OhioEPA Qualitative Habitat Evaluation Index and Use Assessment Field Sheet

QHEI Score: 76

Stream & Location: Cuyahoga River - DS of Tinkers **RM:** 16.20 **Date:** 09/10/14

Scorers Full Name & Affiliation: Francisco Rivera, Seth Hoffem, Julia Kleach — Northeast Ohio Regional Sewer District

River Code: ___-___-___ **STORET #:** _____ **Lat./Long.:** (NAD 83 - decimal °) 41.3678 / 81.6139 **Office verified location** ☐

1] SUBSTRATE

Check ONLY Two substrate TYPE BOXES; estimate % or note every type present

BEST TYPES	POOL	RIFFLE	OTHER TYPES	POOL	RIFFLE
☐ ☐ BLDR/SLABS [10]	X	X	☐ ☐ HARDPAN [4]		
☐ ☐ BOULDER [9]	X	X	☐ ☐ DETRITUS [3]		
☐ ☐ COBBLE [8]	X	X	☐ ☐ MUCK [2]		
☒ ☐ GRAVEL [7]	X	X	☐ ☐ SILT [2]	X	X
☐ ☒ SAND [6]	X	X	☐ ☐ ARTIFICIAL [0]	X	X
☐ ☐ BEDROCK [5]					

(Score natural substrates; ignore sludge from point-sources)

NUMBER OF BEST TYPES: ☒ 4 or more [2] ☐ 3 or less [0]

Check ONE (Or 2 & average)

ORIGIN: ☐ LIMESTONE [1] ☒ TILLS [1] ☐ WETLANDS [0] ☐ HARDPAN [0] ☐ SANDSTONE [0] ☐ RIP/RAP [0] ☐ LACUSTURINE [0] ☐ SHALE [-1] ☐ COAL FINES [-2]

QUALITY: SILT: ☐ HEAVY [-2] ☐ MODERATE [-1] ☒ NORMAL [0] ☐ FREE [1]

EMBEDDEDNESS: ☐ EXTENSIVE [-2] ☒ MODERATE [-1] ☒ NORMAL [0] ☐ NONE [1]

Substrate 15.5 / Maximum 20

Comments

2] INSTREAM COVER

Indicate presence 0 to 3: 0-Absent; 1-Very small amounts or if more common of marginal quality; 2-Moderate amounts, but not of highest quality or in small amounts of highest quality; 3-Highest quality in moderate or greater amounts (e.g., very large boulders in deep or fast water, large diameter log that is stable, well developed rootwad in deep / fast water, or deep, well-defined, functional pools.

1 UNDERCUT BANKS [1]	2 POOLS > 70cm [2]	0 OXBOWS, BACKWATERS [1]	
0 OVERHANGING VEGETATION [1]	1 ROOTWADS [1]	0 AQUATIC MACROPHYTES [1]	
1 SHALLOWS (IN SLOW WATER) [1]	1 BOULDERS [1]	1 LOGS OR WOODY DEBRIS [1]	
1 ROOTMATS [1]			

AMOUNT Check ONE (Or 2 & average)

☐ EXTENSIVE >75% [11] ☒ MODERATE 25-75% [7] ☒ SPARSE 5-<25% [3] ☐ NEARLY ABSENT <5% [1]

Comments

Cover 13 / Maximum 20

3] CHANNEL MORPHOLOGY

Check ONE in each category (Or 2 & average)

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY
☐ HIGH [4]	☒ EXCELLENT [7]	☐ NONE [6]	☒ HIGH [3]
☐ MODERATE [3]	☒ GOOD [5]	☒ RECOVERED [4]	☒ MODERATE [2]
☒ LOW [2]	☐ FAIR [3]	☐ RECOVERING [3]	☐ LOW [1]
☐ NONE [1]	☐ POOR [1]	☐ RECENT OR NO RECOVERY [1]	

Comments

Channel 14.5 / Maximum 20

4] BANK EROSION AND RIPARIAN ZONE

Check ONE in each category for EACH BANK (Or 2 per bank & average)

River right looking downstream

EROSION (L / R)	RIPARIAN WIDTH (L / R)	FLOOD PLAIN QUALITY (L / R)
☒ ☒ NONE / LITTLE [3]	☐ ☐ WIDE > 50m [4]	☒ ☐ FOREST, SWAMP [3]
☐ ☐ MODERATE [2]	☐ ☐ MODERATE 10-50m [3]	☐ ☒ SHRUB OR OLD FIELD [2]
☐ ☐ HEAVY / SEVERE [1]	☐ ☒ NARROW 5-10m [2]	☒ ☒ RESIDENTIAL, PARK, NEW FIELD [1]
2.75	☐ ☐ VERY NARROW < 5m [1]	☐ ☐ FENCED PASTURE [1]
	☒ ☒ NONE [0]	☐ ☐ OPEN PASTURE, ROWCROP [0]
	0.5	2+1.5 1.75

☐ ☐ CONSERVATION TILLAGE [1] ☐ ☐ URBAN OR INDUSTRIAL [0] ☐ ☐ MINING / CONSTRUCTION [0]

Indicate predominant land use(s) past 100m riparian.

Comments

Riparian 5 / Maximum 10

5] POOL / GLIDE AND RIFFLE / RUN QUALITY

MAXIMUM DEPTH Check ONE (ONLY!)

☒ > 1m [6] ☐ 0.7-<1m [4] ☐ 0.4-<0.7m [2] ☐ 0.2-<0.4m [1] ☐ < 0.2m [0]

CHANNEL WIDTH Check ONE (Or 2 & average)

☒ POOL WIDTH > RIFFLE WIDTH [2] ☐ POOL WIDTH = RIFFLE WIDTH [1] ☐ POOL WIDTH < RIFFLE WIDTH [0]

CURRENT VELOCITY Check ALL that apply

☐ TORRENTIAL [-1] ☒ SLOW [1] ☐ VERY FAST [1] ☐ INTERSTITIAL [-1] ☒ FAST [1] ☐ INTERMITTENT [-2] ☒ MODERATE [1] ☒ EDDIES [1]

Indicate for reach - pools and riffles.

Recreation Potential
Primary Contact
Secondary Contact
(circle one and comment on back)

Comments

Pool / Current 12 / Maximum 12

Indicate for functional riffles; Best areas must be large enough to support a population of riffle-obligate species: Check ONE (Or 2 & average). ☐ NO RIFFLE [metric=0]

RIFFLE DEPTH	RUN DEPTH	RIFFLE / RUN SUBSTRATE	RIFFLE / RUN EMBEDDEDNESS
☒ BEST AREAS > 10cm [2]	☒ MAXIMUM > 50cm [2]	☒ STABLE (e.g., Cobble, Boulder) [2]	☐ NONE [2]
☐ BEST AREAS 5-10cm [1]	☐ MAXIMUM < 50cm [1]	☒ MOD. STABLE (e.g., Large Gravel) [1]	☒ LOW [1]
☐ BEST AREAS < 5cm [metric=0]		☐ UNSTABLE (e.g., Fine Gravel, Sand) [0]	☒ MODERATE [0] ☐ EXTENSIVE [-1]

Comments

Riffle / Run 6 / Maximum 8

6] GRADIENT

(3.15 ft/mi) ☐ VERY LOW - LOW [2-4] ☒ MODERATE [6-10] ☐ HIGH - VERY HIGH [10-6]

DRAINAGE AREA (696 mi²)

%POOL: ____ %GLIDE: ____ %RUN: ____ %RIFFLE: ____

Gradient 10 / Maximum 10

A] SAMPLED REACH

Check ALL that apply

METHOD

- ☐ BOAT
- ☐ WADE
- ☐ L. LINE
- ☐ OTHER

STAGE

1st -sample pass-	2nd
☐ HIGH	☐
☐ UP	☐
☐ NORMAL	☐
☐ LOW	☐
☐ DRY	☐

DISTANCE

- ☐ 0.5 Km
- ☐ 0.2 Km
- ☐ 0.15 Km
- ☐ 0.12 Km
- ☐ OTHER

_____ meters

CLARITY

1st --sample pass--	2nd
☐ < 20 cm	☐
☐ 20-<40 cm	☐
☐ 40-70 cm	☐
☐ > 70 cm/ CTB	☐
☐ SECCHI DEPTH	☐

CANOPY

- ☒ > 85%- OPEN
- ☐ 55%-<85%
- ☐ 30%-<55%
- ☐ 10%-<30%
- ☐ <10%- CLOSED

1st pass _____ cm

2nd _____ cm

Comment RE: Reach consistency/ Is reach typical of steam?, *Recreation/* Observed - Inferred, *Other/* Sampling observations, Concerns, Access directions, etc.

B] AESTHETICS

- ☐ NUISANCE ALGAE
- ☐ INVASIVE MACROPHYTES
- ☐ EXCESS TURBIDITY
- ☐ DISCOLORATION
- ☐ FOAM / SCUM
- ☐ OIL SHEEN
- ☐ TRASH / LITTER
- ☐ NUISANCE ODOR
- ☐ SLUDGE DEPOSITS
- ☐ CSOs/SSOs/OUTFALLS

C] RECREATION

AREA DEPTH

POOL: ☐ >100ft² ☐ >3ft

D] MAINTENANCE

Circle some & *COMMENT*

PUBLIC / PRIVATE / BOTH / NA
ACTIVE / HISTORIC / BOTH / NA
YOUNG-SUCCESSION-OLD
SPRAY / SNAG / REMOVED
MODIFIED / DIPPED OUT / NA
LEVEED / ONE SIDED
RELOCATED / CUTOFFS
MOVING-BEDLOAD-STABLE
ARMOURED / SLUMPS
ISLANDS / SCOURED
IMPOUNDED / DESICCATED
FLOOD CONTROL / DRAINAGE

E] ISSUES

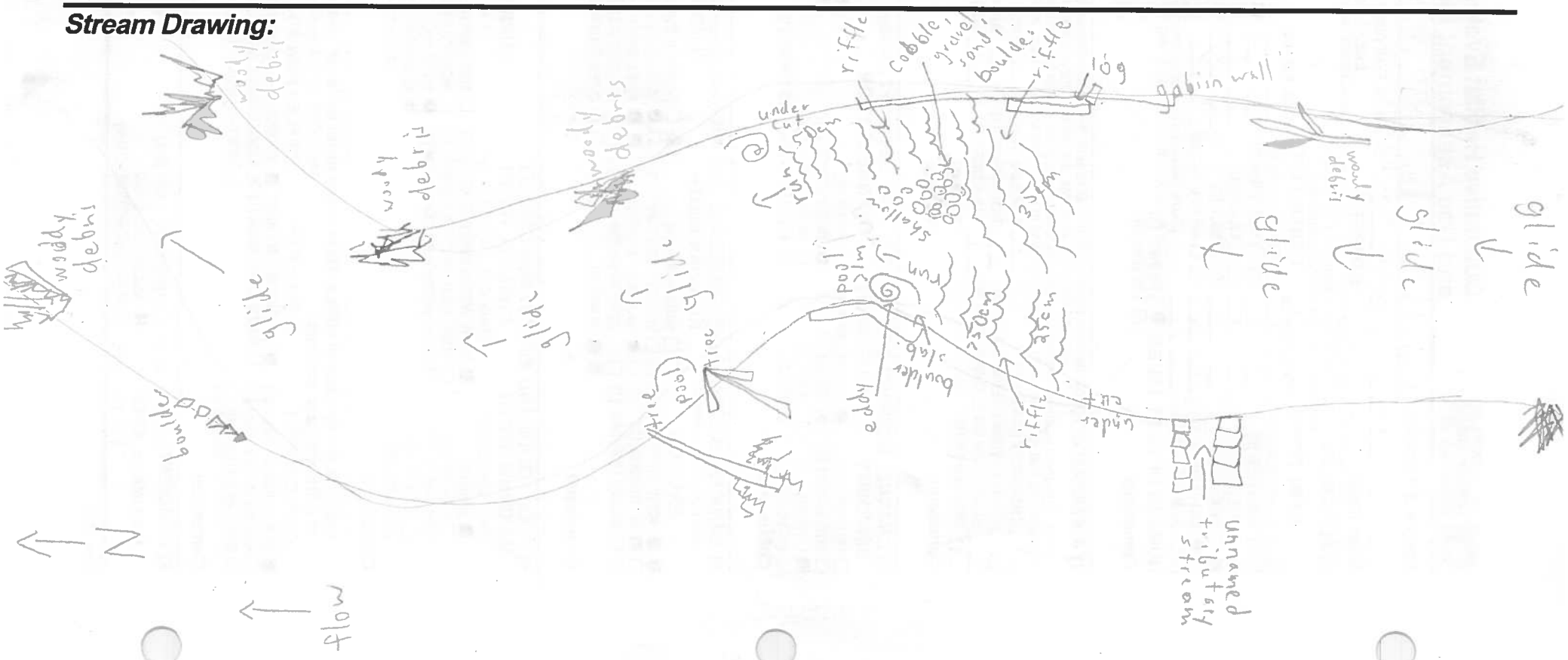
WWTP / CSO / NPDES / INDUSTRY
HARDENED / URBAN / DIRT&GRIME
CONTAMINATED / LANDFILL
BMPs-CONSTRUCTION-SEDIMENT
LOGGING / IRRIGATION / COOLING
BANK / EROSION / SURFACE
FALSE BANK / MANURE / LAGOON
WASH H_20 / TILE / H_20 TABLE
ACID / MINE / QUARRY / FLOW
NATURAL / WETLAND / STAGNANT
PARK / GOLF / LAWN / HOME
ATMOSPHERE / DATA PAUCITY

F] MEASUREMENTS

- $\bar{x}$ width
- $\bar{x}$ depth
- max. depth
- $\bar{x}$ bankfull width
- bankfull $\bar{x}$ depth
- W/D ratio
- bankfull max. depth
- floodprone x^2 width
- entrench. ratio

Legacy Tree:

Stream Drawing:



OhioEPA Qualitative Habitat Evaluation Index and Use Assessment Field Sheet

QHEI Score: 68.5

Stream & Location: Cuyahoga River US of Mill Creek **RM:** 11.95 **Date:** 09/10/14

Scorers Full Name & Affiliation: Francisco Rivera, Seth Hoffhem, Julia Kleeb, Northeast Ohio Regional Sewer District

River Code: ___-___-___ **STORET #:** _____ **Lat./Long.:** (NAD 83 - decimal °) 41.4101 / 81.6346 Office verified location ☐

1] SUBSTRATE
Check *ONLY* Two substrate *TYPE BOXES*; estimate % or note every type present

BEST TYPES	POOL	RIFFLE	OTHER TYPES	POOL	RIFFLE
☐ ☐ BLDR /SLABS [10]	X		☐ ☐ HARDPAN [4]		
☐ ☐ BOULDER [9]	X		☐ ☐ DETRITUS [3]		
☐ ☐ COBBLE [8]	X	X	☐ ☐ MUCK [2]		
☒ ☐ GRAVEL [7]	X	X	☐ ☐ SILT [2]	X	X
☐ ☒ SAND [6]	X	X	☐ ☐ ARTIFICIAL [0]	X	
☐ ☐ BEDROCK [5]			(Score natural substrates; ignore sludge from point-sources)		

NUMBER OF BEST TYPES: ☒ 4 or more [2] ☐ 3 or less [0]

ORIGIN (Check ONE (Or 2 & average))
☐ LIMESTONE [1] ☒ TILLS [1] ☐ WETLANDS [0] ☐ HARDPAN [0] ☐ SANDSTONE [0] ☐ RIP/RAP [0] ☐ LACUSTURINE [0] ☐ SHALE [-1] ☐ COAL FINES [-2]

SILT / EMBEDDEDNESS

QUALITY
☐ HEAVY [-2] ☒ MODERATE [-1] ☐ NORMAL [0] ☐ FREE [1]
☐ EXTENSIVE [-2] ☒ MODERATE [-1] ☒ NORMAL [0] ☐ NONE [1]

Comments

Substrate 14.5 / Maximum 20

2] INSTREAM COVER
Indicate presence 0 to 3: 0-Absent; 1-Very small amounts or if more common of marginal quality; 2-Moderate amounts, but not of highest quality or in small amounts of highest quality; 3-Highest quality in moderate or greater amounts (e.g., very large boulders in deep or fast water, large diameter log that is stable, well developed rootwad in deep / fast water, or deep, well-defined, functional pools.

1 UNDERCUT BANKS [1]	2 POOLS > 70cm [2]	0 OXBOWS, BACKWATERS [1]	**AMOUNT** (Check ONE (Or 2 & average))
0 OVERHANGING VEGETATION [1]	1 ROOTWADS [1]	0 AQUATIC MACROPHYTES [1]	☐ EXTENSIVE >75% [11]
1 SHALLOWS (IN SLOW WATER) [1]	1 BOULDERS [1]	2 LOGS OR WOODY DEBRIS [1]	☐ MODERATE 25-75% [7]
0 ROOTMATS [1]			☒ SPARSE 5-<25% [3]
			☐ NEARLY ABSENT <5% [1]

Comments

Cover Maximum 20: 10

3] CHANNEL MORPHOLOGY
Check ONE in each category (Or 2 & average)

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY
☐ HIGH [4]	☐ EXCELLENT [7]	☒ NONE [6]	☐ HIGH [3]
☐ MODERATE [3]	☐ GOOD [5]	☐ RECOVERED [4]	☒ MODERATE [2]
☒ LOW [2]	☒ FAIR [3]	☐ RECOVERING [3]	☐ LOW [1]
☒ NONE [1]	☐ POOR [1]	☐ RECENT OR NO RECOVERY [1]	

Comments

Channel Maximum 20: 12.5

4] BANK EROSION AND RIPARIAN ZONE
Check ONE in each category for *EACH BANK* (Or 2 per bank & average)

River right looking downstream

EROSION (L R)	RIPARIAN WIDTH (L R)	FLOOD PLAIN QUALITY (L R)
☐ ☐ NONE / LITTLE [3]	☐ ☐ WIDE > 50m [4]	☐ ☐ FOREST, SWAMP [3]
☒ ☒ MODERATE [2]	☐ ☐ MODERATE 10-50m [3]	☐ ☐ SHRUB OR OLD FIELD [2]
☐ ☐ HEAVY / SEVERE [1]	☒ ☒ NARROW 5-10m [2]	☐ ☐ RESIDENTIAL, PARK, NEW FIELD [1]
	☐ ☐ VERY NARROW < 5m [1]	☐ ☐ FENCED PASTURE [1]
	☐ ☐ NONE [0]	☐ ☐ OPEN PASTURE, ROWCROP [0]

☐ ☐	CONSERVATION TILLAGE [1]
☒ ☒	URBAN OR INDUSTRIAL [0]
☐ ☐	MINING / CONSTRUCTION [0]

Indicate predominant land use(s) past 100m riparian.

Comments

Riparian Maximum 10: 4

5] POOL / GLIDE AND RIFFLE / RUN QUALITY

MAXIMUM DEPTH (Check ONE (ONLY!))
☒ > 1m [6]
☐ 0.7-<1m [4]
☐ 0.4-<0.7m [2]
☐ 0.2-<0.4m [1]
☐ < 0.2m [0]

CHANNEL WIDTH (Check ONE (Or 2 & average))
☒ POOL WIDTH > RIFFLE WIDTH [2]
☐ POOL WIDTH = RIFFLE WIDTH [1]
☐ POOL WIDTH < RIFFLE WIDTH [0]

CURRENT VELOCITY (Check ALL that apply)
☐ TORRENTIAL [-1] ☒ SLOW [1]
☐ VERY FAST [1] ☐ INTERSTITIAL [-1]
☒ FAST [1] ☐ INTERMITTENT [-2]
☒ MODERATE [1] ☒ EDDIES [1]
Indicate for reach - pools and riffles.

Recreation Potential
Primary Contact
Secondary Contact
(circle one and comment on back)

Comments

Pool / Current Maximum 12: 12

Indicate for functional riffles; Best areas must be large enough to support a population of riffle-obligate species: (Check ONE (Or 2 & average)). ☐ NO RIFFLE [metric=0]

RIFFLE DEPTH
☒ BEST AREAS > 10cm [2]
☐ BEST AREAS 5-10cm [1]
☐ BEST AREAS < 5cm [metric=0]

RUN DEPTH
☒ MAXIMUM > 50cm [2]
☐ MAXIMUM < 50cm [1]

RIFFLE / RUN SUBSTRATE
☐ STABLE (e.g., Cobble, Boulder) [2]
☒ MOD. STABLE (e.g., Large Gravel) [1]
☐ UNSTABLE (e.g., Fine Gravel, Sand) [0]

RIFFLE / RUN EMBEDDEDNESS
☐ NONE [2]
☒ LOW [1]
☒ MODERATE [0]
☐ EXTENSIVE [-1]

Comments

Riffle / Run Maximum 8: 5.5

6] GRADIENT
(6.93 ft/mi) **DRAINAGE AREA** (709 mi²)

☐ VERY LOW - LOW [2-4]
☐ MODERATE [6-10]
☒ HIGH - VERY HIGH [10-6]

%POOL: ____ %GLIDE: ____
%RUN: ____ %RIFFLE: ____

Gradient Maximum 10: 10

A] SAMPLED REACH

Check ALL that apply

METHOD

- ☐ BOAT
- ☐ WADE
- ☐ L. LINE
- ☐ OTHER

STAGE

1st -sample pass-	2nd
☐ HIGH	☐
☐ UP	☐
☐ NORMAL	☐
☐ LOW	☐
☐ DRY	☐

DISTANCE

- ☐ 0.5 Km
- ☐ 0.2 Km
- ☐ 0.15 Km
- ☐ 0.12 Km
- ☐ OTHER

_____ meters

CLARITY

1st --sample pass--	2nd
☐ < 20 cm	☐
☐ 20-<40 cm	☐
☐ 40-70 cm	☐
☐ > 70 cm/ CTB	☐
☐ SECCHI DEPTH	☐

1st pass _____ cm

2nd _____ cm

CANOPY

- ☐ > 85%- OPEN
- ☐ 55%-<85%
- ☐ 30%-<55%
- ☐ 10%-<30%
- ☐ <10%- CLOSED

Comment RE: Reach consistency/ Is reach typical of steam?, *Recreation/* Observed - Inferred, *Other/* Sampling observations, Concerns, Access directions, etc.

B] AESTHETICS

- ☐ NUISANCE ALGAE
- ☐ INVASIVE MACROPHYTES
- ☐ EXCESS TURBIDITY
- ☐ DISCOLORATION
- ☐ FOAM / SCUM
- ☐ OIL SHEEN
- ☐ TRASH / LITTER
- ☐ NUISANCE ODOR
- ☐ SLUDGE DEPOSITS
- ☐ CSOs/SSOs/OUTFALLS

C] RECREATION

AREA DEPTH

POOL: ☐ >100ft² ☐ >3ft

D] MAINTENANCE

Circle some & *COMMENT*

PUBLIC / PRIVATE / BOTH / NA
ACTIVE / HISTORIC / BOTH / NA
YOUNG-SUCCESSION-OLD
SPRAY / SNAG / REMOVED
MODIFIED / DIPPED OUT / NA
LEVEED / ONE SIDED
RELOCATED / CUTOFFS
MOVING-BEDLOAD-STABLE
ARMOURED / SLUMPS
ISLANDS / SCOURED
IMPOUNDED / DESICCATED
FLOOD CONTROL / DRAINAGE

E] ISSUES

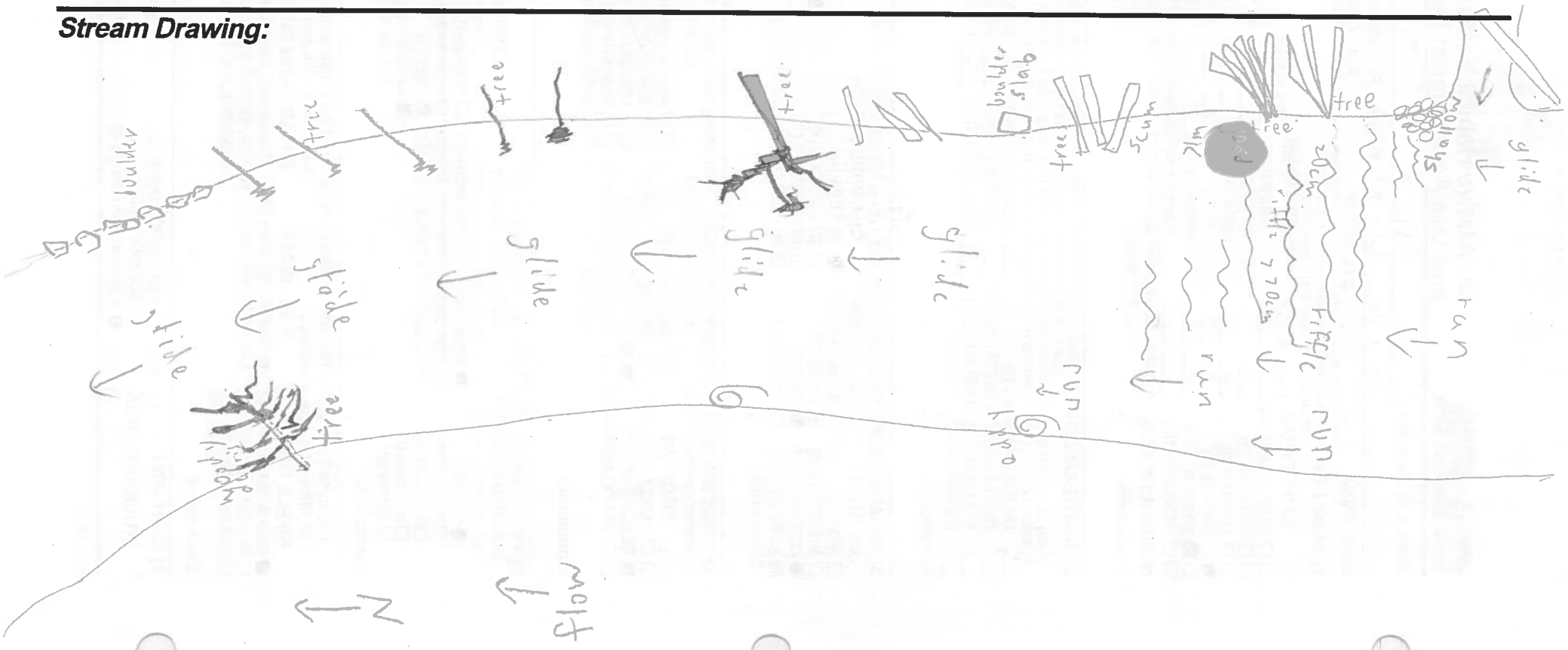
WWTP / CSO / NPDES / INDUSTRY
HARDENED / URBAN / DIRT&GRIME
CONTAMINATED / LANDFILL
BMPs-CONSTRUCTION-SEDIMENT
LOGGING / IRRIGATION / COOLING
BANK / EROSION / SURFACE
FALSE BANK / MANURE / LAGOON
WASH H_20 / TILE / H_20 TABLE
ACID / MINE / QUARRY / FLOW
NATURAL / WETLAND / STAGNANT
PARK / GOLF / LAWN / HOME
ATMOSPHERE / DATA PAUCITY

F] MEASUREMENTS

- $\bar{x}$ width
- $\bar{x}$ depth
- max. depth
- $\bar{x}$ bankfull width
- bankfull $\bar{x}$ depth
- W/D ratio
- bankfull max. depth
- floodprone x^2 width
- entrench. ratio

Legacy Tree:

Stream Drawing:



Qualitative Habitat Evaluation Index and Use Assessment Field Sheet

QHEI Score: 69.25

Stream & Location: Cuyahoga River DS of Mill Creek **RM:** 11.30 **Date:** 09/10/14

Francisco Rivera, Seth Hothem, Julia Klepper **Scorers Full Name & Affiliation:** Northeast Ohio Regional Sewer District

River Code: ___-___-___ **STORET #:** _____ **Lat./Long.:** (NAD 83 - decimal °) 41.41798 / 81.66446 Office verified location ☐

1] SUBSTRATE
Check ONLY Two substrate TYPE BOXES; estimate % or note every type present

BEST TYPES	POOL	RIFFLE	OTHER TYPES	POOL	RIFFLE
☐☐ BLDR /SLABS [10]	X	X	☐☐ HARDPAN [4]		
☐☐ BOULDER [9]	X	X	☐☐ DETRITUS [3]		
☐☐ COBBLE [8]	X	X	☐☐ MUCK [2]		
☐☒ GRAVEL [7]	X	X	☐☐ SILT [2]	X	X
☒☐ SAND [6]	X	X	☐☐ ARTIFICIAL [0]	X	X
☐☐ BEDROCK [5]			(Score natural substrates; ignore sludge from point-sources)		

NUMBER OF BEST TYPES: ☒ 4 or more [2] ☐ 3 or less [0]

Check ONE (Or 2 & average)

ORIGIN
☐ LIMESTONE [1]
☒ TILLS [1]
☐ WETLANDS [0]
☐ HARDPAN [0]
☐ SANDSTONE [0]
☐ RIP/RAP [0]
☐ LACUSTURINE [0]
☐ SHALE [-1]
☐ COAL FINES [-2]

QUALITY
SILT
☒ HEAVY [-2]
☐ MODERATE [-1]
☐ NORMAL [0]
☐ FREE [1]
EMBEDDEDNESS
☐ EXTENSIVE [-2]
☒ MODERATE [-1]
☐ NORMAL [0]
☐ NONE [1]

Comments

Substrate 13 *Maximum 20*

2] INSTREAM COVER
Indicate presence 0 to 3: 0-Absent; 1-Very small amounts or if more common of marginal quality; 2-Moderate amounts, but not of highest quality or in small amounts of highest quality; 3-Highest quality in moderate or greater amounts (e.g., very large boulders in deep or fast water, large diameter log that is stable, well developed rootwad in deep / fast water, or deep, well-defined, functional pools.

1 UNDERCUT BANKS [1]	2 POOLS > 70cm [2]	0 OXBOWS, BACKWATERS [1]	
0 OVERHANGING VEGETATION [1]	1 ROOTWADS [1]	0 AQUATIC MACROPHYTES [1]	
1 SHALLOWS (IN SLOW WATER) [1]	2 BOULDERS [1]	1 LOGS OR WOODY DEBRIS [1]	
1 ROOTMATS [1]			

AMOUNT Check ONE (Or 2 & average)
☐ EXTENSIVE >75% [11]
☒ MODERATE 25-75% [7]
☐ SPARSE 5-<25% [3]
☐ NEARLY ABSENT <5% [1]

Comments

Cover 13 *Maximum 20*

3] CHANNEL MORPHOLOGY
Check ONE in each category (Or 2 & average)

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY
☐ HIGH [4]	☐ EXCELLENT [7]	☐ NONE [6]	☒ HIGH [3]
☐ MODERATE [3]	☒ GOOD [5]	☒ RECOVERED [4]	☒ MODERATE [2]
☒ LOW [2]	☒ FAIR [3]	☐ RECOVERING [3]	☐ LOW [1]
☐ NONE [1]	☐ POOR [1]	☐ RECENT OR NO RECOVERY [1]	

Comments

Channel 12.5 *Maximum 20*

4] BANK EROSION AND RIPARIAN ZONE
Check ONE in each category for EACH BANK (Or 2 per bank & average)

River right looking downstream

EROSION L	EROSION R	RIPARIAN WIDTH L	RIPARIAN WIDTH R
☐ NONE / LITTLE [3]	☐	☐ WIDE > 50m [4]	☐
☒ MODERATE [2]	☒	☐ MODERATE 10-50m [3]	☐
☐ HEAVY / SEVERE [1]	☐	☒ NARROW 5-10m [2]	☐
		☐ VERY NARROW < 5m [1]	☒
		☐ NONE [0]	☐

FLOOD PLAIN QUALITY L	FLOOD PLAIN QUALITY R	
☐ FOREST, SWAMP [3]	☐	☐ CONSERVATION TILLAGE [1]
☐ SHRUB OR OLD FIELD [2]	☐	☒ URBAN OR INDUSTRIAL [0]
☐ RESIDENTIAL, PARK, NEW FIELD [1]	☒	☐ MINING / CONSTRUCTION [0]
☐ FENCED PASTURE [1]	☐	
☐ OPEN PASTURE, ROWCROP [0]	☐	

Indicate predominant land use(s) past 100m riparian.

Comments 2 1.5 0.25

Riparian 3.75 *Maximum 10*

5] POOL / GLIDE AND RIFFLE / RUN QUALITY

MAXIMUM DEPTH Check ONE (ONLY!)
☒ > 1m [6]
☐ 0.7-<1m [4]
☐ 0.4-<0.7m [2]
☐ 0.2-<0.4m [1]
☐ < 0.2m [0]

CHANNEL WIDTH Check ONE (Or 2 & average)
☒ POOL WIDTH > RIFFLE WIDTH [2]
☐ POOL WIDTH = RIFFLE WIDTH [1]
☐ POOL WIDTH < RIFFLE WIDTH [0]

CURRENT VELOCITY Check ALL that apply
☐ TORRENTIAL [-1]
☐ VERY FAST [1]
☒ FAST [1]
☒ MODERATE [1]
☒ SLOW [1]
☐ INTERSTITIAL [-1]
☐ INTERMITTENT [-2]
☒ EDDIES [1]
Indicate for reach - pools and riffles.

Recreation Potential
Primary Contact
Secondary Contact
(circle one and comment on back)

Comments

Pool / Current 12 *Maximum 12*

Indicate for functional riffles; Best areas must be large enough to support a population of riffle-obligate species: Check ONE (Or 2 & average). ☐ NO RIFFLE [metric=0]

RIFFLE DEPTH	RUN DEPTH	RIFFLE / RUN SUBSTRATE	RIFFLE / RUN EMBEDDEDNESS
☒ BEST AREAS > 10cm [2]	☒ MAXIMUM > 50cm [2]	☐ STABLE (e.g., Cobble, Boulder) [2]	☐ NONE [2]
☐ BEST AREAS 5-10cm [1]	☐ MAXIMUM < 50cm [1]	☒ MOD. STABLE (e.g., Large Gravel) [1]	☐ LOW [1]
☐ BEST AREAS < 5cm [metric=0]		☐ UNSTABLE (e.g., Fine Gravel, Sand) [0]	☒ MODERATE [0]
			☐ EXTENSIVE [-1]

Comments

Riffle / Run 5 *Maximum 8*

6] GRADIENT
(4.77 ft/mi) ☐ VERY LOW - LOW [2-4] ☐ MODERATE [6-10] ☒ HIGH - VERY HIGH [10-6]

DRAINAGE AREA (730 mi²)

%POOL: %GLIDE: %RUN: %RIFFLE:

Gradient 10 *Maximum 10*

A] SAMPLED REACH

Check ALL that apply

METHOD

- ☐ BOAT
- ☐ WADE
- ☐ L. LINE
- ☐ OTHER

STAGE

1st -sample pass-	2nd
☐ HIGH	☐
☐ UP	☐
☐ NORMAL	☐
☐ LOW	☐
☐ DRY	☐

DISTANCE

- ☐ 0.5 Km
- ☐ 0.2 Km
- ☐ 0.15 Km
- ☐ 0.12 Km
- ☐ OTHER

_____ meters

CLARITY

1st --sample pass--	2nd
☐ < 20 cm	☐
☐ 20-<40 cm	☐
☐ 40-70 cm	☐
☐ > 70 cm/ CTB	☐
☐ SECCHI DEPTH	☐

1st _____ cm

pass

2nd _____ cm

CANOPY

- ☐ > 85%- OPEN
- ☐ 55%-<85%
- ☐ 30%-<55%
- ☐ 10%-<30%
- ☐ <10%- CLOSED

Comment RE: Reach consistency/ Is reach typical of steam?, *Recreation/* Observed - Inferred, *Other/* Sampling observations, Concerns, Access directions, etc.

B] AESTHETICS

- ☐ NUISANCE ALGAE
- ☐ INVASIVE MACROPHYTES
- ☐ EXCESS TURBIDITY
- ☐ DISCOLORATION
- ☐ FOAM / SCUM
- ☐ OIL SHEEN
- ☐ TRASH / LITTER
- ☐ NUISANCE ODOR
- ☐ SLUDGE DEPOSITS
- ☐ CSOs/SSOs/OUTFALLS

C] RECREATION

AREA DEPTH

POOL: ☐ >100ft² ☐ >3ft

D] MAINTENANCE

Circle some & *COMMENT*

PUBLIC / PRIVATE / BOTH / NA
ACTIVE / HISTORIC / BOTH / NA
YOUNG-SUCCESSION-OLD
SPRAY / SNAG / REMOVED
MODIFIED / DIPPED OUT / NA
LEVEED / ONE SIDED
RELOCATED / CUTOFFS
MOVING-BEDLOAD-STABLE
ARMOURED / SLUMPS
ISLANDS / SCOURED
IMPOUNDED / DESICCATED
FLOOD CONTROL / DRAINAGE

E] ISSUES

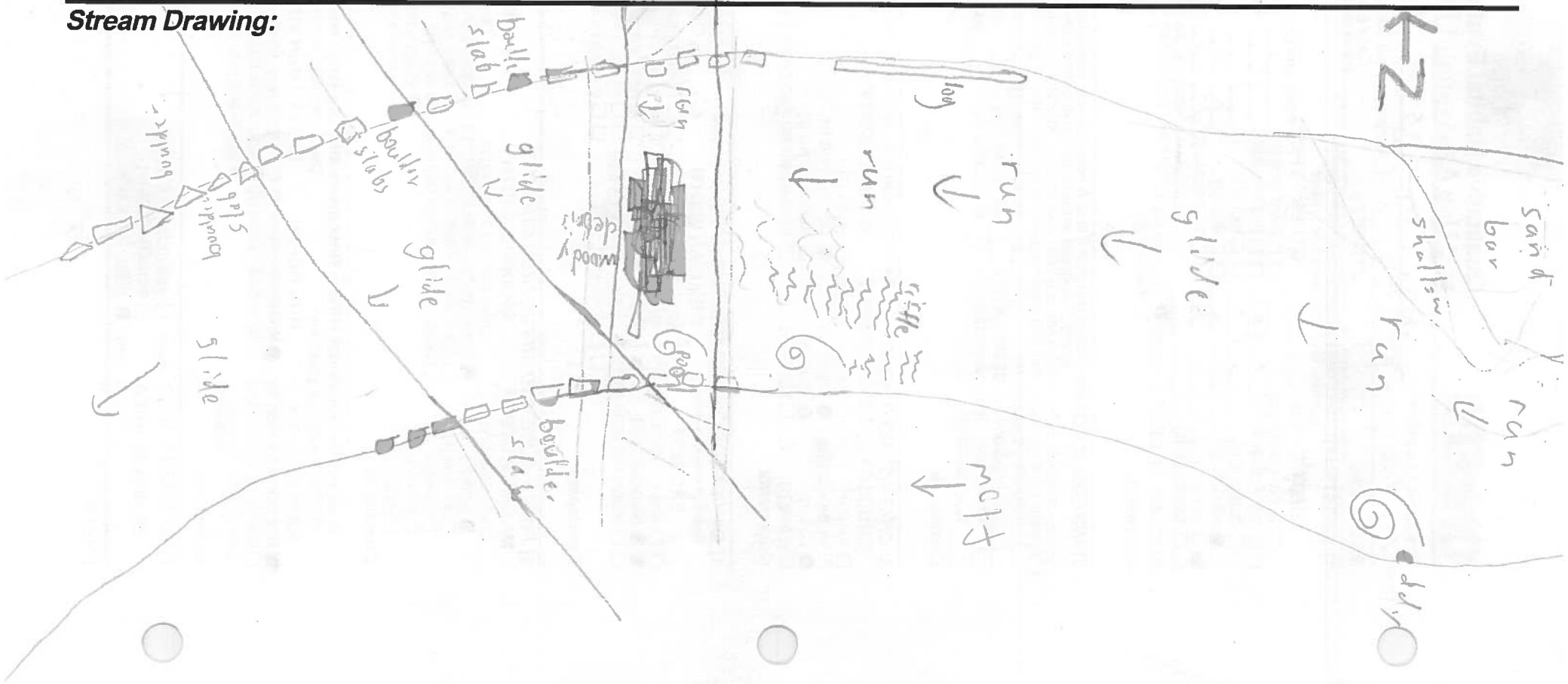
WWTP / CSO / NPDES / INDUSTRY
HARDENED / URBAN / DIRT&GRIME
CONTAMINATED / LANDFILL
BMPs-CONSTRUCTION-SEDIMENT
LOGGING / IRRIGATION / COOLING
BANK / EROSION / SURFACE
FALSE BANK / MANURE / LAGOON
WASH H_20 / TILE / H_20 TABLE
ACID / MINE / QUARRY / FLOW
NATURAL / WETLAND / STAGNANT
PARK / GOLF / LAWN / HOME
ATMOSPHERE / DATA PAUCITY

F] MEASUREMENTS

- $\bar{x}$ width
- $\bar{x}$ depth
- max. depth
- $\bar{x}$ bankfull width
- bankfull $\bar{x}$ depth
- W/D ratio
- bankfull max. depth
- floodprone x^2 width
- entrench. ratio

Legacy Tree:

Stream Drawing:



OhioEPA Qualitative Habitat Evaluation Index and Use Assessment Field Sheet

QHEI Score: 71.75

Stream & Location: Cuyahoga River US of Southerly WWTC **RM:** 10.75 **Date:** 09/10/14

Scorers Full Name & Affiliation: Seth Hothem, Cisco Rivera, Julia Klepach, Northeast Ohio Regional Sewer District

River Code: ___-___-___ **STORET #:** _____ **Lat./ Long.:** (NAD 83 - decimal °) 41.4196 / 81.6547 **Office verified location** ☐

1] SUBSTRATE
Check *ONLY* Two substrate *TYPE BOXES*; estimate % or note every type present

BEST TYPES	POOL	RIFFLE	OTHER TYPES	POOL	RIFFLE
☐☐ BLDR /SLABS [10]			☐☐ HARDPAN [4]		
☐☐ BOULDER [9]	X		☐☐ DETRITUS [3]		
☐☐ COBBLE [8]	X	X	☐☐ MUCK [2]		
☒☐ GRAVEL [7]	X	X	☐☐ SILT [2]	X	X
☐☒ SAND [6]	X	X	☐☐ ARTIFICIAL [0]	X	X
☐☐ BEDROCK [5]			(Score natural substrates; ignore sludge from point-sources)		

NUMBER OF BEST TYPES: ☒ 4 or more [2] ☐ 3 or less [0]

Check ONE (*Or 2 & average*)

ORIGIN
- ☐ LIMESTONE [1]
- ☒ TILLS [1]
- ☐ WETLANDS [0]
- ☐ HARDPAN [0]
- ☐ SANDSTONE [0]
- ☐ RIP/RAP [0]
- ☐ LACUSTURINE [0]
- ☐ SHALE [-1]
- ☐ COAL FINES [-2]

SILT / EMBEDDEDNESS

QUALITY
- ☐ HEAVY [-2]
- ☒ MODERATE [-1]
- ☒ NORMAL [0]
- ☐ FREE [1]
- ☐ EXTENSIVE [-2]
- ☒ MODERATE [-1]
- ☐ NORMAL [0]
- ☐ NONE [1]

Substrate 14.5 / Maximum 20

Comments

2] INSTREAM COVER
Indicate presence 0 to 3: 0-Absent; 1-Very small amounts or if more common of marginal quality; 2-Moderate amounts, but not of highest quality or in small amounts of highest quality; 3-Highest quality in moderate or greater amounts (e.g., very large boulders in deep or fast water, large diameter log that is stable, well developed rootwad in deep / fast water, or deep, well-defined, functional pools.

- 1 UNDERCUT BANKS [1]
- 1 OVERHANGING VEGETATION [1]
- 1 SHALLOWS (IN SLOW WATER) [1]
- 1 ROOTMATS [1]
- 1 POOLS > 70cm [2]
- 1 ROOTWADS [1]
- 1 BOULDERS [1]
- 0 OXBOWS, BACKWATERS [1]
- 0 AQUATIC MACROPHYTES [1]
- 2 LOGS OR WOODY DEBRIS [1]

AMOUNT Check ONE (*Or 2 & average*)
- ☐ EXTENSIVE >75% [11]
- ☒ MODERATE 25-75% [7]
- ☒ SPARSE 5-<25% [3]
- ☐ NEARLY ABSENT <5% [1]

Cover 14 / Maximum 20

Comments

3] CHANNEL MORPHOLOGY
Check ONE in each category (*Or 2 & average*)

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY
☐ HIGH [4]	☐ EXCELLENT [7]	☒ NONE [6]	☐ HIGH [3]
☐ MODERATE [3]	☒ GOOD [5]	☐ RECOVERED [4]	☒ MODERATE [2]
☒ LOW [2]	☐ FAIR [3]	☐ RECOVERING [3]	☒ LOW [1]
☐ NONE [1]	☐ POOR [1]	☐ RECENT OR NO RECOVERY [1]	

Channel 14.5 / Maximum 20

Comments

4] BANK EROSION AND RIPARIAN ZONE
Check ONE in each category for *EACH BANK* (*Or 2 per bank & average*)

River right looking downstream

EROSION (L / R)	RIPARIAN WIDTH (L / R)	FLOOD PLAIN QUALITY (L / R)	
☐☐ NONE / LITTLE [3]	☐☐ WIDE > 50m [4]	☐☐ FOREST, SWAMP [3]	☐☐ CONSERVATION TILLAGE [1]
☒☐ MODERATE [2]	☐☐ MODERATE 10-50m [3]	☐☐ SHRUB OR OLD FIELD [2]	☒☒ URBAN OR INDUSTRIAL [0]
☐☒ HEAVY / SEVERE [1]	☐☐ NARROW 5-10m [2]	☐☒ RESIDENTIAL, PARK, NEW FIELD [1]	☐☐ MINING / CONSTRUCTION [0]
	☒☒ VERY NARROW < 5m [1]	☐☐ FENCED PASTURE [1]	
	☒☒ NONE [0]	☐☐ OPEN PASTURE, ROWCROP [0]	

Indicate predominant land use(s) past 100m riparian.

Riparian 2.25 / Maximum 10

Comments 1.5 0.5 0.25

5] POOL / GLIDE AND RIFFLE / RUN QUALITY

MAXIMUM DEPTH Check ONE (*ONLY!*)
- ☒ > 1m [6]
- ☐ 0.7-<1m [4]
- ☐ 0.4-<0.7m [2]
- ☐ 0.2-<0.4m [1]
- ☐ < 0.2m [0]

CHANNEL WIDTH Check ONE (*Or 2 & average*)
- ☐ POOL WIDTH > RIFFLE WIDTH [2]
- ☒ POOL WIDTH = RIFFLE WIDTH [1]
- ☐ POOL WIDTH < RIFFLE WIDTH [0]

CURRENT VELOCITY Check ALL that apply
- ☐ TORRENTIAL [-1]
- ☐ VERY FAST [1]
- ☒ FAST [1]
- ☒ MODERATE [1]
- ☒ SLOW [1]
- ☐ INTERSTITIAL [-1]
- ☐ INTERMITTENT [-2]
- ☒ EDDIES [1]

Indicate for reach - pools and riffles.

Recreation Potential
Primary Contact
Secondary Contact
(circle one and comment on back)

Pool / Current 11 / Maximum 12

Comments

Indicate for functional riffles; Best areas must be large enough to support a population of riffle-obligate species: Check ONE (*Or 2 & average*). ☐ NO RIFFLE [metric=0]

RIFFLE DEPTH	RUN DEPTH	RIFFLE / RUN SUBSTRATE	RIFFLE / RUN EMBEDDEDNESS
☒ BEST AREAS > 10cm [2]	☒ MAXIMUM > 50cm [2]	☐ STABLE (e.g., Cobble, Boulder) [2]	☐ NONE [2]
☐ BEST AREAS 5-10cm [1]	☐ MAXIMUM < 50cm [1]	☒ MOD. STABLE (e.g., Large Gravel) [1]	☒ LOW [1]
☐ BEST AREAS < 5cm [metric=0]		☐ UNSTABLE (e.g., Fine Gravel, Sand) [0]	☒ MODERATE [0]
			☐ EXTENSIVE [-1]

Riffle / Run 5.5 / Maximum 8

Comments

6] GRADIENT
(1.75 ft/mi) ☐ VERY LOW - LOW [2-4] ☒ MODERATE [6-10] ☐ HIGH - VERY HIGH [10-6]

DRAINAGE AREA (743 mi²)

%POOL: %GLIDE: %RUN: %RIFFLE:

Gradient 10 / Maximum 10

A] SAMPLED REACH

Check ALL that apply

METHOD

- ☐ BOAT
- ☐ WADE
- ☐ L. LINE
- ☐ OTHER

STAGE

1st -sample pass-	2nd
☐ HIGH	☐
☐ UP	☐
☐ NORMAL	☐
☐ LOW	☐
☐ DRY	☐

DISTANCE

- ☐ 0.5 Km
- ☐ 0.2 Km
- ☐ 0.15 Km
- ☐ 0.12 Km
- ☐ OTHER

_____ meters

CLARITY

1st --sample pass--	2nd
☐ < 20 cm	☐
☐ 20-<40 cm	☐
☐ 40-70 cm	☐
☐ > 70 cm/ CTB	☐
☐ SECCHI DEPTH	☐

1st pass _____ cm

2nd _____ cm

CANOPY

- ☐ > 85%- OPEN
- ☐ 55%-<85%
- ☐ 30%-<55%
- ☐ 10%-<30%
- ☐ <10%- CLOSED

C] RECREATION

AREA DEPTH

POOL: ☐ >100ft² ☐ >3ft

Comment RE: Reach consistency/ Is reach typical of steam?, *Recreation/* Observed - Inferred, *Other/* Sampling observations, Concerns, Access directions, etc.

B] AESTHETICS

- ☐ NUISANCE ALGAE
- ☐ INVASIVE MACROPHYTES
- ☐ EXCESS TURBIDITY
- ☐ DISCOLORATION
- ☐ FOAM / SCUM
- ☐ OIL SHEEN
- ☐ TRASH / LITTER
- ☐ NUISANCE ODOR
- ☐ SLUDGE DEPOSITS
- ☐ CSOs/SSOs/OUTFALLS

D] MAINTENANCE

Circle some & *COMMENT*

PUBLIC / PRIVATE / BOTH / NA
ACTIVE / HISTORIC / BOTH / NA
YOUNG-SUCCESSION-OLD
SPRAY / SNAG / REMOVED
MODIFIED / DIPPED OUT / NA
LEVEED / ONE SIDED
RELOCATED / CUTOFFS
MOVING-BEDLOAD-STABLE
ARMOURED / SLUMPS
ISLANDS / SCOURED
IMPOUNDED / DESICCATED
FLOOD CONTROL / DRAINAGE

E] ISSUES

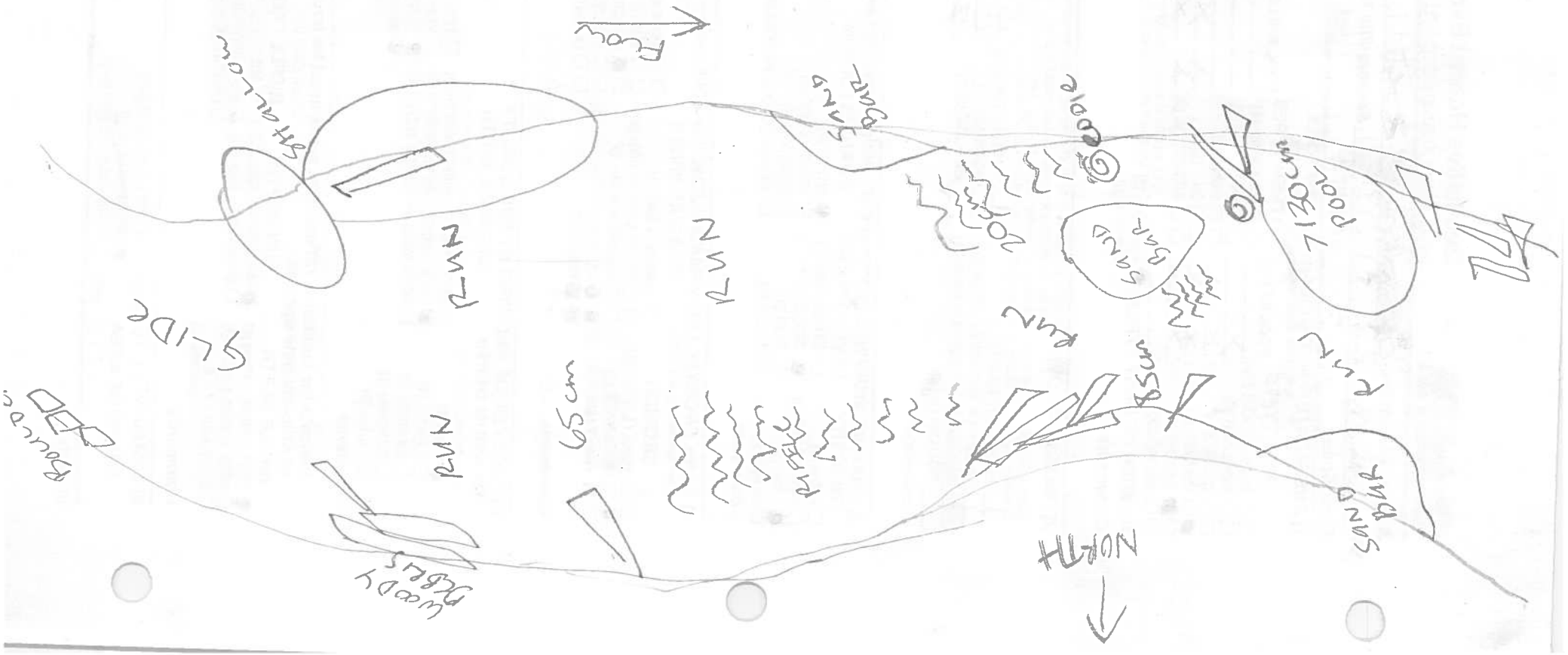
WWTP / CSO / NPDES / INDUSTRY
HARDENED / URBAN / DIRT&GRIME
CONTAMINATED / LANDFILL
BMPs-CONSTRUCTION-SEDIMENT
LOGGING / IRRIGATION / COOLING
BANK / EROSION / SURFACE
FALSE BANK / MANURE / LAGOON
WASH H_20 / TILE / H_20 TABLE
ACID / MINE / QUARRY / FLOW
NATURAL / WETLAND / STAGNANT
PARK / GOLF / LAWN / HOME
ATMOSPHERE / DATA PAUCITY

F] MEASUREMENTS

- $\bar{x}$ width
- $\bar{x}$ depth
- max. depth
- $\bar{x}$ bankfull width
- bankfull $\bar{x}$ depth
- W/D ratio
- bankfull max. depth
- floodprone x^2 width
- entrench. ratio

Legacy Tree:

Stream Drawing:



OhioEPA Qualitative Habitat Evaluation Index and Use Assessment Field Sheet

QHEI Score: 69

Stream & Location: Cuyahoga River Downstream of Southerly WWTC **RM:** 10.10 **Date:** 10/07/14

Seth Hothem **Scorers Full Name & Affiliation:** Northeast Ohio Regional Sewer District

River Code: ___-___-___ **STORET #:** _____ **Lat./Long.:** (NAD 83 - decimal °) 41.4242 /81.6638 **Office verified location** ☐

1] SUBSTRATE
Check *ONLY* Two substrate *TYPE BOXES*; estimate % or note every type present

BEST TYPES	POOL	RIFFLE	OTHER TYPES	POOL	RIFFLE
☐ ☐ BLDR /SLABS [10]	X		☐ ☐ HARDPAN [4]		
☐ ☐ BOULDER [9]	X		☐ ☐ DETRITUS [3]		
☐ ☐ COBBLE [8]	X	X	☐ ☐ MUCK [2]		
☒ ☐ GRAVEL [7]	X	X	☐ ☐ SILT [2]	X	X
☐ ☒ SAND [6]	X	X	☐ ☐ ARTIFICIAL [0]	X	X
☐ ☐ BEDROCK [5]					

(Score natural substrates; ignore sludge from point-sources)

NUMBER OF BEST TYPES: ☒ 4 or more [2] ☐ 3 or less [0]

Check ONE (*Or 2 & average*)

ORIGIN
- ☐ LIMESTONE [1]
- ☒ TILLS [1]
- ☐ WETLANDS [0]
- ☐ HARDPAN [0]
- ☐ SANDSTONE [0]
- ☐ RIP/RAP [0]
- ☐ LACUSTURINE [0]
- ☐ SHALE [-1]
- ☐ COAL FINES [-2]

QUALITY

SILT
- ☐ HEAVY [-2]
- ☒ MODERATE [-1]
- ☐ NORMAL [0]
- ☐ FREE [1]

EMBEDDEDNESS
- ☒ EXTENSIVE [-2]
- ☒ MODERATE [-1]
- ☐ NORMAL [0]
- ☐ NONE [1]

Comments

Substrate 13.5 *Maximum 20*

2] INSTREAM COVER
Indicate presence 0 to 3: 0-Absent; 1-Very small amounts or if more common of marginal quality; 2-Moderate amounts, but not of highest quality or in small amounts of highest quality; 3-Highest quality in moderate or greater amounts (e.g., very large boulders in deep or fast water, large diameter log that is stable, well developed rootwad in deep / fast water, or deep, well-defined, functional pools.

1 UNDERCUT BANKS [1]	2 POOLS > 70cm [2]	0 OXBOWS, BACKWATERS [1]	**AMOUNT** (Check ONE (*Or 2 & average*))
0 OVERHANGING VEGETATION [1]	1 ROOTWADS [1]	0 AQUATIC MACROPHYTES [1]	☐ EXTENSIVE >75% [11]
1 SHALLOWS (IN SLOW WATER) [1]	1 BOULDERS [1]	1 LOGS OR WOODY DEBRIS [1]	☐ MODERATE 25-75% [7]
1 ROOTMATS [1]			☒ SPARSE 5-<25% [3]
			☐ NEARLY ABSENT <5% [1]

Comments

Cover 11 *Maximum 20*

3] CHANNEL MORPHOLOGY
Check ONE in each category (*Or 2 & average*)

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY
☐ HIGH [4]	☐ EXCELLENT [7]	☒ NONE [6]	☐ HIGH [3]
☐ MODERATE [3]	☒ GOOD [5]	☐ RECOVERED [4]	☒ MODERATE [2]
☒ LOW [2]	☒ FAIR [3]	☐ RECOVERING [3]	☐ LOW [1]
☐ NONE [1]	☐ POOR [1]	☐ RECENT OR NO RECOVERY [1]	

Comments

Channel 14 *Maximum 20*

4] BANK EROSION AND RIPARIAN ZONE
Check ONE in each category for *EACH BANK* (*Or 2 per bank & average*)

River right looking downstream

EROSION (L / R)	RIPARIAN WIDTH (L / R)	FLOOD PLAIN QUALITY (L / R)	
☒ ☒ NONE / LITTLE [3]	☐ ☐ WIDE > 50m [4]	☐ ☐ FOREST, SWAMP [3]	☐ ☐ CONSERVATION TILLAGE [1]
☐ ☐ MODERATE [2]	☐ ☐ MODERATE 10-50m [3]	☐ ☐ SHRUB OR OLD FIELD [2]	☐ ☐ URBAN OR INDUSTRIAL [0]
☐ ☐ HEAVY / SEVERE [1]	☒ ☒ NARROW 5-10m [2]	☐ ☒ RESIDENTIAL, PARK, NEW FIELD [1]	☒ ☐ MINING / CONSTRUCTION [0]
	☐ ☐ VERY NARROW < 5m [1]	☐ ☐ FENCED PASTURE [1]	
	☐ ☐ NONE [0]	☐ ☐ OPEN PASTURE, ROWCROP [0]	

Indicate predominant land use(s) past 100m riparian.

Comments

Riparian 5.5 *Maximum 10*

5] POOL / GLIDE AND RIFFLE / RUN QUALITY

MAXIMUM DEPTH (Check ONE (*ONLY!*))
- ☒ > 1m [6]
- ☐ 0.7-<1m [4]
- ☐ 0.4-<0.7m [2]
- ☐ 0.2-<0.4m [1]
- ☐ < 0.2m [0]

CHANNEL WIDTH (Check ONE (*Or 2 & average*))
- ☒ POOL WIDTH > RIFFLE WIDTH [2]
- ☐ POOL WIDTH = RIFFLE WIDTH [1]
- ☐ POOL WIDTH < RIFFLE WIDTH [0]

CURRENT VELOCITY (Check ALL that apply)
- ☐ TORRENTIAL [-1]
- ☐ VERY FAST [1]
- ☒ FAST [1]
- ☒ MODERATE [1]
- ☒ SLOW [1]
- ☐ INTERSTITIAL [-1]
- ☐ INTERMITTENT [-2]
- ☒ EDDIES [1]

Indicate for reach - pools and riffles.

Recreation Potential
Primary Contact
Secondary Contact
(circle one and comment on back)

Comments

Pool / Current 12 *Maximum 12*

Indicate for functional riffles; Best areas must be large enough to support a population of riffle-obligate species: (Check ONE (*Or 2 & average*)) ☐ NO RIFFLE [metric=0]

RIFFLE DEPTH	RUN DEPTH	RIFFLE / RUN SUBSTRATE	RIFFLE / RUN EMBEDDEDNESS
☒ BEST AREAS > 10cm [2]	☒ MAXIMUM > 50cm [2]	☐ STABLE (e.g., Cobble, Boulder) [2]	☐ NONE [2]
☐ BEST AREAS 5-10cm [1]	☐ MAXIMUM < 50cm [1]	☒ MOD. STABLE (e.g., Large Gravel) [1]	☐ LOW [1]
☐ BEST AREAS < 5cm [metric=0]		☐ UNSTABLE (e.g., Fine Gravel, Sand) [0]	☒ MODERATE [0]
			☐ EXTENSIVE [-1]

Comments

Riffle / Run 5 *Maximum 8*

6] GRADIENT (0.90 ft/mi)
DRAINAGE AREA (7.44 mi²)

- ☐ VERY LOW - LOW [2-4]
- ☒ MODERATE [6-10]
- ☐ HIGH - VERY HIGH [10-6]

%POOL: ____ %GLIDE: ____

%RUN: ____ %RIFFLE: ____

Gradient 8 *Maximum 10*

A] SAMPLED REACH

Check ALL that apply

METHOD

- ☐ BOAT
- ☐ WADE
- ☐ L. LINE
- ☐ OTHER

STAGE

1st -sample pass-	2nd
☐ HIGH	☐
☐ UP	☐
☐ NORMAL	☐
☐ LOW	☐
☐ DRY	☐

DISTANCE

- ☐ 0.5 Km
- ☐ 0.2 Km
- ☐ 0.15 Km
- ☐ 0.12 Km
- ☐ OTHER

_____ meters

CLARITY

1st --sample pass--	2nd
☐ < 20 cm	☐
☐ 20-<40 cm	☐
☐ 40-70 cm	☐
☐ > 70 cm/ CTB	☐
☐ SECCHI DEPTH	☐

CANOPY

- ☐ > 85%- OPEN
- ☐ 55%-<85%
- ☐ 30%-<55%
- ☐ 10%-<30%
- ☐ <10%- CLOSED

1st pass _____ cm

2nd _____ cm

Comment RE: Reach consistency/ Is reach typical of steam?, *Recreation/* Observed - Inferred, *Other/* Sampling observations, Concerns, Access directions, etc.

B] AESTHETICS

- ☐ NUISANCE ALGAE
- ☐ INVASIVE MACROPHYTES
- ☐ EXCESS TURBIDITY
- ☐ DISCOLORATION
- ☐ FOAM / SCUM
- ☐ OIL SHEEN
- ☐ TRASH / LITTER
- ☐ NUISANCE ODOR
- ☐ SLUDGE DEPOSITS
- ☐ CSOs/SSOs/OUTFALLS

C] RECREATION

AREA DEPTH

POOL: ☐ >100ft² ☐ >3ft

D] MAINTENANCE

Circle some & *COMMENT*

PUBLIC / PRIVATE / BOTH / NA
ACTIVE / HISTORIC / BOTH / NA
YOUNG-SUCCESSION-OLD
SPRAY / SNAG / REMOVED
MODIFIED / DIPPED OUT / NA
LEVEED / ONE SIDED
RELOCATED / CUTOFFS
MOVING-BEDLOAD-STABLE
ARMOURED / SLUMPS
ISLANDS / SCOURED
IMPOUNDED / DESICCATED
FLOOD CONTROL / DRAINAGE

E] ISSUES

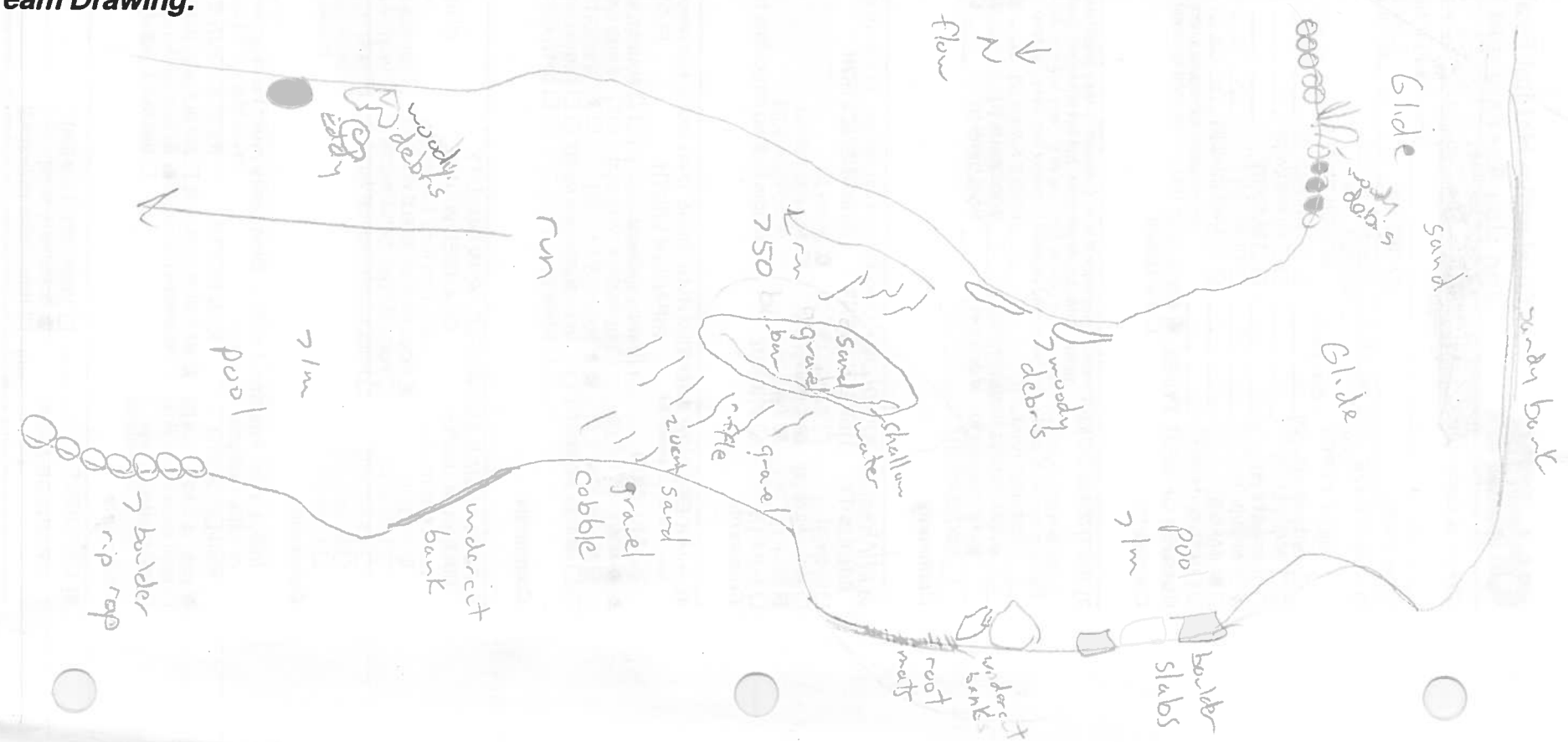
WWTP / CSO / NPDES / INDUSTRY
HARDENED / URBAN / DIRT&GRIME
CONTAMINATED / LANDFILL
BMPs-CONSTRUCTION-SEDIMENT
LOGGING / IRRIGATION / COOLING
BANK / EROSION / SURFACE
FALSE BANK / MANURE / LAGOON
WASH H_20 / TILE / H_20 TABLE
ACID / MINE / QUARRY / FLOW
NATURAL / WETLAND / STAGNANT
PARK / GOLF / LAWN / HOME
ATMOSPHERE / DATA PAUCITY

F] MEASUREMENTS

- $\bar{x}$ width
- $\bar{x}$ depth
- max. depth
- $\bar{x}$ bankfull width
- bankfull $\bar{x}$ depth
- W/D ratio
- bankfull max. depth
- floodprone x^2 width
- entrench. ratio

Legacy Tree:

Stream Drawing:



OhioEPA

Qualitative Habitat Evaluation Index and Use Assessment Field Sheet

QHEI Score: 74.75

Stream & Location: Cuyahoga River Upstream of Big Creek **RM:** 8.60 **Date:** 9/25/14

Seth Hothem, Mark Matteson, Mario Meany **Scorers Full Name & Affiliation:** Northeast Ohio Regional Sewer District

River Code: __-___-___ **STORET #:** ______ **Lat./ Long.:** (NAD 83 - decimal °) 41.4381 /81.6680 Office verified location ☐

1] SUBSTRATE
Check ONLY Two substrate TYPE BOXES; estimate % or note every type present

BEST TYPES	POOL	RIFFLE	OTHER TYPES	POOL	RIFFLE
☐☐ BLDR /SLABS [10]			☐☐ HARDPAN [4]		
☐☐ BOULDER [9]		X	☐☐ DETRITUS [3]		
☐☐ COBBLE [8]	X	X	☐☐ MUCK [2]		
■☐ GRAVEL [7]	X	X	☐☐ SILT [2]	X	X
☐■ SAND [6]		X	☐☐ ARTIFICIAL [0]		X
☐☐ BEDROCK [5]			(Score natural substrates; ignore sludge from point-sources)		

NUMBER OF BEST TYPES: ■ 4 or more [2] ☐ 3 or less [0]

Check ONE (Or 2 & average)

ORIGIN: ☐ LIMESTONE [1] ■ TILLS [1] ☐ WETLANDS [0] ☐ HARDPAN [0] ☐ SANDSTONE [0] ☐ RIP/RAP [0] ☐ LACUSTURINE [0] ☐ SHALE [-1] ☐ COAL FINES [-2]

QUALITY:
SILT: ☐ HEAVY [-2] ☐ MODERATE [-1] ■ NORMAL [0] ☐ FREE [1]
EMBEDDEDNESS: ☐ EXTENSIVE [-2] ☐ MODERATE [-1] ■ NORMAL [0] ☐ NONE [1]

Substrate: 16 Maximum 20

Comments

2] INSTREAM COVER
Indicate presence 0 to 3: 0-Absent; 1-Very small amounts or if more common of marginal quality; 2-Moderate amounts, but not of highest quality or in small amounts of highest quality; 3-Highest quality in moderate or greater amounts (e.g., very large boulders in deep or fast water, large diameter log that is stable, well developed rootwad in deep / fast water, or deep, well-defined, functional pools.

1 UNDERCUT BANKS [1]
0 OVERHANGING VEGETATION [1]
1 SHALLOWS (IN SLOW WATER) [1]
0 ROOTMATS [1]
2 POOLS > 70cm [2]
0 ROOTWADS [1]
0 BOULDERS [1]
0 OXBOWS, BACKWATERS [1]
0 AQUATIC MACROPHYTES [1]
2 LOGS OR WOODY DEBRIS [1]

AMOUNT Check ONE (Or 2 & average)
☐ EXTENSIVE >75% [11]
■ MODERATE 25-75% [7]
☐ SPARSE 5-<25% [3]
☐ NEARLY ABSENT <5% [1]

Cover Maximum 20: 12

Comments

3] CHANNEL MORPHOLOGY
Check ONE in each category (Or 2 & average)

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY
☐ HIGH [4]	☐ EXCELLENT [7]	■ NONE [6]	☐ HIGH [3]
☐ MODERATE [3]	■ GOOD [5]	☐ RECOVERED [4]	■ MODERATE [2]
■ LOW [2]	■ FAIR [3]	☐ RECOVERING [3]	☐ LOW [1]
☐ NONE [1]	☐ POOR [1]	☐ RECENT OR NO RECOVERY [1]	

Channel Maximum 20: 14

Comments

4] BANK EROSION AND RIPARIAN ZONE
Check ONE in each category for EACH BANK (Or 2 per bank & average)

River right looking downstream

EROSION (L R)
■■ MODERATE [2]
☐☐ NONE / LITTLE [3]
☐☐ HEAVY / SEVERE [1]

RIPARIAN WIDTH (L R)
☐☐ WIDE > 50m [4]
■■ MODERATE 10-50m [3]
☐☐ NARROW 5-10m [2]
☐☐ VERY NARROW < 5m [1]
☐☐ NONE [0]

FLOOD PLAIN QUALITY (L R)
☐☐ FOREST, SWAMP [3]
☐☐ SHRUB OR OLD FIELD [2]
■■ RESIDENTIAL, PARK, NEW FIELD [1]
☐☐ FENCED PASTURE [1]
☐☐ OPEN PASTURE, ROWCROP [0]
☐☐ CONSERVATION TILLAGE [1]
☐■ URBAN OR INDUSTRIAL [0]
☐☐ MINING / CONSTRUCTION [0]

Indicate predominant land use(s) past 100m riparian.

1 0.5

Riparian Maximum 10: 5.75

Comments

5] POOL / GLIDE AND RIFFLE / RUN QUALITY

MAXIMUM DEPTH Check ONE (ONLY!)
■ > 1m [6]
☐ 0.7-<1m [4]
☐ 0.4-<0.7m [2]
☐ 0.2-<0.4m [1]
☐ < 0.2m [0]

CHANNEL WIDTH Check ONE (Or 2 & average)
■ POOL WIDTH > RIFFLE WIDTH [2]
☐ POOL WIDTH = RIFFLE WIDTH [1]
☐ POOL WIDTH < RIFFLE WIDTH [0]

CURRENT VELOCITY Check ALL that apply
☐ TORRENTIAL [-1] ■ SLOW [1]
☐ VERY FAST [1] ☐ INTERSTITIAL [-1]
■ FAST [1] ☐ INTERMITTENT [-2]
■ MODERATE [1] ☐ EDDIES [1]
Indicate for reach - pools and riffles.

Recreation Potential
Primary Contact
Secondary Contact
(circle one and comment on back)

Pool / Current Maximum 12: 11

Comments

Indicate for functional riffles; Best areas must be large enough to support a population of riffle-obligate species: Check ONE (Or 2 & average). ☐ NO RIFFLE [metric=0]

RIFFLE DEPTH
■ BEST AREAS > 10cm [2]
☐ BEST AREAS 5-10cm [1]
☐ BEST AREAS < 5cm [metric=0]

RUN DEPTH
■ MAXIMUM > 50cm [2]
☐ MAXIMUM < 50cm [1]

RIFFLE / RUN SUBSTRATE
☐ STABLE (e.g., Cobble, Boulder) [2]
■ MOD. STABLE (e.g., Large Gravel) [1]
☐ UNSTABLE (e.g., Fine Gravel, Sand) [0]

RIFFLE / RUN EMBEDDEDNESS
☐ NONE [2]
■ LOW [1]
☐ MODERATE [0]
☐ EXTENSIVE [-1]

Riffle / Run Maximum 8: 6

Comments

6] GRADIENT (2.03 ft/mi)
DRAINAGE AREA (745 mi²)

☐ VERY LOW - LOW [2-4]
■ MODERATE [6-10]
☐ HIGH - VERY HIGH [10-6]

%POOL: __ %GLIDE: __
%RUN: __ %RIFFLE: __

Gradient Maximum 10: 10

A] SAMPLED REACH

Check ALL that apply

METHOD

- ☐ BOAT
- ☐ WADE
- ☐ L. LINE
- ☐ OTHER

DISTANCE

- ☐ 0.5 Km
- ☐ 0.2 Km
- ☐ 0.15 Km
- ☐ 0.12 Km
- ☐ OTHER

_____ meters

STAGE

1st -sample pass-	2nd
☐ HIGH	☐
☐ UP	☐
☐ NORMAL	☐
☐ LOW	☐
☐ DRY	☐

CLARITY

1st --sample pass--	2nd
☐ < 20 cm	☐
☐ 20-<40 cm	☐
☐ 40-70 cm	☐
☐ > 70 cm/ CTB	☐
☐ SECCHI DEPTH	☐

1st pass _____ cm

2nd _____ cm

CANOPY

- ☐ > 85%- OPEN
- ☐ 55%-<85%
- ☐ 30%-<55%
- ☐ 10%-<30%
- ☐ <10%- CLOSED

Comment RE: Reach consistency/ Is reach typical of steam?, *Recreation/* Observed - Inferred, *Other/* Sampling observations, Concerns, Access directions, etc.

B] AESTHETICS

- ☐ NUISANCE ALGAE
- ☐ INVASIVE MACROPHYTES
- ☐ EXCESS TURBIDITY
- ☐ DISCOLORATION
- ☐ FOAM / SCUM
- ☐ OIL SHEEN
- ☐ TRASH / LITTER
- ☐ NUISANCE ODOR
- ☐ SLUDGE DEPOSITS
- ☐ CSOs/SSOs/OUTFALLS

C] RECREATION

AREA DEPTH

POOL: ☐ >100ft² ☐ >3ft

D] MAINTENANCE

Circle some & *COMMENT*

PUBLIC / PRIVATE / BOTH / NA
ACTIVE / HISTORIC / BOTH / NA
YOUNG-SUCCESSION-OLD
SPRAY / SNAG / REMOVED
MODIFIED / DIPPED OUT / NA
LEVEED / ONE SIDED
RELOCATED / CUTOFFS
MOVING-BEDLOAD-STABLE
ARMOURED / SLUMPS
ISLANDS / SCOURED
IMPOUNDED / DESICCATED
FLOOD CONTROL / DRAINAGE

E] ISSUES

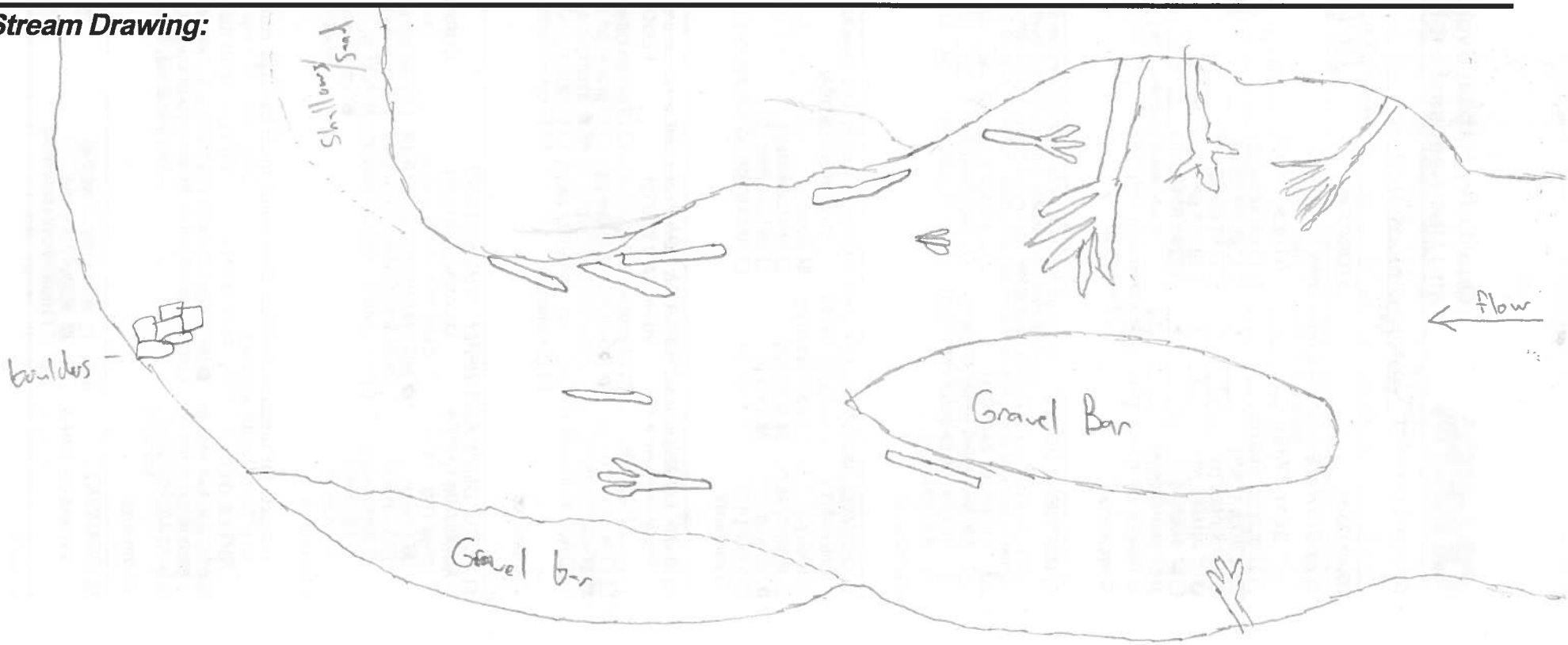
WWTP / CSO / NPDES / INDUSTRY
HARDENED / URBAN / DIRT&GRIME
CONTAMINATED / LANDFILL
BMPs-CONSTRUCTION-SEDIMENT
LOGGING / IRRIGATION / COOLING
BANK / EROSION / SURFACE
FALSE BANK / MANURE / LAGOON
WASH H_20 / TILE / H_20 TABLE
ACID / MINE / QUARRY / FLOW
NATURAL / WETLAND / STAGNANT
PARK / GOLF / LAWN / HOME
ATMOSPHERE / DATA PAUCITY

F] MEASUREMENTS

- $\bar{x}$ width
- $\bar{x}$ depth
- max. depth
- $\bar{x}$ bankfull width
- bankfull $\bar{x}$ depth
- W/D ratio
- bankfull max. depth
- floodprone x^2 width
- entrench. ratio

Legacy Tree:

Stream Drawing:



OhioEPA Qualitative Habitat Evaluation Index and Use Assessment Field Sheet

QHEI Score: 67.5

Stream & Location: Cuyahoga River DS of Big Creek **RM:** 2.00 **Date:** 10/09/14

Scorers Full Name & Affiliation: Seth Hothem, Eric Snethlen, Northeast Ohio Regional Sewer District

River Code: ___-___-___ **STORET #:** _____ **Lat./Long.:** (NAD 83 - decimal °) 41.4492 / 81.6815 **Office verified location** ☐

1] SUBSTRATE

Check *ONLY* Two substrate *TYPE BOXES*; estimate % or note every type present

BEST TYPES	POOL	RIFFLE	OTHER TYPES	POOL	RIFFLE
☐☐ BLDR /SLABS [10]	X		☐☐ HARDPAN [4]	X	
☐☐ BOULDER [9]	X	X	☐☐ DETRITUS [3]		
☐☐ COBBLE [8]	X	X	☐☐ MUCK [2]		
☒☐ GRAVEL [7]	X		☐☐ SILT [2]	X	X
☐☒ SAND [6]	X	X	☐☐ ARTIFICIAL [0]	X	X
☐☐ BEDROCK [5]			(Score natural substrates; ignore sludge from point-sources)		

NUMBER OF BEST TYPES: ☒ 4 or more [2] ☐ 3 or less [0]

Comments

Check ONE (*Or 2 & average*)

ORIGIN	SILT	QUALITY	EMBEDDEDNESS
☐ LIMESTONE [1]		☒ HEAVY [-2]	
☒ TILLS [1]		☒ MODERATE [-1]	
☐ WETLANDS [0]		☐ NORMAL [0]	
☐ HARDPAN [0]		☐ FREE [1]	
☐ SANDSTONE [0]		☒ EXTENSIVE [-2]	
☐ RIP/RAP [0]		☒ MODERATE [-1]	
☐ LACUSTURINE [0]		☐ NORMAL [0]	
☐ SHALE [-1]		☐ NONE [1]	
☐ COAL FINES [-2]			

Substrate 13 *Maximum 20*

2] INSTREAM COVER

Indicate presence 0 to 3: **0**-Absent; **1**-Very small amounts or if more common of marginal quality; **2**-Moderate amounts, but not of highest quality or in small amounts of highest quality; **3**-Highest quality in moderate or greater amounts (e.g., very large boulders in deep or fast water, large diameter log that is stable, well developed rootwad in deep / fast water, or deep, well-defined, functional pools.

1 UNDERCUT BANKS [1]	2 POOLS > 70cm [2]	0 OXBOWS, BACKWATERS [1]	
0 OVERHANGING VEGETATION [1]	0 ROOTWADS [1]	0 AQUATIC MACROPHYTES [1]	
1 SHALLOWS (IN SLOW WATER) [1]	1 BOULDERS [1]	1 LOGS OR WOODY DEBRIS [1]	
1 ROOTMATS [1]			

AMOUNT Check ONE (*Or 2 & average*)

☐ EXTENSIVE >75% [11]
☐ MODERATE 25-75% [7]
☒ SPARSE 5-<25% [3]
☐ NEARLY ABSENT <5% [1]

Comments

Cover *Maximum 20* 10

3] CHANNEL MORPHOLOGY

Check ONE in each category (*Or 2 & average*)

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY
☐ HIGH [4]	☐ EXCELLENT [7]	☒ NONE [6]	☒ HIGH [3]
☐ MODERATE [3]	☐ GOOD [5]	☐ RECOVERED [4]	☒ MODERATE [2]
☒ LOW [2]	☒ FAIR [3]	☐ RECOVERING [3]	☐ LOW [1]
☐ NONE [1]	☐ POOR [1]	☐ RECENT OR NO RECOVERY [1]	

Comments

Channel *Maximum 20* 13.5

4] BANK EROSION AND RIPARIAN ZONE

Check ONE in each category for *EACH BANK* (*Or 2 per bank & average*)

River right looking downstream

EROSION (L / R)	RIPARIAN WIDTH (L / R)	FLOOD PLAIN QUALITY (L / R)	
☐☐ NONE / LITTLE [3]	☐☐ WIDE > 50m [4]	☐☐ FOREST, SWAMP [3]	☐☐ CONSERVATION TILLAGE [1]
☒☒ MODERATE [2]	☐☒ MODERATE 10-50m [3]	☐☐ SHRUB OR OLD FIELD [2]	☒☒ URBAN OR INDUSTRIAL [0]
☐☐ HEAVY / SEVERE [1]	☐☐ NARROW 5-10m [2]	☐☐ RESIDENTIAL, PARK, NEW FIELD [1]	☐☐ MINING / CONSTRUCTION [0]
	☒☐ VERY NARROW < 5m [1]	☐☐ FENCED PASTURE [1]	
	☐☐ NONE [0]	☐☐ OPEN PASTURE, ROWCROP [0]	

Indicate predominant land use(s) past 100m riparian.

Comments

Riparian *Maximum 10* 4

5] POOL / GLIDE AND RIFFLE / RUN QUALITY

MAXIMUM DEPTH Check ONE (*ONLY!*)

☒ > 1m [6]
☐ 0.7-<1m [4]
☐ 0.4-<0.7m [2]
☐ 0.2-<0.4m [1]
☐ < 0.2m [0]

CHANNEL WIDTH Check ONE (*Or 2 & average*)

☒ POOL WIDTH > RIFFLE WIDTH [2]
☐ POOL WIDTH = RIFFLE WIDTH [1]
☐ POOL WIDTH < RIFFLE WIDTH [0]

CURRENT VELOCITY Check ALL that apply

☐ TORRENTIAL [-1]
☒ SLOW [1]
☐ VERY FAST [1]
☐ INTERSTITIAL [-1]
☒ FAST [1]
☐ INTERMITTENT [-2]
☒ MODERATE [1]
☒ EDDIES [1]

Indicate for reach - pools and riffles.

Recreation Potential
Primary Contact
Secondary Contact
(circle one and comment on back)

Comments

Pool / Current *Maximum 12* 12

Indicate for functional riffles; Best areas must be large enough to support a population of riffle-obligate species: Check ONE (*Or 2 & average*). ☐ NO RIFFLE [metric=0]

RIFFLE DEPTH	RUN DEPTH	RIFFLE / RUN SUBSTRATE	RIFFLE / RUN EMBEDDEDNESS
☒ BEST AREAS > 10cm [2]	☒ MAXIMUM > 50cm [2]	☒ STABLE (e.g., Cobble, Boulder) [2]	☐ NONE [2]
☐ BEST AREAS 5-10cm [1]	☐ MAXIMUM < 50cm [1]	☒ MOD. STABLE (e.g., Large Gravel) [1]	☐ LOW [1]
☐ BEST AREAS < 5cm [metric=0]		☐ UNSTABLE (e.g., Fine Gravel, Sand) [0]	☒ MODERATE [0]
			☒ EXTENSIVE [-1]

Comments

Riffle / Run *Maximum 8* 5

6] GRADIENT

(2.03 ft/mi) ☐ VERY LOW - LOW [2-4] ☒ MODERATE [6-10] ☐ HIGH - VERY HIGH [10-6]

DRAINAGE AREA (786 mi²)

%POOL: ____ %GLIDE: ____
%RUN: ____ %RIFFLE: ____

Gradient *Maximum 10* 10

A] SAMPLED REACH

Check ALL that apply

METHOD

- ☐ BOAT
- ☐ WADE
- ☐ L. LINE
- ☐ OTHER

DISTANCE

- ☐ 0.5 Km
- ☐ 0.2 Km
- ☐ 0.15 Km
- ☐ 0.12 Km
- ☐ OTHER

_____ meters

STAGE

1st -sample pass-	2nd
☐ HIGH	☐
☐ UP	☐
☐ NORMAL	☐
☐ LOW	☐
☐ DRY	☐

CLARITY

1st --sample pass--	2nd
☐ < 20 cm	☐
☐ 20-<40 cm	☐
☐ 40-70 cm	☐
☐ > 70 cm/ CTB	☐
☐ SECCHI DEPTH	☐

1st _____ cm

pass

2nd _____ cm

CANOPY

- ☐ > 85%- OPEN
- ☐ 55%-<85%
- ☐ 30%-<55%
- ☐ 10%-<30%
- ☐ <10%- CLOSED

Comment RE: Reach consistency/ Is reach typical of steam?, *Recreation/* Observed - Inferred, *Other/* Sampling observations, Concerns, Access directions, etc.

B] AESTHETICS

- ☐ NUISANCE ALGAE
- ☐ INVASIVE MACROPHYTES
- ☐ EXCESS TURBIDITY
- ☐ DISCOLORATION
- ☐ FOAM / SCUM
- ☐ OIL SHEEN
- ☐ TRASH / LITTER
- ☐ NUISANCE ODOR
- ☐ SLUDGE DEPOSITS
- ☐ CSOs/SSOs/OUTFALLS

C] RECREATION

AREA DEPTH

POOL: ☐ >100ft² ☐ >3ft

D] MAINTENANCE

Circle some & *COMMENT*

PUBLIC / PRIVATE / BOTH / NA
ACTIVE / HISTORIC / BOTH / NA
YOUNG-SUCCESSION-OLD
SPRAY / SNAG / REMOVED
MODIFIED / DIPPED OUT / NA
LEVEED / ONE SIDED
RELOCATED / CUTOFFS
MOVING-BEDLOAD-STABLE
ARMOURED / SLUMPS
ISLANDS / SCOURED
IMPOUNDED / DESICCATED
FLOOD CONTROL / DRAINAGE

E] ISSUES

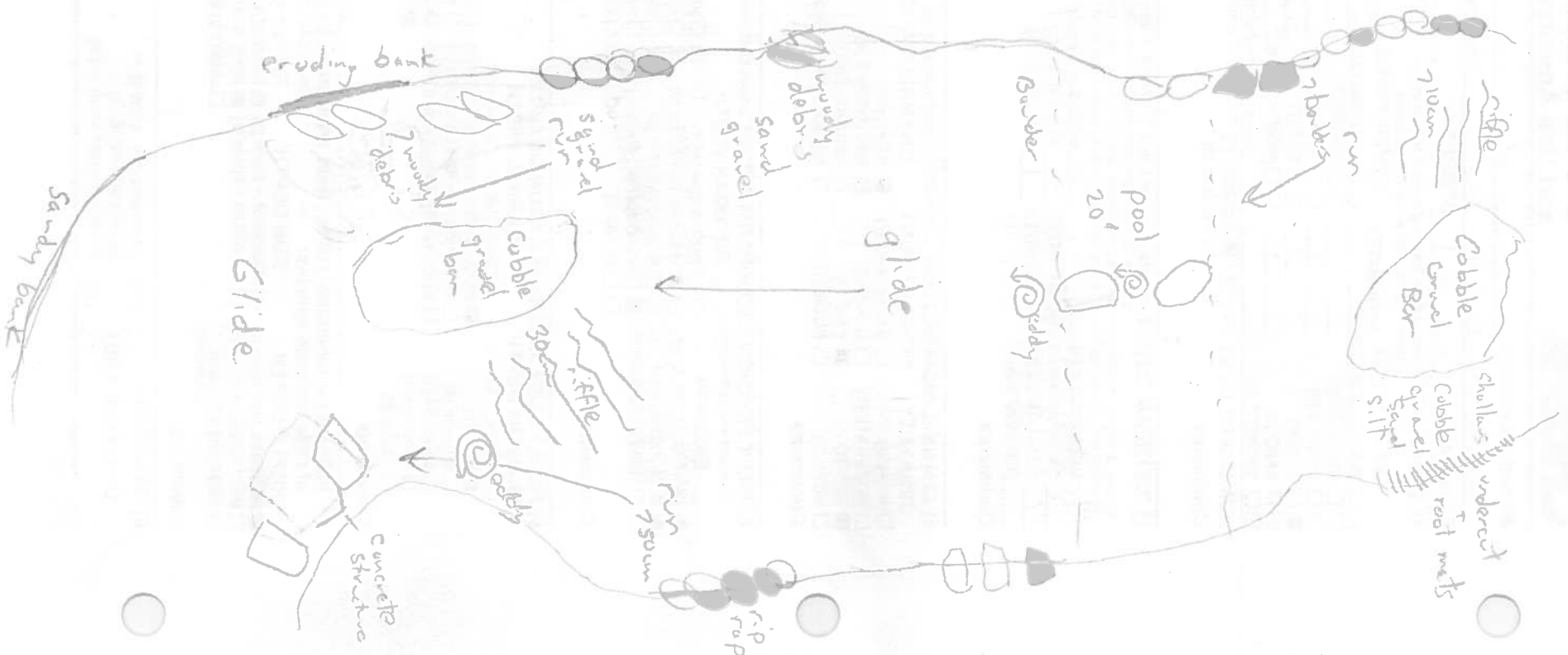
WWTP / CSO / NPDES / INDUSTRY
HARDENED / URBAN / DIRT&GRIME
CONTAMINATED / LANDFILL
BMPs-CONSTRUCTION-SEDIMENT
LOGGING / IRRIGATION / COOLING
BANK / EROSION / SURFACE
FALSE BANK / MANURE / LAGOON
WASH H_20 / TILE / H_20 TABLE
ACID / MINE / QUARRY / FLOW
NATURAL / WETLAND / STAGNANT
PARK / GOLF / LAWN / HOME
ATMOSPHERE / DATA PAUCITY

F] MEASUREMENTS

- $\bar{x}$ width
- $\bar{x}$ depth
- max. depth
- $\bar{x}$ bankfull width
- bankfull $\bar{x}$ depth
- W/D ratio
- bankfull max. depth
- floodprone x^2 width
- entrench. ratio

Legacy Tree:

Stream Drawing:



Lake / Lacustuary (Lentic) QHEI Field Sheet

Ohio Environmental Protection Agency

QHEI Score: ____

RIVERCODE ____ RIVERMILE 5.90 WATERBODY Cuyahoga DISTANCE ASSESSED (m): ____
DATE 10/6/14 LOCATION Head of Navigation Channel
SCORER Seth Hothem LAT. 41.4619 LONG. -81.6816 COMMENT ____

1] SUBSTRATE (Check *ONLY* Two Substrate TYPE BOXES; Estimate % or note every type present); LAKE: ____ LACUSTUARY: X

TYPE	SHORE	BOTTOM		SHORE	BOTTOM
☐☐-BLDR/SLABS [7]			☐☐-HARDPAN [4]		
☐☐-BOULDER [10]			☐☐-BEDROCK [3]		
☐☐-COBBLE [8]			☐☐-DETRITUS [3]		
☐☐-GRAVEL [7]	X		☐☐-SILT [2]	X	X
☐☐-SAND [6]			☒☒-MUCK [2]		

NOTE: Ignore sludge that onginates from point-sources; score on natural substrates
NUMBER OF SUBSTRATE TYPES: ☐-5 or More [2] ☐-4 or Less [0]

SUBSTRATE ORIGIN Check ONE (or 2 & *AVERAGE*)
☐-LIMESTONE [1] ☒-TILLS [1] ☐-WETLANDS [1] ☐-LACUSTUARINE [1] ☐-SANDSTONE [1] ☐-RIP/RAP [1] ☐-HARDPAN [0] ☐-SHALE [-1] ☐-COAL/ORE [-2]

SUBSTRATE QUALITY Check ONE (or 2 & *AVERAGE*)
SILT: ☒-SILT HEAVY [-2] ☐-SILT MODERATE [-1] ☐-SILT NORMAL [0] ☐-SILT FREE [1]
SILT ORIGIN: ☒-CLAY [-2] ☐-INDUSTRIAL [-1] ☐-ORGANIC [1] ☐-NONE [1]

Substrate: 1 Max 20

COMMENTS: ____

2] COVER TYPES **TYPE:** (Check All That Apply) **AMOUNT** (Check *ONLY* One or check2 and AVERAGE)

☐-OFF-SHORE SAND BARS [4]	☒-DEEPWATER > 1 M [1]	☐-WETLAND POOLS [1]	☐-EXTENSIVE > 75% [9]
☐-OVERHANGING VEGETATION [1]	☐-ROOTWADS [1]	☐-SUBMERGED AQUATIC VEG. [4]	☐-MODERATE 25-75% [7]
☐-SHALLOWS (ON BEACH) [1]	☒-BOULDERS [1]	☒-LOGS OR WOODY DEBRIS [1]	☐-SPARSE 5-25% [3]
☐-ROOTMATS [1]	☐-SAND BEACH [1]	☐-GRAVEL BEACH [1]	☒-NEARLY ABSENT < 5% [1]

Cover: 4 Max 20

COMMENTS: ____

3] SHORELINE MORPHOLOGY (Check *ONLY* one PER category or check 2 and *AVERAGE*)

SHORE SINUOSITY
☐-HIGH [2] ☐-MODERATE [4] ☐-LOW [3] ☒-NONE [1]

DEVELOPMENT
☐-EXCELLENT [6] ☐-GOOD [5] ☐-FAIR [3] ☒-POOR [1]

MODIFICATION
☐-NONE [7] ☐-RECOVERED [5] ☐-RECOVERING [3] ☒-RECENT OR NO RECOVERY [1]

STABILITY
☒-HIGH [3] ☐-MODERATE [2] ☐-LOW [1]

SHORE to BOTTOM SLOPE MORPHOLOGIES
☐-SLOPE < 15 deg. [0] ☒-SLOPE > 45 deg. [2] ☐-SLOPE < 25 deg. [1] ☐-SLOPE 90 deg. [0] ☐-SLOPE > 25 deg. [3]

AVERAGE DEPTH (of 5 measures)
☐-< 50 cm [0] ☐-> 400 – 500 cm [4] ☐-50 - <100 cm [1] ☐-> 500 - 900 cm [2] ☐-≥100 - 200 cm [2] ☒-> 900 cm [1] ☐-> 200 - 400 cm [3]

MODIFICATIONS OF SAMPLED SHORELINE
☒-CEMENTED [-1] ☒-STEEL BULKHEADS [-2] ☐-RIP RAPPED [1] ☐-ISLANDS [1] ☐-RAILROAD TIES [-1] ☐-DIKES [-1] ☐-DREDGED [-1] ☐-BANK SHAPING [-1] ☒-TWO SIDE CHANNEL MODIFICATIONS [-1] ☐-WOOD PILINGS [1] ☒-SHIP CHANNEL [-2]

Shore Line: 3 Max 20

COMMENTS: ____

★ Shore Right Looking East or South on Lake ★
★ Shore Right Looking Toward Lake in Lacustuary ★

4] RIPARIAN ZONE AND BANK EROSION (Check *ONE* box PER bank or 2 and *AVERAGE*)

RIPARIAN WIDTH (L R Per Bank)
☐☐-WIDE > 50 m [4] ☐☐-MODERATE 10-50 m [3] ☐☐-NARROW 5-10 m [2] ☐☒-VERY NARROW < 5 m [1] ☒☒-NONE [0]

SHORE LINE QUALITY (PAST 100 FOOT RIPARIAN) (L R Most Predominant Per Bank)
☐☐-FOREST, WETLAND, LAKE [3] ☐☐-SHRUB OR OLD FIELD [2] ☐☐-VINEYARD, ORCHARD [2] ☐☐-FENCED PASTURE [1] ☐☐-RESIDENTIAL, PARK, NEW FIELD [1]
☐☐-CONSERVATION TILLIAGE [1] ☒☒-URBAN OR INDUSTRIAL [0] ☐☐-OPEN PASUTRE, ROWCROP [0] ☐☐-MINING/CONSTRUCTION [0] ☐☐-DIKED WETLAND [0]

BANK EROSION (L R Per Bank)
☒☒-NONE/LITTLE [3] ☐☐-MODERATE [-1] ☐☐-HEAVY/SEVERE [-3]

Riparian: 3.2 Max 10

COMMENTS: ____

5] AQUATIC VEGETATION QUALITY: PLANT SPECIES OBSERVED (Sum All Scores)
(Score all for observed abundance: ABUNDANT = [3], COMMON = [5], FEW = [1]; UNCOMMON = [0])
____NO AQUATIC VEGETATION = 0

____-Pond Lilies (NYMPHAEA) ____-Sedge (CYPERACEAE) ____-Wild Celery (VALLISNERIA)
____-Pond Weed (POTAMOGETON) ____-Bulrush (SCIRPUS) ____-Waterweed (ELODEA) ____-Wild Rice (ZIZANIA)

(Score all for observed abundance: ABUNDANT = [-2]; COMMON = [-1], FEW = [0])

____-Purple Loosestrife ____-Reed Grass ____-Eurasian Milfoil ____-Cattails ____-Algae (mats) ____-Algae (planktonic)

Vegetation: 0 Max 30

COMMENTS: ____

Is the Sampling Reach Representative of Area Habitat? (Y/N) X if Not, Explain: _____

Depth measures: | | | | | |

Zebra Mussel/Quagga Mussel Coverage ☐->60% ☐-60->25% ☐-25->10% ☐-<10->1% ☐-1-0%

	Gear	Distance	Water Clarity	Wave Height
First Sampling Pass:				
Second Sampling Pass:				
Third Sampling Pass:				

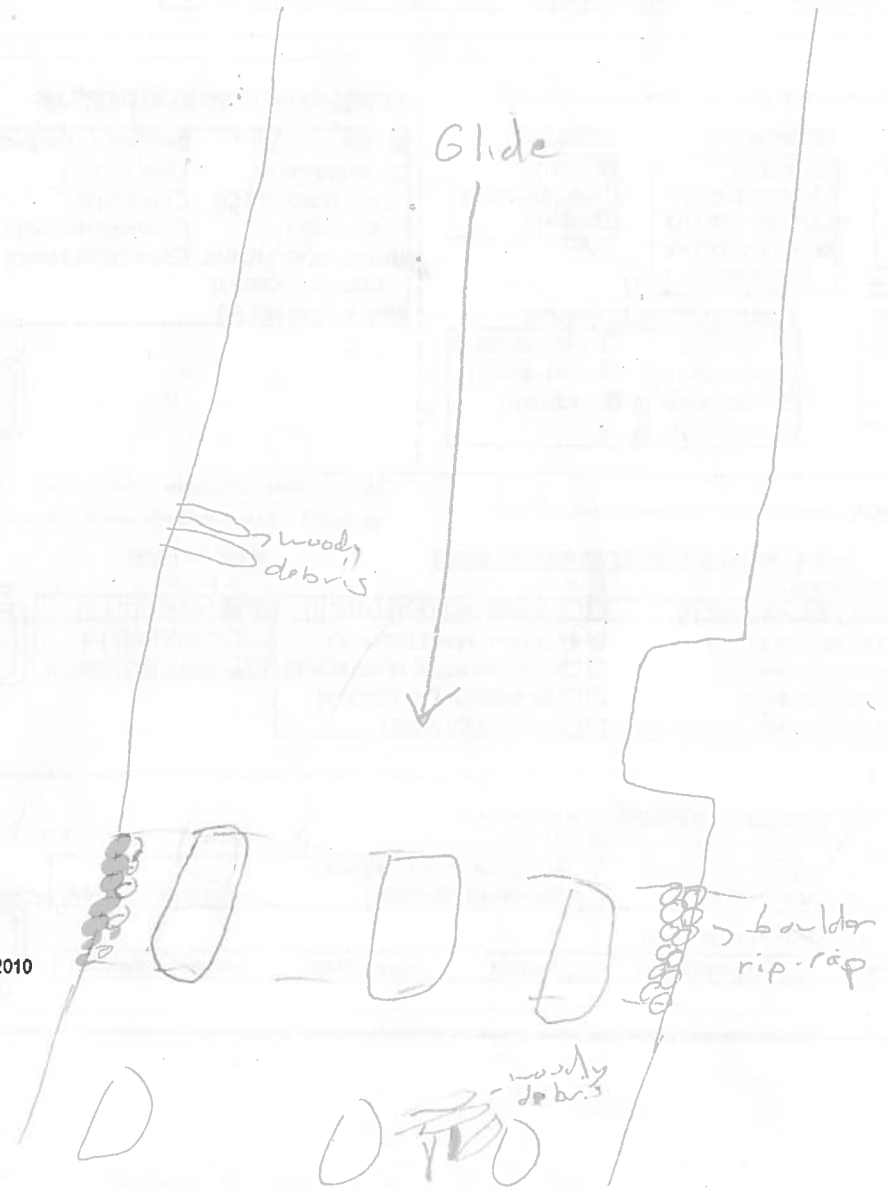
Subjective Rating (1-10) ☐ Aesthetic Rating (1-10) ☐

Photos: _____

WATERBODY MEASUREMENTS: AVERAGE WIDTH: _____ AVERAGE DEPTH: _____ Maximum Depth: _____

DRAWING OF SITE:

North Arrow: Flow ↓



Lake / Lacustuary (Lentic) QHEI Field Sheet

Ohio Environmental Protection Agency

QHEI Score: ____

RIVERCODE ____ RIVERMILE 2.75 WATERBODY Cuyahoga River DISTANCE ASSESSED (m): ____
DATE 9/19/14 LOCATION Scranton Road Restoration Site
SCORER Hothem / Meany / Amidon LAT. 41.4881 LONG. -81.6938 COMMENT ____

1] SUBSTRATE (Check *ONLY* Two Substrate TYPE BOXES; Estimate % or note every type present); LAKE: ____ LACUSTUARY: X

TYPE	SHORE	BOTTOM
☐☐-BLDR/SLABS [7]		
☐☐-BOULDER [10]	X	
☐☐-COBBLE [8]		
☐☐-GRAVEL [7]	X	
☐☐-SAND [6]	X	
☐☐-HARDPAN [4]		
☐☐-BEDROCK [3]		
☐☐-DETRITUS [3]		
☐☐-SILT [2]		
☒☒-MUCK [2]	X	X

NOTE: Ignore sludge that originates from point-sources; score on natural substrates
NUMBER OF SUBSTRATE TYPES: ☐-5 or More [2] ☒-4 or Less [0]

SUBSTRATE ORIGIN Check ONE (or 2 & AVERAGE)
☐-LIMESTONE [1]
☒-TILLS [1]
☐-WETLANDS [1]
☐-LACUSTUARINE [1]
☐-SANDSTONE [1]
☐-RIP/RAP [1]
☐-HARDPAN [0]
☐-SHALE [-1]
☐-COAL/ORE [-2]

SILT/SILT ORIGIN
SILT QUALITY Check ONE (or 2 & AVERAGE)
☒-SILT HEAVY [-2]
☐-SILT MODERATE [-1]
☐-SILT NORMAL [0]
☐-SILT FREE [1]
SILT ORIGIN
☒-CLAY [-2]
☐-INDUSTRIAL [-1]
☐-ORGANIC [1]
☐-NONE [1]

Substrate: 1 Max 20

COMMENTS: ____

2] COVER TYPES

TYPE: (Check All That Apply)
☐-OFF-SHORE SAND BARS [4]
☐-OVERHANGING VEGETATION [1]
☐-SHALLOWS (ON BEACH) [1]
☐-ROOTMATS [1]
☒-DEEPWATER > 1 M [1]
☐-ROOTWADS [1]
☐-BOULDERS [1]
☐-SAND BEACH [1]
☐-WETLAND POOLS [1]
☐-SUBMERGED AQUATIC VEG. [4]
☐-LOGS OR WOODY DEBRIS [1]
☐-GRAVEL BEACH [1]

AMOUNT: (Check *ONLY* One or check2 and AVERAGE)
☐-EXTENSIVE > 75% [9]
☐-MODERATE 25-75% [7]
☐-SPARSE 5-25% [3]
☒-NEARLY ABSENT < 5% [1]

Cover: 3 Max 20

COMMENTS: ____

3] SHORELINE MORPHOLOGY (Check *ONLY* one PER category or check 2 and *AVERAGE*)

SHORE SINUOSITY
☐-HIGH [2]
☐-MODERATE [4]
☒-LOW [3]
☐-NONE [1]

DEVELOPMENT
☐-EXCELLENT [6]
☐-GOOD [5]
☐-FAIR [3]
☒-POOR [1]

MODIFICATION
☐-NONE [7]
☐-RECOVERED [5]
☐-RECOVERING [3]
☒-RECENT OR NO RECOVERY [1]

STABILITY
☒-HIGH [3]
☐-MODERATE [2]
☐-LOW [1]

7 9.5

SHORE to BOTTOM SLOPE MORPHOLOGIES
☐-SLOPE < 15 deg. [0] ☐-SLOPE > 45 deg. [2]
☐-SLOPE < 25 deg. [1] ☒-SLOPE 90 deg. [0]
☒-SLOPE > 25 deg. [3]

AVERAGE DEPTH (of 5 measures)
☐-<50 cm [0] ☐->400 – 500 cm [4]
☐-50 - <100 cm [1] ☐->500 - 900 cm [2]
☐-≥100 - 200 cm [2] ☒->900 cm [1]
☐->200-400 cm [3]

MODIFICATIONS OF SAMPLED SHORELINE
☐-CEMENTED [-1] ☒-STEEL BULKHEADS [-2]
☐-RIP RAPPED [1] ☐-ISLANDS [1]
☐-RAILROAD TIES [-1] ☐-DIKES [-1]
☒-DREDGED [-1] ☐-BANK SHAPING [-1]
☒-TWO SIDE CHANNEL MODIFICATIONS [-1] ☒-WOOD PILINGS [1]
☒-SHIP CHANNEL [-2]

Shore Line: ____ Max 20

COMMENTS: ____

★ Shore Right Looking East or South on Lake ★
★ Shore Right Looking Toward Lake in Lacustuary ★

4] RIPARIAN ZONE AND BANK EROSION (Check *ONE* box PER bank or 2 and *AVERAGE*)

RIPARIAN WIDTH L R (Per Bank)
☐☐-WIDE > 50 m [4]
☐☐-MODERATE 10-50 m [3]
☐☐-NARROW 5-10 m [2]
☐☐-VERY NARROW < 5 m [1]
☒☒-NONE [0]

SHORE LINE QUALITY (PAST 100 FOOT RIPARIAN) L R (Most Predominant Per Bank)
☐☐-FOREST, WETLAND, LAKE [3]
☐☐-SHRUB OR OLD FIELD [2]
☐☐-VINEYARD, ORCHARD [2]
☐☐-FENCED PASTURE [1]
☐☐-RESIDENTIAL, PARK, NEW FIELD [1]
☐☐-CONSERVATION TILLIAGE [1]
☒☒-URBAN OR INDUSTRIAL [0]
☐☐-OPEN PASUTRE, ROWCROP [0]
☐☐-MINING/CONSTRUCTION [0]
☐☐-DIKED WETLAND [0]

BANK EROSION L R (Per Bank)
☒☒-NONE/LITTLE [3]
☐☐-MODERATE [-1]
☐☐-HEAVY/SEVERE [-3]

Riparian: 3 Max 10

COMMENTS: ____

5] AQUATIC VEGETATION QUALITY: PLANT SPECIES OBSERVED (Sum All Scores)
(Score all for observed abundance: ABUNDANT = [3], COMMON = [5], FEW = [1], UNCOMMON = [0])
X NO AQUATIC VEGETATION = 0

0 -Pond Lilies (NYMPHAEA) 0 -Sedge (CYPERACEAE) 0 -Wild Celery (VALLISNERIA)
0 -Pond Weed (POTAMOGETON) 0 -Bulrush (SCIRPUS) 0 -Waterweed (ELODEA) 0 -Wild Rice (ZIZANIA)

(Score all for observed abundance: ABUNDANT = [-2], COMMON = [-1], FEW = [0])
0 -Purple Loosestrife 0 -Reed Grass 0 -Eurasian Milfoil 0 -Cattails ____ -Algae (mats) ____ -Algae (planktonic)

Vegetation: 0 Max 30

COMMENTS: ____

Is the Sampling Reach Representative of Area Habitat? (Y/N) X if Not, Explain: _____

Depth measures: | | | | | |

Zebra Mussel/Quagga Mussel Coverage ☐ ->60% ☐ -60->25% ☐ -25->10% ☐ -<10->1% ☐ -1-0%

	Gear	Distance	Water Clarity	Wave Height
First Sampling Pass:				
Second Sampling Pass:				
Third Sampling Pass:				

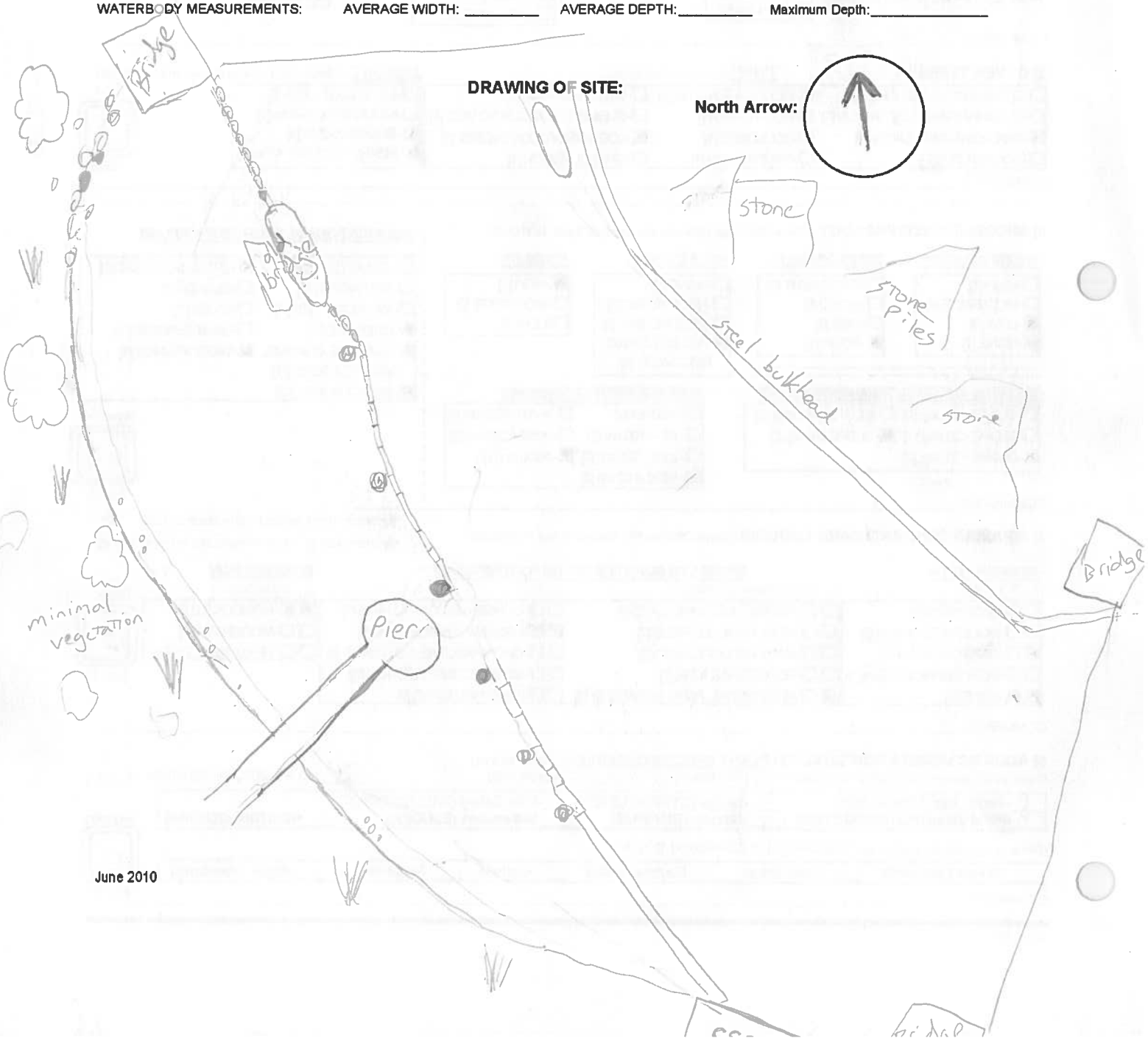
Subjective Rating (1-10) ☐ Aesthetic Rating (1-10) ☐

Photos: _____

WATERBODY MEASUREMENTS: AVERAGE WIDTH: _____ AVERAGE DEPTH: _____ Maximum Depth: _____

DRAWING OF SITE:

North Arrow:



Lake / Lacustuary (Lentic) QHEI Field Sheet

Ohio Environmental Protection Agency

QHEI Score: 9

RIVERCODE _____ RIVERMILE 0.20 WATERBODY Cuyahoga River DISTANCE ASSESSED (m): 50
DATE 9/19/14 LOCATION Near River Mouth
SCORER Hatten / Meany / Amidon LAT. 41.5008 LONG. -81.7098 COMMENT _____

1] SUBSTRATE (Check *ONLY* Two Substrate TYPE BOXES; Estimate % or note every type present); LAKE: ____ LACUSTUARY: X

TYPE	SHORE	BOTTOM		SHORE	BOTTOM
☐☐-BLDR/SLABS [7]	X		☐☐-HARDPAN [4]		
☐☐-BOULDER [10]			☐☐-BEDROCK [3]		
☐☐-COBBLE [8]			☐☐-DETRITUS [3]		
☐☐-GRAVEL [7]	X		☐☐-SILT [2]		X
☐☐-SAND [6]			☒☒-MUCK [2]	X	X

NOTE: Ignore sludge that originates from point-sources; score on natural substrates
NUMBER OF SUBSTRATE TYPES: ☐-5 or More [2] ☒-4 or Less [0]

SUBSTRATE ORIGIN Check ONE (or 2 & *AVERAGE*)
☐-LIMESTONE [1] ☒-TILLS [1] ☐-WETLANDS [1] ☐-LACUSTUARINE [1] ☐-SANDSTONE [1] ☐-RIP/RAP [1] ☐-HARDPAN [0] ☐-SHALE [-1] ☐-COAL/ORE [-2]

SUBSTRATE QUALITY Check ONE (or 2 & *AVERAGE*)
SILT: ☒-SILT HEAVY [-2] ☐-SILT MODERATE [-1] ☐-SILT NORMAL [0] ☐-SILT FREE [1]
SILT ORIGIN: ☒-CLAY [-2] ☐-INDUSTRIAL [-1] ☐-ORGANIC [1] ☐-NONE [1]

Substrate: 1 Max 20

COMMENTS: _____

2] COVER TYPES

TYPE: (Check All That Apply)		
☐-OFF-SHORE SAND BARS [4]	☒-DEEPWATER > 1 M [1]	☐-WETLAND POOLS [1]
☐-OVERHANGING VEGETATION [1]	☐-ROOTWADS [1]	☐-SUBMERGED AQUATIC VEG. [4]
☐-SHALLOWS (ON BEACH) [1]	☒-BOULDERS [1]	☒-LOGS OR WOODY DEBRIS [1]
☐-ROOTMATS [1]	☐-SAND BEACH [1]	☐-GRAVEL BEACH [1]

AMOUNT: (Check *ONLY* One or check2 and AVERAGE)
☐-EXTENSIVE > 75% [9] ☐-MODERATE 25-75% [7] ☐-SPARSE 5-25% [3] ☒-NEARLY ABSENT < 5% [1]

Cover: 4 Max 20

COMMENTS: _____

3] SHORELINE MORPHOLOGY (Check *ONLY* one PER category or check 2 and *AVERAGE*)

SHORE SINUOSITY
☐-HIGH [2] ☐-MODERATE [4] ☐-LOW [3] ☒-NONE [1]

DEVELOPMENT
☐-EXCELLENT [6] ☐-GOOD [5] ☐-FAIR [3] ☒-POOR [1]

MODIFICATION
☐-NONE [7] ☐-RECOVERED [5] ☐-RECOVERING [3] ☒-RECENT OR NO RECOVERY [1]

STABILITY
☒-HIGH [3] ☐-MODERATE [2] ☐-LOW [1]

SHORE to BOTTOM SLOPE MORPHOLOGIES
☐-SLOPE < 15 deg. [0] ☐-SLOPE > 45 deg. [2] ☐-SLOPE < 25 deg. [1] ☒-SLOPE 90 deg. [0] ☐-SLOPE > 25 deg. [3]

AVERAGE DEPTH (of 5 measures)
☐-< 50 cm [0] ☐-> 400 – 500 cm [4] ☐-50 - <100 cm [1] ☐-> 500 - 900 cm [2] ☐-≥100 - 200 cm [2] ☒->900 cm [1] ☐->200-400 cm [3]

MODIFICATIONS OF SAMPLED SHORELINE
☐-CEMENTED [-1] ☒-STEEL BULKHEADS [-2] ☐-RIP RAPPED [1] ☐-ISLANDS [1] ☐-RAILROAD TIES [-1] ☐-DIKES [-1] ☒-DREDGED [-1] ☐-BANK SHAPING [-1] ☐-TWO SIDE CHANNEL MODIFICATIONS [-1] ☐-WOOD PILINGS [1] ☐-SHIP CHANNEL [-2]

Shore Line: 1 Max 20

COMMENTS: _____

★ Shore Right Looking East or South on Lake ★
★ Shore Right Looking Toward Lake in Lacustuary ★

4] RIPARIAN ZONE AND BANK EROSION (Check *ONE* box PER bank or 2 and *AVERAGE*)

RIPARIAN WIDTH (L / R Per Bank)	SHORE LINE QUALITY (PAST 100 FOOT RIPARIAN) (L R Most Predominant Per Bank)		BANK EROSION (L R Per Bank)
☐☐-WIDE > 50 m [4]	☐☐-FOREST, WETLAND, LAKE [3]	☐☐-CONSERVATION TILLIAGE [1]	☒☒-NONE/LITTLE [3]
☐☐-MODERATE 10-50 m [3]	☐☐-SHRUB OR OLD FIELD [2]	☒☒-URBAN OR INDUSTRIAL [0]	☐☐-MODERATE [-1]
☐☐-NARROW 5-10 m [2]	☐☐-VINEYARD, ORCHARD [2]	☐☐-OPEN PASUTRE, ROWCROP [0]	☐☐-HEAVY/SEVERE [-3]
☐☐-VERY NARROW < 5 m [1]	☐☐-FENCED PASTURE [1]	☐☐-MINING/CONSTRUCTION [0]	
☒☒-NONE [0]	☐☐-RESIDENTIAL, PARK, NEW FIELD [1]	☐☐-DIKED WETLAND [0]	

Riparian: 3 Max 10

COMMENTS: _____

5] AQUATIC VEGETATION QUALITY: PLANT SPECIES OBSERVED (Sum All Scores)
(Score all for observed abundance: ABUNDANT = [3]; COMMON = [5], FEW = [1]; UNCOMMON = [0])
X NO AQUATIC VEGETATION = 0

____-Pond Lilies (NYMPHAEA) ____-Sedge (CYPERACEAE) ____-Wild Celery (VALLISNERIA)
____-Pond Weed (POTAMOGETON) ____-Bulrush (SCIRPUS) ____-Waterweed (ELODEA) ____-Wild Rice (ZIZANIA)

(Score all for observed abundance: ABUNDANT = [-2]; COMMON = [-1]; FEW = [0])

____-Purple Loosestrife ____-Reed Grass ____-Eurasian Milfoil ____-Cattails ____-Algae (mats) ____-Algae (planktonic)

Vegetation: 0 Max 30

COMMENTS: _____

Is the Sampling Reach Representative of Area Habitat? (Y/N) X If Not, Explain: _____

Depth measures: | | | | | |

Zebra Mussel/Quagga Mussel Coverage ☐ ->60% ☐ -60->25% ☐ -25->10% ☐ -<10->1% ☐ -1-0%

	Gear	Distance	Water Clarity	Wave Height
First Sampling Pass:				
Second Sampling Pass:				
Third Sampling Pass:				

☐ Subjective Rating (1-10) ☐ Aesthetic Rating (1-10)

Photos: _____

WATERBODY MEASUREMENTS: AVERAGE WIDTH: _____ AVERAGE DEPTH: _____ Maximum Depth: _____

DRAWING OF SITE:

North Arrow: