Table 2-1 Assessment and Measurement Endpoints

Assessment Endpoint	Media	Measurement Endpoint
AQUATIC HABITATS [1]		
Protection and maintenance of fish and water column invertebrate communities	Surface Water	Comparison of maximum surface water concentration to chronic surface water screening values.
Protection and maintenance of freshwater benthic invertebrate populations	Sediment	Comparison of maximum bulk sediment concentrations with risk-based low effect sediment screening values.
Protection and maintenance of indigenous wetland plant community	Wetland Hydric Soil	Comparison of maximum soil concentration to lesser of sediment benchmark and soil benchmark for protection of plants.
Protection and maintenance of indigenous amphibian community	Wetland Hydric Soil, Sediment and Surface Water	Qualitative evaluation based on surface water, hydric soil, and sediment screening. No amphibian-specific benchmarks anticipated.
Protection and maintenance of semi-aquatic wildlife receptors	Surface Water,Sediments, Biota	Comparison of calculated total daily dose for avian and mammalian receptors from exposure to surface water, sediments, and ingestion of contaminated prey items to constituent-specific toxicity reference value.
TERRESTRIAL HABITATS [2]		
Protection and maintenance of indigenous terrestrial plant and soil invertebrate communities	Historic CCB Fill (soil)	Comparison of maximum soil concentration to soil benchmarks for protection of plants and soil invertebrates.
Protection and maintenance of terrestrial food wildlife receptors	Soil, Plants, Biota, and Fresh Water	Comparison of calculated total daily dose for avian and mammalian receptors from exposure to soil, fresh water, and ingestion of contaminated prey items to constituent-specific toxicity reference value

1 - Brown Ditch, other potentially affected water bodies, and associated wetlands.
2 - Upland terrestrial habitat areas potentially affected by historic CCB fill.

Table 3-1 Proposed Surface Water and Sediment Sampling Locations, Frequency, Description and Rationale

Location	Samples to be Collected	Frequency	Description/Location	Rationale
A	Surface Water Sediment	4X 1X	▪ Background sample, upstream of Yard 520 on WB	▪ Used as reference sample for W. Branch samples, well outside Area of Investigation
B	Surface Water	4X	▪ Background sample, upstream of landfill areas on SB-1 ▪ Upstream of road crossing	▪ Used as reference sample ▪ Drainage off farm fields
C	Surface Water Sediment	4X 1X	▪ Background sample, upstream of Pines landfill area on SB-2 ▪ Downstream of road crossing	▪ Used as reference surface water and sediment sample
D	Surface Water	4X	▪ Background sample, upstream station on Kintzele Ditch ▪ Upstream of Route 20 crossing	▪ Used as reference sample for regional water quality, well outside Area of Investigation
E	Surface Water Sediment	4X 1X	▪ Background sample, upstream station on Kintzele Ditch ▪ Upstream of Earle Road crossing	▪ Used as regional reference surface water and sediment sample
F	Surface Water	4X	▪ Background sample, upstream station on Kintzele Ditch	▪ Used as regional reference surface water sample
G	Surface Water Sediment	4X 1X	▪ Background sample, Kintzele Ditch just upstream of IDNL at power easement / Calumet Trail	▪ Used as regional reference surface water and sediment sample ▪ Comparison to H
H	Surface Water Sediment	4X 1X	▪ Brown Ditch just upstream of IDNL at power easement / Calumet Trail	▪ Downstream limit of Brown Ditch prior to entry onto IDNL property
I	Surface Water Sediment	4X 1X	▪ Brown Ditch, midway between Route 12 and 20 ▪ Near small pond to west	▪ Captures influence of Route 20 crossing and within ecological habitat (large wetland area)
J	Surface Water Sediment	4X 1X	▪ Brown Ditch, upstream of Route 20 crossing and downstream of confluence of EB and WB	▪ Downstream of confluence of EB and WB
K	Surface Water Sediment	4X 1X	▪ Located in one of the man-made ponds near the eastern end of the EB	▪ To evaluate potential “attractive nuisance” area ▪ Potential overlap with HHRA
L	Surface Water Sediment	4X 1X	▪ Located in one of the man-made ponds adjacent to EB ▪ South of Carolina Ave.	▪ Same rationale as for K
M	Surface Water Sediment	4X 1X	▪ EB, upstream of private unpaved road crossing ▪ Accessible off unpaved road	▪ Downstream of old town “dump” and small tributary from south ▪ Downstream of suspected CCBs encountered in utility trenches

Table 3-2 Proposed Ecological Receptors

Potential Ecological Receptors	Discussion	Suggested Representative Species or Community
AQUATIC HABITATS [1]		
PRIMARY PRODUCERS/DETRITIVORES		
Aquatic Vegetation	Aquatic vegetation found in Brown Ditch system channels or at the riparian/bank interface; including submerged and emergent forms.	Wetland plant community (e.g., *Typha, Phragmites*)
Benthic Invertebrates	Benthic invertebrates inhabiting the sediments of permanent aquatic environments, particularly those adapted to slow sluggish streams.	Benthic invertebrates (epi-, infaunal) (e.g., Diptera, Hemiptera)
Amphibians	Amphibians are expected in wetlands and ditches, which can be used . for both foraging and breeding purposes.	Wetland amphibians (e.g., frogs, toads)
PRIMARY/SECONDARY CONSUMERS		
Fish	Aquatic habitats provide a range of marginal to good fishery habitat for smaller fish species.	Warmwater fish community (e.g, , creek chub, grass pickerel)
Avian Herbivore	Dabbling duck feeding on submerged and emergent aquatic vegetation; in ponds w/ potential for resting/nesting activity.	Mallard duck (*Anas platyrhynchos*)
Avian Omnivore	Potential exposure to analytes through ingestion of benthic invertebrates.	Green heron (*Butorides virescens*)
Mammalian Herbivore	Herbivore that may occur in ponds or deep wetlands; allows evaluation of analyte exposure due to plant uptake.	Muskrat (*Ondatra zibethicus*)
Mammalian Omnivore	Widely distributed species; used to evaluate analyte exposure from mixed diet in diverse habitat.	Raccoon (*Procyon lotor*)
Mammalian Insectivore	Used to evaluate analyte exposure from foraging on insects.	Little brown bat (*Myotis lucifugus*)
TERTIARY CONSUMERS		
Avian Piscivore	Potential exposure to analytes through ingestion of fish; habitat in riparian zone using tree perchs.	Belted Kingfisher (*Ceryle alcyon*)
Mammalian Piscivore	Widely distributed; potential exposure to analytes through ingestion of fish; habitat in riparian zone.	Mink (*Mustela vison*)
TERRESTRIAL HABITATS [2]		
PRIMARY PRODUCERS/DETRITIVORES		
Terrestrial Vegetation	Mixture of disturbed, old-field succession, shrub-sapling areas, and mixed deciduous forested habitat.	Successional grass and shrub spp.
Terrestrial Invertebrates	Soil invertebrates in the 0 to 5 foot soil layer exposed to soil analytes.	Soil Invertebrate Community (e.g., earthworms)
PRIMARY/SECONDARY CONSUMERS		
Avian Herbivore	Herbivorous bird foraging mainly in open fields.	Canada goose (*Branta canadensis*)
Avian Omnivore	Ground foragers consuming plant material and terrestrial invertebrates.	Eastern Meadowlark (*Sturnella magna*) [3]
Avian Insectivore	Widely distributed species; used to evaluate analyte exposure from foraging on terrestrial invertebrates.	American robin (*Turdus migratorius)*
Mammalian Herbivore	Herbivore that may occur in mixture of terrestrial habitats allows evaluation of analyte exposure due to plant uptake.	Meadow vole (*Microtus pennsylvanicus*)
Mammalian Omnivore	Widely distributed species; used to evaluate analyte exposure from mixed diet in diverse habitat.	Raccoon (*Procyon lotor*)
Mammalian Insectivore	Used to evaluate analyte exposure from foraging on insects.	Least shrew (*Cryptotis parva*)
TERTIARY CONSUMERS		
Avian Carnivore	Potential exposure to analytes through ingestion of small mammals.	Red Tailed Hawk (*Buteo jamaicensis*)
Mammalian Carnivore	Widely distributed; potential exposure to analytes primarily through ingestion of small mammals.	Red fox (*Vulpes vulpes*)

1 - Brown Ditch, other potentially affected water bodies, and associated wetlands.
2 - Upland terrestrial habitat areas potentially affected by CCBs.
3 - The mourning dove (*Zenaida macroura*) may be evaluated in place of the eastern meadowlark.

Table 3-3 Exposure Factors for Ecological Receptors

Receptor Species	Receptor Body Weight (kg)	Assumed Diet Fraction Food Items in Diet (%)						Fraction Abiotic Media in Diet (%)	
		Benthic Invertebrate	Wetland Plants	Fish	Terrestrial Invertebrates	Small Mammals	Terrestrial Plants	Soil	Sediment
Carnivores									
Red-tailed Hawk (*Buteo jamaicensis*)	1.056 [a]	--	--	--	--	97% [b]	--	3% [c]	--
Red fox (*Vulpes vulpes*)	3.6 [a]	--	--	--	--	97% [b]	--	3% [c]	-- --
Belted Kingfisher (*Ceryle alcyon*)	0.159 [a]	--	--	98% [b]	--	--	--	--	2% [c]
Mink (*Mustela vison*)	0.711 [a]	38.1% [b]	--	52.5% [b]	--	--	--	--	9.4% [c]
Omnivores									
Raccoon - aquatic habitats (*Procyon lotor*)	5.0 [a]	48% [b]	42.6% [b]	--	--	--	--	--	9.4% [c]
Raccoon - upland habitats (*Procyon lotor*)	5.0 [a]	--	--	--	48% [b]	--	42.6% [b]	9.4% [c]	--
Eastern Meadowlark *(Sturnella magna)*	0.086 [a]	--	--	--	58% [b]	--	32.7% [b]	9.3% [c]	--
Green Heron *(Butorides virescens)*	0.158 [a]	53% [b]	--	45% [b]	--	--	--	--	2% [c]
Insectivores									
American Robin (*Turdus migratorius*)	0.077 [a]	--	--	--	89.6% [b]	--	--	10.4% [c]	--
Least shrew *(Cryptotis parva)*	0.004 [a]	--	--	--	87.0% [b]	--	--	13.0% [c]	--
Little Brown Bat *(Myotis lucifugus)*	0.0063 [a]	100% [b]	--	--	--	--	--	--	-- [c]
Herbivore									
Canada Goose (*Branta canadensis*)	1.362 [a]	--	--	--	--	--	91.8% [b]	8.2% [c]	--
Meadow vole (*Microtus pennsylvanicus*)	0.020 [a]	--	--	--	--	--	97.6% [b]	2.4% [c]	
Mallard (*Anas platyrhynchos*)	1.043 [a]	--	99% [b]	--	--	--	--	--	1% [c]
Muskrat (*Ondatra zibethicus*)	0.68 [a]	--	90.6% [b]	--	--	--	--	--	9.4% [c]

General Notes:
Footnotes for individual species parameters and assumptions continued on next page.