.48 cpm lower: -0.24 cpm +20%Source: mean: 47.83 cpm upper: 5/39 cpm lower: 3426 cpm +20%

Daily Instrument Check Logs for Model 12

Response Check

9/23/03 through 10/31/03

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Instrument Type / SN: M-12 / 44 52B

Probe Type / SN: 44-9 / 010672

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Cal. Date: 5-22-03 Cal. Due Date: 5-22-04

Technician:

Source Type / #: Tc -99 / 5047-03 ONS-12

Source Activity: <u>4370</u> dpm

-	Date	Cal. Check Sat/Unsat	Batt. Check Sat/Unsat	BKG Check: cpm	BKG Sat/unsat	Source Check: cpm	Source Sat/UnSat	Technician Signature	Remarks or Comments Adjustments, Corrective Actions, etc.
;	4-23-03	SAT	SAT	50	SAT	420	SAF	L2	
	9-24-03	SAT	SAT	50	SAT	400	SAT	P	
	9-25-03	SAT	SAT	40	SAT	410	SAT		
	9-26-03	SAT	SAT	40	SAF	420	SAT	LL	
	9-29-03	SAT	SAT	50	SAT	440	SAT	4L	
	9-30-03	SAT	SAT	40	SAT	410	SAT	ZL	
	10-1-03	SIT	SAT	40	SAT	430	SOT	Rend	
1	10-2-03	SAT	SAT	40	SAT	430	SAT	ATSilvio	
	10-7-03	SAT	SAT	40	SAT	420	SAT	the	· · · · · · · · · · · · · · · · · · ·
	10-8-03	SAT	SAT	40	SAT	420	SAT	DTShow	
	10-7-03	SAT	SAT	40	SAT	480	SAY	Stsles	
	10-8-03	SAT	SAT	40	SAT	420	SAT	STSilvis	
	10-9-03	SAT	SAT	40	SAT	420	SAT	StSchor	
	10-10-03	SAT	SAT	40	SAT	H20	SAT	StSilves	
- [10-13-03	SAT	SAT	50	545	420	SAT	421	
	10-14-03		SAT	40	SAT	420	SAT	STS Lino	

Response Check Criteria:

Background (BKG) -

+20%

mean: <u>46.5 cpm</u> upper: <u>55.8 cpm</u> lower: <u>37-2 cpm</u> -20%

Source -

mean: <u>409.5 cpm</u> upper: <u>491.4 cpm</u> lower: <u>327.6 cpm</u> -20% +20%

Instrument Type / SN: M-12/ 44528 Probe Type / SN: 44-9 / 010672

Technician:

Source Type / #: TE-99 / 5047 -03

Cal. Date: 5-72-03 Cal. Due Date: 5-72-04

Source Activity: 4370 dpm

-	Date	Cal. Check Sat/Unsat	Batt. Check Sat/Unsat	BKG Check: cpm	BKG Sat/unsat	Source Check: cpm	Source Sat/UnSat	Technician Signature	Adjustme	or Comments nts, Corrective ons, etc.
	10-15-03	SAT	SAT	50	SAT	420	SAT	STSolio		
	10-16-03	SAT	SAT	50	SAT	420	SAT	STSINO.		
	10-20-03	SAT	SAT	50	SAT	420	SAT	ATSilvio		
. (10-21-03	SAT	SAT	50	SAT	420	SAT	STSilves	Glass	Broken
	10-22.03	SAT	SAT	50	SAT	420	SAT	DIStrio	<i></i>	11
	10-23-03	SAT	SAT	50	SAT	NOO	SAT	ITSilvio	11	۶۹
e	10-2:4-03	SAT	SAT	50	SAT	420	SAT	STS to a	11	pt
9	10-27-03	SAT	SAT	50	SAT	420	SAT	GTSilveo	11	21
	10-28-03	SAT-	SAT	50	SAT	420	SAT	STSINIO	12	12
	10-29-07	SAT	SAT	50	SAT	H20	SAT	GTSIvio	11	jt -
. [10-30-03	SAT	SAT	50	SAT	420	SAT	STSdres]1	61
	10-31-03	SAT	SAT	50	SAT	420	SAT	ATSINO	11	(ر
. [11-3-03	SAT	JAT	50	SAT	410	SAT	Alat		
	11-6-07	SAT	SAT	50	SAT	420	SAT	Kanl		
-	(1-7-0)	SAL	SAT	50	SAT	470	545-	Ph		
	11=40=03	SAT	SAT	50	SAT	410	SAT	ALT-		1

Response Check Criteria:

Background (BKG) -

mean: <u>46.5 cpm</u> upper: <u>SS.8 cpm</u> lower: <u>37.2 cpm</u> +20% -20%

Source -

mean: <u>409.5 cpm</u> upper: <u>491.4 cpm</u> lower: <u>327.6 cpm</u> -20% +20%

Last 4 entries de not regard Wordington Site. Emp 04/30/04

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Certificates of Calibration

(C)	O)	<u>p</u>	Y
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CERTIFICATE OF CALIBRATION

ENERCON Services, Inc. 650-I Seco Road Monroeville, PA 15146 Ph. 412-373-8455 Fax 412-373-5930

Customer: <u>Enercor</u>	Services Inc.		Order No/A
Mfg.: <u>Ludlum</u>	Mo	del ¹¹ 19 12 Serial No.:	
Cal Date: 05/21/03 Meterface 129		ite:05/25704/	Cal. Interval <u>12 months</u>
Check mark 🗍 applies to ap	plicable instruments and/	or detector IAW Mfg. Spec. T	°F RH% Alt. 1,180 Ft.
New Instrument or Instrumer	nt Received 🔲 Within Toler	r +/-10% 🔲 0-20% 🗍 Out of To	ol.
Mechanical Ck.	Meter Zeroed	Background Subtract	Input Sens. Linearity
🖾 F/S Resp. OK	Reset Ck.	Window Operation	Geotropism
Audio. Ck.	Alarm Setting Ck.	Batt. Ck. (Min. Volt)	MA22 VDC
Calibrated in accordance v	with EAL No.	Calibrated in accordance w	vith EAL No.
Instrument Volt Set 900	V Input Sens.	MV	
Det. Oper	_ V atmV	Threshold Dial Ratio	— — <u>—</u>
HV Readout (2 points)	Ref./Inst.	V F	Ref./Inst//

COMMENTS: Calibrated with 44-9 probe. Serial number 010672

44 To Efficiency = 15.4%

Gamma Calibration: GM detectors positioned perpendicular to source except for M44-9 in which the front of probe faces source.

RANGE/ MULTIPLER	REFERENCE CAL. POINT	INSTRUMENT REC'D "AS FOUND READING"	INSTRUMENT METER READING*	
XI	100 cpm	100 cpm	100 cpm	
XI	200 cpm	200 cpm	200 cpm	
XI	400 cpm	380 cpm	380 cpm	
X10	ik	1.1 k cpm	1.1k cpm	
X10	2k	2k cpm	2k cpm	
X10	4k	4k cpm	4k cpm	
X100	10k 20k 40k	10k cpm 20k cpm 38k cpm	10k cpm 20k cpm 38k cpm	
X1000	100k cpm	100k cpm	100k cpm	
X1000	200k cpm	200k cpm	200k cpm	
X1000	400k cpm	410k cpm	410k cpm	

*Uncertainty within ±20%

50, 25 Range(s) Calibrated Electronically

	REFERENCE CAL POINT	INSTRUMENT RECEIVED	INSTRUMENT METER READING*		REFERENCE CAL POINT	INSTRUMENT RECEIVED	INSTRUMENT METER READING
Digital Readout				Log Scale			
1							

Reference Instruments and/or Source Cs-137 Gamma S/N 6205GF Alpha S/N	:s: _ 🗌 Beta S/N	☐Other <u>Tc99 s.n 5048-03</u>
 Д м 500 S/N 187460	Oscilloscope S/N	AMultimeter S/N 020513278
Calibrated By: <u>T. James</u> XI. a Reviewed By: <u>Fr Slag</u>	1 5-22-03 1 5-22-03	Date: $521/03 - 52203$ Date: 5^22-03 AC Inst. \Box Passed Dielectric (hi-Pot) and Continuity Only \Box Failed

C	GOP ERTIFICATE O	Y F CALIBRA	TION		ENERCON Services, Inc. 650-I Seco Road Monroeville, PA 15146 Ph. 412-373-8455 Fax 412-373-5930
Customer:Enercoi	n Services Inc.				Order No.
	Cal Due Da	ate: <u>05/29/04</u>	Cal.	Interval 12	months_Meterface 129
Check mark applies to ap	•				
Mechanical Ck. F/S Resp. OK Audio. Ck. Calibrated in accordance Instrument Volt Set 902	Meter Zeroed Reset Ck. Alarm Setting Ck. with EAL No. V Input Sens. <u>39.3</u>	Backgro Windov BBatt. Cl Calibrated in MV	ound Subtract v Operation k. (Min. Volt) n accordance w	K VDC	E Geotropism
Det. Oper	_ V atmV	Threshold Dial	Ratio	=	
HV Readout (2 points)	Ref./Inst	/	V R	ef./Inst	/

COMMENTS: 10.5% eff.

Gamma Calibration: GM detectors positioned perpendicular to source except for M44-9 in which the front of probe faces source.

RANGE/ MULTIPLER	REFERENCE CAL. POINT	INSTRUMENT REC'D "AS FOUND READING"	INSTRUMENT METER READING*	
XI	100 cpm	105 cpm	105 cpm	
	200 cpm	200 cpm	200 cpm	
	400 cpm 400 cpm		400 cpm	
X10	lk cpm	1000 cpm	1000 cpm	
	2k cpm	2000 cpm	2000 cpm	
	4k cpm	3800 cpm	4000 cpm	
X100	10k 20k 40k (cpm)	10000 cpm 20000 cpm 40000 cpm	10000 cpm 20000 cpm 40000 cpm	
X1000	100k 200k 400k (cpm)	120000 cpm 200000 cpm 4000000 cpm	100000 срт 200000 срт 400000 ср	
	1			

*Uncertainty within ±20%

50, 25 Range(s) Calibrated Electronically

				the second s			and the second se
	REFERENCE CAL POINT	INSTRUMENT RECEIVED	INSTRUMENT METER READING*		REFERENCE CAL. POINT	INSTRUMENT RECEIVED	INSTRUMENT METER READING
Digital				Log			
Readout		1		Scale		·	
		778				//	
	A					N	
	10	17			101		

Reference Instruments and/or S Cs-137 Gamma S/N [6205GF Alpha S/N	Durces:	Other
M 500 S/N 187460	Oscilloscope S/N	[]Multimeter S/N020513278
Calibrated By: <u>R. Shank</u>	2 Shank	Date: 05/29/03
Reviewed By:	g. kg	Date: AC Inst. D Passed Dielectric (hi-Pot) and Continuity

	GOP' CERTIFICATE OF	U	N	ENERCON Services, Inc. 650-I Seco Road Monroeville, PA 15146 Ph. 412-373-8455 Fax 412-373-5930
Customer:Energy	con Services Inc.			Order No. <u>N/A</u>
Mfg.: <u>Ludlum Meas</u>	urements Inc.		Model 19	Serial No.: 182671
Cal Date: 06/25/03	Cal Due Date: <u>12/2</u>	<u>5/03</u> Cal. Interval _	<u>6 mo.</u> Mete	erface 202-016
Check mark 🔲 applies to	applicable instruments and/o	r detector IAW Mfg. S	Spec. T <u>79.0</u> °F	RH <u>43</u> % Alt. <u>1,180 Ft</u> .
New Instrument or Instru	ment Received 🕬 Within Toler	+/-10% 🗍 0-20% 🗍 🖲	out of Tol. 🔲 Requ	uiring Repair Other-See Comment
	Meter Zeroed		•	
☑F/S Resp. OK	🗭 Reset Ck.	Window Opera	ation	€⊈Geotropism
🖉 Audio. Ck.	Alarm Setting Ck.	Batt. Ck. (Min	. Volt) 4.4_ 22 V	/DC
Calibrated in accordance	ce with EAL 206 Rev. 0 01/23	3/03.		
Instrument Volt Set <u>815</u> V	Input Sens. 35	MV		
	VatmV 1			
HV Readout (2 points)	Ref./Inst		V Ref./Inst	/

COMMENTS:

Gamma Calibration: GM detectors positioned perpendicular to source except for M44-9 in which the front of probe faces source.

RANGE/	REFERENCE	INSTRUMENT REC'D	INSTRUMENT METER
MULTIPLER	CAL. POINT	"AS FOUND READING"	READING*
5000	4000 µR/hr		4000 μR/hr
5000	1000 µR/hr		1000 µR/hr
500	400 μR/hr		400 μR/hr
500	100 µR/hr		100 µR/hr
250	200 µR/hr		200 μR/hr
250	100 μR/hr		100 µR/hr
50	40 μR/hr		40 µR/hr (7350 cpm)
50	1840 cpm		1840 cpm
25	20 μR/hr		20 µR/hr (3880 cpm)
25	970 cpm		970 cpm

*Uncertainty within ±20%

50, 25 Range(s) Calibrated Electronically

	REFERENCE CAL POINT	INSTRUMENT RECEIVED	INSTRUMENT METER READING*		REFERENCE CAL. POINT	INSTRUMENT RECEIVED	INSTRUMENT METER READING
Digital Readout				Log Scale			

Reference Ins Cs-137 Gamma	S∕N ∰6205GF		N/A	[] Other N/A
∯ M 500 S/N	<u>187460</u>	Oscilloscope S/N	[]Multime	eter S/N 020513278
Calibrated By Reviewed By:		tyames_		Date: <u>6/25/03</u> Date: <u>6/25/03</u>
	- <u></u>	<u> </u>	A	AC Inst. Passed Dielectric (hi-Pot) and Conti Dnly Pailed

CERTIFICATE OF CALIBRATIO	DN ENERCON Services, Inc. 650-I Seco Road Monroeville, PA 15146 Ph. 412-373-8455 Fax 412-373-5930
Customer: Enercon Services Inc. Order No. <u>N/A</u>	
Mfg.: <u>Ludium</u> Model 19 Seria	l No.:91563_
Cal Date: 09/29/03 Cal Due Date: 03/29/ 04 Cal. Interval 6 mo. N	1eterface
Check mark 🔲 applies to applicable instruments and/or detector IAW Mfg	2. Spec. T. 673_ °F RH 26 % Alt. 1,180_Ft.
New Instrument or Instrument Received Within Toler +/-10% 0-20%	Out of Tol. Requiring Repair Other-See Comment
Mechanical Ck. Meter Zeroed Background	Subtract Input Sens. Linearity
F/S Resp. OK Reset Ck. Window Opt	eration Geotropism
Audio. Ck. Alarm Setting Ck. Batt. Ck. (M	in. Volt) 4.4_22 VDC
Calibrated in accordance with EAL 206 Rev. 0 01/23/03.	
Instrument Volt Set 610 V Input Sens. / 0 MV	
Det. Oper V atmV Threshold Dial Ratio	/0 = /00
HV Readout (2 points) Ref./Inst. 4000 / 4000	

COMMENTS:

Gamma Calibration: GM detectors positioned perpendicular to source except for M44-9 in which the front of probe faces source.

RANGE/ MULTIPLER	REFERENCE CAL. POINT	INSTRUMENT REC'D "AS FOUND READING"	INSTRUMENT METER READING*
5000	4000 μR/hr	3500 µR/hr	4000 µR/hr
5000	1000 µR/hr	1000 µR/hr	1000 µR/hr
500	400 µR/hr	320 µR/hr	400 µR/hr
500	100 μR/hr	100 µR/hr	100 µR/hr
250	200 µR/hr	180 µR/hr	200 µR/hr
250	100 µR/hr	100 µR/hr	100 µR/hr
50	40 μR/hr	35 μR/hr	40 µR/hr
50	9400 cpm	9400 cpm	940 0 cpm
25	20 μR/hr	18 µR/hr	19 µR/hr
25	1800 cpm	1800 cpm	1800 cpm

*Uncertainty within ±20%

50, 25 Range(s) Calibrated Electronically

			· · · · · · · · · · · · · · · · · · ·				
	REFERENCE CAL POINT	INSTRUMENT RECEIVED	INSTRUMENT METER READING*		REFERENCE CAL. POINT	INSTRUMENT RECEIVED	INSTRUMENT METER READING
Digital Readout		1		Log Scale			
		/-A				V A	
	\mathcal{N}	/_/ ٩			10-	-/-/	

Reference Instruments and/or	Sources:		
Cs-137 Gamma S/N 26205GF	_		
Alpha S/N <u>N/A</u>	🖸 Beta S/N	<u>N/A</u> Other <u>N/A</u>	
IM 500 S/N 187460 □0	scilloscope S/N	Multimeter S/N 020513278	
_	•		
Calibrated By:R. Shank	00		
Calibrated By:R. Shank 7.	dian -	Date: 09/29/03	
Reviewed By: Ken QA	Million	Date:	
· Jungf	<u> </u>		
		AC Inst. D Passed Dielectric (hi-Pot) and Continuity	
		Only 🔲 Failed	
		· /	

CERTIFICAT	ENERCON Services, Inc. 650-I Seco Road Monroeville, PA 15146 Ph. 412-373-8455 Fax 412-373-5930		
Customer: <u>Enercon Services Inc.</u>			Order No.N/A
Mfg: Ludlum			
Mfg.:	Model	19	Serial No.:
CalDate: 01/28/03 Cal Due Date:	_01/28/04Cal. Inte	rval <u>12 mo</u>	<u>'s</u> Meterface 202-159
Check mark 🔲 applies to applicable instrumer	ts and/or detector IAW Mfg. Sp	ec. T <u>75</u> °F	RH <u>30.22</u> % Alt. <u>1120</u> F
New Instrument Instrument Received 🗹 Withi	n Toler +/-10% 🗍 0-20% 🗍 Out c	fTol. 🔲 Requirir	ng Repair Other-See Comment
Mechanical Ck. Meter Zeroed			
FS Resp. OK Reset Ck.			
Audio. Ck.	Ck. Batt. Ck. (Min. V	olt) <u>5,6</u> 22 VD	C
Clibrated in accordance with ECL 205-1 R	ev. 0 1/23/03 🛛 🗍 Calibra	ted in accordance	e with ECL 205-1Rev. 0 1/23/03
Instrument Volt Set 1000 V Input Sens	<u>10</u> MV		
Det. Oper. <u>N/A</u> V at <u>N/A</u>	mV Threshold Dial Ratio	<u>10 = 10</u>	20
Eff Readout (2 points) Ref./Inst.	504/500	V Ref./Inst.	

COMMENTS: Digital Calibration done using a 0.1 minute count time. Results reflect that count time.

Gamma Calibration: GM detectors positioned perpendicular to source except for M44-9 in which the front of probe faces source.

RANGE/	REFERENCE	INSTRUMENT REC'D "AS FOUND READING"	INSTRUMENT METER READING*
MULTIPLER	CAL. POINT	"AS FOUND READING"	
	400 Kcpm		400k
X1K	100 kcpm		100k
X100	40 Kcpm		40k
X100	10 Kcpm		10k
X10	4 Kcpm		4k
X10	l Kcpm		lk
XI	400 cpm		400
XI	100 cpm		100
	1		

*Uncertainty within ±20%

	REFERENCE CAL POINT	INSTRUMENT RECEIVED	INSTRUMENT METER READING*		REFERENCE CAL. POINT	INSTRUMENT RECEIVED	INSTRUMENT METER READING
Digital				Log			
Readout	400cpm		40cpm	Scale	50 cpm		50
	400 Kcpm		40042		500 Kcpm		500k
	40 Kcpm		4000		50 Kcpm		50k
	4 Kcpm		400		5 Kcpm		5k
	40 cpm		4		500 cpm		500

Reference Instrum Cs-137 Gamma S/N	6205GF G1	12 DM565 D5105	1879	DE552		Other	Neutron AM-241 Be S/N
🗹 м 500 S/N	187460	[]Oscilloscope S/N					er S/N
Calibrated By:	Theresa James	Theresa I'K	Jam	-	AC Inst.	Date: 01/28/0 /23/43] Passed Diele] Failed	3 ectric (hi-Pot) and Continuity