TETLP OPEN PROJECT
STREAM SUMMARY

OPEN Facility: ☐ 30" ☒ 36" MP: 61.52 ☐ Compressor Station

Observers: J Gravel, M Lychwala, J Boldue Date: 6/7/12

Town: MERD County:

Crossing Name/ID: A12-13-S1 Recent Rain Event (date/amount):

Flow Characteristics

Bank Full Width (average): 20' Flow Conditions: ☒ Flowing ☐ Subsurface ☐ Moist Channel ☐ Dry

Flow Type		Flow Velocity		Comments:
☒ Perennial	☐ Intermittent	☐ Torrential	☒ Mod/Slow	
☐ Interstitial	☐ Ephemeral	☐ Fast	☐ Eddies	

Max Pool Depth: ☒ > 40 cm/15.8 in ☒ < 40 cm/15.8 in Max Pool Depth: 3-4'

Max Run Depth:

Riffle and Pool Width: ☐ Same ☒ Wider Pool ☐ Wider Riffle

Channel and Bank Characteristics

Channel Substrate %:	Origin	Quality	Bank Height
5 BLDR Slab	☒ Limestone	*Silted Stream Channel*	Ave. 10' ft @ ℄ = 3'
0 Boulder	☐ Tills	☐ High	Bank Erosion
15 Bedrock	☐ Wetlands	☐ Moderate	L R
35 Cobble	☐ Hardpan	☒ Normal	☐ ☐ None- Some
45 Gravel	☐ Sandstone	☐ Free	☐ ☐ Moderate
10 Sand	☐ Rip/Rap	*Embeddedness*	☐ ☐ High-Severe
0 Silt Mud	☐ Lacustrine	☐ Extensive	
0 Clay Hardpan	☐ Shale	☐ Moderate	
0 Peat-Muck	☐ Coal Fines	☐ Normal	
0 Artificial		☒ None	
		Embedded Riffle/Run: N/A	

Bank vary Cliff to gradual

Stream Cover

Instream Cover (presence 0-3 [ranges 0, 1-33%, 33-66%, 66-100%])		Instream Total Cover	Canopy Cover	
1 Undercut Bank	1 Boulders/slabs	☐ Extensive 25-75%	☒ 90-100%	Closed
1 Overhanging Veg.	0 Backwater	☐ High 25-75%	☐ 70-90%	
0 Shallows (slow moving)	0 Aquatic Macrophytes	☒ Mod. 5-25%	☐ 45-70%	
0 Rootmats	1 Logs or Woody Debris	☐ Low <5%	☐ 10-45%	
1 Rootwads			☐ 0-10%	Open

Stream Morphology and Riparian Zone

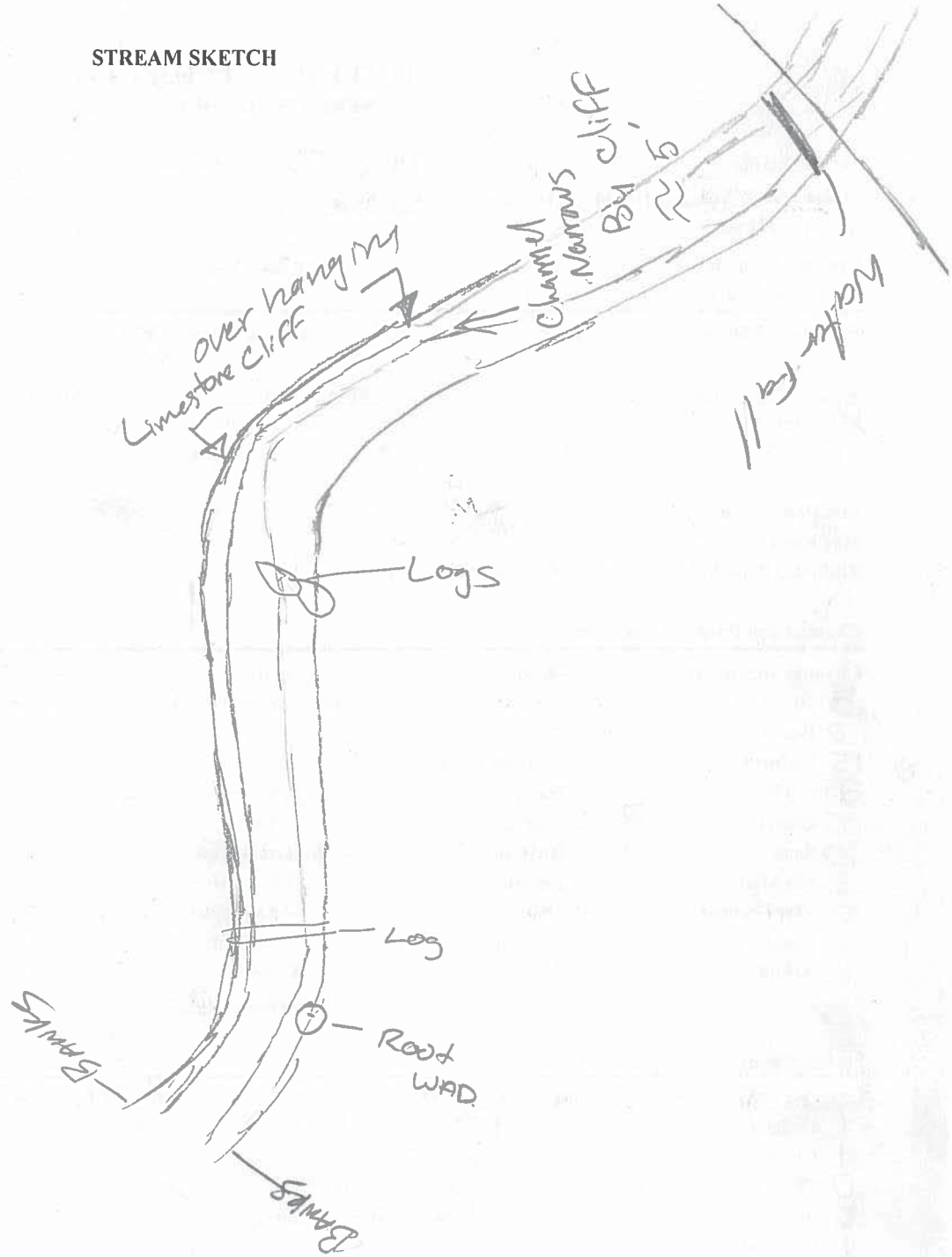
Sinuosity	Gradient (estimate)	Riparian Zone (Right/Left)	Flood Plain Quality
☐ High	☐ Flat (0.5/100 ft)	☐ ☐ Wide >50 m	☒ Forested
☐ Mod	☐ Mod Flat	☒ ☒ Mod 10-50 m	☐ Shrub or old field
☒ Low	☐ Mod (2/100 ft)	☐ ☐ Narrow 5-10 m	☐ Hay field
☐ None	☒ Mod Severe	☐ ☐ Very Narrow <5	☐ Active Pasture
# of Bends 1	☐ Severe (10/100 ft)		☐ Row crops
			☐ Development

Stream Ecology and Associated Wildlife Comments (i.e. marcos, salamanders, fish):

Two lined Salamander found within S2.

In S1 caddis Fly larvae, water pennies. Water fall located NEAR Southern edge.

STREAM SKETCH



TOB
(1-12)
(13-28)

Checklist:

- — **Stream ID#** = A12-13 S1
- — North arrow.
- — Detailed sketch of stream (Riffle, Run, Pool).
- — Natural and man-made features – roads, culverts, outcrops, structures, etc.
- — Photo locations.
- — Location of important wildlife sign.

A12-13-S1 Rock Hollow

Qualitative Habitat Evaluation Index and Use Assessment Field Sheet

QHEI Score: 74

Stream & Location: A12-13-S1 Rock Hollow **RM:** _ _ _._ **Date:** 6/07/12

revisited and extended on 4/22/13 by Jon Gravel, Steve Everette - TRC **Scorers Full Name & Affiliation:** Jon Gravel, Mike Lychwala, Jim Bolduc - TRC

River Code: _ _ _-_ _ _-_ _ _ **STORET #:** _ _ _ _ _ _ **Lat./ Long.:** (NAD 83 - decimal º) 39.9413 /80.8505 **Office verified location** ☐

1] SUBSTRATE

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

BEST TYPES		POOL	RIFFLE
☐	☐ BLDR /SLABS [10]		5
☐	☐ BOULDER [9]		
☐	☑ COBBLE [8]		25
☑	☐ GRAVEL [7]		45
☐	☐ SAND [6]		10
☐	☐ BEDROCK [5]		15

OTHER TYPES		POOL	RIFFLE
☐	☐ HARDPAN [4]		
☐	☐ DETRITUS [3]		
☐	☐ MUCK [2]		
☐	☐ SILT [2]		
☐	☐ ARTIFICIAL [0]		

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

Substrate 19 *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]		POOLS > 70cm [2]		OXBOWS, BACKWATERS [1]
1	OVERHANGING VEGETATION [1]	1	ROOTWADS [1]		AQUATIC MACROPHYTES [1]
	SHALLOWS (IN SLOW WATER) [1]	1	BOULDERS [1]	1	LOGS OR WOODY DEBRIS [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* 8

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

pool is excellent, glide is good, riffle is good, run is good

Channel *Maximum 20* 17

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	
☑	☑	NONE / LITTLE [3]
☐	☐	MODERATE [2]
☑	☑	HEAVY / SEVERE [1]

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

FLOOD PLAIN QUALITY L	FLOOD PLAIN QUALITY R	
☑	☑	FOREST, SWAMP [3]
☐	☐	SHRUB OR OLD FIELD [2]
☐	☐	RESIDENTIAL, PARK, NEW FIELD [1]
☐	☐	FENCED PASTURE [1]
☐	☐	OPEN PASTURE, ROWCROP [0]

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

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

Comments

banks erosion varied, some areas severe others gradual erosion. Existing transmission line ROW near right stream bank

Riparian *Maximum 10* 10

5] POOL / GLIDE AND RIFFLE / RUN QUALITY

MAXIMUM DEPTH	CHANNEL WIDTH	CURRENT VELOCITY	
Check **ONE** (*ONLY!*)	Check ONE (*Or 2 & average*)	Check ALL that apply	
☑ > 1m [6]	☑ POOL WIDTH > RIFFLE WIDTH [2]	☐ TORRENTIAL [-1]	☑ SLOW [1]
☐ 0.7-<1m [4]	☐ POOL WIDTH = RIFFLE WIDTH [1]	☐ VERY FAST [1]	☐ INTERSTITIAL [-1]
☐ 0.4-<0.7m [2]	☐ POOL WIDTH < RIFFLE WIDTH [0]	☐ FAST [1]	☐ INTERMITTENT [-2]
☐ 0.2-<0.4m [1]		☑ MODERATE [1]	☐ EDDIES [1]
☐ < 0.2m [0]		*Indicate for reach - pools and riffles.*	

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

Comments

Pool / Current *Maximum 12* 10

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* 6

6] GRADIENT

(71 ft/mi) **DRAINAGE AREA** (1.16 mi²)

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

%POOL: 15 **%GLIDE:** 5 **%RUN:** 30 **%RIFFLE:** 50

Gradient *Maximum 10* 4

gradient score exceeded "very high" category, defaulted to score of 4.

A] SAMPLED REACH

Check ALL that apply

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

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

62.5 cm
meters

CLARITY

1st --sample pass-- 2nd

- ☐ < 20 cm ☐
- ☐ 20-<40 cm ☐
- ☐ 40-70 cm ☐
- ☑ > 70 cm/ CTB ☐
- ☐ SECCHI DEPTH ☐

1st 121.6 cm
pass
2nd _____ cm

CANOPY

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

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	6.1 m
$\bar{x}$ depth	
max. depth	121.6
$\bar{x}$ bankfull width	
bankfull $\bar{x}$ depth	
W/D ratio	
bankfull max. depth	
floodprone x^2 width	
entrench. ratio	

Legacy Tree:

Stream Drawing:

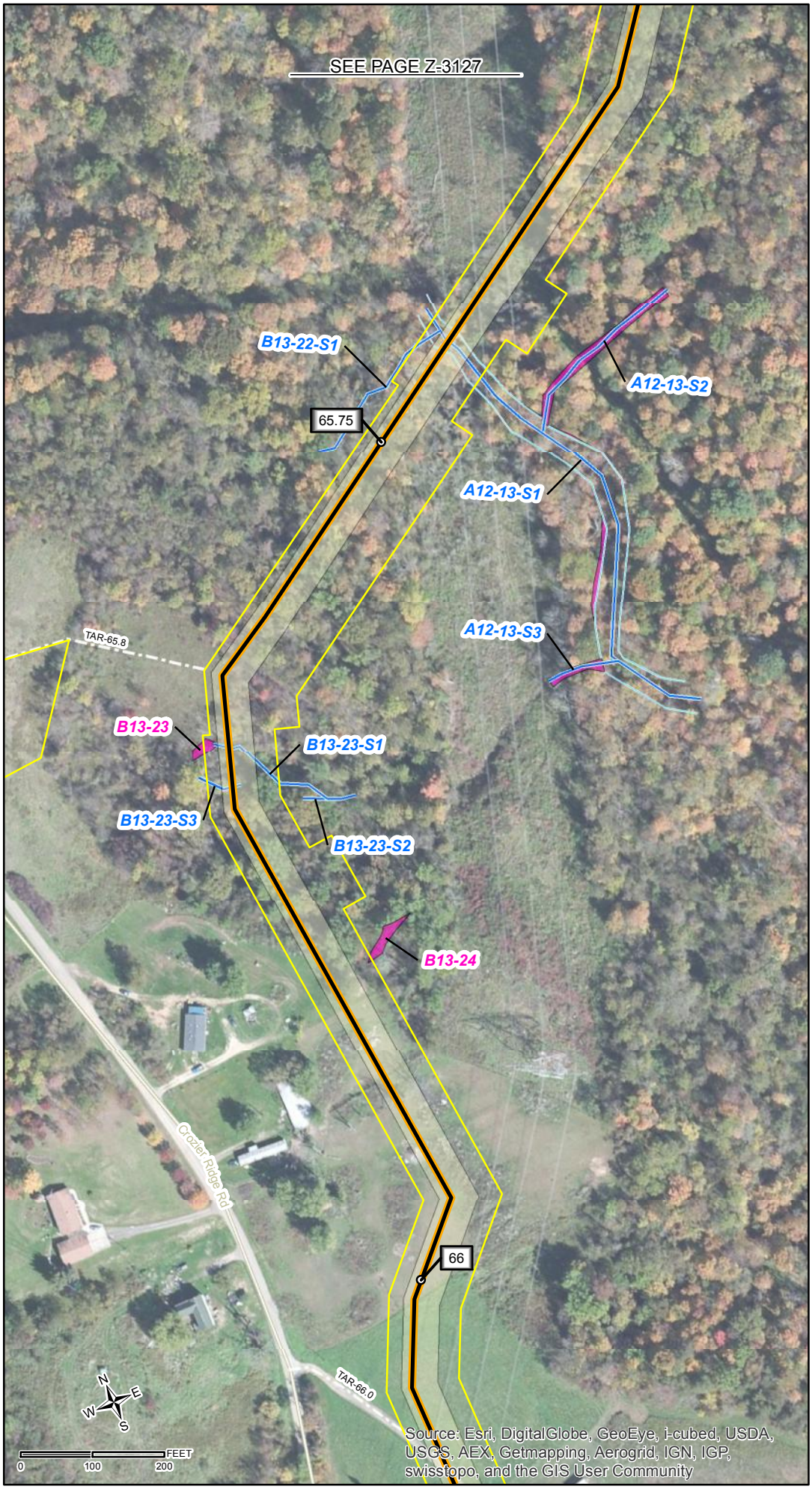
See data form and project mapping for stream characteristics and depictions for waterbody crossing

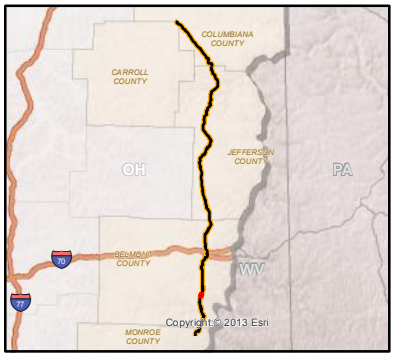
OPEN 30” Mainline Waterbody Photographs
Belmont County, Ohio

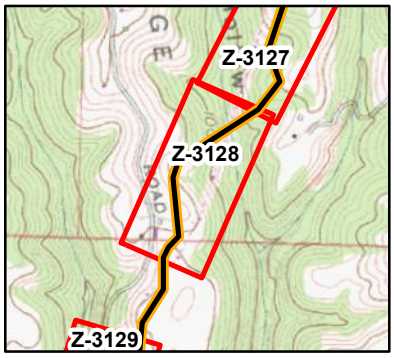
Mead Township MP 65.73
A12-13-S1

Photo 1	**Photo 2**
Photo 3	**Photo 4**
N/A	N/A

Photo 1: Perennial stream 1, looking upstream to the north
Photo 2: Perennial stream 1, looking downstream to the south







LEGEND

- MILE POST
- PROPOSED PIPELINE
- PROPOSED ACCESS ROAD
- DELINEATED STREAM
- DELINEATED WATERBODY EDGE
- EXISTING ROAD CENTERLINE
- DELINEATED WATERBODY
- DELINEATED WETLAND
- PROPOSED PERMANENT EASEMENT
- PROPOSED CONSTRUCTION WORKSPACE
- MUNICIPALITY BOUNDARY

Data Sources: ESRI, Spectra, TRC, Hatch Mott MacDonald

Projection: NAD83, StatePlane
Ohio NorthFIPS 3401
US Survey Feet

Spectra Energy Partners
Texas Eastern Transmission, LP
5400 Westheimer Court, Houston, TX 77056-5310 713/627-5400

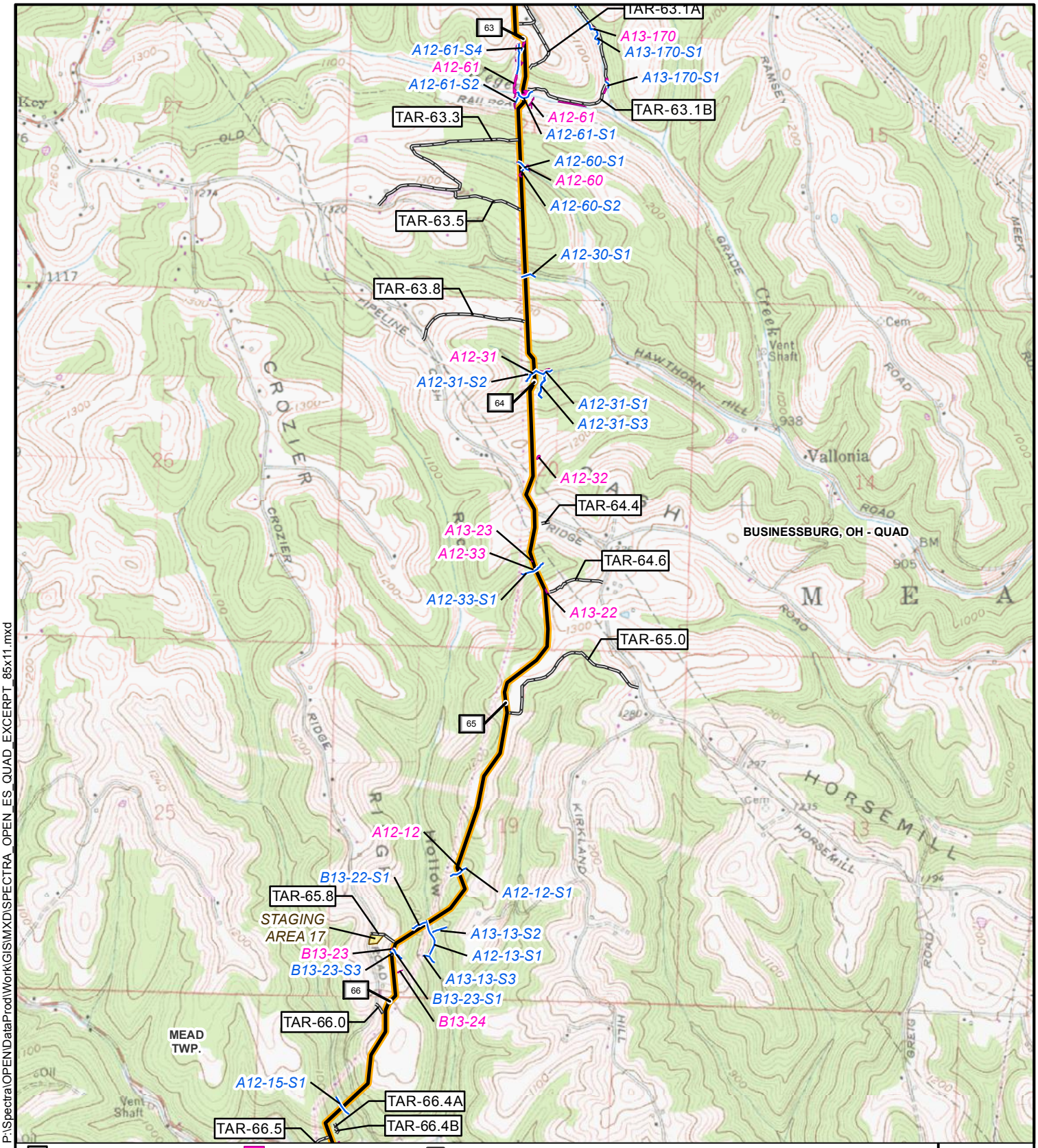
Spectra Natural Gas Pipeline
2015 OPEN Project
Proposed 30in. Line NO. 73

Natural Resource Maps

Map Z-3128

Hatch Mott MacDonald
150 Lower Westfield Rd.
Holyoke, MA 01040
Ph: (413) 536-0155 Fax: (413) 536-0136

Created:
02/19/2014



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1 MILE POST	DELINEATED WETLAND	PROPOSED M&R STATION	PROPOSED COMPRESSOR STATION
PROPOSED PIPELINE	DELINEATED WATERBODY	PROPOSED REGULATOR STATION	MUNICIPALITY BOUNDARY
PROPOSED ACCESS ROAD	PROPOSED STAGING AREA	PROPOSED TAP VALVE	COUNTY BOUNDARY
EXISTING TEXAS EASTERN PIPELINE	PROPOSED MAINLINE VALVE		USGS QUADRANGLE BOUNDARY
DELINEATED STREAM CENTERLINE			

N W E S

TITLE: **OPEN PROJECT**
DELINEATED STREAMS & WETLANDS - USGS QUAD MAP

LOC.: BELMONT COUNTY, OHIO			REV. 0
CKD. BY: HMMHOL	ENG.	DATE: 02/2014	W.O.
DRN. BY: HMMHOL	SCALE: 1" = 2000'	DWG. NO. Z-2020	

I.G.

Spectra Energy Partners

Texas Eastern Transmission, LP
5400 Westheimer Court, Houston, TX 77056-5310 713/627-5400