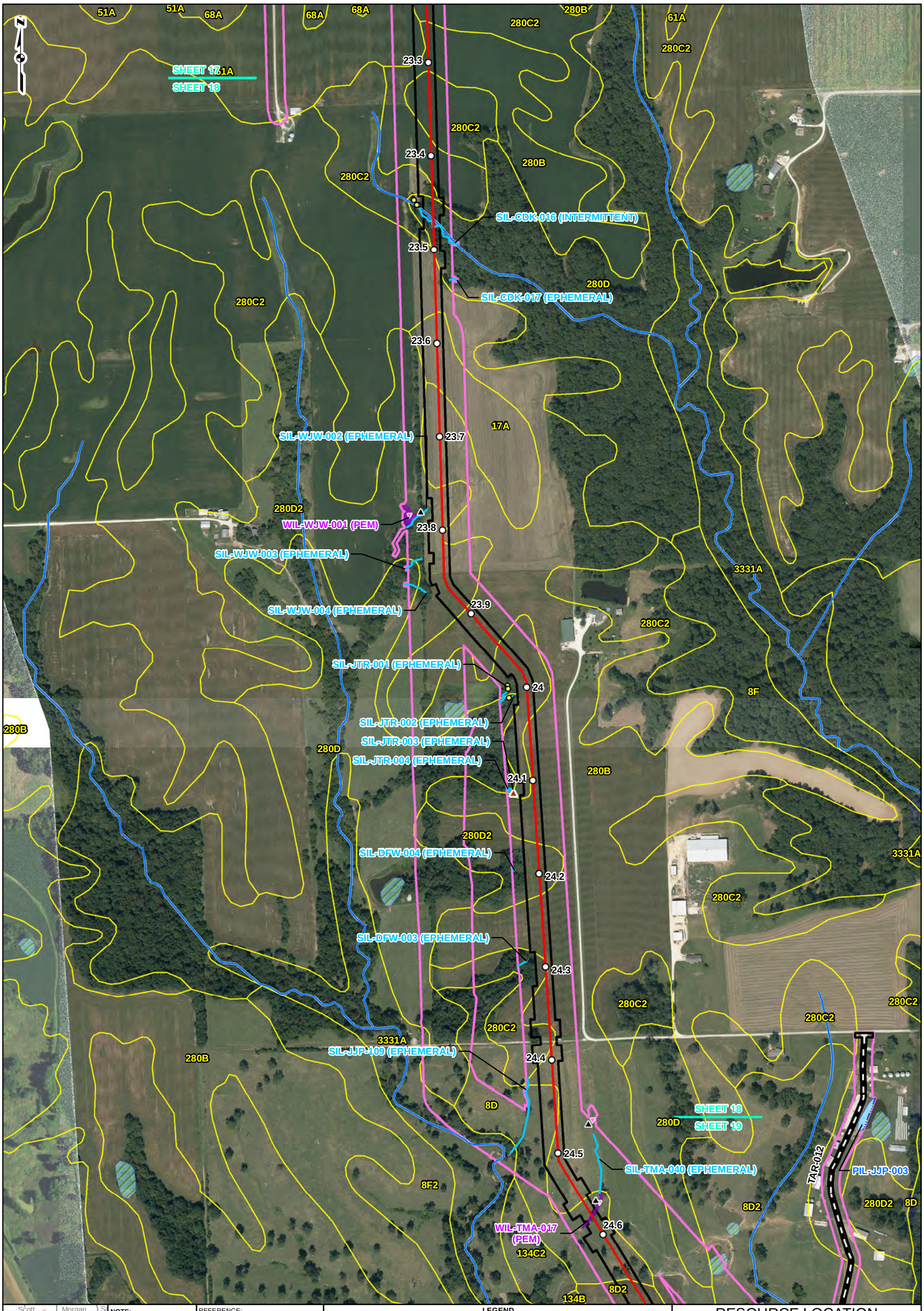

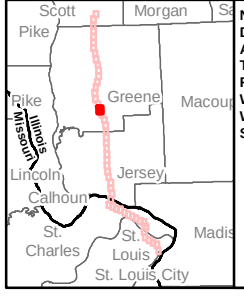

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LEGEND

- FACILITY
- MILEPOST
- CULVERT
- GROUNDWATER SEEP
- UPLAND LOCATION
- WETLAND DATA POINT
- SOIL TEST PIT
- ACCESS ROAD
- 24-INCH PIPELINE
- NORTH COUNTY EXTENSION
- STREAM
- NHD STREAM
- POND OPEN END
- WETLAND OPEN END
- POND
- WETLAND
- NWI WETLAND
- NWI WATERBODY
- 100-YEAR FLOODPLAIN
- SOIL TYPE BOUNDARY
- LIMIT OF DISTURBANCE
- STUDY CORRIDOR
- COUNTY BOUNDARY
- STATE BOUNDARY

0 250 500 1,000 Feet

RESOURCE LOCATION AND SOILS MAP SHEET 18 OF 51

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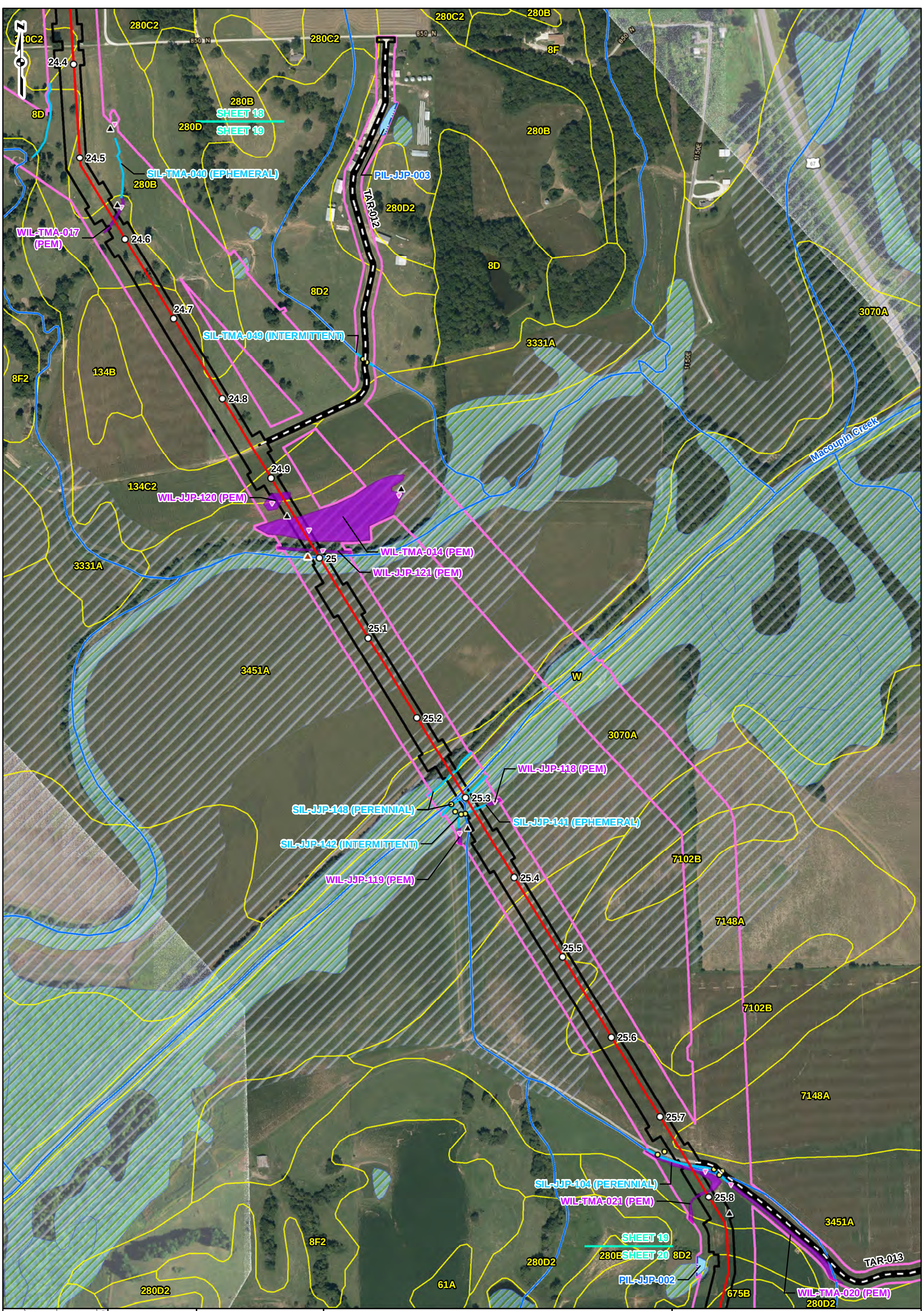

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LEGEND

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- MILEPOST
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- LIMIT OF DISTURBANCE
- STUDY CORRIDOR
- COUNTY BOUNDARY
- STATE BOUNDARY

0 250 500 1,000 Feet

RESOURCE LOCATION AND SOILS MAP SHEET 19 OF 51

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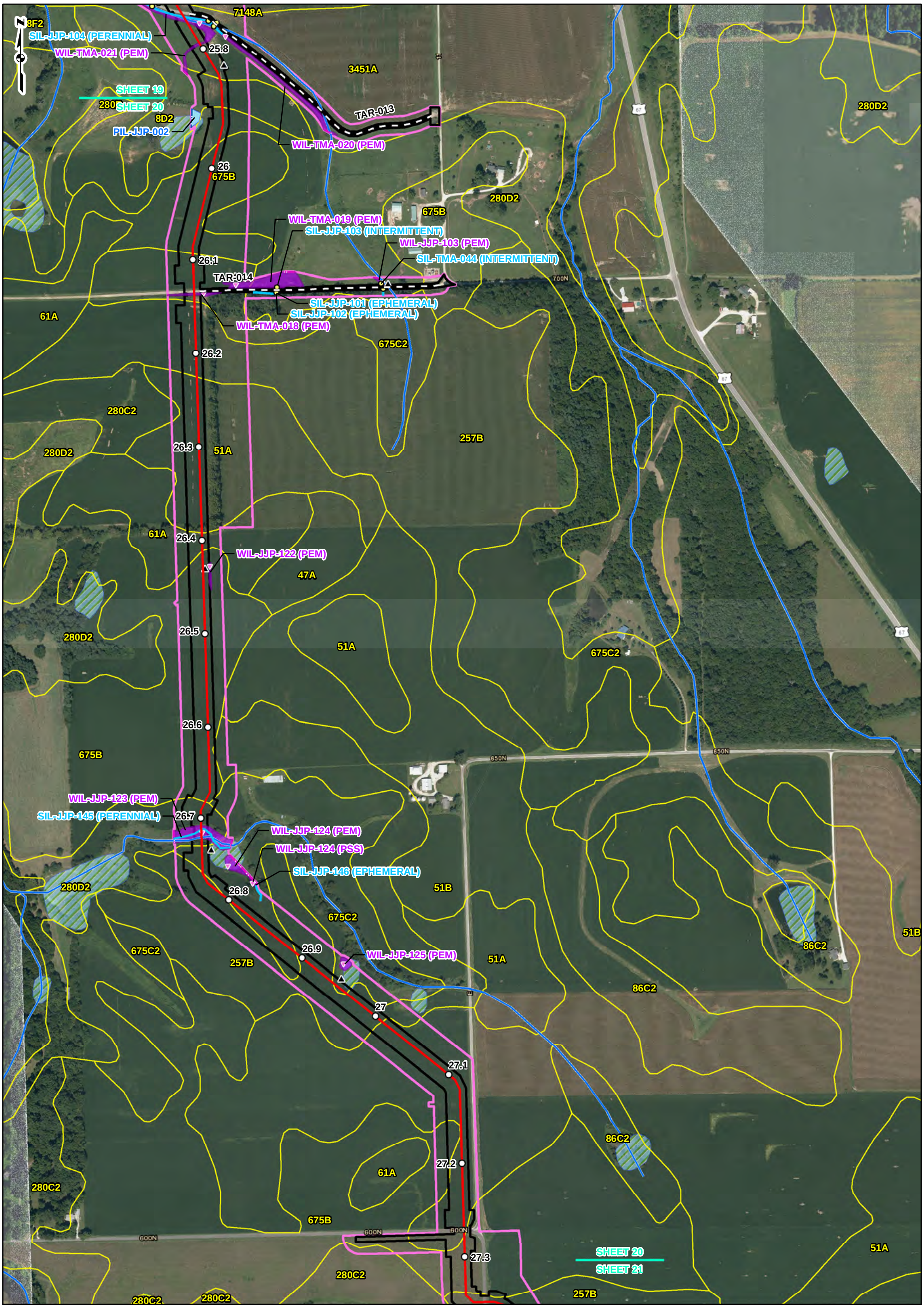

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LEGEND

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- 100-YEAR FLOODPLAIN
- SOIL TYPE BOUNDARY
- LIMIT OF DISTURBANCE
- STUDY CORRIDOR
- COUNTY BOUNDARY
- STATE BOUNDARY

0 250 500 1,000 Feet

RESOURCE LOCATION AND SOILS MAP SHEET 20 OF 51

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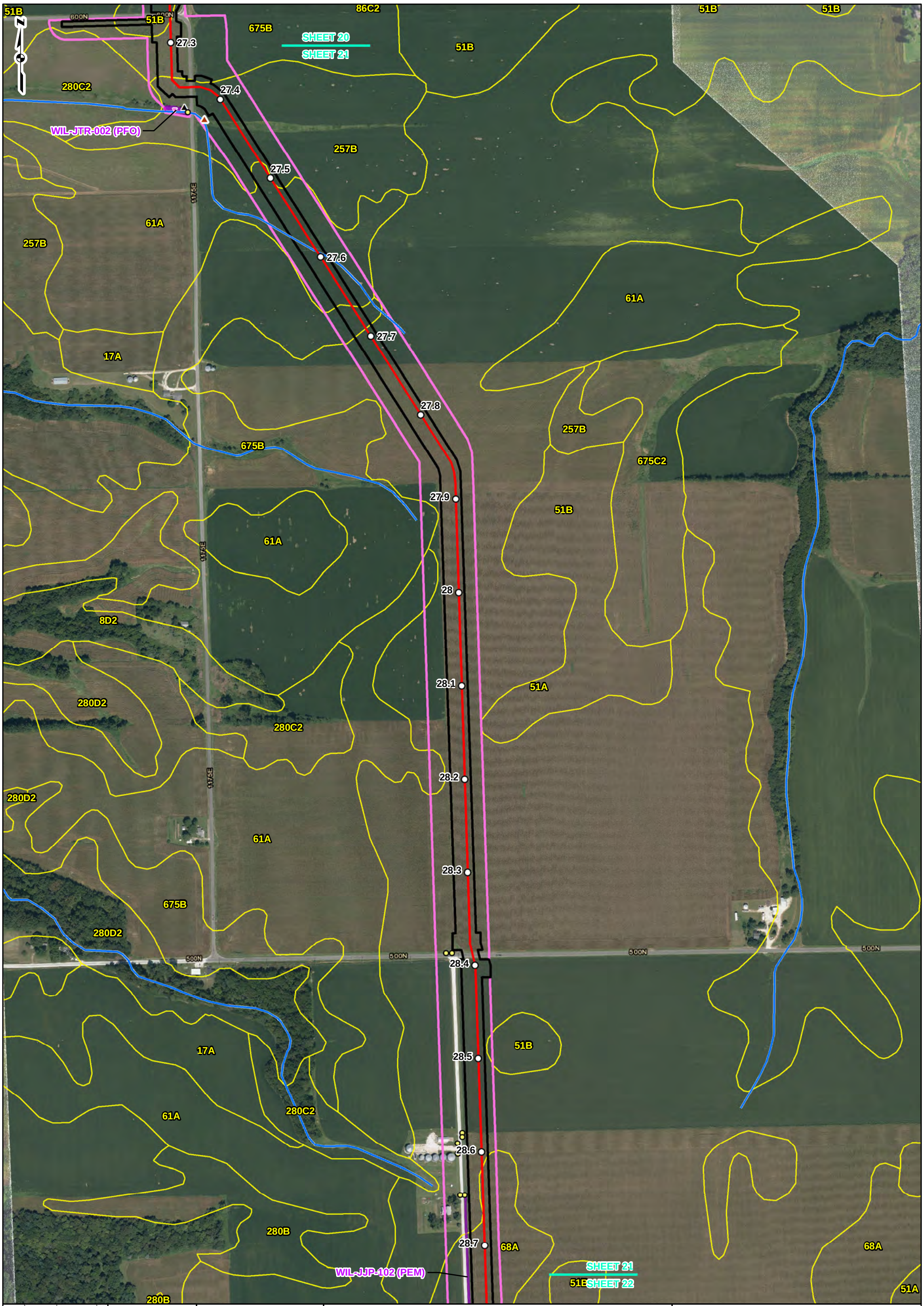

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LEGEND

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- LIMIT OF DISTURBANCE
- STUDY CORRIDOR
- COUNTY BOUNDARY
- STATE BOUNDARY

0 250 500 1,000 Feet

RESOURCE LOCATION AND SOILS MAP SHEET 21 OF 51

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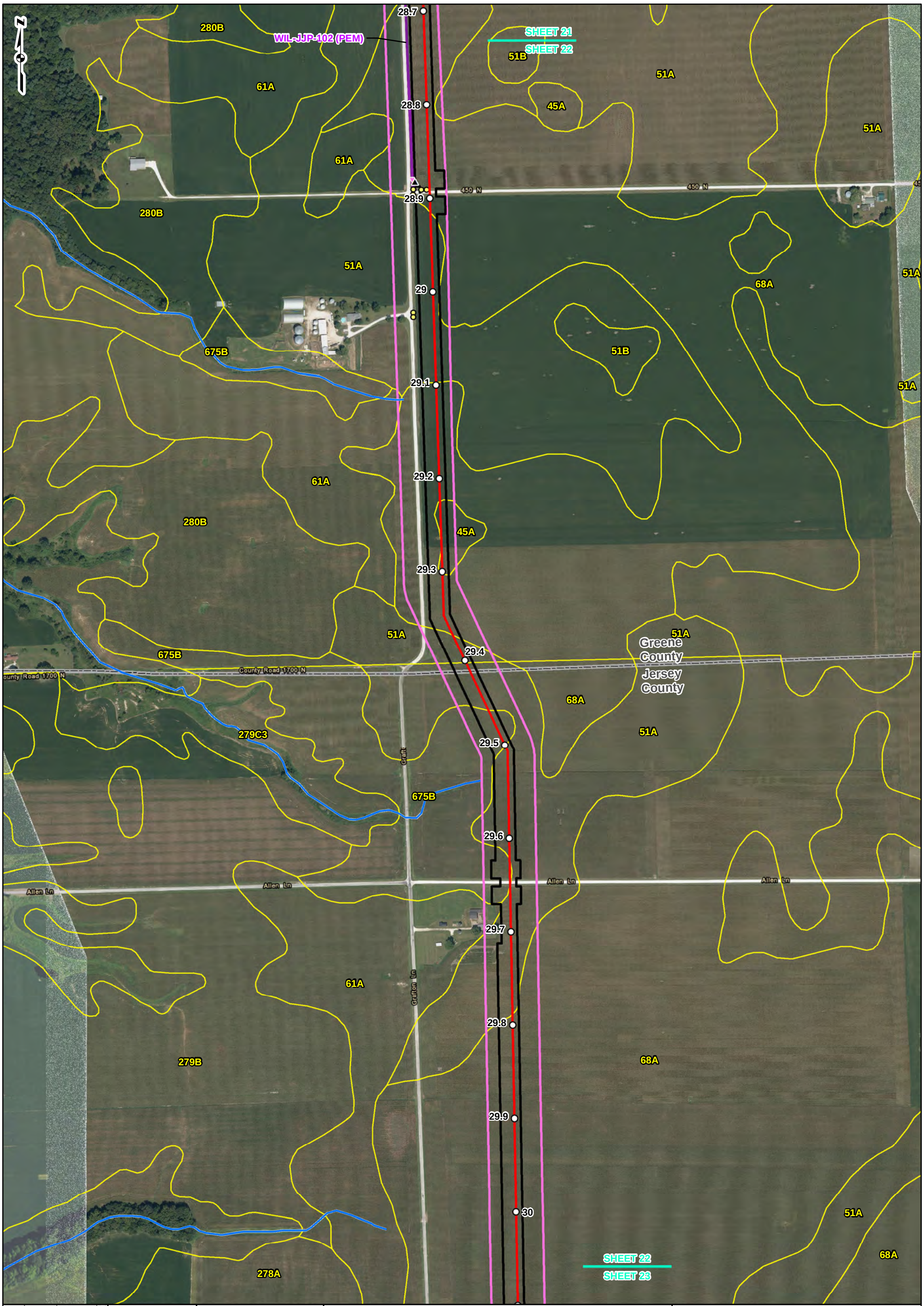

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- UPLAND LOCATION
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- 100-YEAR FLOODPLAIN
- SOIL TYPE BOUNDARY
- LIMIT OF DISTURBANCE
- STUDY CORRIDOR
- COUNTY BOUNDARY
- STATE BOUNDARY

0 250 500 1,000 Feet

RESOURCE LOCATION AND SOILS MAP SHEET 22 OF 51

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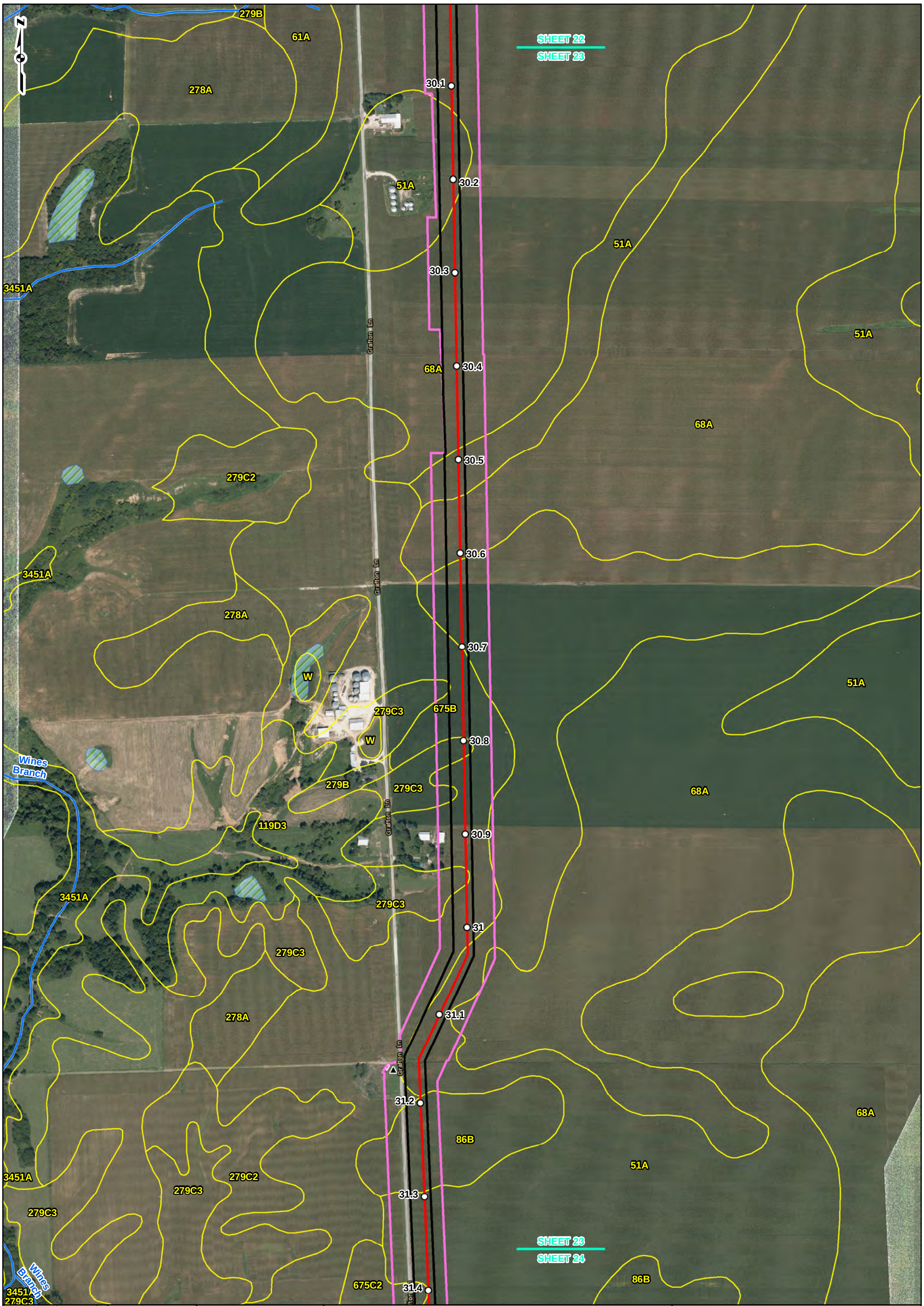

RESOURCE LOCATION AND SOILS MAP SHEET 23 OF 51

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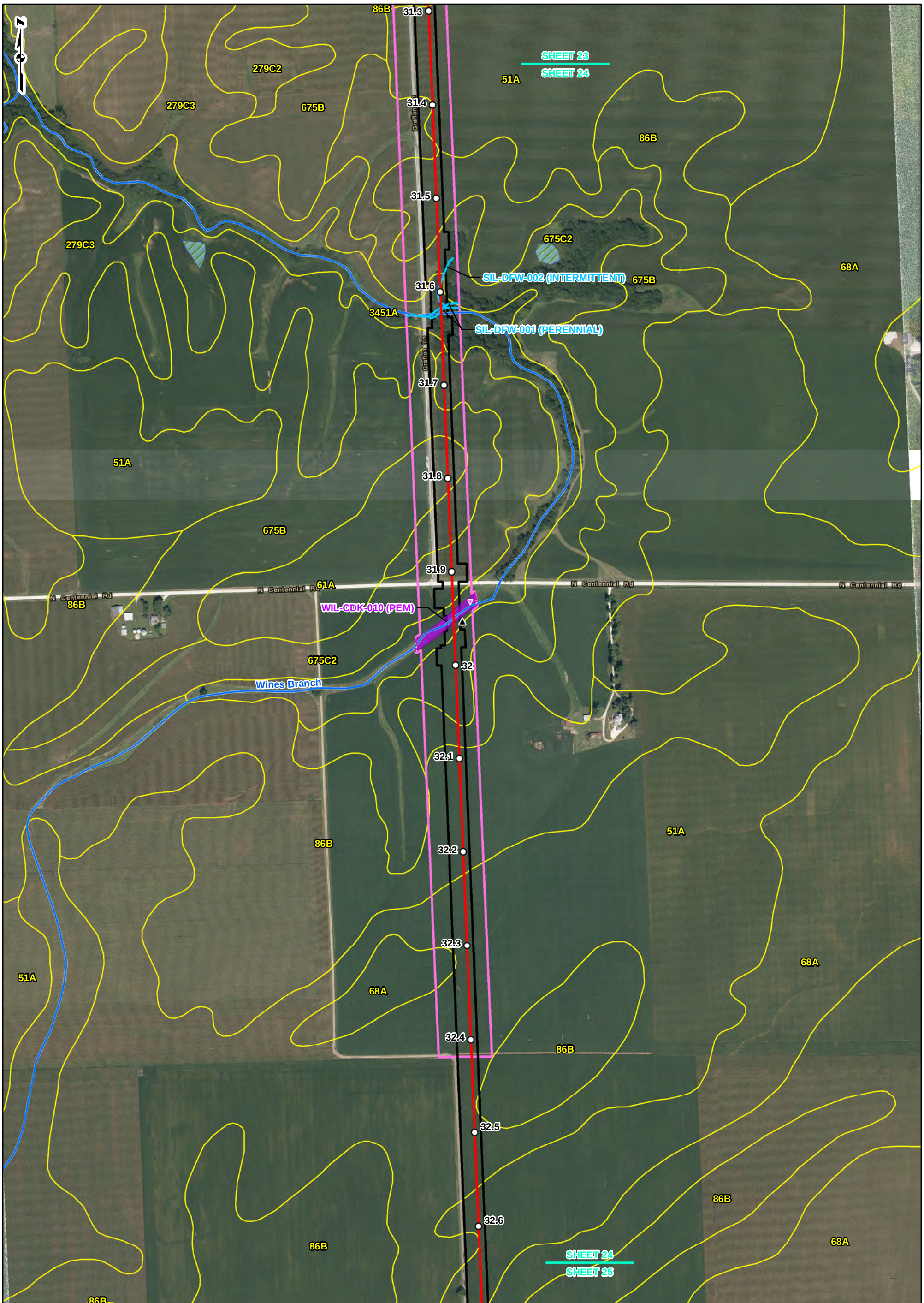

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LEGEND

- FACILITY
- MILEPOST
- CULVERT
- GROUNDWATER SEEP
- UPLAND LOCATION
- WETLAND DATA POINT
- SOIL TEST PIT
- ACCESS ROAD
- 24-INCH PIPELINE
- NORTH COUNTY EXTENSION
- STREAM
- NHD STREAM
- POND OPEN END
- WETLAND OPEN END
- POND
- WETLAND
- NWI WETLAND
- NWI WATERBODY
- 100-YEAR FLOODPLAIN
- SOIL TYPE BOUNDARY
- LIMIT OF DISTURBANCE
- STUDY CORRIDOR
- COUNTY BOUNDARY
- STATE BOUNDARY

0 250 500 1,000 Feet

RESOURCE LOCATION AND SOILS MAP SHEET 24 OF 51

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SPIRE STL PIPELINE PROJECT

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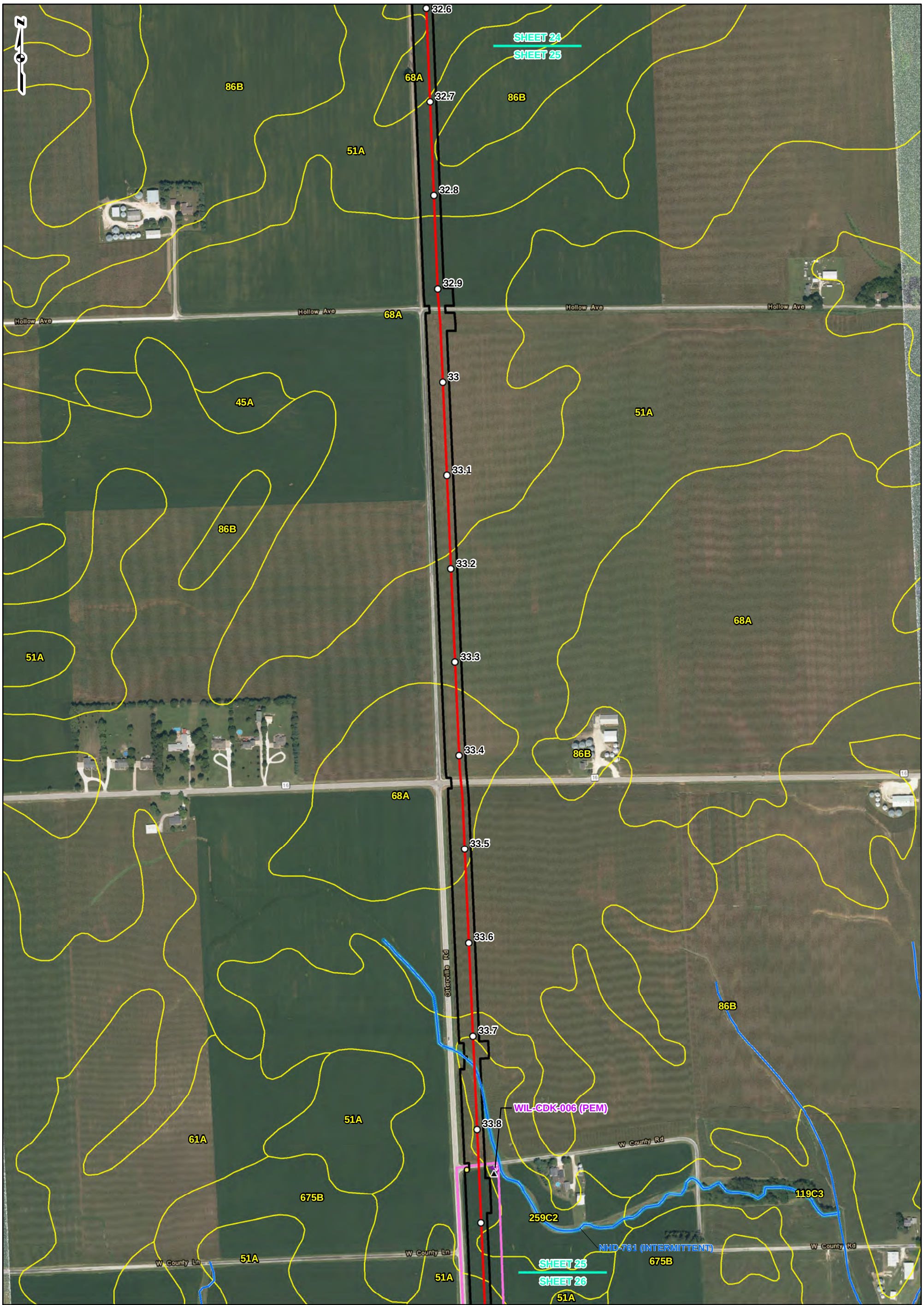

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LEGEND

- FACILITY
- MILEPOST
- CULVERT
- GROUNDWATER SEEP
- UPLAND LOCATION
- WETLAND DATA POINT
- SOIL TEST PIT
- ACCESS ROAD
- 24-INCH PIPELINE
- NORTH COUNTY EXTENSION
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- NHD STREAM
- POND OPEN END
- WETLAND OPEN END
- POND
- WETLAND
- NWI WETLAND
- NWI WATERBODY
- 100-YEAR FLOODPLAIN
- SOIL TYPE BOUNDARY
- LIMIT OF DISTURBANCE
- STUDY CORRIDOR
- COUNTY BOUNDARY
- STATE BOUNDARY

0 250 500 1,000 Feet

RESOURCE LOCATION AND SOILS MAP SHEET 25 OF 51

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SPIRE STL PIPELINE PROJECT

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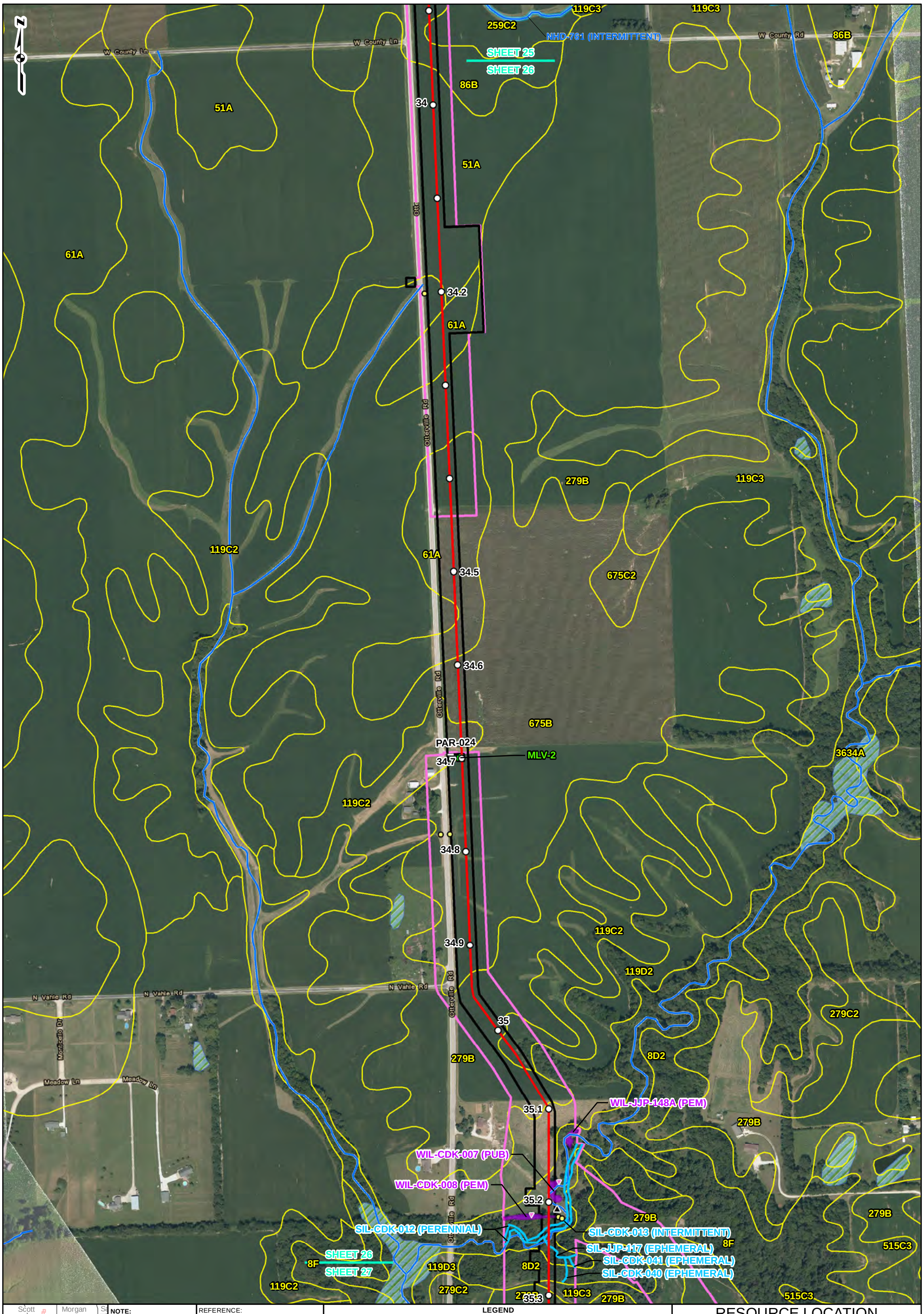

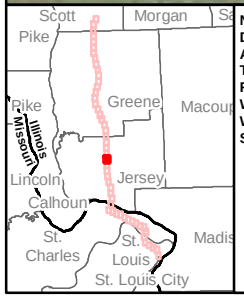

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LEGEND

- FACILITY
- MILEPOST
- CULVERT
- GROUNDWATER SEEP
- UPLAND LOCATION
- WETLAND DATA POINT
- SOIL TEST PIT
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- STREAM
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- POND
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- NWI WATERBODY
- 100-YEAR FLOODPLAIN
- SOIL TYPE BOUNDARY
- LIMIT OF DISTURBANCE
- STUDY CORRIDOR
- COUNTY BOUNDARY
- STATE BOUNDARY

0 250 500 1,000 Feet

RESOURCE LOCATION AND SOILS MAP SHEET 26 OF 51

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SPIRE STL PIPELINE PROJECT

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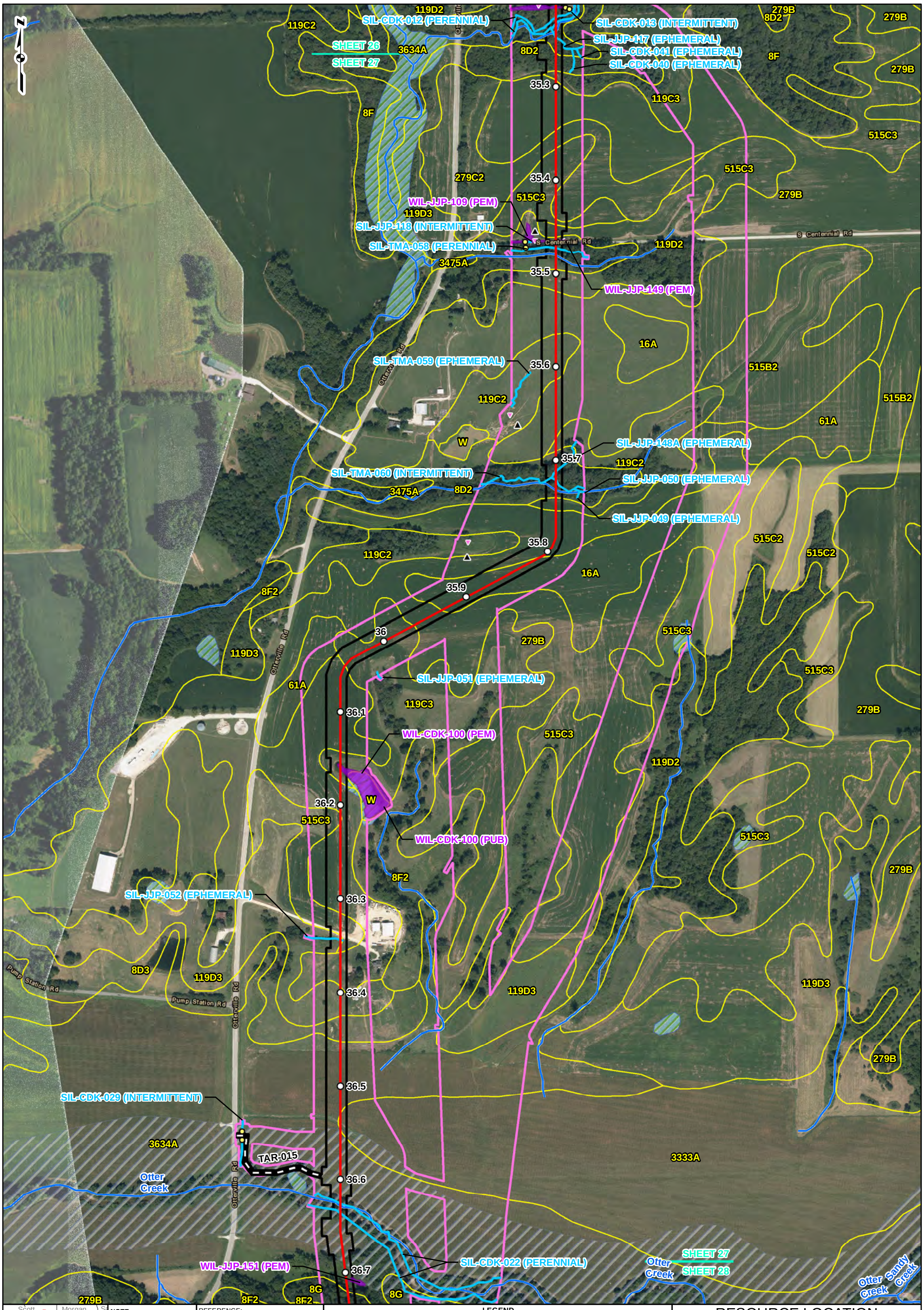

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LEGEND

- FACILITY
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- GROUNDWATER SEEP
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- NWI WATERBODY
- 100-YEAR FLOODPLAIN
- SOIL TYPE BOUNDARY
- LIMIT OF DISTURBANCE
- STUDY CORRIDOR
- COUNTY BOUNDARY
- STATE BOUNDARY

0 250 500 1,000 Feet

RESOURCE LOCATION AND SOILS MAP SHEET 27 OF 51

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SPIRE STL PIPELINE PROJECT

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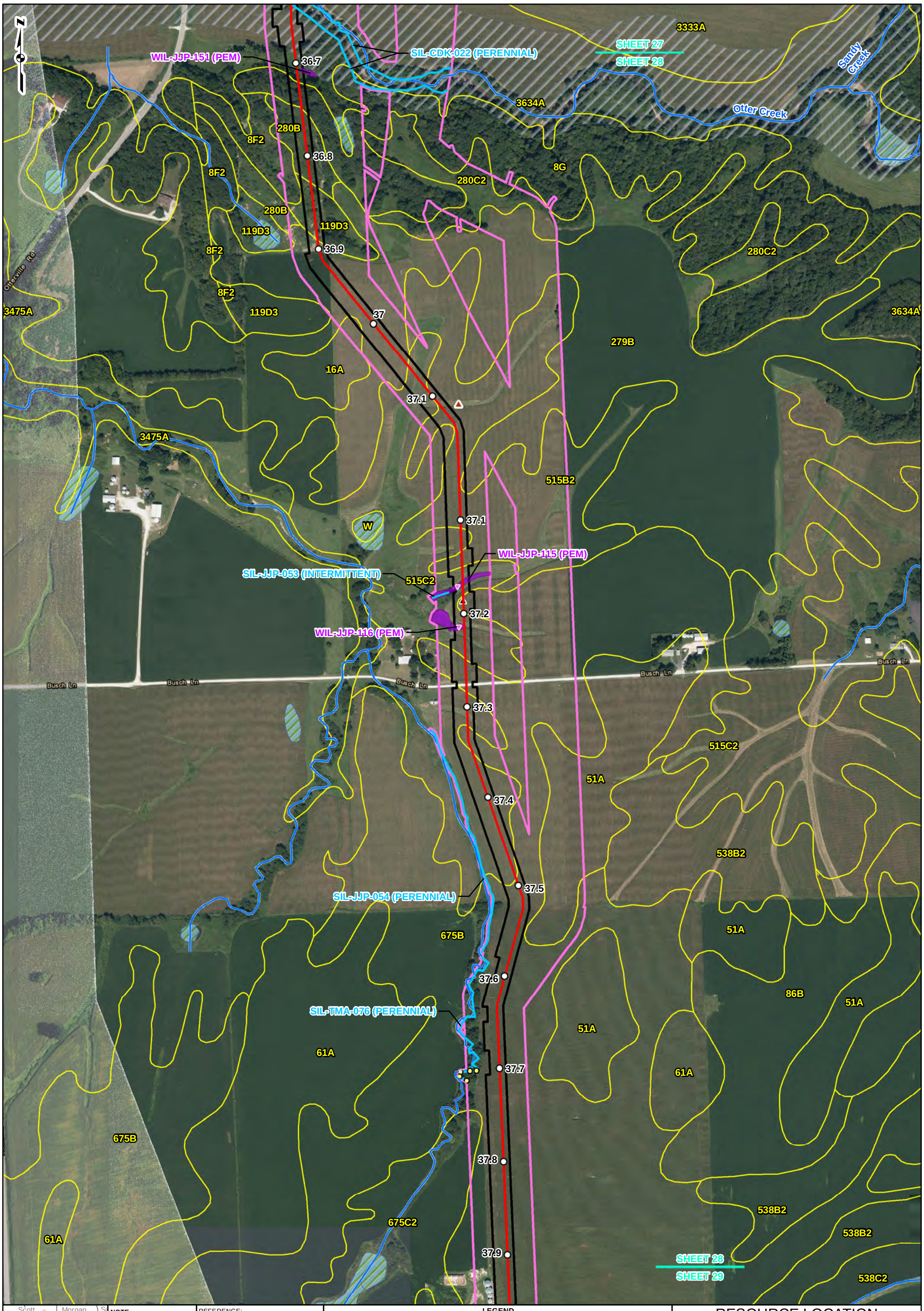

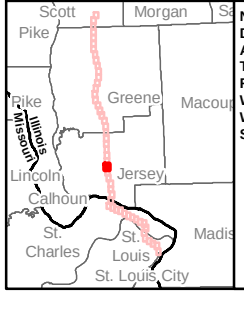

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LEGEND

- FACILITY
- MILEPOST
- CULVERT
- GROUNDWATER SEEP
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- WETLAND DATA POINT
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- 100-YEAR FLOODPLAIN
- SOIL TYPE BOUNDARY
- LIMIT OF DISTURBANCE
- STUDY CORRIDOR
- COUNTY BOUNDARY
- STATE BOUNDARY

0 250 500 1,000 Feet

RESOURCE LOCATION AND SOILS MAP SHEET 28 OF 51

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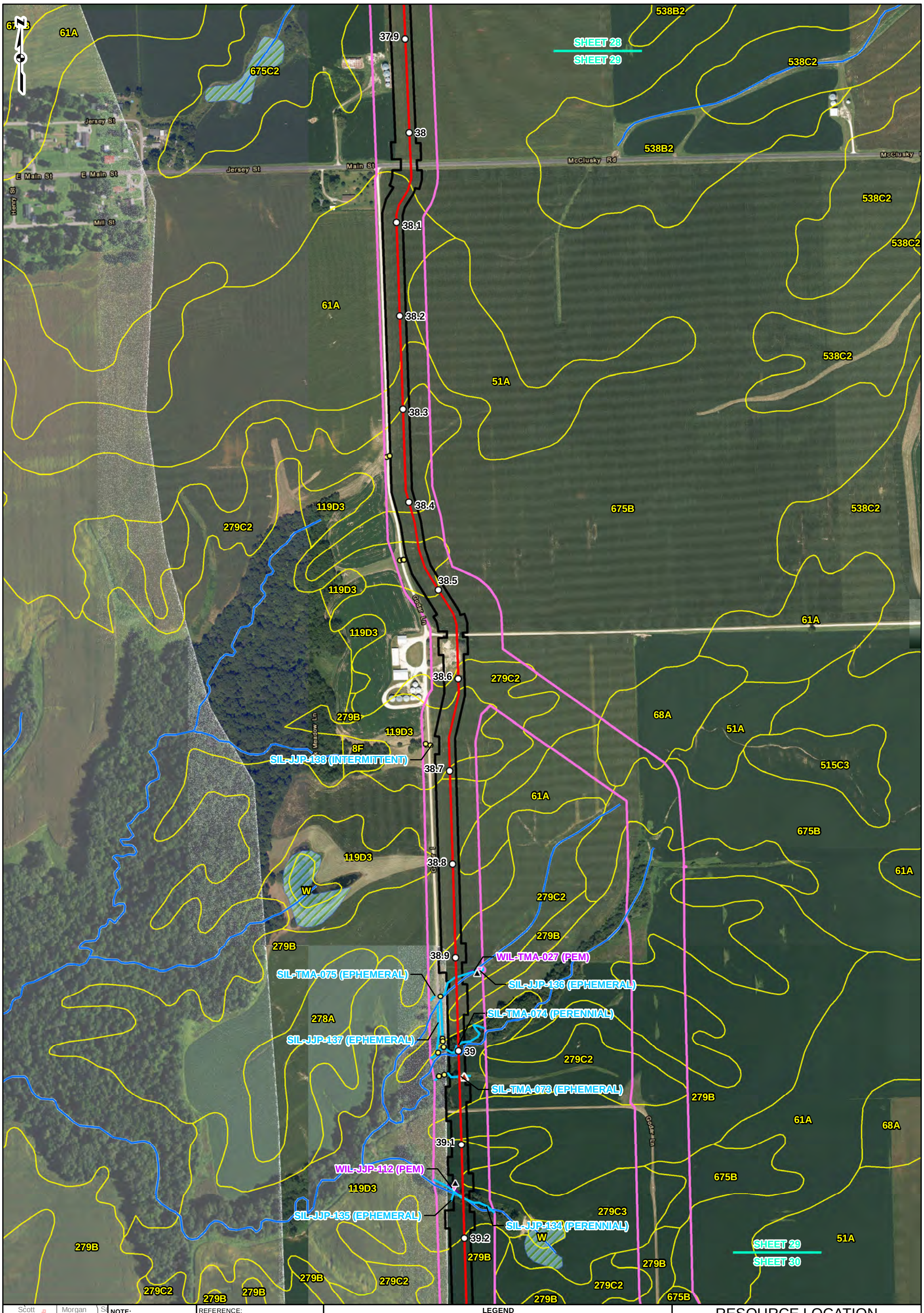

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- STUDY CORRIDOR
- COUNTY BOUNDARY
- STATE BOUNDARY

0 250 500 1,000 Feet

RESOURCE LOCATION AND SOILS MAP SHEET 29 OF 51

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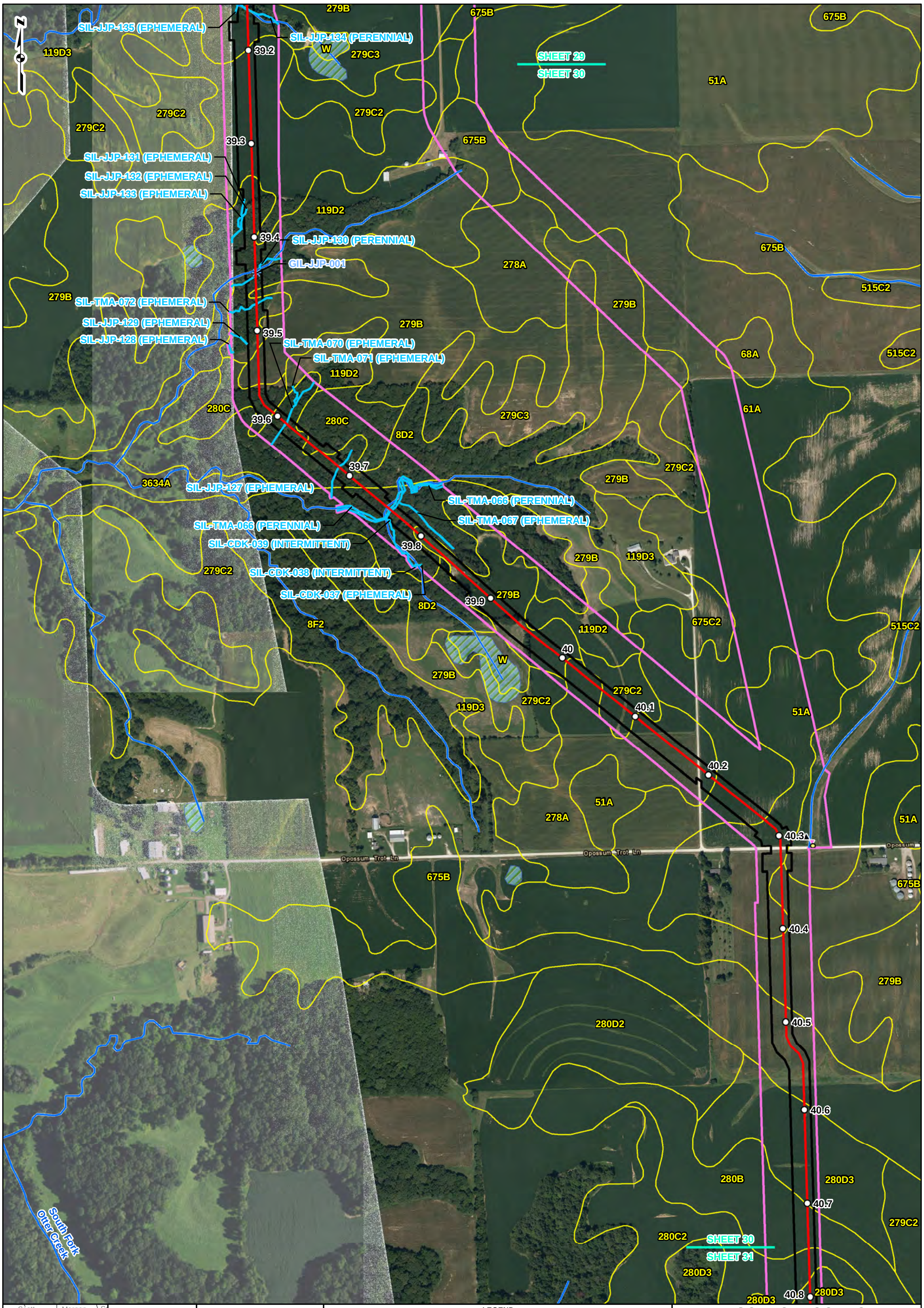

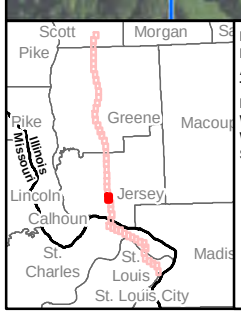

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LEGEND

- FACILITY
- MILEPOST
- CULVERT
- GROUNDWATER SEEP
- UPLAND LOCATION
- WETLAND DATA POINT
- SOIL TEST PIT
- ACCESS ROAD
- 24-INCH PIPELINE
- NORTH COUNTY EXTENSION
- STREAM
- NHD STREAM
- POND OPEN END
- WETLAND OPEN END
- POND
- WETLAND
- NWI WETLAND
- NWI WATERBODY
- 100-YEAR FLOODPLAIN
- SOIL TYPE BOUNDARY
- LIMIT OF DISTURBANCE
- STUDY CORRIDOR
- COUNTY BOUNDARY
- STATE BOUNDARY

0 250 500 1,000 Feet

RESOURCE LOCATION AND SOILS MAP SHEET 30 OF 51

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SPIRE STL PIPELINE PROJECT

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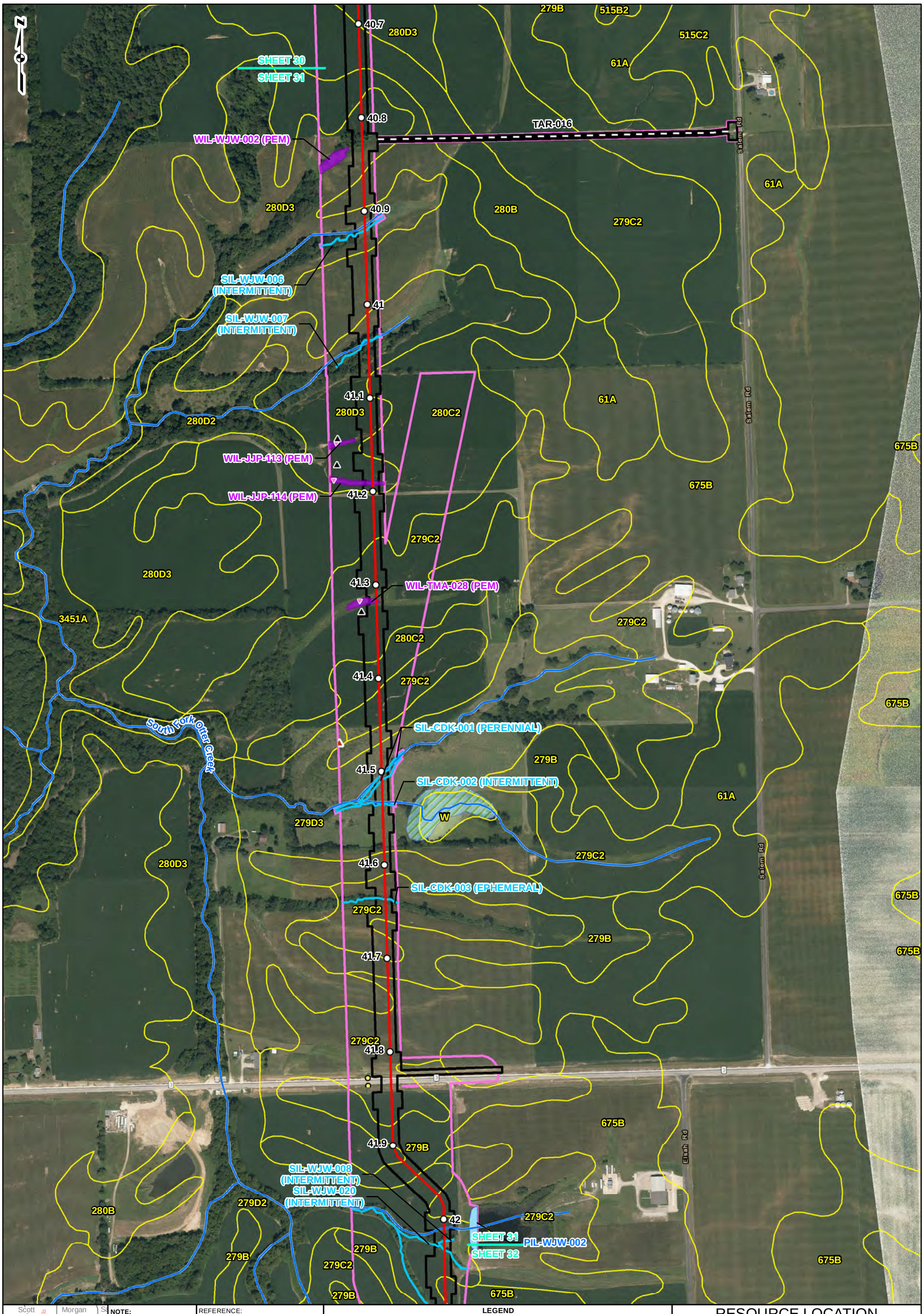

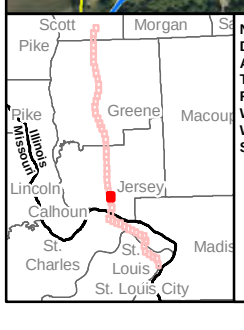

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- STUDY CORRIDOR
- COUNTY BOUNDARY
- STATE BOUNDARY

0 250 500 1,000 Feet

RESOURCE LOCATION AND SOILS MAP SHEET 31 OF 51

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SPIRE STL PIPELINE PROJECT

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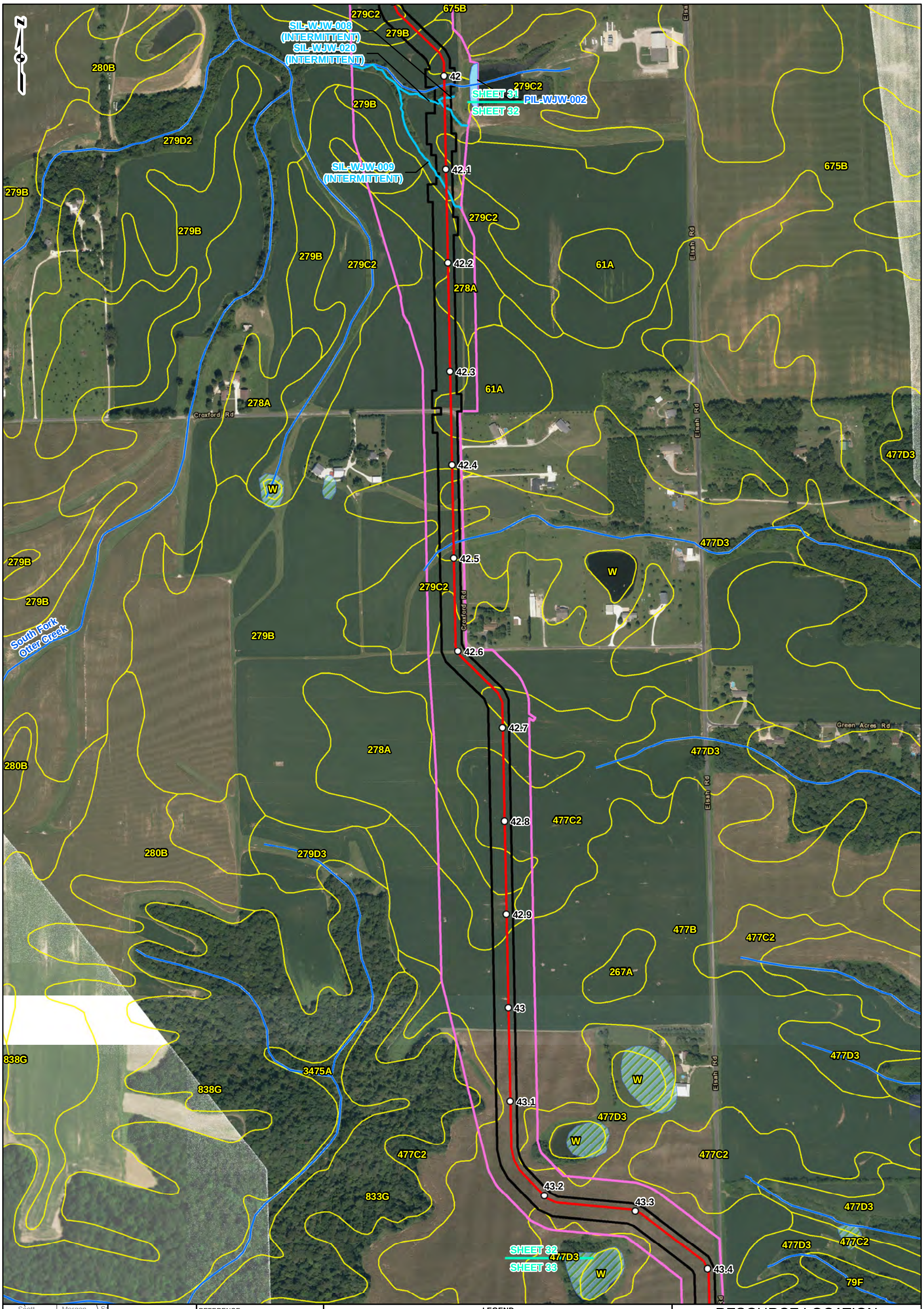

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- NWI WATERBODY
- 100-YEAR FLOODPLAIN
- SOIL TYPE BOUNDARY
- LIMIT OF DISTURBANCE
- STUDY CORRIDOR
- COUNTY BOUNDARY
- STATE BOUNDARY

0 250 500 1,000 Feet

RESOURCE LOCATION AND SOILS MAP SHEET 32 OF 51

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SPIRE STL PIPELINE PROJECT

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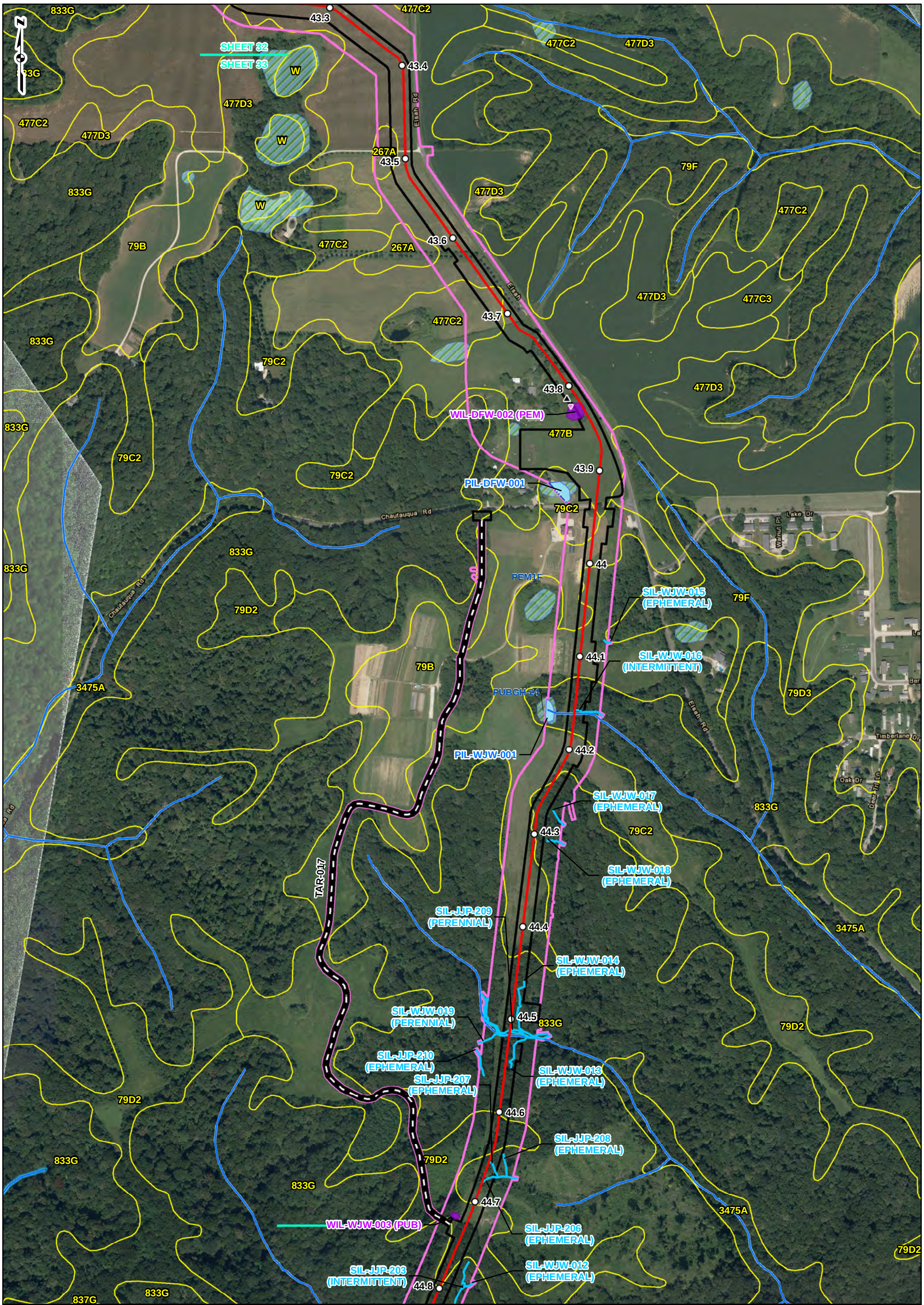

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LEGEND

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- LIMIT OF DISTURBANCE
- STUDY CORRIDOR
- COUNTY BOUNDARY
- STATE BOUNDARY

0 250 500 1,000 Feet

RESOURCE LOCATION AND SOILS MAP SHEET 33 OF 51

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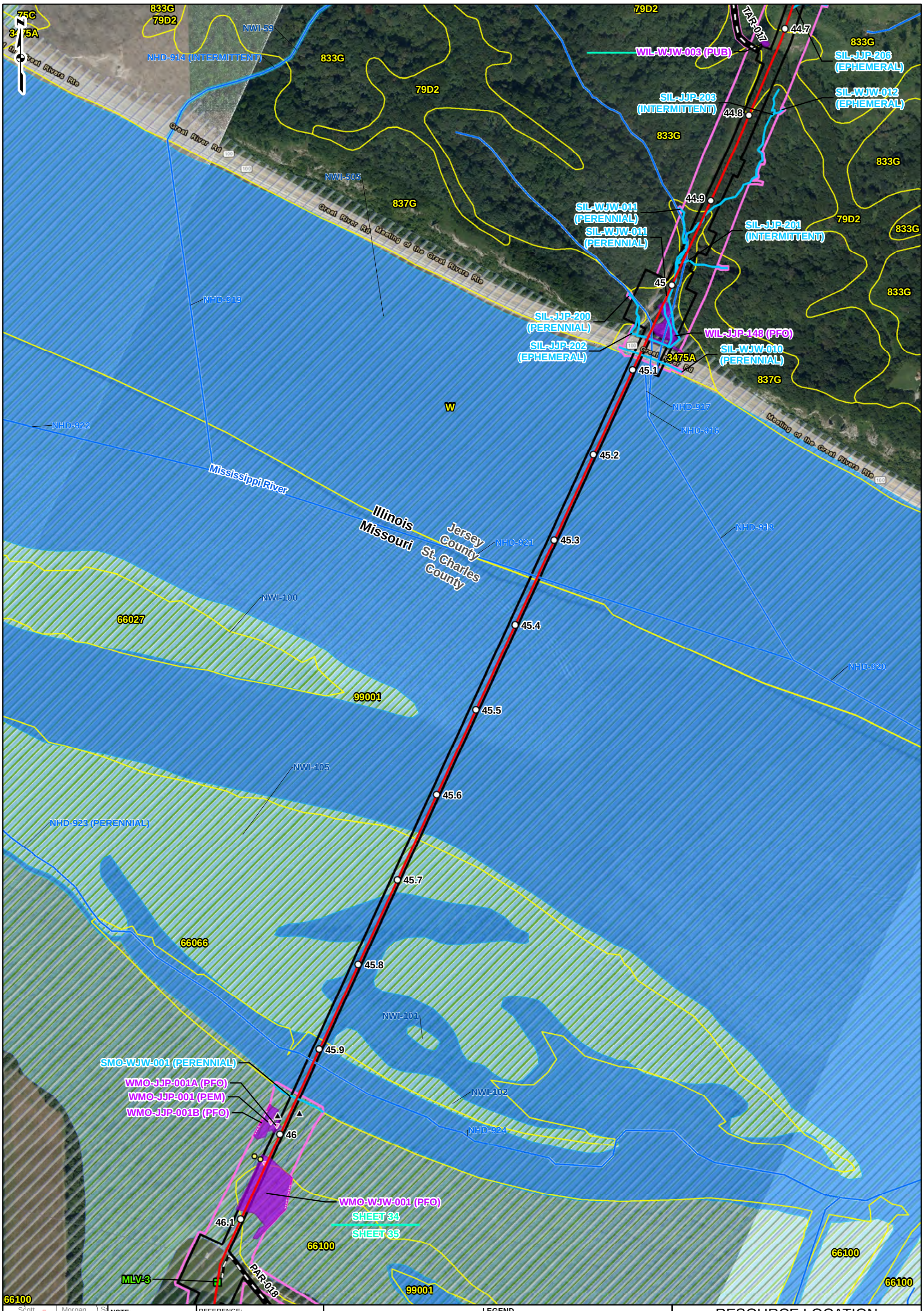

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- COUNTY BOUNDARY
- STATE BOUNDARY

0 250 500 1,000 Feet

RESOURCE LOCATION AND SOILS MAP SHEET 34 OF 51

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SPIRE STL PIPELINE PROJECT

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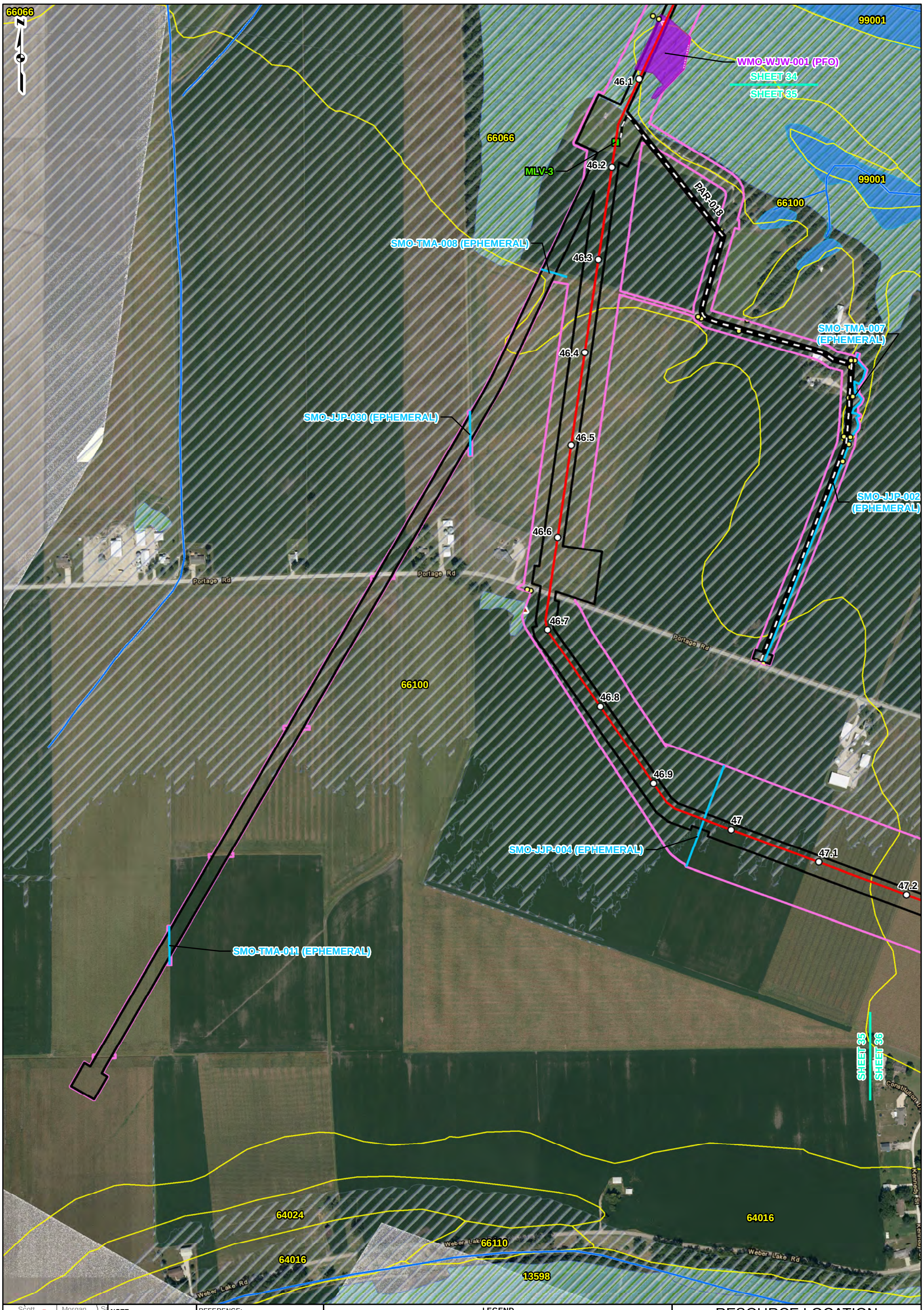

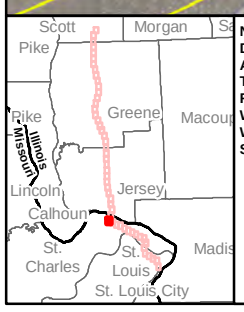

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LEGEND

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- LIMIT OF DISTURBANCE
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- COUNTY BOUNDARY
- STATE BOUNDARY

0 250 500 1,000 Feet

RESOURCE LOCATION AND SOILS MAP SHEET 35 OF 51

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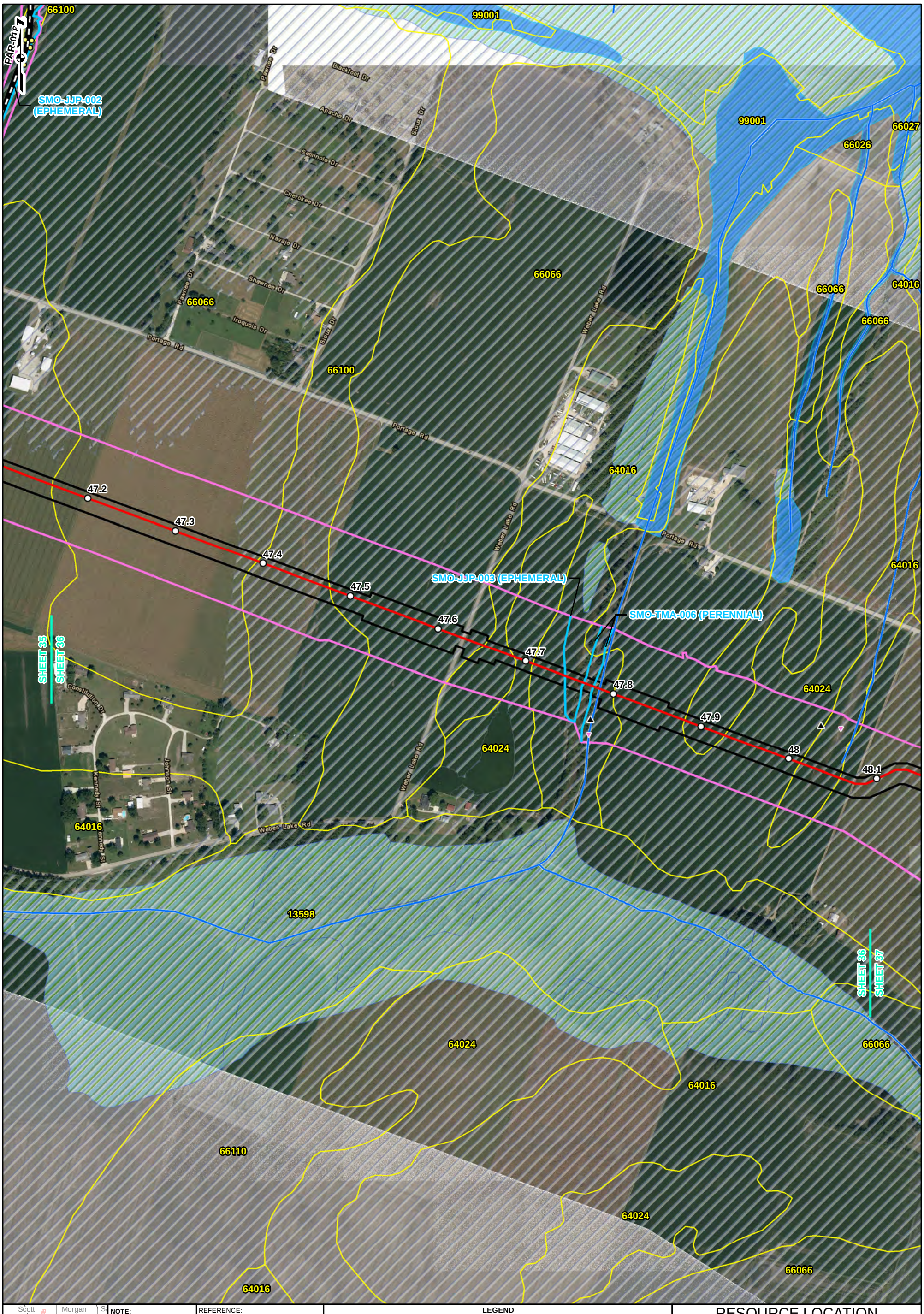

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LEGEND

- FACILITY
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- SOIL TYPE BOUNDARY
- LIMIT OF DISTURBANCE
- STUDY CORRIDOR
- COUNTY BOUNDARY
- STATE BOUNDARY

0 250 500 1,000 Feet

RESOURCE LOCATION AND SOILS MAP SHEET 36 OF 51

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SPIRE STL PIPELINE PROJECT

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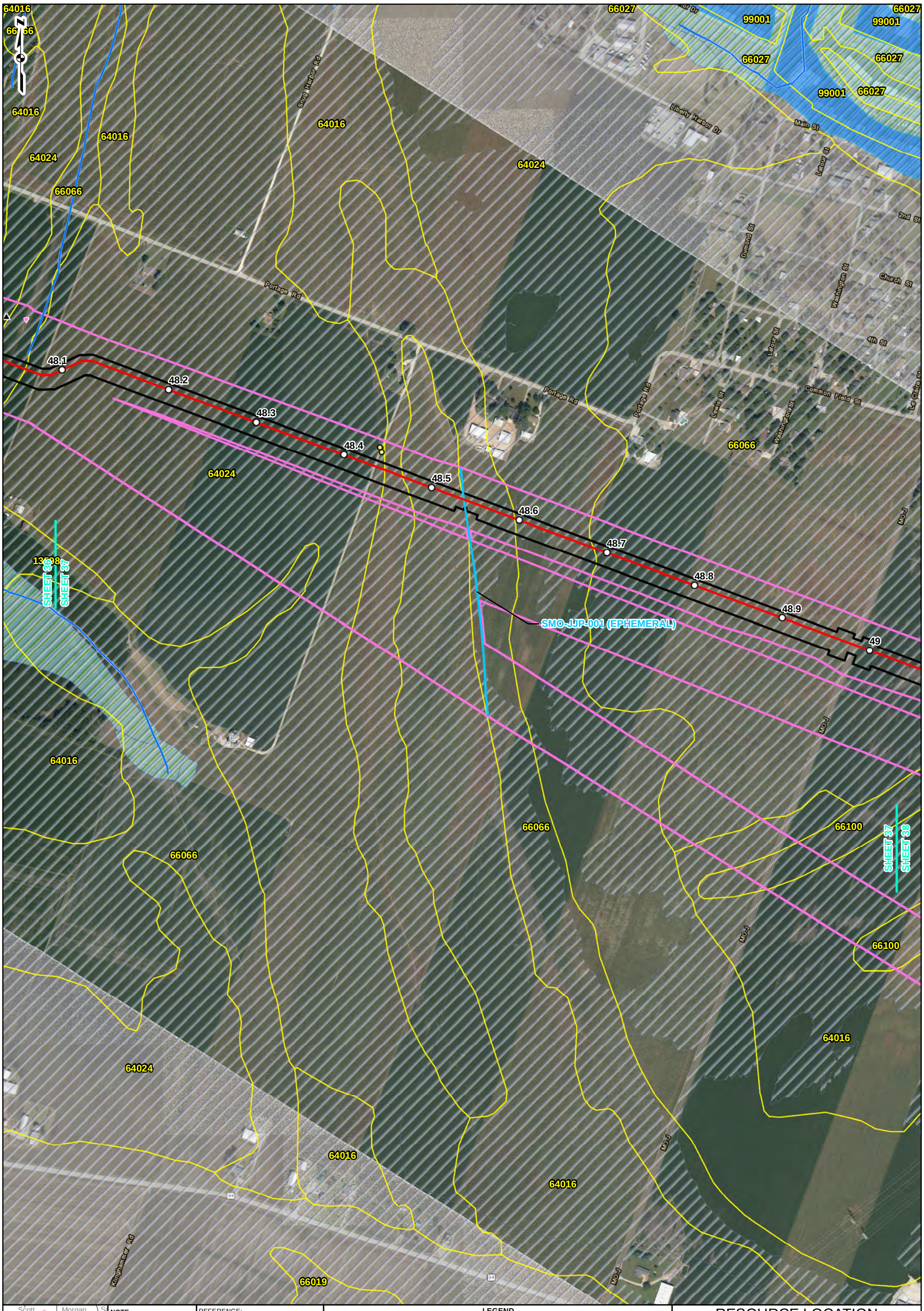

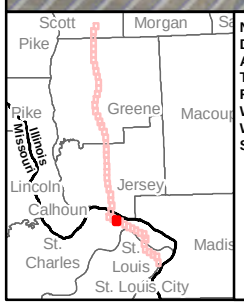

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LEGEND

- FACILITY
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0 250 500 1,000 Feet

RESOURCE LOCATION AND SOILS MAP SHEET 37 OF 51

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SPIRE STL PIPELINE PROJECT

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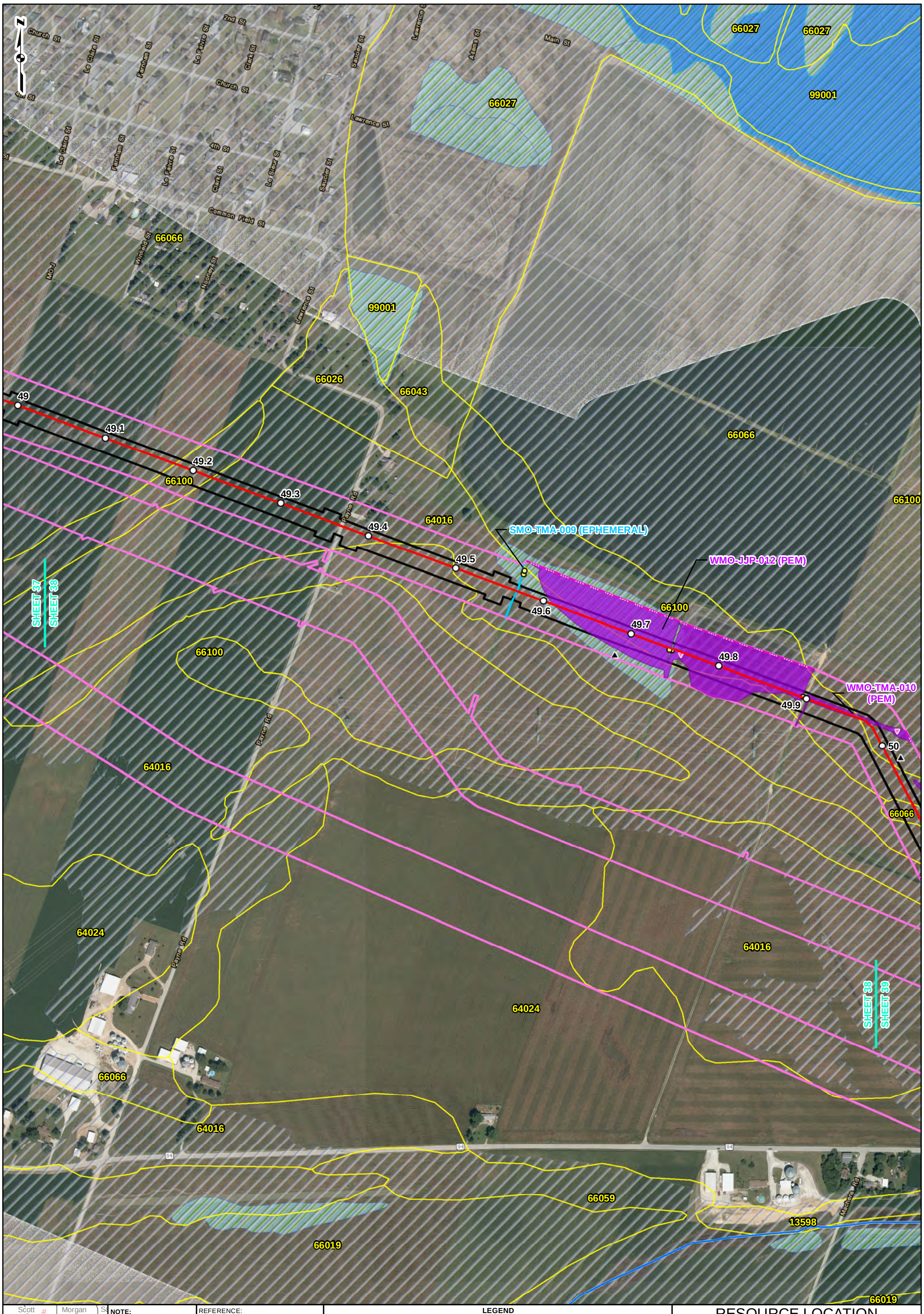
N
Church St
2nd St
Le Claire St
Farnham St
Le Favre St
Clark St
Church St
Saucier St
Lawrence St
Adams St
Main St
66027
66027
99001
66027
Lawrence St
4th St
Le Claire St
Farnham St
Le Favre St
Clark St
Le Sieur St
Saucier St
Common Field St
66066
Winfield St
Mo-J
Nooney St
Lawrence St
99001
66026
66043
66066
49
49.1
49.2
66100
49.3
Payne Rd
49.4
64016
SMO-TMA-009 (EPHEMERAL)
49.5
WMO-JJP-012 (PEM)
49.6
66100
49.7
49.8
WMO-TMA-010 (PEM)
49.9
50
SHEET 37
SHEET 38
66100
64016
Payne Rd
66066
64016
64024
Payne Rd
64016
SHEET 38
SHEET 39
64024
66066
64016
94
94
66059
Machens Rd
13598
66019
66019
Scott
Morgan
Pike
Pike
Greene
Illinois
Missouri
Lincoln
Jersey
Calhoun
St. Charles
St. Louis
St. Louis City
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LEGEND
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GROUNDWATER SEEP
UPLAND LOCATION
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SOIL TYPE BOUNDARY
LIMIT OF DISTURBANCE
STUDY CORRIDOR
COUNTY BOUNDARY
STATE BOUNDARY
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RESOURCE LOCATION AND SOILS MAP
SHEET 38 OF 51
gai consultants
SPIRE STL PIPELINE PROJECT
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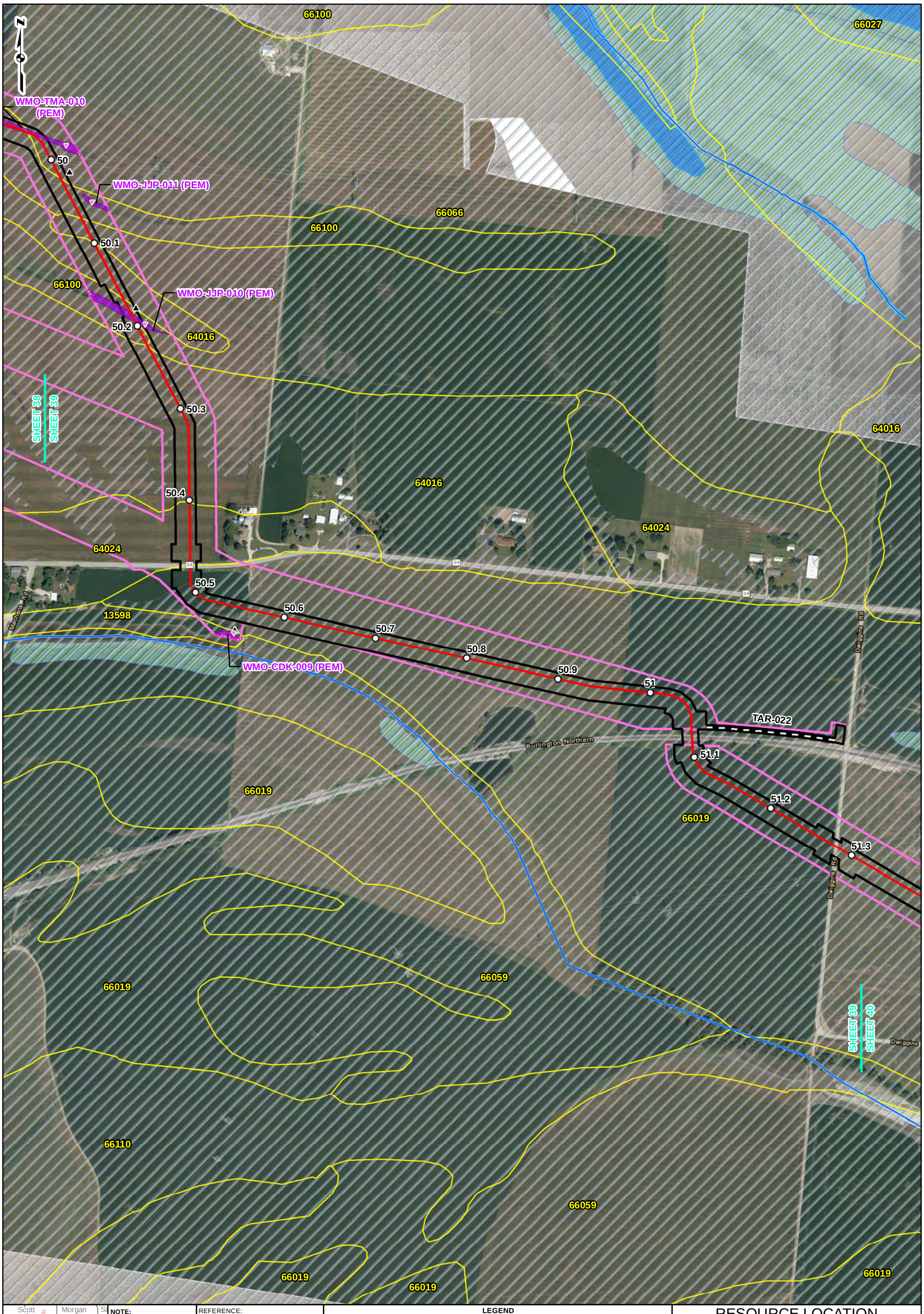

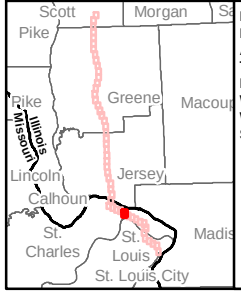

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LEGEND

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0 250 500 1,000 Feet

RESOURCE LOCATION AND SOILS MAP SHEET 39 OF 51

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SPIRE STL PIPELINE PROJECT

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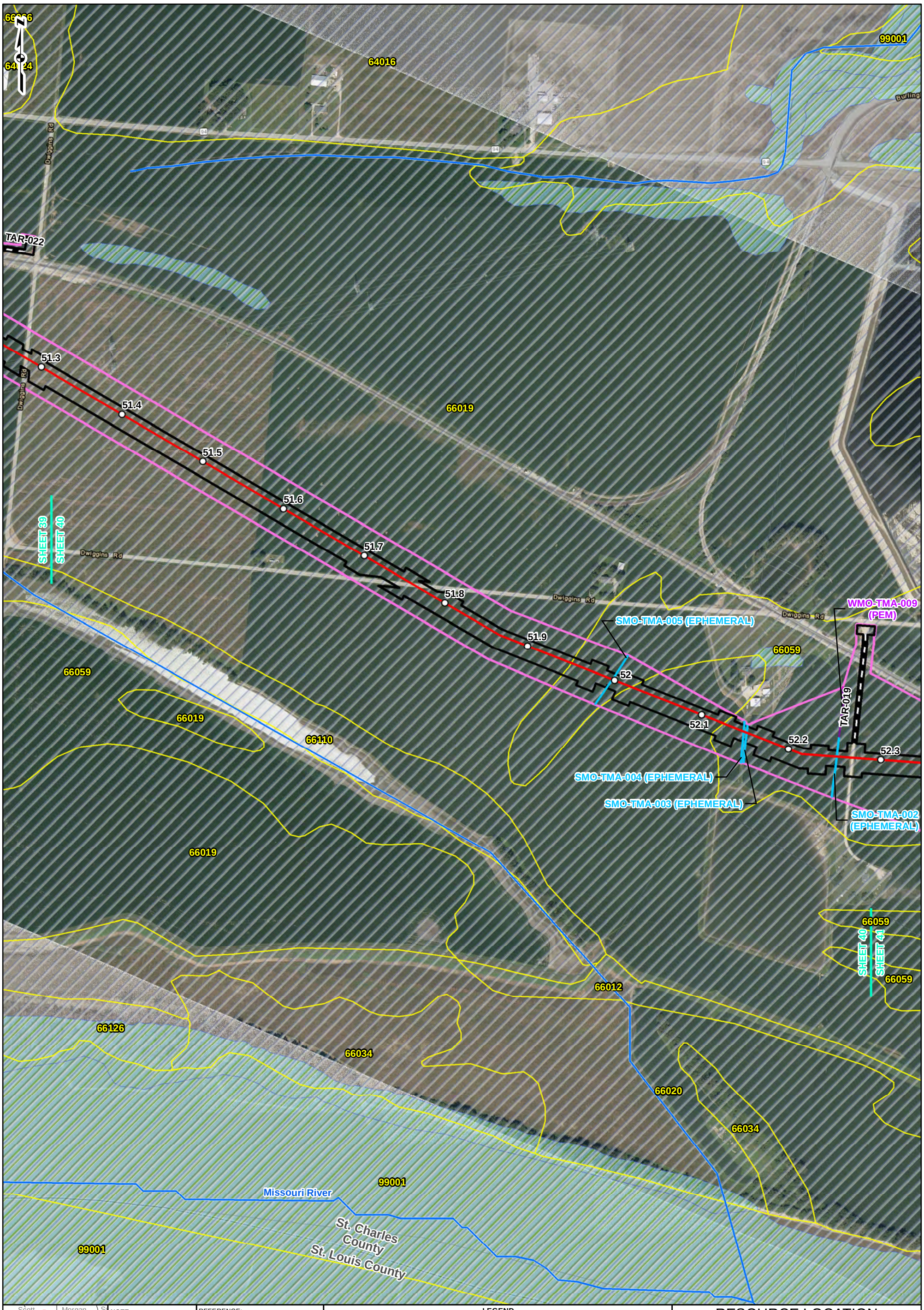

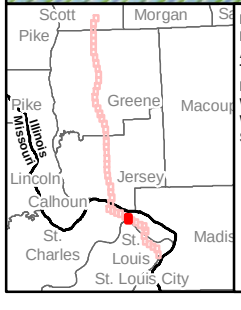

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LEGEND

- FACILITY
- MILEPOST
- CULVERT
- GROUNDWATER SEEP
- UPLAND LOCATION
- WETLAND DATA POINT
- SOIL TEST PIT
- ACCESS ROAD
- 24-INCH PIPELINE
- NORTH COUNTY EXTENSION
- STREAM
- NHD STREAM
- POND OPEN END
- WETLAND OPEN END
- POND
- WETLAND
- NWI WETLAND
- NWI WATERBODY
- 100-YEAR FLOODPLAIN
- SOIL TYPE BOUNDARY
- LIMIT OF DISTURBANCE
- STUDY CORRIDOR
- COUNTY BOUNDARY
- STATE BOUNDARY

0 250 500 1,000 Feet

RESOURCE LOCATION AND SOILS MAP SHEET 40 OF 51

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SPIRE STL PIPELINE PROJECT

spire

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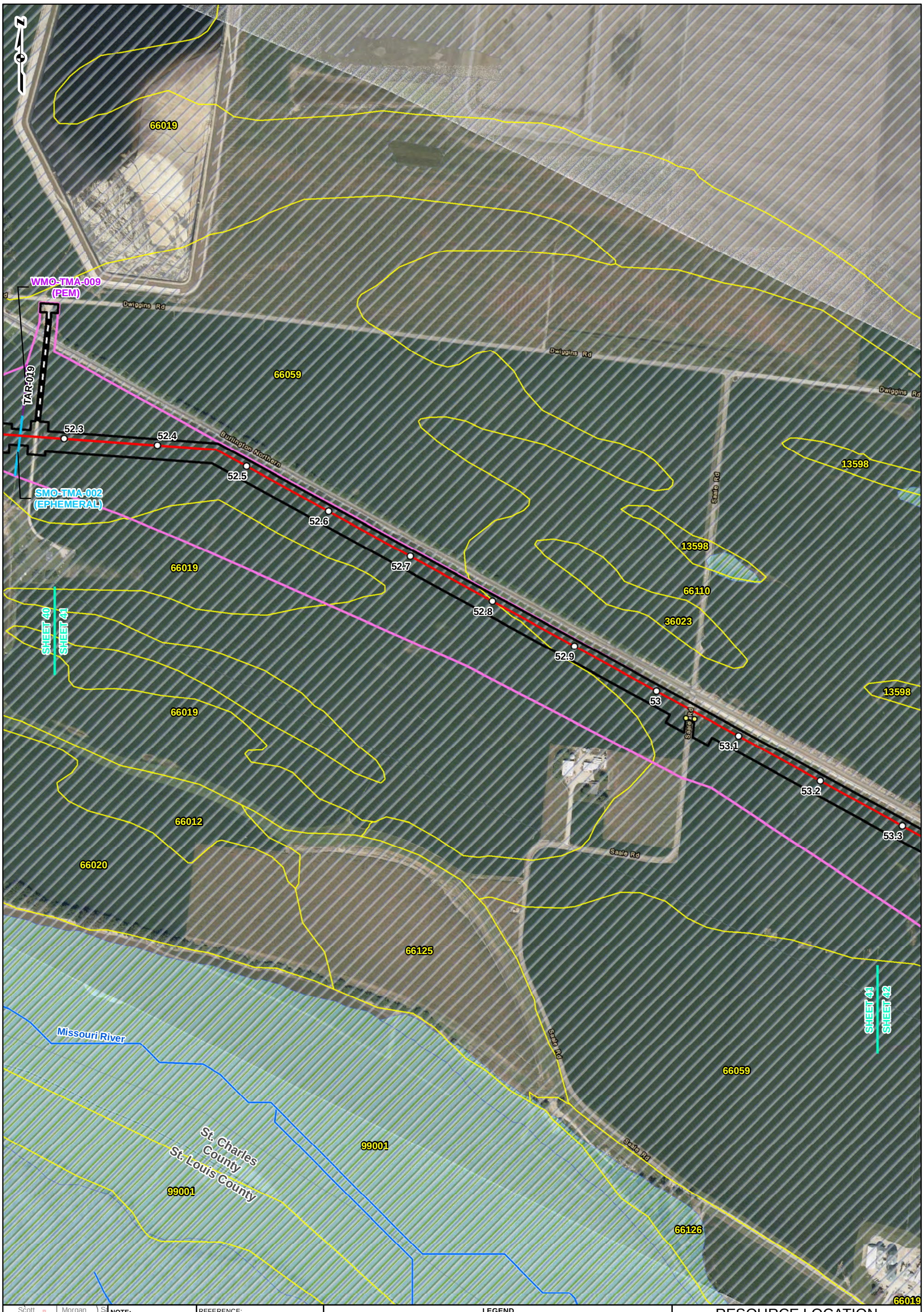

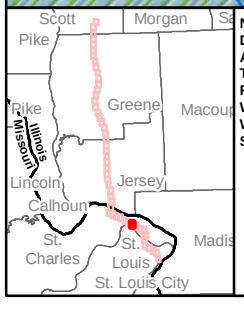

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- COUNTY BOUNDARY
- STATE BOUNDARY

0 250 500 1,000 Feet

RESOURCE LOCATION AND SOILS MAP SHEET 41 OF 51

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SPIRE STL PIPELINE PROJECT

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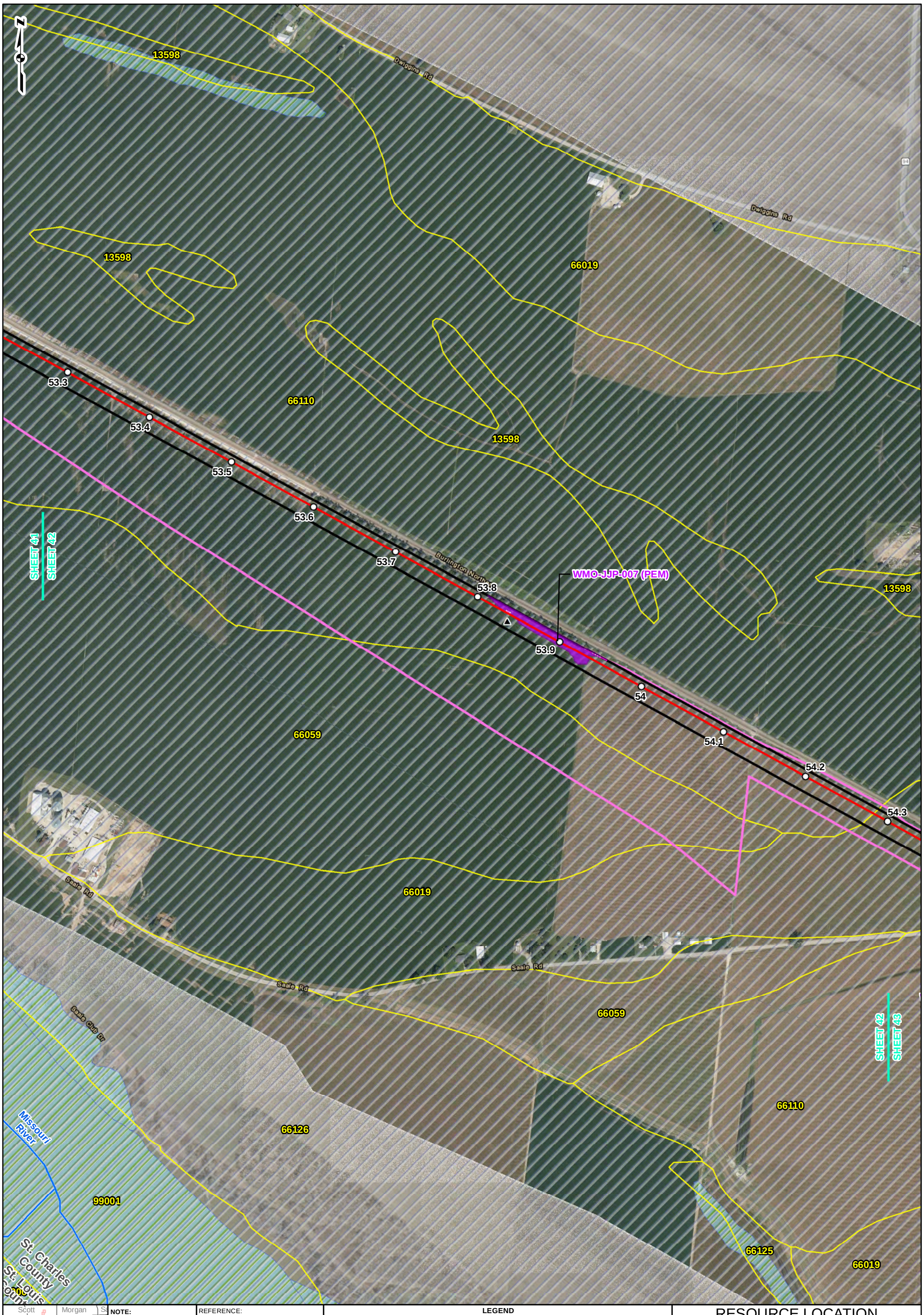

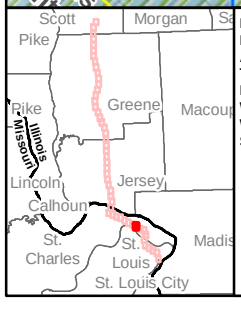

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0 250 500 1,000 Feet

RESOURCE LOCATION AND SOILS MAP SHEET 42 OF 51

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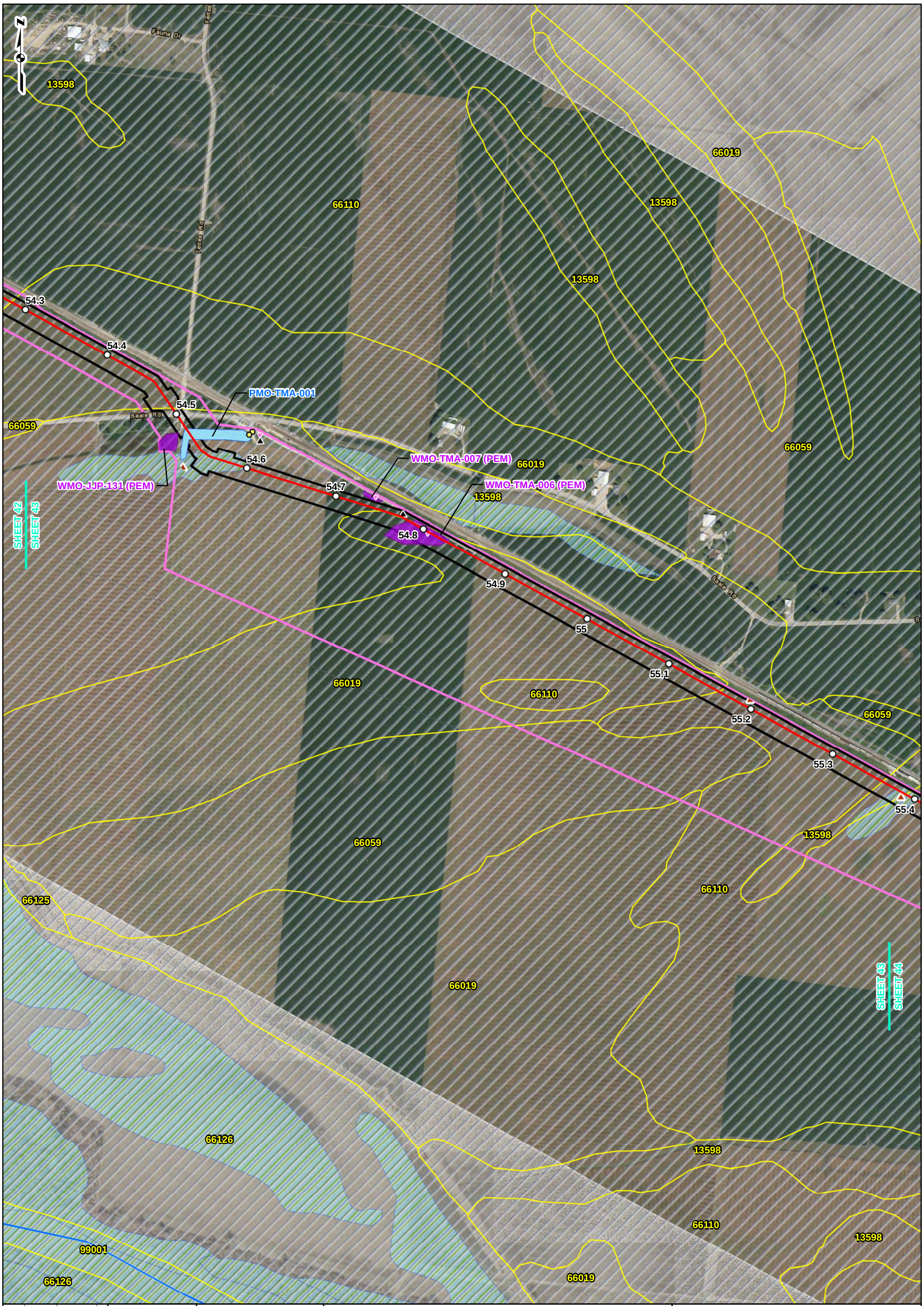

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- COUNTY BOUNDARY
- STATE BOUNDARY

0 250 500 1,000 Feet

RESOURCE LOCATION AND SOILS MAP SHEET 43 OF 51

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SPIRE STL PIPELINE PROJECT

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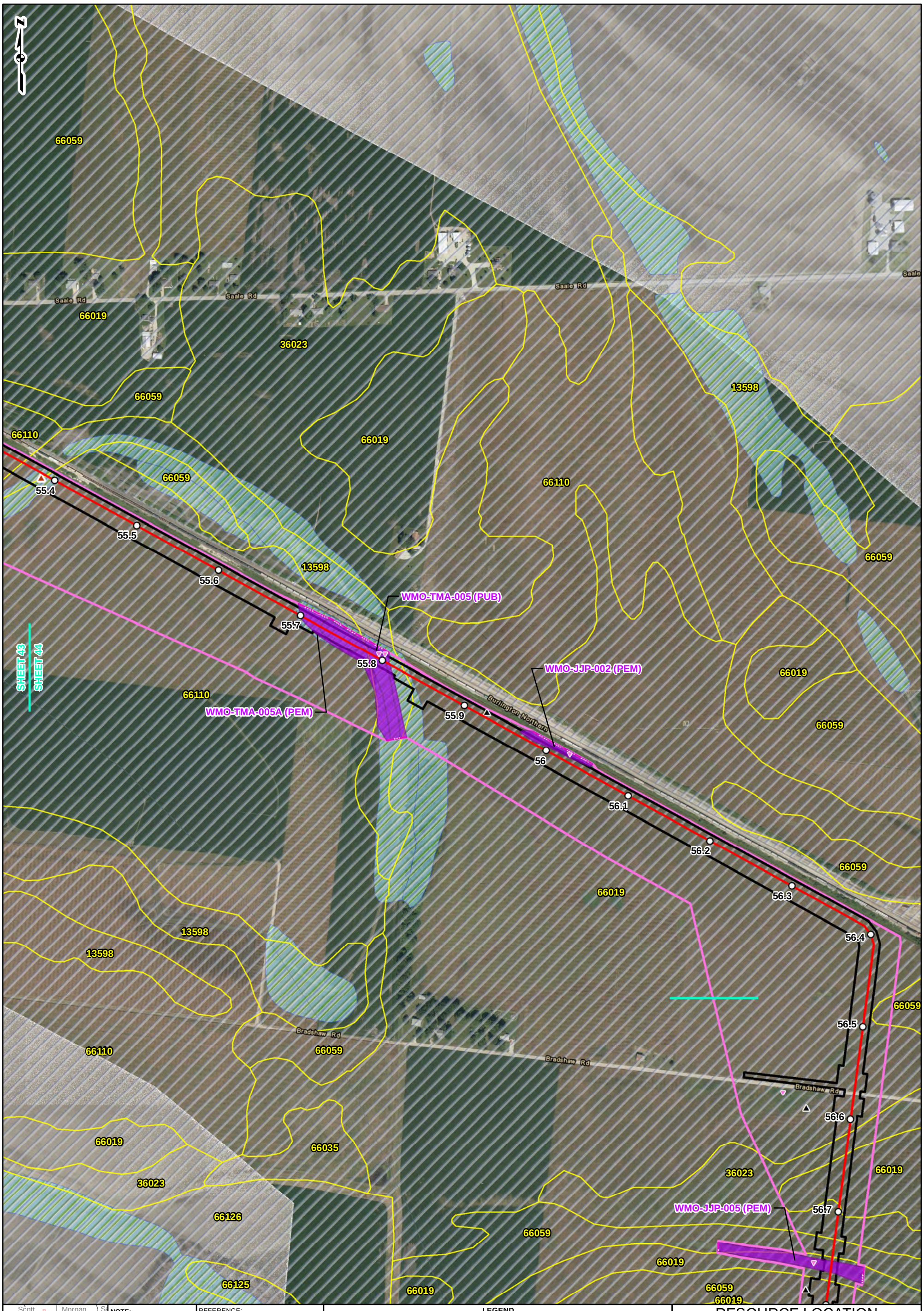

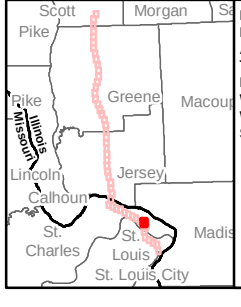

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- COUNTY BOUNDARY
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0 250 500 1,000 Feet

RESOURCE LOCATION AND SOILS MAP SHEET 44 OF 51

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SPIRE STL PIPELINE PROJECT

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56.6
56.7
56.8
56.9
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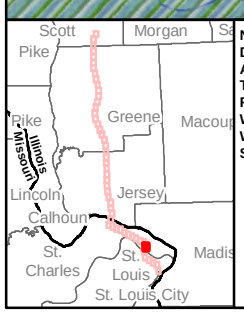
57.1
57.2
57.3
57.4
57.5
57.6
57.7
57.8
WMO-JJP-005 (PEM)
WMO-JJP-006 (PEM)
WMO-TMA-004 (PEM)
WMO-TMA-003A (PEM)
WMO-TMA-003 (PUB)
WMO-TMA-002 (PEM)
WMO-TMA-001 (PFO)
WMO-TMA-001A (PFO)
WMO-TMA-001 (PEM)
SMO-TMA-001 (PERENNIAL)
SHEET 45
SHEET 46
Bradshaw Rd
Mintert Rd
St Louis St
Red School Rd
Hood Dr
Cinder Rd
Burlington Northern
66019
66059
36023
66035
66126
66012
66125
66020
99001



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- CULVERT
- GROUNDWATER SEEP
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- WETLAND DATA POINT
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- NWI WATERBODY
- 100-YEAR FLOODPLAIN
- SOIL TYPE BOUNDARY
- LIMIT OF DISTURBANCE
- STUDY CORRIDOR
- COUNTY BOUNDARY
- STATE BOUNDARY

0 250 500 1,000 Feet

RESOURCE LOCATION AND SOILS MAP
SHEET 45 OF 51

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SPIRE STL PIPELINE PROJECT

spire

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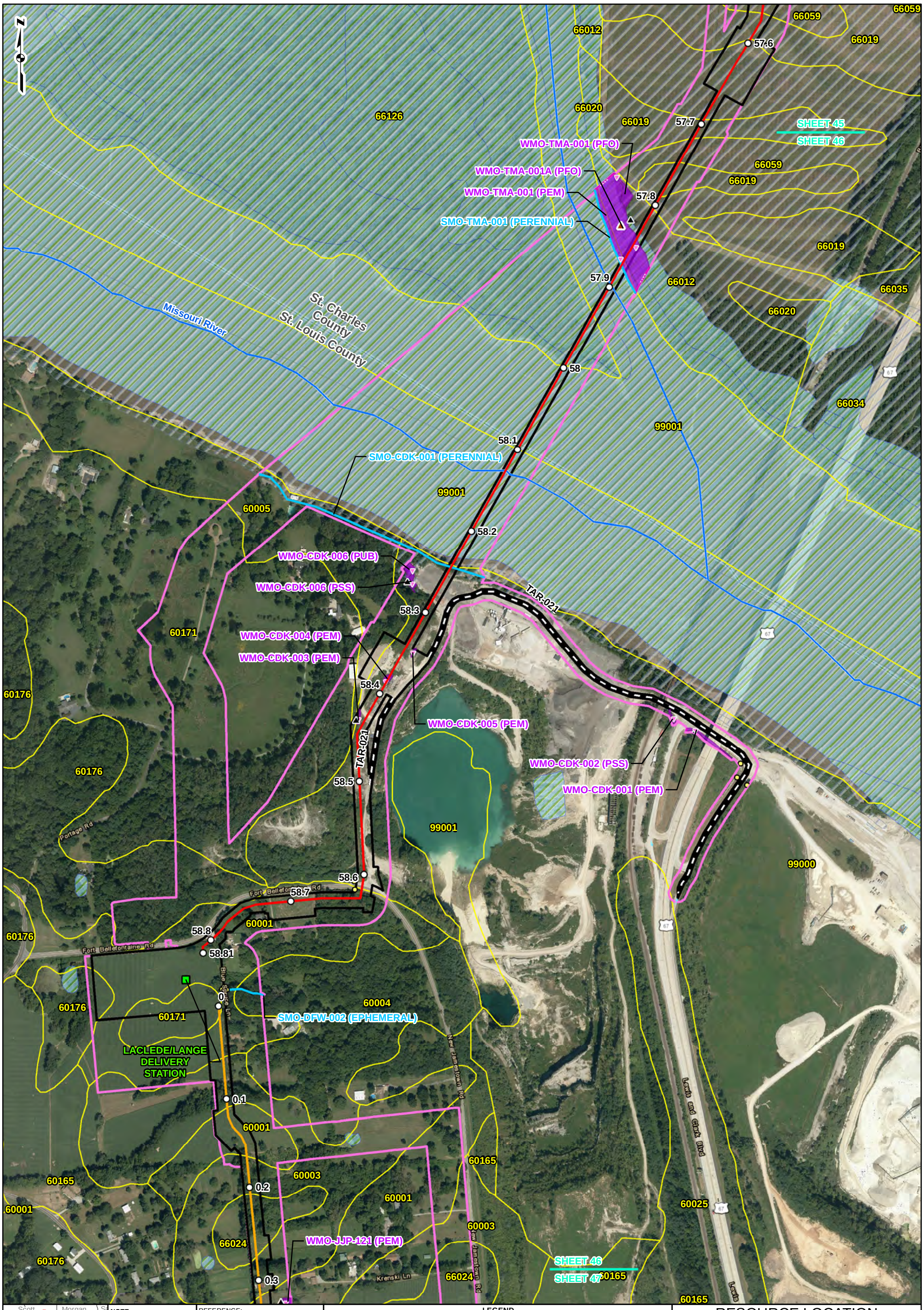

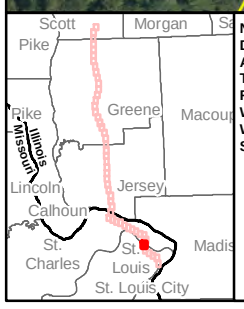

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0 250 500 1,000 Feet

RESOURCE LOCATION AND SOILS MAP SHEET 46 OF 51

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SPIRE STL PIPELINE PROJECT

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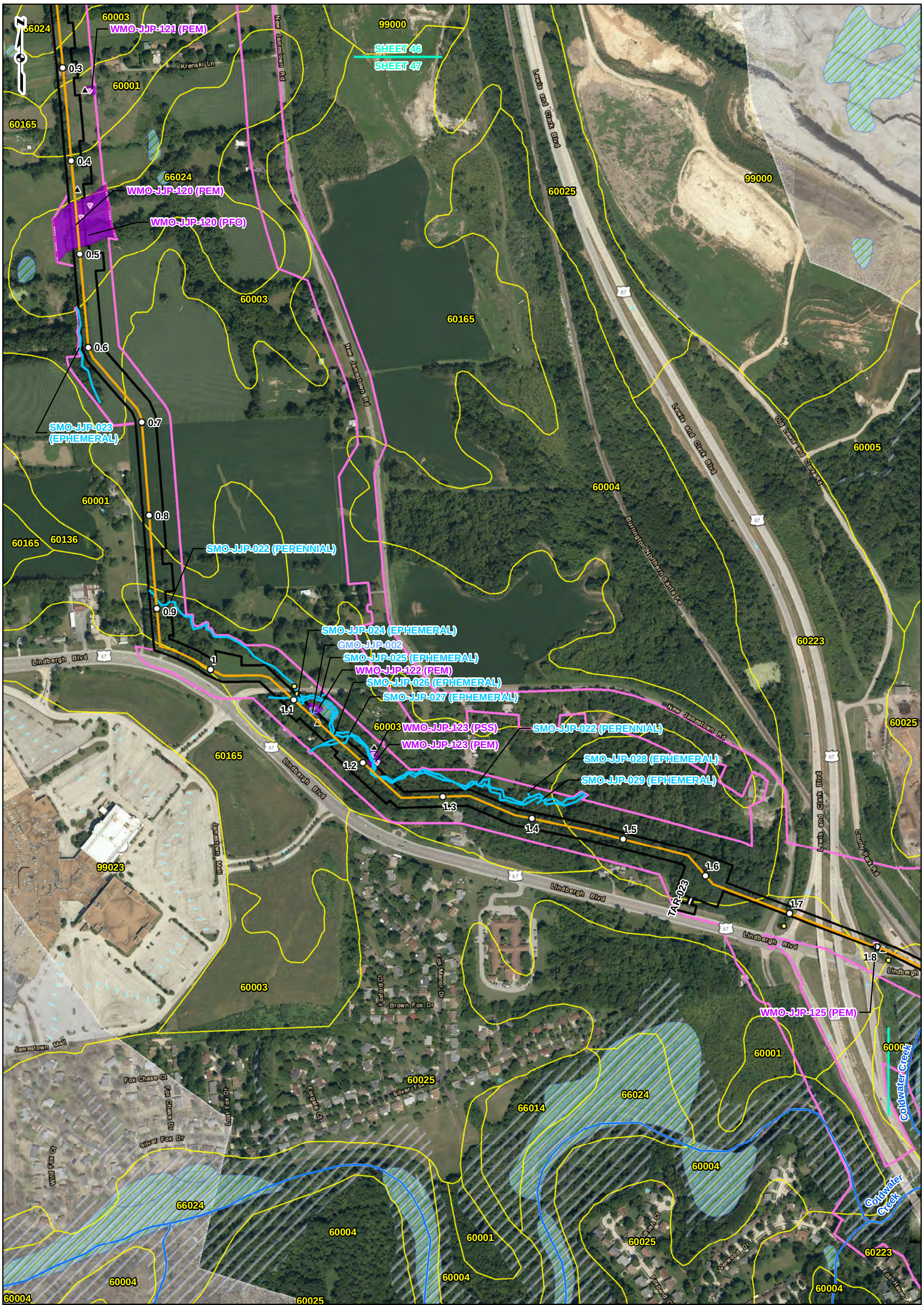

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0 250 500 1,000 Feet

RESOURCE LOCATION AND SOILS MAP SHEET 47 OF 51

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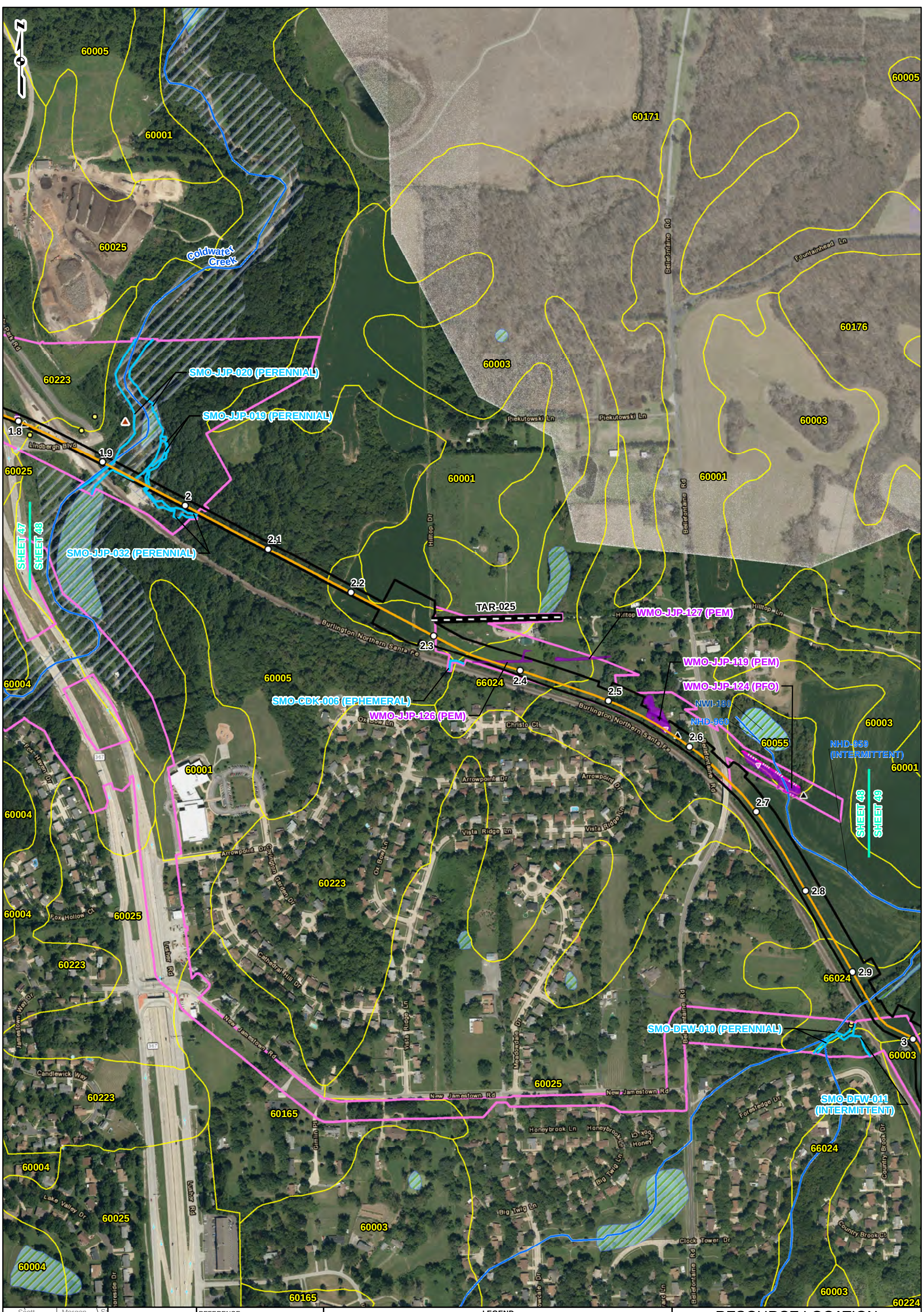

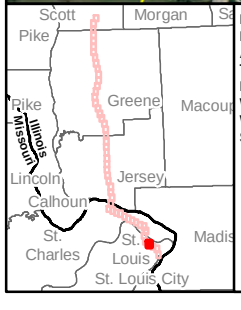

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0 250 500 1,000 Feet

RESOURCE LOCATION AND SOILS MAP
SHEET 48 OF 51

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SPIRE STL PIPELINE PROJECT

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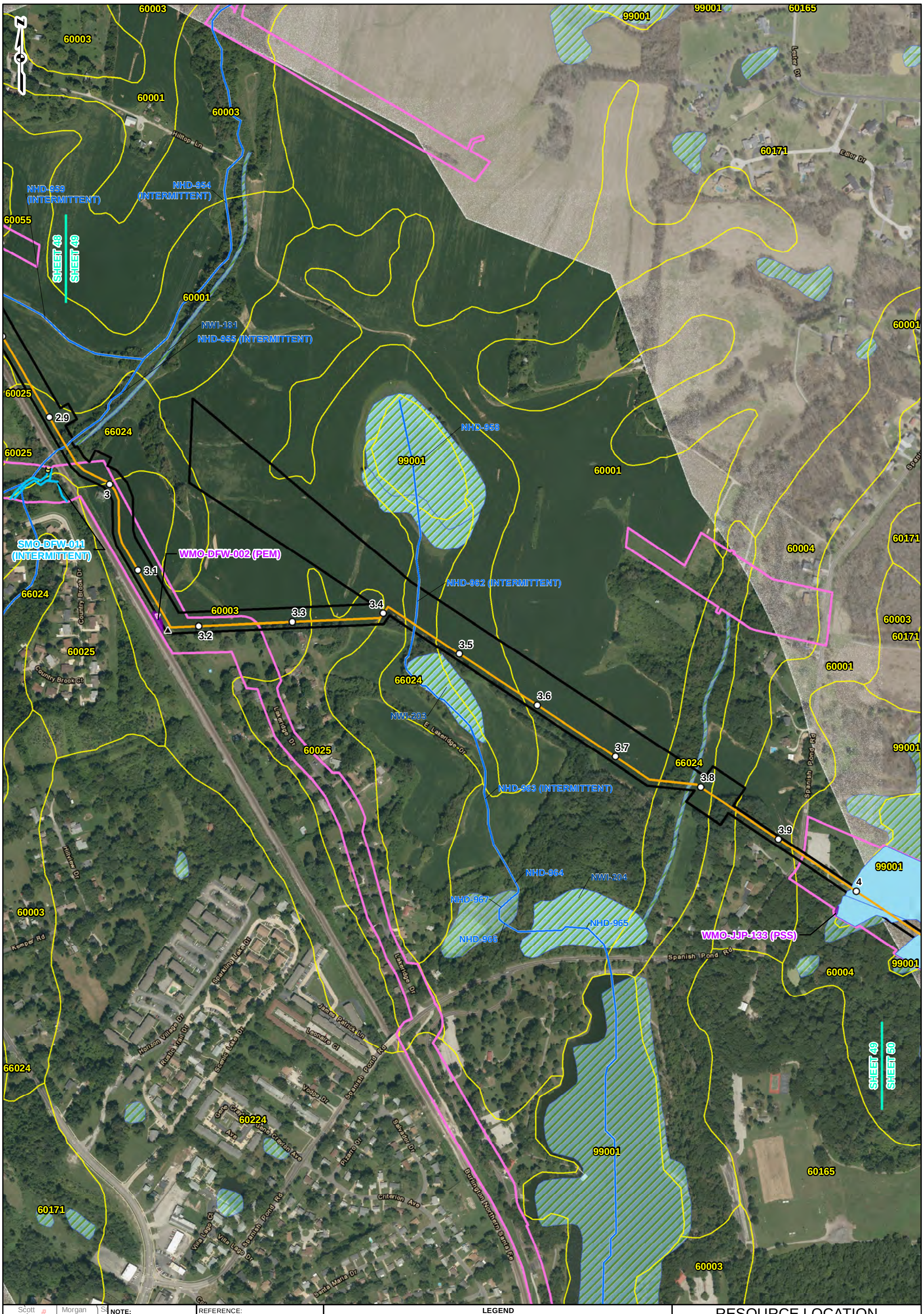

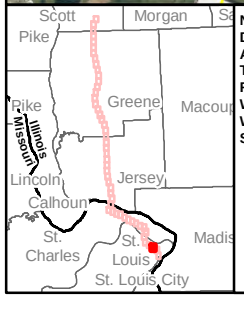

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RESOURCE LOCATION AND SOILS MAP SHEET 49 OF 51

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CHECKED: EFJ APPROVED: TCW

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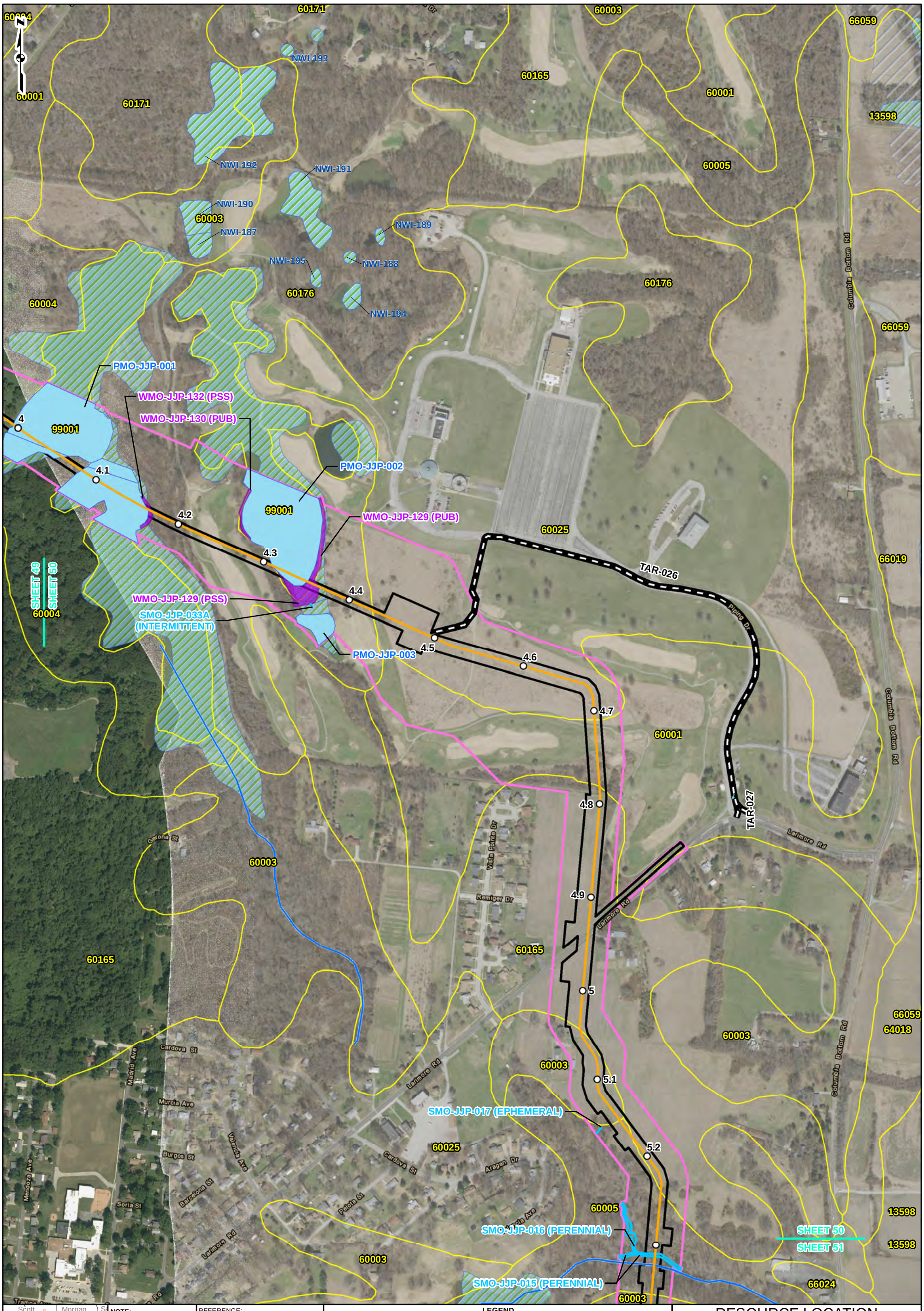

NOTE:
DELINEATED FEATURES ARE SHOWN ONLY FOR THE CURRENT PROJECT ROUTE AND WORKSPACES, AND NOT WITHIN PREVIOUSLY SURVEYED AREAS.

REFERENCE:
ORTHOPHOTOGRAPHY, 2016. ESRI WORLD IMAGERY AND TRANSPORTATION, NAIP, USDA FSA, 2014, ACCESSED 07/2017. SOIL SURVEY GEOGRAPHIC (SSURGO) DATABASE FOR ILLINOIS (2014) AND MISSOURI (2015), USDA/NRCS. NATIONAL WETLAND INVENTORY (NWI) WATERBODIES AND WETLANDS, USFWS 2016. NATIONAL HYDROGRAPHY DATASET (NHD) STREAMS FOR ILLINOIS (2015) AND MISSOURI (2016), USGS. NATIONAL FLOOD HAZARD LAYER FOR ILLINOIS (2015), FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA).

LEGEND

- FACILITY
- MILEPOST
- CULVERT
- GROUNDWATER SEEP
- UPLAND LOCATION
- WETLAND DATA POINT
- SOIL TEST PIT
- ACCESS ROAD
- 24-INCH PIPELINE
- NORTH COUNTY EXTENSION
- STREAM
- NHD STREAM
- POND OPEN END
- WETLAND OPEN END
- POND
- WETLAND
- NWI WETLAND
- NWI WATERBODY
- 100-YEAR FLOODPLAIN
- SOIL TYPE BOUNDARY
- LIMIT OF DISTURBANCE
- STUDY CORRIDOR
- COUNTY BOUNDARY
- STATE BOUNDARY

0 250 500 1,000 Feet

RESOURCE LOCATION AND SOILS MAP SHEET 50 OF 51

gai consultants

SPIRE STL PIPELINE PROJECT

spire

DRAWN BY: SWW DATE: 7/14/2017
CHECKED: EFJ APPROVED: TCW

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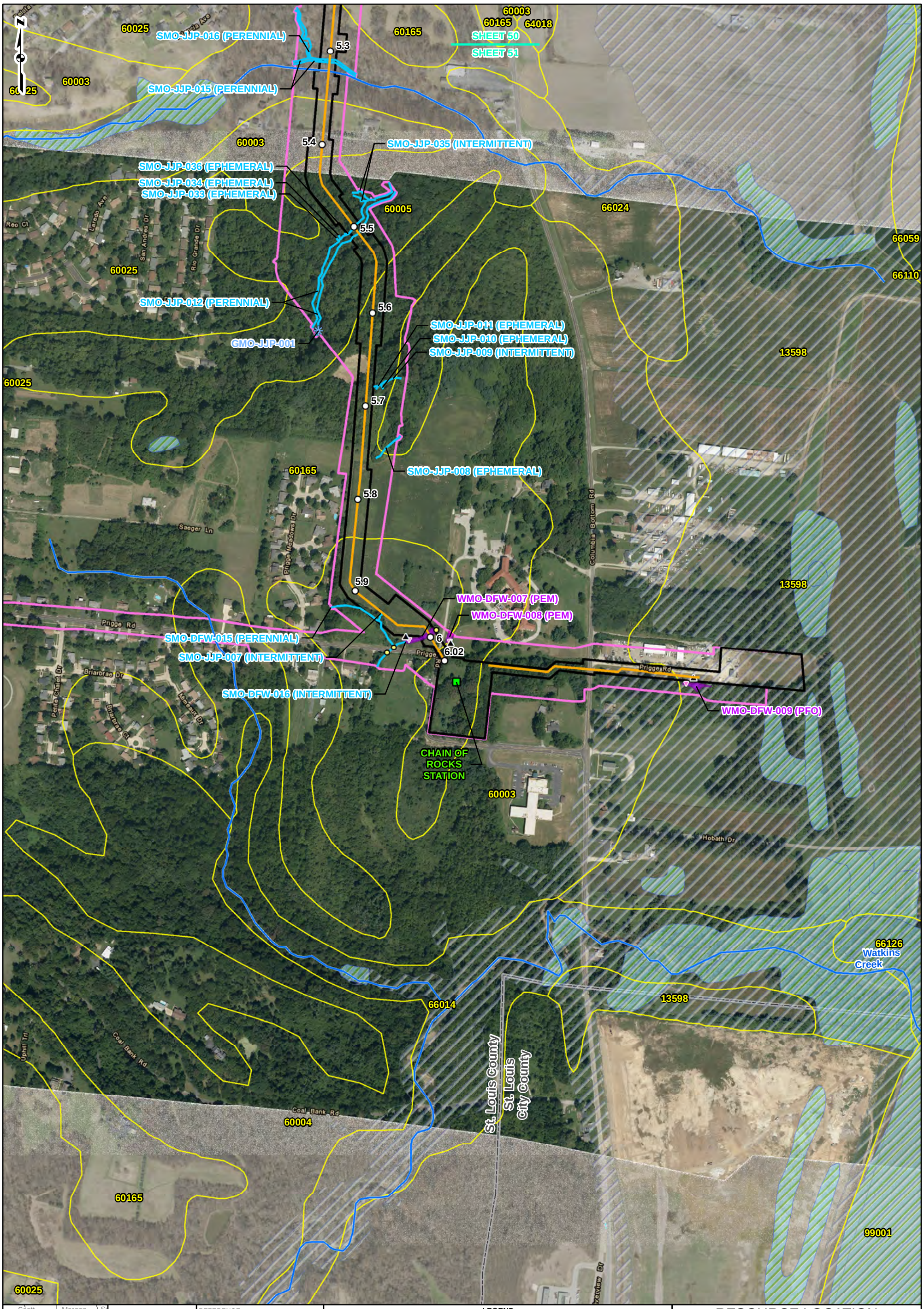

NOTE: DELINEATED FEATURES ARE SHOWN ONLY FOR THE CURRENT PROJECT ROUTE AND WORKSPACES, AND NOT WITHIN PREVIOUSLY SURVEYED AREAS.

REFERENCE: ORTHOPHOTOGRAPHY, 2016. ESRI WORLD IMAGERY AND TRANSPORTATION, NAIP, USDA FSA, 2014, ACCESSED 07/2017. SOIL SURVEY GEOGRAPHIC (SSURGO) DATABASE FOR ILLINOIS (2014) AND MISSOURI (2015), USDA/NRCS. NATIONAL WETLAND INVENTORY (NWI) WATERBODIES AND WETLANDS, USFWS 2016. NATIONAL HYDROGRAPHY DATASET (NHD) STREAMS FOR ILLINOIS (2015) AND MISSOURI (2016), USGS. NATIONAL FLOOD HAZARD LAYER FOR ILLINOIS (2015), FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA).

LEGEND

- FACILITY
- MILEPOST
- CULVERT
- GROUNDWATER SEEP
- UPLAND LOCATION
- WETLAND DATA POINT
- SOIL TEST PIT
- ACCESS ROAD
- 24-INCH PIPELINE
- NORTH COUNTY EXTENSION
- STREAM
- NHD STREAM
- POND OPEN END
- WETLAND OPEN END
- POND
- WETLAND
- NWI WETLAND
- NWI WATERBODY
- 100-YEAR FLOODPLAIN
- SOIL TYPE BOUNDARY
- LIMIT OF DISTURBANCE
- STUDY CORRIDOR
- COUNTY BOUNDARY
- STATE BOUNDARY

0 250 500 1,000 Feet

RESOURCE LOCATION AND SOILS MAP SHEET 51 OF 51

gai consultants

SPIRE STL PIPELINE PROJECT

spire

DRAWN BY: SWW DATE: 7/14/2017

CHECKED: EFJ APPROVED: TCW

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APPENDIX A
Wetland Data Forms
(Additional Features Only)

gai consultants
transforming ideas into reality

WIL-CDK-100
PEM

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: STL City/County: Jersey Co. Sampling Date: 3/14/17
Applicant/Owner: Spire State: IL Sampling Point: PEM
Investigator(s): JJF / CDK Section, Township, Range: 2 / 12N / 7W
Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave
Slope (%): 2% Lat: 39.079048 Long: -90.39192 Datum: NAD83
Soil Map Unit Name: Water NWI classification: PUSCh
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation Y*, Soil Y*, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No ____	Is the Sampled Area within a Wetland?	Yes X No ____
Hydric Soil Present?	Yes X No ____		
Wetland Hydrology Present?	Yes X No ____		

Remarks:
-PEM fringe along manmade impoundment. NWI wetland
* Soil and veg. disturbed by livestock

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30' r)			
1. Absent			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15' r)			
1. Absent			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: 5' r)			
1. Ranunculus sceleratus	60	Y	OBL
2. Echinochloa crus-galli	30	Y	FACW
3. Panicum dichotomiflorum	10	N	FACW
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30' r)			
1. Absent			
2.			
	0 = Total Cover		

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)
Total Number of Dominant Species Across All Strata: 2 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:
X 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤3.0[1]
___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: (Include photo numbers here or on a separate sheet.)
Vegetation grazed by livestock.

WIL-CDK-100

SOIL

Sampling Point: PEM

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-7 in	2.5Y 4/2	90	7.5YR 4/6	6	C	M/PL	SCL	
			5YR 3/4	4	C	M/PL		
7-16 in	2.5Y 4/1	95	7.5YR 4/6	5	C	M/PL	SCL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Mangenese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: None

Depth (inches): ~

Hydric Soil Present? Yes X No ___

Remarks:

Soil disturbed by livestock.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes X No ___ Depth (inches): < 1 in

Water Table Present? Yes ___ No X Depth (inches): ~

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): ~

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: N/A

Remarks:

Abuts stream (out of study area).

WTL - CDK - 100
PUB

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: STL City/County: Jersey Co. Sampling Date: 3/14/17
Applicant/Owner: Spire State: IL Sampling Point: PUB
Investigator(s): JP / CDK Section, Township, Range: 2 / 12W / 7N
Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave
Slope (%): <1% Lat: 39.078842 Long: -90.391476 Datum: NAD83
Soil Map Unit Name: Water NWI classification: PUBGh
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	Is the Sampled Area within a Wetland? Yes X No ____
Hydric Soil Present?	Yes X	No ____	
Wetland Hydrology Present?	Yes X	No ____	

Remarks:
Man-made impoundment; mapped NWI, * soil and veg. disturbed by livestock.

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30'r)			
1. Absent	—	—	—
2.			
3.			
4.			
5.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15'r)			
1. Absent	—	—	—
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: 5'r)			
1. Ranunculus sceleratus	10	Y	OBL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	10 = Total Cover		
Woody Vine Stratum (Plot size: 30'r)			
1. Absent	—	—	—
2.			
	0 = Total Cover		

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)
Total Number of Dominant Species Across All Strata: 1 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:
X 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤3.0[1]
___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: (Include photo numbers here or on a separate sheet.)
Vegetation grazed by livestock.

WIL-CDK-100

SOIL

Sampling Point: PUB

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-16in	2.5Y 4/2	100	-	-	-	-	Mucky SL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- X Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Mangenese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: None

Depth (inches): -

Hydric Soil Present? Yes X No ___

Remarks:

Soil disturbed by livestock.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marke (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- X Algal Met or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes X No ___ Depth (Inches): ~36 in

Water Table Present? Yes ___ No X Depth (Inches): -

Saturation Present? (Includes capillary fringe) Yes ___ No X Depth (Inches): -

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: N/A

Remarks:

Abuts stream (out of study area).

WIL-550-117

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: STL City/County: Greene Sampling Date: 11-20-2016
Applicant/Owner: Spire State: IL Sampling Point: wetland
Investigator(s): WP-TMA Section, Township, Range: 34/10N/12W
Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave
Slope (%): 2 Lat: 39.266181 Long: -90.417681 Datum: NAD83
Soil Map Unit Name: (279(2) Rozetta silt loam, 5-10% slopes, eroded NWI classification: N/A
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks.)
Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____
Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ✓ No ____
Hydric Soil Present? Yes ✓ No ____
Wetland Hydrology Present? Yes ✓ No ____
Is the Sampled Area within a Wetland? Yes ____ No ____

Remarks:
- Area sample point for PEM/Abutting wetland WIL-SP117
- wetland area is abutting NHD stream

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30' r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3. Absent			
4.			
5.			
	0 = Total Cover		

Sapling/Shrub Stratum (Plot size: 15' r)			
1.			
2.			
3. Absent			
4.			
5.			
	0 = Total Cover		

Herb Stratum (Plot size: 5' r)			
1. Poa trivialis	40	Y	FACW
2. Setaria pumila	20	Y	FAC
3. Leersia oryzoides	20	Y	OBL
4. Schedonorus arundinaceus	10	N	FACU
5. Rumex crispus	10	N	FAC
6. Carex frankii	5	N	OBL
7.			
8.			
9.			
10.			
	105 = Total Cover		

Woody Vine Stratum (Plot size: 30' r)			
1. Absent			
2.			
	= Total Cover		

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)
Total Number of Dominant Species Across All Strata: 3 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:
✓ 1 - Rapid Test for Hydrophytic Vegetation
__ 2 - Dominance Test is >50%
__ 3 - Prevalence Index is ≤3.0[1]
__ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No ____

Remarks: (Include photo numbers here or on a separate sheet.)
- None

WILSJP117

SOIL

Sampling Point: wetland

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3	10YR3/2	85	10YR4/2	10	D	M	SCL	
			5YR3/4	5	C	M/PL		
3-6	2.5Y4/2	85	7.5YR3/4	5	C	M/L	SCL	
			2.5YR2.5/3	5	C	M		
			10YR4/2	5	D	M		
6-17	5Y4/1	85	7.5YR3/4	10	C	M/PL	SCL	
			5YR3/4	5	C	M		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ✓ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: None

Depth (inches): ___

Hydric Soil Present? Yes ✓ No ___

Remarks:

- None

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ✓ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ✓ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ✓ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ✓ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ✓ No ___ Depth (inches): 4"

Water Table Present? Yes ___ No ✓ Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No ✓ Depth (inches): ___

Wetland Hydrology Present? Yes ✓ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: N/A

Remarks:

- wetland abuts NHD stream SILTMA078

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: STL / Principia City/County: Jersey Co Sampling Date: 6-5-2017
Applicant/Owner: Spire State: IL Sampling Point: wetland
Investigator(s): JJP. WJW Section, Township, Range: 36/12W/18N
Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): concave
Slope (%): 2 Lat: 39.956943 Long: -90.373616 Datum: NAD83
Soil Map Unit Name: (3475A) Elsah gravelly loam 0-2% frequently flooded NWI classification: N/A
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks.)
Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____
Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No ____	Is the Sampled Area within a Wetland? Yes ✓ No ____
Hydric Soil Present?	Yes ✓ No ____	
Wetland Hydrology Present?	Yes ✓ No ____	

Remarks:
- Area sample point for PFO/Abutting wetland WILJJP148
- area subjected to high occurences of deposition from streams and rivers

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30'r)	Absolute % Cover	Dominant Species?	Indicator Status
1. Celtis laevigata	60	Y	FACW
2. Platanus occidentalis	10	N	FACW
3. Diospyros virginiana	5	N	FAC
4.			
5.			
	75 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15'r)			
1. Asimina triloba	5	Y	FAC
2. Diospyros virginiana	5	Y	FAC
3.			
4.			
5.			
	10 = Total Cover		
Herb Stratum (Plot size: 5'r)			
1. Saururus cernuus	15	Y	OBL
2. Laportea canadensis	15	Y	FACW
3. Diospyros virginiana	10	Y	FAC
4. Boehmeria cylindrica	5	N	OBL
5. Menispermum canadense	5	N	FAC
6.			
7.			
8.			
9.			
10.			
	50 = Total Cover		
Woody Vine Stratum (Plot size: 15'r)			
1.			
2. Absent			
	0 = Total Cover		

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)
Total Number of Dominant Species Across All Strata: 6 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:
___ 1 - Rapid Test for Hydrophytic Vegetation
___ 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤3.0[1]
___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No ____

Remarks: (Include photo numbers here or on a separate sheet.)
- None

WILWP148

SOIL

Sampling Point: wetland

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-9	10YR3/1	97	10YR3/4	5	C	M	SiCL	
9-17	10YR3/2	60	10YR3/4	35	C	M	SiCL	saturated
			7.5YR4/6	5	C	M		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: None

Depth (Inches): ✓

Hydric Soil Present? Yes _____ No _____

Remarks:

- Area of test pit within floodplain of perennial stream and Mississippi river back wash causing frequent deposition in wetland area. High organic matter on surface in wetland area

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ✓ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ✓ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ✓ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ✓ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (Inches): ✓

Water Table Present? Yes ✓ No ___ Depth (Inches): 10

Saturation Present? (Includes capillary fringe) Yes ✓ No ___ Depth (Inches): 10

Wetland Hydrology Present? Yes ✓ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: N/A

Remarks:

- possible source of hydrology from abutting streams, upslope run-off and back wash from river

WIL-JJP-148A

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: STL City/County: Jersey Co Sampling Date: 3-14-2017
Applicant/Owner: SDIRP State: IL Sampling Point: wetland
Investigator(s): JJP-CDK Section, Township, Range: 26/12N/8W
Landform (hillslope, terrace, etc.): Depression on Floodplain Local relief (concave, convex, none): Concave
Slope (%): 0 Lat: 39.092082 Long: -90.386645 Datum: NAD83
Soil Map Unit Name: Blyton silt loam, 0-2% slopes, freq. flooded NWI classification: None
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks.)
Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____
Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No ____	Is the Sampled Area within a Wetland?	Yes X No ____
Hydric Soil Present?	Yes ✓ No ____		
Wetland Hydrology Present?	Yes ✓ No ____		

Remarks:
- Area sample point for PEM/Adjacent wetland WIL-JJP148.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30'r)	Absolute % Cover	Dominant Species?	Indicator Status
1. Juglans nigra	10	Y	FACU
2.			
3.			
4.			
5.			
	10 = Total Cover		

Sapling/Shrub Stratum (Plot size: 15'r)			
1.			
2.			
3. Absent			
4.			
5.			
	0 = Total Cover		

Herb Stratum (Plot size: 5'r)			
1. Persicaria Maculosa	10	Y	FACW
2. Symphyotrichum lanceolatum	5	Y	FAC
3. Penthorum sedoides	5	Y	OBL
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	20 = Total Cover		

Woody Vine Stratum (Plot size: 30'r)			
1. Absent			
2.			
	0 = Total Cover		

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)
Total Number of Dominant Species Across All Strata: 4 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 75% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals: (A)		(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:
___ 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤3.0[1]
___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No ____

Remarks: (Include photo numbers here or on a separate sheet.)
- None

WILWP148A

SOIL

Sampling Point: wetland

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3	10YR4/3	100	–	–	–	–	SCL	
3-17	10YR4/1	60	10YR4/6	10	C	M	SCL	
			7.5YR4/6	10	C	M		
			10YR3/1	20	D	M		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ✓ Loamy Gleyed Matrix (F2)
- ✓ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: None

Depth (inches): –

Hydric Soil Present? Yes ✓ No ___

Remarks:

- None

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ✓ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ✓ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ✓ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): –

Water Table Present? Yes ___ No ✓ Depth (inches): –

Saturation Present? (includes capillary fringe) Yes ___ No ✓ Depth (inches): –

Wetland Hydrology Present? Yes ✓ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: N/A

Remarks:

- wetland abuts SILCOK012 ext 1

WIL-SSP-149

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: STL City/County: Jersey Co Sampling Date: 11-15-2016
Applicant/Owner: SP, RP State: IL Sampling Point: wetland
Investigator(s): WP – TMA Section, Township, Range:
Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave
Slope (%): 3 Lat: 39.097207 Long: -90.387065 Datum: NAD83
Soil Map Unit Name: (9D2) Hickory silt loam, 10-18% slopes, eroded NWI classification: N/A
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks.)
Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____
Are Vagetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No ____	Is the Sampled Area within a Wetland? Yes ✓ No ____
Hydric Soil Present?	Yes ✓	No ____	
Wetland Hydrology Present?	Yes ✓	No ____	

Remarks:
- Area sample point for DCM/Abutting wetland WILJJP149
- wetland runs along roadside ditch and extends in agric. field

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30'r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3. Absent			
4.			
5.			
	0 = Total Cover		

Sapling/Shrub Stratum (Plot size: 15'r)			
1.			
2.			
3. Absent			
4.			
5.			
	0 = Total Cover		

Herb Stratum (Plot size: 5'r)			
1. Scirpus atrovirens	45	Y	OBL
2. Schedonorus arundinacea	20	Y	FACU
3. Leersia oryzoides	20	Y	OBL
4. Echinochloa crus-galli	10	N	FACW
5. Eupatorium fortunei	5	N	UPL
6. Symphyotrichum lanceolatum	5	N	FAC
7. Rumex obtusifolius	5	N	FAC
8.			
9.			
10.			
	100 = Total Cover		

Woody Vine Stratum (Plot size: 30'r)			
1. Absent			
2.			
	0 = Total Cover		

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)
Total Number of Dominant Species Across All Strata: 3 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:
___ 1 - Rapid Test for Hydrophytic Vegetation
___ 2 - Dominance Test is >60%
___ 3 - Prevalence Index ≤3.0[1]
___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No ____

Remarks: (Include photo numbers here or on a separate sheet.)
– None

WILJP149

SOIL

Sampling Point: wetland

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 4/3	90	7.5YR 4/6	10	C	PL-M	SiCL	
4-17	2.5Y 4/1		7.5YR 4/6	10	C	PL-M	SiCL	
			5YR 3/4	5	C	M		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ✓ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Menganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: None

Depth (inches): —

Hydric Soil Present? Yes ✓ No ___

Remarks:

- None

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ✓ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ✓ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ✓ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): ___

Water Table Present? Yes ✓ No ___ Depth (inches): 14"

Saturation Present? (includes capillary fringe) Yes ✓ No ___ Depth (inches): 12"

Wetland Hydrology Present? Yes ✓ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: N/A

Remarks:

- wetland abuts intermittent stream SILJP118

WIL JJP 151

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: STL City/County: Jersey Co. Sampling Date: 3/14/17
Applicant/Owner: Speir State: IL Sampling Point: PEM
Investigator(s): JJP / CDK Section, Township, Range: 11 / 12W / 7N
Landform (hillslope, terrace, etc.): Depression on floodplain Local relief (concave, convex, none): Concave
Slope (%): 0% Lat: 39.07147 Long: -90 39 17 14 Datum: NAD83
Soil Map Unit Name: Blyton silt loam, 0-2% slopes, frq. Flood NWI classification: None
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation N, Soil *Y, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No ____	Is the Sampled Area within a Wetland? Yes X No ____
Hydric Soil Present?	Yes X No ____	
Wetland Hydrology Present?	Yes X No ____	

Remarks: Depressional PEM wetland. Area disturbed: uneven topography, possibly old fallow field

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Absent	–	–	–
2.			
3.			
4.			
5.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1. Absent	–	–	–
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Phalaris arundinacea	30	Y	FACW
2. Lysimachia nummularia	10	Y	FACW
3. Cardamine hirsuta	10	Y	FACU
4. Symphyotrichum lanceolatum	10	Y	FAC
5. Artemisia annua	10	Y	FACU
6. Stellaria media	10	Y	FACU
7. Setaria viridis	5	N	UPL
8. Amaranthus tuberculatus	5	N	OBL
9.			
10.			
	90 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1. Absent	–	–	–
2.			
	0 = Total Cover		

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)
Total Number of Dominant Species Across All Strata: 6 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 50.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	5	x 1 =	5
FACW species	40	x 2 =	80
FAC species	10	x 3 =	30
FACU species	30	x 4 =	120
UPL species	5	x 5 =	25
Column Totals:	90 (A)		260 (B)

Prevalence Index = B/A = 2.88

Hydrophytic Vegetation Indicators:
__ 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
__ 3 - Prevalence Index is ≤3.0[1]
__ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: (Include photo numbers here or on a separate sheet.)

WIL-JJP-151

SOIL

Sampling Point: Wetland

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4"	10YR 3/2	98	10YR 3/4	2	C	M	SiCL	
4-17"	10YR 4/2	90	7.5YR 4/6	5	C	M/PL	SCL	
			7.5YR 3/4	5	C	M/PL		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: None

Depth (inches): -

Hydric Soil Present? Yes X No ___

Remarks:

None

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): -

Water Table Present? Yes ___ No X Depth (inches): -

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): -

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: N/A

Remarks:

WMU-JJP-126

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: STL NCE City/County: St. Louis Co Sampling Date: 3/15/17

Applicant/Owner: Spire State: MO Sampling Point: WetHand

Investigator(s): JJP/CDK Section, Township, Range: 15 / 7E / 47N

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave

Slope (%): 0% Lat: 38.81441 Long: -90.22084 Datum: NAD83

Soil Map Unit Name: Wilbur silt loam, 0-2% slopes, freq. flooded NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation N, Soil Y*, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No ____	Is the Sampled Area within a Wetland? Yes X No ____
Hydric Soil Present?	Yes X No ____	
Wetland Hydrology Present?	Yes X No ____	

Remarks:
Depressional PEM situated in a lawn.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Absent	—	—	—
2.			
3.			
4.			
5.			
	0 = Total Cover		

Sapling/Shrub Stratum (Plot size: 15')			
1. Absent	—	—	—
2.			
3.			
4.			
5.			
	0 = Total Cover		

Herb Stratum (Plot size: 5')			
1. Lysimachia nummularia	60	Y	FACW
2. Schedonorus arundinaceus	15	N	FACU
3. Echinochloa crus-galli	15	N	FACW
4. Aster sp. *	5*	*	*
5.			
6.			
7.			
8.			
9.			
10.			
	70 = Total Cover		

Woody Vine Stratum (Plot size: 30')			
1. Absent	—	—	—
2.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ____ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ____ 3 - Prevalence Index is ≤3.0[1]
- ____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: (Include photo numbers here or on a separate sheet.)
*Species not identified beyond genus level have been omitted from dominance and prevalence index calculations.

WMO-JJP-126

SOIL

Sampling Point: wetland

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-17"	2.5Y 4/1	90	7.5YR 4/6	5	C	M/PL	S:CL	
			7.5YR 3/4	5	C	M/PL		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: None

Depth (inches): —

Hydric Soil Present? Yes X No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): —

Water Table Present? Yes X No ___ Depth (inches): Surface

Saturation Present? (includes capillary fringe) Yes X No ___ Depth (inches): Surface

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: N/A

Remarks:

Abuts SMO-CDK-006

WMO-JJP-127

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: STL NCE City/County: St. Louis Co. Sampling Date: 3/15/17
Applicant/Owner: Spire State: MO Sampling Point: wetland
Investigator(s): JJP/CDK Section, Township, Range: 15/7E/47N
Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): concave
Slope (%): 0% Lat: 38.814409 Long: -90.219947 Datum: NAD83
Soil Map Unit Name: Wilbur silt loam, 0-2% slopes, frequently flooded NWI classification: none
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation Y*, Soil Y*, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	Is the Sampled Area within a Wetland? Yes X No ____
Hydric Soil Present?	Yes X	No ____	
Wetland Hydrology Present?	Yes X	No ____	

Remarks: Depressional PEM situated in a residential lawn; soil + veg disturbed

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30')			
1. Absent	—	—	—
2.			
3.			
4.			
5.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1. Absent	—	—	—
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Lysimachia nummularia	70	Y	FACW
2. Poa pratensis	20	Y	FAC
3. Rumex crispus	10	N	FAC
4. Schedonorus pratensis	10	N	FACU
5.			
6.			
7.			
8.			
9.			
10.			
	110 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1. Absent	—	—	—
2.			
	0 = Total Cover		

Remarks: (Include photo numbers here or on a separate sheet.)

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)
Total Number of Dominant Species Across All Strata: 2 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:
- ____ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ____ 3 - Prevalence Index is ≤3.0[1]
- ____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

WMO-JJ-127

SOIL

Sampling Point: Wetland

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-17"	10YR 3/2	90	10YR 3/4	10	C	M/PL	SCL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: None

Depth (inches): —

Hydric Soil Present? Yes X No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes X No ___ Depth (inches): 6in

Saturation Present? (includes capillary fringe) Yes X No ___ Depth (inches): 3in

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: N/A

Remarks:

Isolated

WMO-JJP-129 Ext 1

PSS

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: STL NCE City/County: St. Louis Co. Sampling Date: 3/16/17
Applicant/Owner: Spire State: Mo Sampling Point: PSS
Investigator(s): JJP / CDK Section, Township, Range: 1840
Landform (hillslope, terrace, etc.): Lacustrine Fringe Local relief (concave, convex, none): None
Slope (%): 0% Lat: 38.79886 Long: -90.193171 Datum: NAD83
Soil Map Unit Name: Menfro silt loam, karst, 9-35% slopes NWI classification: PUBGh
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	Is the Sampled Area within a Wetland? Yes X No ____
Hydric Soil Present?	Yes X	No ____	
Wetland Hydrology Present?	Yes X	No ____	

Remarks:
PSS fringe around lake.
* No soil data due to landowner request.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Salix nigra	10	Y	OBL
2.			
3.			
4.			
5.			
	10 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1. Cephalanthus occidentalis	5	Y	OBL
2. Juglans nigra	5	Y	FACU
3.			
4.			
5.			
	10 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Phalaris arundinacea	35	Y	FACW
2. Cinna arundinacea	15	Y	FACW
3. Elymus virginicus	15	Y	FACW
4. Carex sp. *	5*	*	*
5.			
6.			
7.			
8.			
9.			
10.			
	70* = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1. Absent			
2.			
	0 = Total Cover		

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)
Total Number of Dominant Species Across All Strata: 6 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 83.3% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:
___ 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤3.0[1]
___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: (Include photo numbers here or on a separate sheet.)
* Species not identified beyond genus level have been omitted from dominance and prevalence index calculations.

WMO-JJP-129 EXT1

SOIL

Sampling Point: PSS

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
*	NO DATA							

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Bleck Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Derk Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Derk Surface (F6)
- ___ Depleted Derk Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- X Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No ____

Remarks:

* No soil data by landowner request: golf course.

Soil assumed to be hydric: lake fringe.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Spersely Vegetated Concave Surface (B8)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches): —

Water Table Present? Yes X No ____ Depth (inches): Surface

Saturation Present? (includes capillary fringe) Yes X No ____ Depth (inches): Surface

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: N/A

Remarks:

VMO-JJP-129 + 130

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: STL NCF City/County: St. Louis Co. Sampling Date: 3/16/17
Applicant/Owner: Spire State: MO Sampling Point: PUB
Investigator(s): JJP / CDK Section, Township, Range: 1840
Landform (hillslope, terrace, etc.): Lacustrine Fringe Local relief (concave, convex, none): None
Slope (%): 2% Lat: 38.799849 Long: -90.192734 Datum: NAD83
Soil Map Unit Name: Menfro silt loam, karst, 9-35% slopes NWI classification: PUBGh
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation Y*, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	Is the Sampled Area within a Wetland? Yes X No ____
Hydric Soil Present?	Yes X	No ____	
Wetland Hydrology Present?	Yes X	No ____	

Remarks:
PUB around fringe of lake. NWI wetland.
* No soil data due to landowner request (golf course).

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30'r)	Absolute % Cover	Dominant Species?	Indicator Status
1. Absent			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15'r)			
1. Absent			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: 5'r)			
1. Absent			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	0 = Total Cover		
Woody Vine Stratum (Plot size: 30'r)			
1. Absent			
2.			
	0 = Total Cover		

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: ____ (A)
Total Number of Dominant Species Across All Strata: ____ (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: ____ (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:
___ 1 - Rapid Test for Hydrophytic Vegetation
___ 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤3.0[1]
___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
X Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: (Include photo numbers here or on a separate sheet.)
* No veg at time of survey, however area assumed to have hydrophytic vegetation present during the growing season

VMO-JJP-129+130

SOIL

Sampling Point: PUB

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
	No Data							

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- X Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No ____

Remarks:

*No soil data due to landowner request: golf course. Assumed to be hydric: fringe of lake.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches): ~

Water Table Present? Yes X No ____ Depth (inches): Surface

Saturation Present? (includes capillary fringe) Yes X No ____ Depth (inches): Surface

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: N/A

Remarks:

WMO-JJP-131

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: STL NCE City/County: St. Louis Co. Sampling Date: 3/17/17
Applicant/Owner: Spire State: Mo Sampling Point: Wetland
Investigator(s): JJP/CDK Section, Township, Range: 1838
Landform (hillslope, terrace, etc.): Depression on plain Local relief (concave, convex, none): Concave
Slope (%): 0% Lat: 38.881643 Long: -90.262542 Datum: NAD83
Soil Map Unit Name: Sans Dessein silty clay, 0-2% slopes NWI classification: None
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation Y*, Soil Y*, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	Is the Sampled Area within a Wetland? Yes X No ____
Hydric Soil Present?	Yes X	No ____	
Wetland Hydrology Present?	Yes X	No ____	

Remarks:
PEM situated in an agricultural field depression. Soil + veg disturbed.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Absent			
2.			
3.			
4.			
5.			
	0 = Total Cover		

Sapling/Shrub Stratum (Plot size: 15')			
1. Absent			
2.			
3.			
4.			
5.			
	0 = Total Cover		

Herb Stratum (Plot size: 5')			
1. Ammannia coccinea	5	Y	OBL
2. Rumex crispus	5	Y	FAC
3. Amaranthus tuberculatus	5	Y	OBL
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	15 = Total Cover		

Woody Vine Stratum (Plot size: 30')			
1. Absent			
2.			
	0 = Total Cover		

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)
Total Number of Dominant Species Across All Strata: 3 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:
X 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤3.0[1]
___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: (Include photo numbers here or on a separate sheet.)

VMO-JJP-131

SOIL

Sampling Point: PEM

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6"	10YR 3/1	98	10YR 3/4	2	C	M	SL	
6-17"	10YR 3/1	85	10YR 3/4	15	C	M	SCL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: None

Depth (inches): —

Hydric Soil Present? Yes X No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- X Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- X Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): —

Water Table Present? Yes ___ No X Depth (inches): —

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): —

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: N/A

Remarks:

Adjacent to pond.

WMO-JJP-132

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: STL NCE City/County: St. Louis Co. Sampling Date: 3/17/17
Applicant/Owner: Spire State: MO Sampling Point: PUB
Investigator(s): JJP / CDK Section, Township, Range: 0155
Landform (hillslope, terrace, etc.): Lacustrine fringe Local relief (concave, convex, none): Concave
Slope (%): 0 Lat: 38.800309 Long: -90.196151 Datum: NAD83
Soil Map Unit Name: Menfro silt loam, karst, 9-35% slopes NWI classification: L1UBHh
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	Is the Sampled Area within a Wetland? Yes X No ____
Hydric Soil Present?	Yes X	No ____	
Wetland Hydrology Present?	Yes X	No ____	

Remarks:
PUB situated on the fringe of a lake

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30')			
1. Absent	–	–	–
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1. Cephalanthus occidentalis	35	Y	OBL
2.			
3.			
4.			
5.			
	35 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Scirpus cyperinus	40	Y	OBL
2. Lonicera japonica	20	Y	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	60 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1. Absent	–	–	–
2.			
	0 = Total Cover		

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)
Total Number of Dominant Species Across All Strata: 3 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 66.7% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:
__ 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >60%
__ 3 - Prevalence Index is ≤3.0[1]
__ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: (Include photo numbers here or on a separate sheet.)

PMO-JJP - 132

SOIL

Sampling Point: PuB

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3"	10YR 4/2	95	7.5YR 4/6	5	C	M/PL	SCL	
3-17"	2.5Y 5/1	85	10YR 4/6	10	C	M/PL	SCL	
			7.5YR 4/6	5	C	M/PL		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: None

Depth (inches): -

Hydric Soil Present? Yes X No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): -

Water Table Present? Yes X No ___ Depth (inches): 6in

Saturation Present? (includes capillary fringe) Yes X No ___ Depth (inches): Surface

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: N/A

Remarks:

Abutting PMO-JJP-001

WMO-JJP - 133

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: STL NCE City/County: St. Louis Co. Sampling Date: 3/17/17
Applicant/Owner: Spire State: MO Sampling Point: PSS
Investigator(s): JJP / CDK Section, Township, Range: 0155
Landform (hillslope, terrace, etc.): Lacustrine fringe Local relief (concave, convex, none): None
Slope (%): 3% Lat: 38.801446 Long: -90.199097 Datum: NAD83
Soil Map Unit Name: Manfro silt loam, 14-20% slopes, eroded NWI classification: L1UBHh
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remerks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes X No ____
Hydric Soil Present? Yes X No ____
Wetland Hydrology Present? Yes X No ____
Is the Sampled Area within a Wetland? Yes X No ____

Remarks:
PSS situated on the fringe of a lake. NWI wetland.

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30')			
1. Absent	—	—	—
2.			
3.			
4.			
5.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1. Cephalanthus occidentalis	35	Y	OBL
2. Salix nigra	5	N	OBL
3. Ulmus americana	5	N	FACW
4.			
5.			
	45 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Lonicera japonica	40	Y	FACU
2. Arthraxon hispidus	10	N	FACW
3. Carex tribuloides	5	N	OBL
4. Impatiens capensis	5	N	FACW
5.			
6.			
7.			
8.			
9.			
10.			
	60 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1. Absent	—	—	—
2.			
	0 = Total Cover		

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)
Total Number of Dominant Species Across All Strata: 2 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 50% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species 45	x 1 =	45
FACW species 20	x 2 =	40
FAC species 0	x 3 =	0
FACU species 40	x 4 =	160
UPL species 0	x 5 =	0
Column Totals: 105 (A)		245 (B)

Prevalence Index = B/A = 2.33

Hydrophytic Vegetation Indicators:
__ 1 - Rapid Test for Hydrophytic Vegetation
__ 2 - Dominance Test is >50%
X 3 - Prevalence Index is ≤3.0[1]
__ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: (Include photo numbers here or on a separate sheet.)

VMO-JJP-133

SOIL

Sampling Point: PSS

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-3"	10YR 4/2	80	7.5YR 4/6	20	C	M/PL	SL	
3-17"	2.5Y 4/1	70	10YR 3/4	10	C	M	SCL	
			7.5YR 4/6	20	C	M/PL		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: None

Depth (Inches): —

Hydric Soil Present? Yes X No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): —

Water Table Present? Yes X No ___ Depth (inches): 6 in

Saturation Present? (includes capillary fringe) Yes X No ___ Depth (inches): Surface

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: N/A

Remarks:

Abuts PMO-JJP-001 EXT.

APPENDIX B
Upland Data Forms
(Additional Features Only)

gai consultants
transforming ideas into reality

WIL-CDK-100
UPL

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: STL City/County: Jersey Co Sampling Date: 3-14-2017
Applicant/Owner: Spire State: IL Sampling Point: upland
Investigator(s): JP-CDK Section, Township, Range: 2 | 12N 7W
Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): convex
Slope (%): 3% Lat: 39.079024 Long: -90.391895 Datum: NAD 83
Soil Map Unit Name: Elco silty clay loam, 5-10% slopes, severely eroded NWI classification: None
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks.)
Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____
Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No ✓	Is the Sampled Area within a Wetland? Yes ____ No ✓
Hydric Soil Present?	Yes ____	No ✓	
Wetland Hydrology Present?	Yes ____	No ✓	

Remarks:
- Area upland sample point for wetland WIL CDK100
- Area of sample point within active cattle pasture

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30' r)	Absolute % Cover	Dominant Species?	Indicator Status
1. Robinia pseudoacacia	10	Y	FACU
2.			
3.			
4.			
5.			
	10 = Total Cover		

Sapling/Shrub Stratum (Plot size: 15' r)			
1.			
2.			
3. Absent			
4.			
5.			
	0 = Total Cover		

Herb Stratum (Plot size: 5' r)			
1. Trifolium repens	60	Y	FACU
2. Poa annua	15	N	FACU
3. Setaria viridis	10	N	UPL
4. Taraxacum officinale	5	N	FACU
5.			
6.			
7.			
8.			
9.			
10.			
	90 = Total Cover		

Woody Vine Stratum (Plot size: 30' r)			
1.			
2. Absent			
	0 = Total Cover		

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)
Total Number of Dominant Species Across All Strata: 2 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	90	x 4 =	360
UPL species	10	x 5 =	50
Column Totals:	100 (A)		410 (B)

Prevalence Index = B/A = 4.10

Hydrophytic Vegetation Indicators:
___ 1 - Rapid Test for Hydrophytic Vegetation
___ 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤3.0[1]
___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No ✓

Remarks: (Include photo numbers here or on a separate sheet.)
- None

WTL CDK100

SOIL

Sampling Point: Upland

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 3/2	90	7.5YR 4/6	10	C	M-PL	SCL	
4-17	10YR 4/6	60	2.5Y 4/2	20	D	M	SCL	
			7.5YR 4/6	20	C	M		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: None

Depth (Inches): —

Hydric Soil Present? Yes ____ No ✓

Remarks:

- None

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No ✓ Depth (Inches): —

Water Table Present? Yes ____ No ✓ Depth (Inches): —

Saturation Present? (Includes capillary fringe) Yes ____ No ✓ Depth (inches): —

Wetland Hydrology Present? Yes ____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: None

Remarks:

- No hydrology indicators observed

WILJJP117

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: STL PIPELINE City/County: GREENE CO. Sampling Date: 11/20/2016

Applicant/Owner: SPIRE STL State: IL Sampling Point: UPLAND

Investigator(s): JJP/TMA Section, Township, Range: S34 | 10N | 18W

Landform (hillslope, terrace, etc.): HILLSLOPE Local relief (concave, convex, none): CONVEX

Slope (%): 2 Lat: 39.266094 Long: -90.41771 Datum: NAD83

Soil Map Unit Name: (279C2 Rozetta silt loam, 5-10% slopes, eroded) NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes Y No ____ (If no, explain in Remarks.)

Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	Is the Sampled Area within a Wetland? Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	

Remarks:

UPLAND DATA PT. FOR WETLAND WILJJP117.
@ AG FIELD PLANTED WITH ALFALFA.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2. NONE			
3.			
4.			
5.			
	0 = Total Cover		

Sapling/Shrub Stratum (Plot size: 15')			
1.			
2. NONE			
3.			
4.			
5.			
	0 = Total Cover		

Herb Stratum (Plot size: 5')			
1. MEDICAGO SATIVA	60	Y	FACU
2. LAMIUM AMPLEXICAULE	10	N	UPL
3. ELEUSINE INDICA	10	N	FACU
4. DACTYLIS GLOMERATA	10	Y	FACU
5.			
6.			
7.			
8.			
9.			
10.			
	90 = Total Cover		

Woody Vine Stratum (Plot size: 30')			
1. NONE			
2.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals: (A)		(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

__ 1 - Rapid Test for Hydrophytic Vegetation

__ 2 - Dominance Test is >50%

__ 3 - Prevalence Index is ≤3.0[1]

__ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

WILSSP117

SOIL

Sampling Point: UPLAND

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 4/3	85	10YR 5/2	10	C	D	SL	
			10YR 5/6	5	C	PL		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

None

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (Includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

None

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: STL/Principia City/County: Jersey Co Sampling Date: 6-5-2017
Applicant/Owner: Spire State: IL Sampling Point: upland
Investigator(s): JJP-WJW Section, Township, Range: 36/12N/9N
Landform (hillslope, terrace, etc.): Floodplain - Footslope Local relief (concave, convex, none): convex
Slope (%): 7 Lat: 38.956989 Long: -90.373662 Datum: NAD83
Soil Map Unit Name: (347A) Elsah gravelly loam, 0-2%, frequently flooded NWI classification: N/A
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks.)
Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____
Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No ✓	Is the Sampled Area within a Wetland? Yes ____ No ✓
Hydric Soil Present?	Yes ____	No ✓	
Wetland Hydrology Present?	Yes ____	No ✓	

Remarks:
- Area upland sample point for WETLJJP148

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30'r)	Absolute % Cover	Dominant Species?	Indicator Status
1. Carya glabra	15	Y	FACU
2. Asimina triloba	15	Y	FAC
3. Celtis laevigata	15	Y	FACW
4. Sassafras albidum	10	N	FACU
5. Acer negundo	5	N	FAC
	60	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15'r)			
1. Lonicera maackii	25	Y	UPL
2. Asimina triloba	5	N	FAC
3.			
4.			
5.			
	30	= Total Cover	

Herb Stratum (Plot size: 5'r)			
1. Lonicera maackii	5	Y	UPL
2. Perilla frutescens	5	Y	FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	10	= Total Cover	

Woody Vine Stratum (Plot size: 30'r)			
1. Absent			
2.			
	0	= Total Cover	

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)
Total Number of Dominant Species Across All Strata: 6 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:
___ 1 - Rapid Test for Hydrophytic Vegetation
___ 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤3.0[1]
___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No ____

Remarks: (Include photo numbers here or on a separate sheet.)
- None

WILJP148

SOIL

Sampling Point: upland

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR 3/2	100					SL	
10-17	10YR 4/4	65	10YR 3/2	35	D	M	SL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: None

Depth (Inches): /

Hydric Soil Present? Yes ____ No ____

Remarks:

— None

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No ✓ Depth (inches): ____

Water Table Present? Yes ____ No ✓ Depth (inches): ____

Saturation Present? (includes capillary fringe) Yes ____ No ✓ Depth (inches): ____

Wetland Hydrology Present? Yes ____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: N/A

Remarks:

— None

WIL-JJP-148A UPL

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: STL City/County: Jersey Co. Sampling Date: 3/14/17
Applicant/Owner: Soire State: IL Sampling Point: UPLAND
Investigator(s): JJP / CDK Section, Township, Range: 36 / 12W / 8N
Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex
Slope (%): 10% Lat: 39.09192 9 Long: -90.386791 Datum: NAD83
Soil Map Unit Name: Blyton silt loam, 0-2% slopes, Freq. Flooded NWI classification: None
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	Is the Sampled Area within a Wetland? Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	

Remarks:
Open pasture / forested hillslope
- upland representative to WIL-JJP-148 (PEM).

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30'r)	Absolute % Cover	Dominant Species?	Indicator Status
1. Juglans nigra	15	Y	FACW
2.			
3.			
4.			
5.			
	15	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15'r)			
1. Rosa multiflora	10	Y	FACU
2.			
3.			
4.			
5.			
	10	= Total Cover	
Herb Stratum (Plot size: 5'r)			
1. Schedonorus pratensis	50	Y	FACU
2. Solidago canadensis	15	N	FACU
3. Perilla frutescens	10	N	FAC
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	75	= Total Cover	
Woody Vine Stratum (Plot size: 30'r)			
1. Absent	-	-	-
2.			
	0	= Total Cover	

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)
Total Number of Dominant Species Across All Strata: 3 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	10	x 3 =	30
FACU species	90	x 4 =	360
UPL species	0	x 5 =	0
Column Totals:	100 (A)		390 (B)

Prevalence Index = B/A = 3.90

Hydrophytic Vegetation Indicators:
___ 1 - Rapid Test for Hydrophytic Vegetation
___ 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤3.0[1]
___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: (Include photo numbers here or on a separate sheet.)
No hydrophytic vegetation indicators observed.

WIL-JJP-148A

SOIL

Sampling Point: UPLAND

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4"	10YR 4/2	100	—	—	—	—	SL	
4-16in	10YR 4/4	100	—	—	—	—	SCL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Mengenese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: None

Depth (inches): —

Hydric Soil Present? Yes ___ No X

Remarks:

No hydric soil indicators observed.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheras on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): —

Water Table Present? Yes ___ No X Depth (inches): —

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): —

Wetland Hydrology Present? Yes ___ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: N/A

Remarks:

No hydrology indicators observed.

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: STL City/County: Jersey Sampling Date: 11-15-2016
Applicant/Owner: Spire State: IL Sampling Point: Upland
Investigator(s): JWP · TMA Section, Township, Range: 36/6N/12W
Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): convex
Slope (%): 5 Lat: 39.087369 Long: -90.387662 Datum: NAD83
Soil Map Unit Name: (8D2) Hickory silt loam 10-15% Slopes, eroded NWI classification: N/A
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks.)
Are Vegetation Y, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____
Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____ No ✓	Is the Sampled Area within a Wetland? Yes ____ No ✓
Hydric Soil Present?	Yes ____ No ✓	
Wetland Hydrology Present?	Yes ____ No ✓	

Remarks:
- Area upland sample point for wetland WILWP109 +149
- Area is located in active soybean field

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30'r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3. Absent			
4.			
5.			
	0 = Total Cover		

Sapling/Shrub Stratum (Plot size: 15'r)			
1.			
2.			
3. Absent			
4.			
5.			
	0 = Total Cover		

Herb Stratum (Plot size: 5'r)			
1. Lamium purpureum	25	Y	UPL
2. Erigeron annuus	10	Y	FACU
3. Stellaria media	5	N	FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	40 = Total Cover		

Woody Vine Stratum (Plot size: 30'r)			
1.			
2. Absent			
	0 = Total Cover		

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)
Total Number of Dominant Species Across All Strata: 2 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals: (A)		(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:
___ 1 - Rapid Test for Hydrophytic Vegetation
___ 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤3.0[1]
___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No ____

Remarks: (Include photo numbers here or on a separate sheet.)
- Senesed soybean plant stem throughout plot
- Area active soybean field.

WILJWP109

SOIL

Sampling Point: upland

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 3/3	100					SL	
6-17	10YR 4/6	80	10YR 3/2	20	D	M	SL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No _____ Depth (inches): _____

Water Table Present? Yes _____ No _____ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No _____ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

+ WIL-JJP-150+151
+ WIL-CDK-101 UPL

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: STL City/County: Jersey Co. Sampling Date: 3/14/17
Applicant/Owner: Spire State: IL Sampling Point: UPLAND
Investigator(s): JJP / CDK Section, Township, Range: 11 / 12N / 7W
Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): none
Slope (%): 3% Lat: 39.07089 Long: -90.39193 Datum: NAD83
Soil Map Unit Name: Blyton silt loam, 0-2% slopes, frq flooded NWI classification: None
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____ No X	
Hydric Soil Present?	Yes ____ No X	Is the Sampled Area within a Wetland? Yes ____ No X
Wetland Hydrology Present?	Yes ____ No X	

Remarks:
Upland representative to WIL-JJP-150/151 + WIL-CDK-101,

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30'r)	Absolute % Cover	Dominant Species?	Indicator Status
1. Juglans nigra	40	Y	FACU
2. Celtis occidentalis	10	N	FAC
3. Platanus occidentalis	5	N	FACW
4. Fraxinus pennsylvanica	5	N	FACW
5.			
	60	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15'r)			
1. Asimina triloba	10	Y	FAC
2. Lonicera maackii	5	Y	UPL
3.			
4.			
5.			
	15	= Total Cover	
Herb Stratum (Plot size: 5'r)			
1. Geum aderatum	10	Y	UPL
2. Allium vineale	5	Y	FACU
3. Ranunculus abortivus	5	Y	FACW
4. Osmorhiza claytonii	5	Y	FACU
5.			
6.			
7.			
8.			
9.			
10.			
	25	= Total Cover	
Woody Vine Stratum (Plot size: 30'r)			
1. Absent			
2.			
	0	= Total Cover	

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)
Total Number of Dominant Species Across All Strata: 7 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 28.6 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	15	x 2 =	30
FAC species	20	x 3 =	60
FACU species	50	x 4 =	200
UPL species	15	x 5 =	75
Column Totals:	100 (A)		365 (B)

Prevalence Index = B/A = 3.65

Hydrophytic Vegetation Indicators:
___ 1 - Rapid Test for Hydrophytic Vegetation
___ 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤3.0[1]
___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: (Include photo numbers here or on a separate sheet.)
No hydrophytic vegetation indicators observed.

WIL-JJP-150+151
WIL-CDK-101

SOIL

Sampling Point: UPLAND

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 3/2	100	-	-	-	-	SiCL	
6-17	10YR 3/3	80	10YR 4/4	20	C	M	SiCL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: None

Depth (Inches): -

Hydric Soil Present? Yes ____ No X

Remarks:

No hydric soil indicators observed.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches): -

Water Table Present? Yes ____ No X Depth (inches): -

Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches): -

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: N/A

Remarks:

None observed.

WMO-JJP-126 + 127
upland

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: STL NCE City/County: St. Louis Co. Sampling Date: 3/15/17
Applicant/Owner: Spire State: MO Sampling Point: UPLAND
Investigator(s): JJP/CDK Section, Township, Range: 15/17E/47N
Landform (hillslope, terrace, etc.): plain Local relief (concave, convex, none): none
Slope (%): 0 Lat: 38.814354 Long: -90.220484 Datum: NAD83
Soil Map Unit Name: Wilbur silt loam, 0-2% slopes, freq. flooded NWI classification: None
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	
Hydric Soil Present?	Yes X	No ____	Is the Sampled Area within a Wetland? Yes ____ No X
Wetland Hydrology Present?	Yes ____	No X	

Remarks:
upland representative to WMO-JJP-126 + 127.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30'r)	Absolute % Cover	Dominant Species?	Indicator Status
1. Absent	—	—	—
2.			
3.			
4.			
5.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15'r)			
1. Lonicera maackii	10	Y	UPL
2.			
3.			
4.			
5.			
	10 = Total Cover		
Herb Stratum (Plot size: 5'r)			
1. Tridens flavus	20	Y	UPL
2. Solidago canadensis	10	Y	FACU
3. Solanum carolinense	5	N	FACU
4. Schedonorus arundinaceus	10	Y	FACU
5. Symphyotrichum sp.*	5*	*	*
6.			
7.			
8.			
9.			
10.			
	45 = Total Cover		
Woody Vine Stratum (Plot size: 30'r)			
1. Absent	—	—	—
2.			
	0 = Total Cover		

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)
Total Number of Dominant Species Across All Strata: 4 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	25	x 4 =	100
UPL species	30	x 5 =	150
Column Totals:	55 (A)		250 (B)

Prevalence Index = B/A = 4.55

Hydrophytic Vegetation Indicators:
___ 1 - Rapid Test for Hydrophytic Vegetation
___ 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤3.0[1]
___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: (Include photo numbers here or on a separate sheet.)
Species not identified beyond genus level have been omitted from dominance and prevalence index calculations.

WMO-JJP-126+127

SOIL

Sampling Point: UPLAND

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-7	10YR 4/2	99	10YR 4/6	1	C	M	SL	
7-17	10YR 4/2	88	10YR 5/4	10	C	M	SCL	
			10YR 4/6	2	C	M		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: None

Depth (inches): —

Hydric Soil Present? Yes X No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): —

Water Table Present? Yes ___ No X Depth (inches): —

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): —

Wetland Hydrology Present? Yes ___ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: N/A

Remarks:

No hydro indicators observed

WMO-JJP-129 + 130
UPLAND

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: STL NCE City/County: St. Louis Co. Sampling Date: 3/16/17
Applicant/Owner: Spire State: MO Sampling Point: UPLAND
Investigator(s): JJP / CDK Section, Township, Range: 1840
Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): None
Slope (%): 4% Lat: 38.799811 Long: -90.192634 Datum: NAD83
Soil Map Unit Name: Menfro silt loam, karst, 9-35% slopes NWI classification: None
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	Is the Sampled Area within a Wetland? Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	

Remarks:
upland representative to WMO-JJP-129 + 130.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Ulmus rubra	10	Y	FAC
2.			
3.			
4.			
5.			
	10 = Total Cover		

Sapling/Shrub Stratum (Plot size: 15')			
1. Elaeagnus umbellata	10	Y	UPL
2. Ulmus rubra	5	Y	FAC
3.			
4.			
5.			
	15 = Total Cover		

Herb Stratum (Plot size: 5')			
1. Phalaris arundinacea	80	Y	FACW
2. Schedonorus arundinaceus	15	N	FACU
3. Lonicera japonica	15	N	FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	110 = Total Cover		

Woody Vine Stratum (Plot size: 30')			
1. Absent			
2.			
	0 = Total Cover		

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)
Total Number of Dominant Species Across All Strata: 4 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 75% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:
___ 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤3.0[1]
___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: (Include photo numbers here or on a separate sheet.)
No hydrophytic vegetation indicators observed.

VMO-JJP-129+130

SOIL

Sampling Point: UPLAND

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
*	NO DATA							

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Mangenese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- X Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ____ No X

Remarks:

* No soil data due to landowner request; golf course. Soil assumed to be non-hydric

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (Inches): ~

Water Table Present? Yes ____ No X Depth (inches): ~

Saturation Present? (includes capillary fringe) Yes ____ No X Depth (Inches): ~

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: N/A

Remarks:

No hydrology indicators observed.

WMO-JJP-131 UPL

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: STL : NCF City/County: St. Louis Co Sampling Date: 3/17/17
Applicant/Owner: Spire State: MO Sampling Point: UPLAND
Investigator(s): JJP / CDK Section, Township, Range: 1838
Landform (hillslope, terrace, etc.): Slope on plain Local relief (concave, convex, none): Concave
Slope (%): 3% Lat: 38.581994 Long: -90.262321 Datum: NAD83
Soil Map Unit Name: Sans Dessein silty clay 0-2% slopes NWI classification: n/a
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetetion N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	Is the Sampled Area within a Wetland? Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	

Remarks:
Upland representative to WMO-JJP-131. Edge of agricultural field

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30' r)			
1. Absent			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15' r)			
1. Absent			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: 5' r)			
1. Poa annua	60	Y	FACU
2. Setaria viridis	10	N	UPL
3. Cirsium sp. *	10*	N*	*
4. Lamium amplexicaule	10	N	UPL
5. Allium vineale	5	N	FACU
6. Amaranthus tuberculatus	5	N	OBL
7.			
8.			
9.			
10.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30' r)			
1. Absent			
2.			
	0 = Total Cover		

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)
Total Number of Dominant Species Across All Strata: 1 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	5	x 1 =	5
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	65	x 4 =	260
UPL species	20	x 5 =	100
Column Totals:	90 (A)		365 (B)

Prevalence Index = B/A = 4.06

Hydrophytic Vegetation Indicators:
___ 1 - Rapid Test for Hydrophytic Vegetation
___ 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤3.0[1]
___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: (Include photo numbers here or on a separate sheet.)
*Species not identified beyond genus level have been omitted from calculations.

WMO-JJP-131

SOIL

Sampling Point: UPLAND

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-19 in	10YR 3/1	100	-	-	-	-	SL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Bleck Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: None

Depth (inches): -

Hydric Soil Present? Yes ____ No X

Remarks:

No hydric soil indicators observed.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches): -

Water Table Present? Yes ____ No X Depth (inches): -

Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches): -

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: N/A

Remarks:

No hydro indicators observed.

WMO-JJP-132 UPL

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: STL NCE City/County: St. Louis Co Sampling Date: 3/17/17
Applicant/Owner: Spire State: MO Sampling Point: UPLAND
Investigator(s): JJP / CDK Section, Township, Range: 0155
Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): None
Slope (%): 6% Lat: 38.800283 Long: -90.196000 Datum: NAD83
Soil Map Unit Name: Menfro silt loam, karst, 9-35% slopes NWI classification: N/A
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	Is the Sampled Area within a Wetland? Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	

Remarks:
Upland representative to WMO-JJP-132. Forested hillslope.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30'r)	Absolute % Cover	Dominant Species?	Indicator Status
1. Quercus coccinea	40	Y	UPL
2. Diospyros virginiana	10	N	FAC
3. Sassafras albidum	10	N	FACU
4. Quercus imbricaria	5	N	FACU
5.			
	65	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15'r)			
1. Lonicera maackii	15	Y	UPL
2. Asimina triloba	5	Y	FAC
3.			
4.			
5.			
	20	= Total Cover	

Herb Stratum (Plot size: 5'r)			
1. Absent			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	0	= Total Cover	

Woody Vine Stratum (Plot size: 30'r)			
1. Absent			
2.			
	0	= Total Cover	

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)
Total Number of Dominant Species Across All Strata: 3 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 33.3% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	15	x 3 =	45
FACU species	15	x 4 =	60
UPL species	55	x 5 =	275
Column Totals:	85 (A)		380 (B)

Prevalence Index = B/A = 4.47

Hydrophytic Vegetation Indicators:
___ 1 - Rapid Test for Hydrophytic Vegetation
___ 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤3.0[1]
___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: (Include photo numbers here or on a separate sheet.)
No hydrophytic vegetation indicators observed.

WMO-JJP-132

SOIL

Sampling Point: UPLAND

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-10"	10YR 3/2	100	-	-	-	-	SL	
10-14"	10YR 4/3	100	-	-	-	-	SL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Root

Depth (inches): 14in

Hydric Soil Present? Yes ____ No X

Remarks:

No hydric soil indicators observed.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches): -

Water Table Present? Yes ____ No X Depth (inches): -

Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches): -

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

N/A

Remarks:

No hydrology indicators observed

WMO-JJP-133
UPL

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: STL NCE City/County: St. Louis Co. Sampling Date: 3/17/17
Applicant/Owner: Spire State: MO Sampling Point: UPLAND
Investigator(s): JJP/ CDK Section, Township, Range: 3097
Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): None
Slope (%): 5% Lat: 38.801678 Long: -90.198979 Datum: NAD83
Soil Map Unit Name: Menfro Silt loam, 14-20% slopes, eroded NWI classification: None
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)
Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	
Hydric Soil Present?	Yes X	No ____	Is the Sampled Area within a Wetland? Yes ____ No X
Wetland Hydrology Present?	Yes ____	No X	

Remarks:
Upland representative to WMO-JJP-133. Forested hillslope / county park.

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30' r)			
1. Ulmus americana	30	Y	FACW
2. Robinia Pseudoacacia	10	Y	FACU
3.			
4.			
5.			
	40	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15' r)			
1. Lonicera maackii	10	Y	UPL
2.			
3.			
4.			
5.			
	10	= Total Cover	
Herb Stratum (Plot size: 5' r)			
1. Poa annua	25	Y	FACU
2. Lonicera japonica	10	Y	FACU
3. Allium vineale	10	Y	FACU
4. Veronica serpyllifolia	10	Y	FACW
5. Trifolium repens	10	Y	FACU
6. Digitaria sanguinalis	10	Y	FACU
7. Arthraxon hispidus	5	N	FACW
8.			
9.			
10.			
	80	= Total Cover	
Woody Vine Stratum (Plot size: 30' r)			
1. Absent			
2.			
	0	= Total Cover	

Remarks: (Include photo numbers here or on a separate sheet.)
No hydrophytic veg. indicators observed.

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)
Total Number of Dominant Species Across All Strata: 9 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 22.2% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	45	x 2 =	90
FAC species	0	x 3 =	0
FACU species	175	x 4 =	300
UPL species	10	x 5 =	50
Column Totals:	130 (A)		440 (B)

Prevalence Index = B/A = 3.38

Hydrophytic Vegetation Indicators:
___ 1 - Rapid Test for Hydrophytic Vegetation
___ 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤3.0[1]
___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

LMO-JJP-133

SOIL

Sampling Point: UPLAND

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-10"	10YR 4/2	100	-	-	-	-	SL	
10-17"	10YR 4/2	80	10YR 5/4	15	C	M	SCL	
			10YR 4/6	5	C	M		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: None

Depth (Inches): -

Hydric Soil Present? Yes X No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): -

Water Table Present? Yes ___ No X Depth (inches): -

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): -

Wetland Hydrology Present? Yes ___ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: N/A

Remarks:

None observed.

APPENDIX C
Stream Data Forms
(Additional Features Only)

gai consultants
transforming ideas into reality

Spire STL Pipeline Stream Survey Data Collection Form

DATE: 11/5/16
REVIEWER(S): CDK/JTR
WEATHER CONDITIONS: 65°F
GAI STREAM ID: STL-CDK-022

STREAM TYPE: ☒ PERENNIAL ☐ INTERMITTENT ☐ EPHEMERAL
Stream crossed by centerline: ☒ YES ☐ NO
Stream crossed by access road: ☐ YES ☒ NO

PHOTOGRAPHS TAKEN:
#3207 - Upstream W #3208 - Downstream E #3209 - Impact Area S
X - Culvert Inflow # X - Culvert Outflow

FULLY FUNCTIONAL: ☐ YES ☒ NO
Considered fully functional if the following criteria are met:
1. Unaltered in any significant manner by human activities
2. Is stable and does not exhibit headcutting, incision, or excessive aggradation
3. Is connected to its overbank flood plain supporting normal hydrological functions
4. Has a riparian buffer of at least 25 ft in width
5. If stream segment is impacted by a minor structural alteration but otherwise fully functional and does not significantly alter stream segments above and below, then the alteration should be considered separate and moderately functional

MODERATELY FUNCTIONAL: ☐ YES ☒ NO
Considered moderately functional if the following are met:
1. Streams have been altered; however, system recovery has a moderate probability of occurring naturally
2. Streams support many, but not all, of the hydraulic and geomorphic functions characteristic of fully functioning streams of similar order in the watershed

FUNCTIONALLY IMPAIRED: ☒ YES ☐ NO
Considered functionally impaired if the stream has more than one of the following:
1. Has been channelized and shows no evidence of self-recovery
2. Is levee protected, impounded, or artificially constricted
3. Entrenched or contains active headcuts
4. Has little or no riparian buffer of deep-rooted vegetation on 1 or both sides of channel
5. Has banks that are extensively eroded or unstable, bank sloughing, erosional scars
6. Has 4 or greater stream impacts within 0.5 mile upstream of proposed stream impact, and stream impacts individually or cumulatively exceed 100 ft in length

GENERAL WATERSHED AND/OR RIPARIAN AREA CHARACTERISTICS WITHIN 100FT BUFFER

RIGHT BANK:
- ☒ FORESTED
- ☒ FARMLAND
- ☐ HAYFIELD
- ☐ INDUSTRIAL
- ☐ RESIDENTIAL
- ☐ WETLAND
- ☐ SCRUB/SHRUB
- ☐ PRAIRIE
- ☐ HIGH BLUFFS

LEFT BANK:
- ☒ FORESTED
- ☒ FARMLAND
- ☐ HAYFIELD
- ☐ INDUSTRIAL
- ☐ RESIDENTIAL
- ☐ WETLAND
- ☐ SCRUB/SHRUB
- ☐ PRAIRIE
- ☐ HIGH BLUFFS

Spire STL Pipeline Stream Survey Data Collection Form (PAGE 2)

DATE: 11/5/16
REVIEWER(S): CDK/JTR
GAI STREAM ID: STL-CDK-022

STREAM CHANNEL PROPERTIES WITH RESPECT TO TOP OF BANK (ESTIMATE):
Average bank-to-bank width (feet): 75 ; at centerline (feet): 75
Average bank height (feet): 7 ; at centerline (feet): 7'
Bottom width (feet): 50' Water width (feet): 20' Water depth (feet): 16 in
Ordinary High Water Mark (OHWM), if observed (feet): 65 ft ↔ 60 ft

FLOW CHARACTERISTICS:
Water present: ☐ NO WATER, STREAMBED DRY ☐ STREAMBED MOIST ☐ STANDING WATER ☒ FLOWING WATER
If flow present, estimate stage at time of survey: ☐ HIGH ☒ MEDIUM ☐ LOW
Average depth of water (feet): 16 in

BANK EROSION: ☐ EXTENSIVE ☒ MODERATE ☐ LITTLE / NONE
Explain (sloughing banks, exposed root wads, undercut banks, etc.): Scour, undercut banks, exposed roots

OBSERVED PRESENCE OF GROUNDWATER SEEPS: ☐ YES ☒ NO

OBSERVED PRESENCE OF SUBSURFACE FLOW: ☐ YES ☒ NO

WATER QUALITY CHARACTERISTICS:
Obvious siltation: ☐ YES ☒ NO
Observable water quality (siltation, water color is clear, discolored, oily film, scum, water odor; etc.): clear
Identify specific pollutants, if known:

AQUATIC PLANTS: none ☐ PERIPHYTON (brown or yellowish algae on rocks or substrate) ☐ FILAMENTOUS ALGAE ☐ MACROPHYTES

WETLAND FRINGE: ☒ YES ☐ ABUTTING or ☒ ADJACENT ☐ NO
Describe: PEM

BIOLOGICAL CHARACTERISTICS:
Macroinvertebrates observed? ☒ YES ☐ NO Describe: Bivalves
Fish or wildlife observed? ☒ YES ☐ NO Describe:
Habitat for:
Fish/spawn areas? ☐ YES ☐ NO

JURISDICTIONAL STATUS:
Is this stream jurisdictional? ☒ YES ☐ NO Describe:

OTHER OBSERVATIONS AND COMMENTS: Silt, sand, gravel, cobble

SIL-CDK-040

Spire STL Pipeline Stream Survey Data Collection Form

DATE: 3/14/17
REVIEWER(S): JJP / CDK
GAI STREAM ID: SIL-CDK-040

WEATHER CONDITIONS: 33°F High, <1 in Snow

STREAM TYPE: ☐ PERENNIAL ☐ INTERMITTENT ☒ EPHEMERAL
Stream crossed by centerline: ☐ YES ☒ NO
Stream crossed by access road: ☐ YES ☒ NO

PHOTOGRAPHS TAKEN:
#3796 - Upstream S #3797 - Downstream, N #3798 - across Impact Area, E
X - Culvert Inflow # X - Culvert Outflow

FULLY FUNCTIONAL: ☐ YES ☒ NO
Considered fully functional if the following criteria are met:
1. Unaltered in any significant manner by human activities
2. Is stable and does not exhibit headcutting, incision, or excessive aggradation
3. Is connected to its overbank flood plain supporting normal hydrological functions
4. Has a riparian buffer of at least 25 ft in width
5. If stream segment is impacted by a minor structural alteration but otherwise fully functional and does not significantly alter stream segments above and below, then the alteration should be considered separate and moderately functional

MODERATELY FUNCTIONAL: ☐ YES ☒ NO
Considered moderately functional if the following are met:
1. Streams have been altered; however, system recovery has a moderate probability of occurring naturally
2. Streams support many, but not all, of the hydraulic and geomorphic functions characteristic of fully functioning streams of similar order in the watershed

FUNCTIONALLY IMPAIRED: ☒ YES ☐ NO
Considered functionally impaired if the stream has more than one of the following:
1. Has been channelized and shows no evidence of self-recovery
2. Is levee protected, impounded, or artificially constricted
3. Entrenched or contains active headcuts
4. Has little or no riparian buffer of deep-rooted vegetation on 1 or both sides of channel
5. Has banks that are extensively eroded or unstable, bank sloughing, erosional scars .
6. Has 4 or greater stream impacts within 0.5 mile upstream of proposed stream impact, and stream impacts individually or cumulatively exceed 100 ft in length

GENERAL WATERSHED AND/OR RIPARIAN AREA CHARACTERISTICS WITHIN 100FT BUFFER

RIGHT BANK:
☒ FORESTED ☐ WETLAND
☐ FARMLAND ☐ SCRUB/SHRUB
☐ HAYFIELD ☐ PRAIRIE
☐ INDUSTRIAL ☐ HIGH BLUFFS
☐ RESIDENTIAL

LEFT BANK:
☒ FORESTED ☐ WETLAND
☐ FARMLAND ☐ SCRUB/SHRUB
☐ HAYFIELD ☐ PRAIRIE
☐ INDUSTRIAL ☐ HIGH BLUFFS
☐ RESIDENTIAL

SIL-CDK-040

Spire STL Pipeline Stream Survey Data Collection Form (PAGE 2)

DATE: 3/14/17
REVIEWER(S): JJT/CDK
GAI STREAM ID: SIL-CDK-040

STREAM CHANNEL PROPERTIES WITH RESPECT TO TOP OF BANK (ESTIMATE):
Average bank-to-bank width (feet): 2 ft; at centerline (feet): N/A
Average bank height (feet): 1 ft; at centerline (feet): N/A
Bottom width (feet): 1.5ft Water width (feet): dry Water depth (feet): dry
Ordinary High Water Mark (OHWM), if observed (feet): 2.5in ↔ 1.5ft

FLOW CHARACTERISTICS:
Water present: ☒ NO WATER, STREAMBED DRY ☐ STREAMBED MOIST ☐ STANDING WATER ☐ FLOWING WATER
If flow present, estimate stage at time of survey: ☐ HIGH ☐ MEDIUM ☒ LOW
Average depth of water (feet): dry

BANK EROSION: ☐ EXTENSIVE ☐ MODERATE ☒ LITTLE / NONE
Explain (sloughing banks, exposed root wads, undercut banks, etc.): Scour

OBSERVED PRESENCE OF GROUNDWATER SEEPS: ☐ YES ☒ NO

OBSERVED PRESENCE OF SUBSURFACE FLOW: ☐ YES ☒ NO

WATER QUALITY CHARACTERISTICS:
Obvious siltation: ☐ YES ☒ NO
Observable water quality (siltation, water color is clear, discolored, oily film, scum, water odor; etc.): dry
Identify specific pollutants, if known: None

AQUATIC PLANTS: ☐ PERIPHYTON (brown or yellowish algae on rocks or substrate) ☐ FILAMENTOUS ALGAE ☐ MACROPHYTES None

WETLAND FRINGE: ☐ YES ☐ ABUTTING or ☐ ADJACENT ☒ NO
Describe:

BIOLOGICAL CHARACTERISTICS:
Macroinvertebrates observed? ☐ YES ☒ NO Describe:
Fish or wildlife observed? ☐ YES ☒ NO Describe:
Habitat for:
Fish/spawn areas? ☐ YES ☒ NO

JURISDICTIONAL STATUS:
Is this stream jurisdictional? ☒ YES ☐ NO Describe:

OTHER OBSERVATIONS AND COMMENTS: None

SIL-CDK-041

Spire STL Pipeline Stream Survey Data Collection Form

DATE: 3/14/17
REVIEWER(S): JJP / CDK
GAI STREAM ID: SIL-CDK-041

WEATHER CONDITIONS: High 33°F, <1 in snow

STREAM TYPE: ☐ PERENNIAL ☐ INTERMITTENT ☒ EPHEMERAL
Stream crossed by centerline: ☐ YES ☒ NO
Stream crossed by access road: ☐ YES ☒ NO

PHOTOGRAPHS TAKEN:
3799 - Upstream, SSE # 3800 - Downstream, NNW # 3801 - ~~Impact Area~~ across, ENE
X - Culvert Inflow # X - Culvert Outflow

FULLY FUNCTIONAL: ☐ YES ☒ NO
Considered fully functional if the following criteria are met:
1. Unaltered in any significant manner by human activities
2. Is stable and does not exhibit headcutting, incision, or excessive aggradation
3. Is connected to its overbank flood plain supporting normal hydrological functions
4. Has a riparian buffer of at least 25 ft in width
5. If stream segment is impacted by a minor structural alteration but otherwise fully functional and does not significantly alter stream segments above and below, then the alteration should be considered separate and moderately functional

MODERATELY FUNCTIONAL: ☐ YES ☒ NO
Considered moderately functional if the following are met:
1. Streams have been altered; however, system recovery has a moderate probability of occurring naturally
2. Streams support many, but not all, of the hydraulic and geomorphic functions characteristic of fully functioning streams of similar order in the watershed

FUNCTIONALLY IMPAIRED: ☒ YES ☐ NO
Considered functionally impaired if the stream has more than one of the following:
1. Has been channelized and shows no evidence of self-recovery
2. Is levee protected, impounded, or artificially constricted
3. Entrenched or contains active headcuts
4. Has little or no riparian buffer of deep-rooted vegetation on 1 or both sides of channel
5. Has banks that are extensively eroded or unstable, bank sloughing, erosional scars
6. Has 4 or greater stream impacts within 0.5 mile upstream of proposed stream impact, and stream impacts individually or cumulatively exceed 100 ft in length

GENERAL WATERSHED AND/OR RIPARIAN AREA CHARACTERISTICS WITHIN 100FT BUFFER

RIGHT BANK:
☒ FORESTED ☐ WETLAND
☐ FARMLAND ☐ SCRUB/SHRUB
☐ HAYFIELD ☐ PRAIRIE
☐ INDUSTRIAL ☐ HIGH BLUFFS
☐ RESIDENTIAL

LEFT BANK:
☒ FORESTED ☐ WETLAND
☐ FARMLAND ☐ SCRUB/SHRUB
☐ HAYFIELD ☐ PRAIRIE
☐ INDUSTRIAL ☐ HIGH BLUFFS
☐ RESIDENTIAL

STL-CDK-041

Spire STL Pipeline Stream Survey Data Collection Form (PAGE 2)

DATE: 3/14/17
REVIEWER(S): CDK / JJP
GAI STREAM ID: STL-CDK-041

STREAM CHANNEL PROPERTIES WITH RESPECT TO TOP OF BANK (ESTIMATE):
Average bank-to-bank width (feet): 3ft ; at centerline (feet): N/A
Average bank height (feet): 0.5ft at centerline (feet): N/A
Bottom width (feet): 2.5ft Water width (feet): dry Water depth (feet): dry
Ordinary High Water Mark (OHWM), if observed (feet): ↕ 4in ↔ 2.5 ft.

FLOW CHARACTERISTICS:
Water present: ☒ NO WATER, STREAMBED DRY ☐ STREAMBED MOIST ☐ STANDING WATER ☐ FLOWING WATER
If flow present, estimate stage at time of survey: ☐ HIGH ☐ MEDIUM ☒ LOW
Average depth of water (feet): dry

BANK EROSION: ☐ EXTENSIVE ☐ MODERATE ☒ LITTLE / NONE
Explain (sloughing banks, exposed root wads, undercut banks, etc.): Scour

OBSERVED PRESENCE OF GROUNDWATER SEEPS: ☐ YES ☒ NO

OBSERVED PRESENCE OF SUBSURFACE FLOW: ☐ YES ☒ NO

WATER QUALITY CHARACTERISTICS:
Obvious siltation: ☐ YES ☒ NO
Observable water quality (siltation, water color is clear, discolored, oily film, scum, water odor; etc.): dry
Identify specific pollutants, if known: None

AQUATIC PLANTS: ☐ PERIPHYTON (brown or yellowish algae on rocks or substrate) ☐ FILAMENTOUS ALGAE ☐ MACROPHYTES None

WETLAND FRINGE: ☐ YES ☐ ABUTTING or ☐ ADJACENT ☒ NO
Describe:

BIOLOGICAL CHARACTERISTICS:
Macroinvertebrates observed? ☐ YES ☒ NO Describe:
Fish or wildlife observed? ☐ YES ☒ NO Describe:
Habitat for:
Fish/spawn areas? ☐ YES ☒ NO

JURISDICTIONAL STATUS:
Is this stream jurisdictional? ☒ YES ☐ NO Describe:

OTHER OBSERVATIONS AND COMMENTS: None

Spire STL Pipeline Stream Survey Data Collection Form

DATE: 3/14/17
REVIEWER(S): JJP / CDK
GAI STREAM ID: SIL-JJP-049

WEATHER CONDITIONS: 30°F, Light Snow

STREAM TYPE: ☐ PERENNIAL ☐ INTERMITTENT ☒ EPHEMERAL
Stream crossed by centerline: ☐ YES ☒ NO
Stream crossed by access road: ☐ YES ☒ NO

PHOTOGRAPHS TAKEN:
#7191 - Upstream S #7192 - Downstream N #7193 - Impact Area E
X - Culvert Inflow # X - Culvert Outflow

FULLY FUNCTIONAL: ☐ YES ☒ NO
Considered fully functional if the following criteria are met:
1. Unaltered in any significant manner by human activities
2. Is stable and does not exhibit headcutting, incision, or excessive aggradation
3. Is connected to its overbank flood plain supporting normal hydrological functions
4. Has a riparian buffer of at least 25 ft in width
5. If stream segment is impacted by a minor structural alteration but otherwise fully functional and does not significantly alter stream segments above and below, then the alteration should be considered separate and moderately functional

MODERATELY FUNCTIONAL: ☐ YES ☒ NO
Considered moderately functional if the following are met:
1. Streams have been altered; however, system recovery has a moderate probability of occurring naturally
2. Streams support many, but not all, of the hydraulic and geomorphic functions characteristic of fully functioning streams of similar order in the watershed

FUNCTIONALLY IMPAIRED: ☒ YES ☐ NO
Considered functionally impaired if the stream has more than one of the following:
1. Has been channelized and shows no evidence of self-recovery
2. Is levee protected, impounded, or artificially constricted
3. Entrenched or contains active headcuts
4. Has little or no riparian buffer of deep-rooted vegetation on 1 or both sides of channel
5. Has banks that are extensively eroded or unstable, bank sloughing, erosional scars
6. Has 4 or greater stream impacts within 0.5 mile upstream of proposed stream impact, and stream impacts individually or cumulatively exceed 100 ft in length

GENERAL WATERSHED AND/OR RIPARIAN AREA CHARACTERISTICS WITHIN 100FT BUFFER

RIGHT BANK:
☒ FORESTED ☐ WETLAND
☒ FARMLAND ☐ SCRUB/SHRUB
☐ HAYFIELD ☐ PRAIRIE
☐ INDUSTRIAL ☐ HIGH BLUFFS
☐ RESIDENTIAL

LEFT BANK:
☒ FORESTED ☐ WETLAND
☒ FARMLAND ☐ SCRUB/SHRUB
☐ HAYFIELD ☐ PRAIRIE
☐ INDUSTRIAL ☐ HIGH BLUFFS
☐ RESIDENTIAL

Spire STL Pipeline Stream Survey Data Collection Form (PAGE 2)

DATE: 3/14/17
REVIEWER(S): JJP / CDK
GAI STREAM ID: STL-JJP-049

STREAM CHANNEL PROPERTIES WITH RESPECT TO TOP OF BANK (ESTIMATE):
Average bank-to-bank width (feet): 3 ft ; at centerline (feet): N/A
Average bank height (feet): 3 ft ; at centerline (feet): N/A
Bottom width (feet): 1 ft Water width (feet): dry Water depth (feet): dry
Ordinary High Water Mark (OHWM), if observed (feet): 6in

FLOW CHARACTERISTICS:
Water present: ☒ NO WATER, STREAMBED DRY ☐ STREAMBED MOIST ☐ STANDING WATER ☐ FLOWING WATER
If flow present, estimate stage at time of survey: ☐ HIGH ☐ MEDIUM ☒ LOW
Average depth of water (feet): dry

BANK EROSION: ☐ EXTENSIVE ☐ MODERATE ☒ LITTLE / NONE
Explain (sloughing banks, exposed root wads, undercut banks, etc.): scour, headcut

OBSERVED PRESENCE OF GROUNDWATER SEEPS: ☐ YES ☒ NO

OBSERVED PRESENCE OF SUBSURFACE FLOW: ☐ YES ☒ NO

WATER QUALITY CHARACTERISTICS:
Obvious siltation: ☐ YES ☒ NO
Observable water quality (siltation, water color is clear, discolored, oily film, scum, water odor; etc.): dry
Identify specific pollutants, if known: None

AQUATIC PLANTS: ☐ PERIPHYTON (brown or yellowish algae on rocks or substrate) ☐ FILAMENTOUS ALGAE ☐ MACROPHYTES None

WETLAND FRINGE: ☐ YES ☐ ABUTTING or ☐ ADJACENT ☒ NO
Describe:

BIOLOGICAL CHARACTERISTICS:
Macroinvertebrates observed? ☐ YES ☒ NO Describe:
Fish or wildlife observed? ☐ YES ☒ NO Describe:
Habitat for:
Fish/spawn areas? ☐ YES ☒ NO

JURISDICTIONAL STATUS:
Is this stream jurisdictional? ☒ YES ☐ NO Describe:

OTHER OBSERVATIONS AND COMMENTS:

Spire STL Pipeline Stream Survey Data Collection Form

DATE: 3/14/17
REVIEWER(S): JJP/CDK
GAI STREAM ID: STL - JJP - 050

WEATHER CONDITIONS: 30°F, Light Snow

STREAM TYPE: ☐ PERENNIAL ☐ INTERMITTENT ☒ EPHEMERAL
Stream crossed by centerline: ☐ YES ☒ NO
Stream crossed by access road: ☐ YES ☒ NO

PHOTOGRAPHS TAKEN:
7195 - Upstream (E)
7196 - Downstream (W)
7197 - Impact Area (~)
X - Culvert Inflow
X - Culvert Outflow

FULLY FUNCTIONAL: ☐ YES ☒ NO
Considered fully functional if the following criteria are met:
1. Unaltered in any significant manner by human activities
2. Is stable and does not exhibit headcutting, incision, or excessive aggradation
3. Is connected to its overbank flood plain supporting normal hydrological functions
4. Has a riparian buffer of at least 25 ft in width
5. If stream segment is impacted by a minor structural alteration but otherwise fully functional and does not significantly alter stream segments above and below, then the alteration should be considered separate and moderately functional

MODERATELY FUNCTIONAL: ☐ YES ☒ NO
Considered moderately functional if the following are met:
1. Streams have been altered; however, system recovery has a moderate probability of occurring naturally
2. Streams support many, but not all, of the hydraulic and geomorphic functions characteristic of fully functioning streams of similar order in the watershed

FUNCTIONALLY IMPAIRED: ☒ YES ☐ NO
Considered functionally impaired if the stream has more than one of the following:
1. Has been channelized and shows no evidence of self-recovery
2. Is levee protected, impounded, or artificially constricted
3. Entrenched or contains active headcuts
4. Has little or no riparian buffer of deep-rooted vegetation on 1 or both sides of channel
5. Has banks that are extensively eroded or unstable, bank sloughing, erosional scars
6. Has 4 or greater stream impacts within 0.5 mile upstream of proposed stream impact, and stream impacts individually or cumulatively exceed 100 ft in length

GENERAL WATERSHED AND/OR RIPARIAN AREA CHARACTERISTICS WITHIN 100FT BUFFER

RIGHT BANK:
- ☒ FORESTED
- ☒ FARMLAND
- ☐ HAYFIELD
- ☐ INDUSTRIAL
- ☐ RESIDENTIAL
- ☐ WETLAND
- ☐ SCRUB/SHRUB
- ☐ PRAIRIE
- ☐ HIGH BLUFFS

LEFT BANK:
- ☒ FORESTED
- ☒ FARMLAND
- ☐ HAYFIELD
- ☐ INDUSTRIAL
- ☐ RESIDENTIAL
- ☐ WETLAND
- ☐ SCRUB/SHRUB
- ☐ PRAIRIE
- ☐ HIGH BLUFFS

Spire STL Pipeline Stream Survey Data Collection Form (PAGE 2)

DATE: 3/14/17
REVIEWER(S): JJH / CDK
GAI STREAM ID: STL-JJH-050

STREAM CHANNEL PROPERTIES WITH RESPECT TO TOP OF BANK (ESTIMATE):
Average bank-to-bank width (feet): 3 ft ; at centerline (feet): N/A
Average bank height (feet): 3 ft ; at centerline (feet): N/A
Bottom width (feet): 1.5 ft Water width (feet): dry Water depth (feet): dry
Ordinary High Water Mark (OHWM), if observed (feet): 4 in

FLOW CHARACTERISTICS:
Water present: ☒ NO WATER, STREAMBED DRY ☐ STREAMBED MOIST ☐ STANDING WATER ☐ FLOWING WATER
If flow present, estimate stage at time of survey: ☐ HIGH ☐ MEDIUM ☒ LOW
Average depth of water (feet): dry

BANK EROSION: ☐ EXTENSIVE ☐ MODERATE ☒ LITTLE / NONE
Explain (sloughing banks, exposed root wads, undercut banks, etc.): Scour

OBSERVED PRESENCE OF GROUNDWATER SEEPS: ☐ YES ☒ NO

OBSERVED PRESENCE OF SUBSURFACE FLOW: ☐ YES ☒ NO

WATER QUALITY CHARACTERISTICS:
Obvious siltation: ☐ YES ☒ NO
Observable water quality (siltation, water color is clear, discolored, oily film, scum, water odor; etc.): dry
Identify specific pollutants, if known: None

AQUATIC PLANTS: ☐ PERIPHYTON (brown or yellowish algae on rocks or substrate) ☐ FILAMENTOUS ALGAE ☐ MACROPHYTES

WETLAND FRINGE: ☐ YES ☐ ABUTTING or ☐ ADJACENT ☒ NO
Describe:

BIOLOGICAL CHARACTERISTICS:
Macroinvertebrates observed? ☐ YES ☒ NO Describe:
Fish or wildlife observed? ☐ YES ☒ NO Describe:
Habitat for:
Fish/spawn areas? ☐ YES ☒ NO

JURISDICTIONAL STATUS:
Is this stream jurisdictional? ☒ YES ☐ NO Describe:

OTHER OBSERVATIONS AND COMMENTS:

Spire STL Pipeline Stream Survey Data Collection Form

DATE: 3/14/17
REVIEWER(S): JJP / CDK
GAI STREAM ID: SIL-JJP-051

WEATHER CONDITIONS: 30°F, Light Snow

STREAM TYPE: ☐ PERENNIAL ☐ INTERMITTENT ☒ EPHEMERAL
Stream crossed by centerline: ☐ YES ☒ NO
Stream crossed by access road: ☐ YES ☒ NO

PHOTOGRAPHS TAKEN:
#7199 - Upstream ✓ #7200 - Downstream ✓ #7201 - Impact Area ✓
#____ - Culvert Inflow #____ - Culvert Outflow

FULLY FUNCTIONAL: ☐ YES ☒ NO
Considered fully functional if the following criteria are met:
1. Unaltered in any significant manner by human activities
2. Is stable and does not exhibit headcutting, incision, or excessive aggradation
3. Is connected to its overbank flood plain supporting normal hydrological functions
4. Has a riparian buffer of at least 25 ft in width
5. If stream segment is impacted by a minor structural alteration but otherwise fully functional and does not significantly alter stream segments above and below, then the alteration should be considered separate and moderately functional

MODERATELY FUNCTIONAL: ☐ YES ☒ NO
Considered moderately functional if the following are met:
1. Streams have been altered; however, system recovery has a moderate probability of occurring naturally
2. Streams support many, but not all, of the hydraulic and geomorphic functions characteristic of fully functioning streams of similar order in the watershed

FUNCTIONALLY IMPAIRED: ☒ YES ☐ NO
Considered functionally impaired if the stream has more than one of the following:
1. Has been channelized and shows no evidence of self-recovery
2. Is levee protected, impounded, or artificially constricted
3. Entrenched or contains active headcuts
4. Has little or no riparian buffer of deep-rooted vegetation on 1 or both sides of channel
5. Has banks that are extensively eroded or unstable, bank sloughing, erosional scars
6. Has 4 or greater stream impacts within 0.5 mile upstream of proposed stream impact, and stream impacts individually or cumulatively exceed 100 ft in length

GENERAL WATERSHED AND/OR RIPARIAN AREA CHARACTERISTICS WITHIN 100FT BUFFER

RIGHT BANK:
☒ FORESTED ☐ WETLAND
☒ FARMLAND ☐ SCRUB/SHRUB
☐ HAYFIELD ☐ PRAIRIE
☐ INDUSTRIAL ☐ HIGH BLUFFS
☐ RESIDENTIAL

LEFT BANK:
☒ FORESTED ☐ WETLAND
☒ FARMLAND ☐ SCRUB/SHRUB
☐ HAYFIELD ☐ PRAIRIE
☐ INDUSTRIAL ☐ HIGH BLUFFS
☐ RESIDENTIAL

Spire STL Pipeline Stream Survey Data Collection Form (PAGE 2)

DATE: 3/14/17
REVIEWER(S): JJP / CDK
GAI STREAM ID: SIL-JJP-051

STREAM CHANNEL PROPERTIES WITH RESPECT TO TOP OF BANK (ESTIMATE):
Average bank-to-bank width (feet): 4ft ; at centerline (feet): N/A
Average bank height (feet): 2ft ; at centerline (feet): N/A
Bottom width (feet): 1 ft Water width (feet): dry Water depth (feet): dry
Ordinary High Water Mark (OHWM), if observed (feet): 6in

FLOW CHARACTERISTICS:
Water present: ☒ NO WATER, STREAMBED DRY ☐ STREAMBED MOIST ☐ STANDING WATER ☐ FLOWING WATER
If flow present, estimate stage at time of survey: ☐ HIGH ☐ MEDIUM ☒ LOW
Average depth of water (feet): dry

BANK EROSION: ☐ EXTENSIVE ☐ MODERATE ☒ LITTLE / NONE
Explain (sloughing banks, exposed root wads, undercut banks, etc.): _____

OBSERVED PRESENCE OF GROUNDWATER SEEPS: ☐ YES ☒ NO

OBSERVED PRESENCE OF SUBSURFACE FLOW: ☐ YES ☒ NO

WATER QUALITY CHARACTERISTICS:
Obvious siltation: ☐ YES ☒ NO
Observable water quality (siltation, water color is clear, discolored, oily film, scum, water odor; etc.): dry
Identify specific pollutants, if known: none

AQUATIC PLANTS: ☐ PERIPHYTON (brown or yellowish algae on rocks or substrate) none ☐ FILAMENTOUS ALGAE ☐ MACROPHYTES

WETLAND FRINGE: ☐ YES ☐ ABUTTING or ☐ ADJACENT ☒ NO
Describe: _____

BIOLOGICAL CHARACTERISTICS:
Macroinvertebrates observed? ☐ YES ☒ NO Describe: _____
Fish or wildlife observed? ☐ YES ☒ NO Describe: _____
Habitat for: _____
Fish/spawn areas? ☐ YES ☒ NO

JURISDICTIONAL STATUS:
Is this stream jurisdictional? ☒ YES ☐ NO Describe: _____

OTHER OBSERVATIONS AND COMMENTS: _____

Spire STL Pipeline Stream Survey Data Collection Form

DATE: 3/14/17
REVIEWER(S): JJP / CDK
GAI STREAM ID: IL-JJP-052

WEATHER CONDITIONS: 30°F, Light Snow

STREAM TYPE: ☐ PERENNIAL ☐ INTERMITTENT ☒ EPHEMERAL
Stream crossed by centerline: ☒ YES ☐ NO
Stream crossed by access road: ☐ YES ☒ NO

PHOTOGRAPHS TAKEN:
#7207 - Upstream E #7208 - Downstream W #7211 - Impact Area N
#X - Culvert Inflow #X - Culvert Outflow

FULLY FUNCTIONAL: ☐ YES ☒ NO
Considered fully functional if the following criteria are met:
1. Unaltered in any significant manner by human activities
2. Is stable and does not exhibit headcutting, incision, or excessive aggradation
3. Is connected to its overbank flood plain supporting normal hydrological functions
4. Has a riparian buffer of at least 25 ft in width
5. If stream segment is impacted by a minor structural alteration but otherwise fully functional and does not significantly alter stream segments above and below, then the alteration should be considered separate and moderately functional

MODERATELY FUNCTIONAL: ☐ YES ☒ NO
Considered moderately functional if the following are met:
1. Streams have been altered; however, system recovery has a moderate probability of occurring naturally
2. Streams support many, but not all, of the hydraulic and geomorphic functions characteristic of fully functioning streams of similar order in the watershed

FUNCTIONALLY IMPAIRED: ☒ YES ☐ NO
Considered functionally impaired if the stream has more than one of the following:
1. Has been channelized and shows no evidence of self-recovery
2. Is levee protected, impounded, or artificially constricted
3. Entrenched or contains active headcuts
4. Has little or no riparian buffer of deep-rooted vegetation on 1 or both sides of channel
5. Has banks that are extensively eroded or unstable, bank sloughing, erosional scars
6. Has 4 or greater stream impacts within 0.5 mile upstream of proposed stream impact, and stream impacts individually or cumulatively exceed 100 ft in length

GENERAL WATERSHED AND/OR RIPARIAN AREA CHARACTERISTICS WITHIN 100FT BUFFER

RIGHT BANK:
☐ FORESTED ☐ WETLAND
☒ FARMLAND ☒ SCRUB/SHRUB
☐ HAYFIELD ☐ PRAIRIE
☐ INDUSTRIAL ☐ HIGH BLUFFS
☐ RESIDENTIAL

LEFT BANK:
☐ FORESTED ☐ WETLAND
☒ FARMLAND ☒ SCRUB/SHRUB
☐ HAYFIELD ☐ PRAIRIE
☐ INDUSTRIAL ☐ HIGH BLUFFS
☐ RESIDENTIAL

Spire STL Pipeline Stream Survey Data Collection Form (PAGE 2)

DATE: 3/14/17
REVIEWER(S): JJP / CDK
GAI STREAM ID: SIL-JJP-052

STREAM CHANNEL PROPERTIES WITH RESPECT TO TOP OF BANK (ESTIMATE):
Average bank-to-bank width (feet): 3 ft ; at centerline (feet): 3 ft
Average bank height (feet): 2.5 ft ; at centerline (feet): 2.5 ft
Bottom width (feet): 1 ft Water width (feet): dry Water depth (feet): dry
Ordinary High Water Mark (OHWM), if observed (feet): _____

FLOW CHARACTERISTICS:
Water present: ☒ NO WATER, STREAMBED DRY ☐ STREAMBED MOIST ☐ STANDING WATER ☐ FLOWING WATER
If flow present, estimate stage at time of survey: ☐ HIGH ☐ MEDIUM ☒ LOW
Average depth of water (feet): dry

BANK EROSION: ☐ EXTENSIVE ☐ MODERATE ☒ LITTLE / NONE
Explain (sloughing banks, exposed root wads, undercut banks, etc.): Scour

OBSERVED PRESENCE OF GROUNDWATER SEEPS: ☐ YES ☒ NO

OBSERVED PRESENCE OF SUBSURFACE FLOW: ☐ YES ☒ NO

WATER QUALITY CHARACTERISTICS:
Obvious siltation: ☐ YES ☒ NO
Observable water quality (siltation, water color is clear, discolored, oily film, scum, water odor; etc.): dry
Identify specific pollutants, if known: none

AQUATIC PLANTS: ☐ PERIPHYTON (brown or yellowish algae on rocks or substrate) None ☐ FILAMENTOUS ALGAE ☐ MACROPHYTES

WETLAND FRINGE: ☐ YES ☐ ABUTTING or ☐ ADJACENT ☒ NO
Describe: _____

BIOLOGICAL CHARACTERISTICS:
Macroinvertebrates observed? ☐ YES ☒ NO Describe: _____
Fish or wildlife observed? ☐ YES ☒ NO Describe: _____
Habitat for: _____
Fish/spawn areas? ☐ YES ☒ NO

JURISDICTIONAL STATUS:
Is this stream jurisdictional? ☒ YES ☐ NO Describe: _____

OTHER OBSERVATIONS AND COMMENTS: _____

Spire STL Pipeline Stream Survey Data Collection Form

DATE: 3/14/17
REVIEWER(S): JJP / CDK
GAI STREAM ID: SIL-JJP-053

WEATHER CONDITIONS: 30°F, Light Snow

STREAM TYPE: ☐ PERENNIAL ☒ INTERMITTENT ☐ EPHEMERAL
Stream crossed by centerline: ☐ YES ☒ NO
Stream crossed by access road: ☐ YES ☒ NO

PHOTOGRAPHS TAKEN:
7258 - Upstream E # 7259 - Downstream W # 7260 - Impact Area NW
X - Culvert Inflow # X - Culvert Outflow

FULLY FUNCTIONAL: ☐ YES ☒ NO
Considered fully functional if the following criteria are met:
1. Unaltered in any significant manner by human activities
2. Is stable and does not exhibit headcutting, incision, or excessive aggradation
3. Is connected to its overbank flood plain supporting normal hydrological functions
4. Has a riparian buffer of at least 25 ft in width
5. If stream segment is impacted by a minor structural alteration but otherwise fully functional and does not significantly alter stream segments above and below, then the alteration should be considered separate and moderately functional

MODERATELY FUNCTIONAL: ☐ YES ☒ NO
Considered moderately functional if the following are met:
1. Streams have been altered; however, system recovery has a moderate probability of occurring naturally
2. Streams support many, but not all, of the hydraulic and geomorphic functions characteristic of fully functioning streams of similar order in the watershed

FUNCTIONALLY IMPAIRED: ☒ YES ☐ NO
Considered functionally impaired if the stream has more than one of the following:
1. Has been channelized and shows no evidence of self-recovery
2. Is levee protected, impounded, or artificially constricted
3. Entrenched or contains active headcuts
4. Has little or no riparian buffer of deep-rooted vegetation on 1 or both sides of channel
5. Has banks that are extensively eroded or unstable, bank sloughing, erosional scars
6. Has 4 or greater stream impacts within 0.5 mile upstream of proposed stream impact, and stream impacts individually or cumulatively exceed 100 ft in length

GENERAL WATERSHED AND/OR RIPARIAN AREA CHARACTERISTICS WITHIN 100FT BUFFER

RIGHT BANK:
☐ FORESTED ☒ WETLAND
☒ FARMLAND ☐ SCRUB/SHRUB
☐ HAYFIELD ☐ PRAIRIE
☐ INDUSTRIAL ☐ HIGH BLUFFS
☐ RESIDENTIAL

LEFT BANK:
☐ FORESTED ☒ WETLAND
☒ FARMLAND ☐ SCRUB/SHRUB
☐ HAYFIELD ☐ PRAIRIE
☐ INDUSTRIAL ☐ HIGH BLUFFS
☐ RESIDENTIAL

Spire STL Pipeline Stream Survey Data Collection Form (PAGE 2)

DATE: 3/14/17
REVIEWER(S): JJP / CDK
GAI STREAM ID: SIL - JJP - 053

STREAM CHANNEL PROPERTIES WITH RESPECT TO TOP OF BANK (ESTIMATE):
Average bank-to-bank width (feet): 5 ft; at centerline (feet): n/a
Average bank height (feet): 3 ft; at centerline (feet): N/A
Bottom width (feet): 1 ft Water width (feet): 2 ft Water depth (feet): 2 in
Ordinary High Water Mark (OHWM), if observed (feet): 5 in

FLOW CHARACTERISTICS:
Water present: ☐ NO WATER, STREAMBED DRY ☐ STREAMBED MOIST ☐ STANDING WATER ☒ FLOWING WATER
If flow present, estimate stage at time of survey: ☐ HIGH ☐ MEDIUM ☒ LOW
Average depth of water (feet): 2 in

BANK EROSION: ☐ EXTENSIVE ☐ MODERATE ☒ LITTLE / NONE
Explain (sloughing banks, exposed root wads, undercut banks, etc.): Scour

OBSERVED PRESENCE OF GROUNDWATER SEEPS: ☐ YES ☒ NO

OBSERVED PRESENCE OF SUBSURFACE FLOW: ☐ YES ☒ NO

WATER QUALITY CHARACTERISTICS:
Obvious siltation: ☐ YES ☒ NO
Observable water quality (siltation, water color is clear, discolored, oily film, scum, water odor; etc.): clear
Identify specific pollutants, if known: None

AQUATIC PLANTS: ☐ PERIPHYTON (brown or yellowish algae on rocks or substrate) None ☐ FILAMENTOUS ALGAE ☐ MACROPHYTES

WETLAND FRINGE: ☒ YES ☒ ABUTTING or ☐ ADJACENT ☐ NO
Describe: SIL - JJP - 116 ext 1 (PEM)

BIOLOGICAL CHARACTERISTICS:
Macroinvertebrates observed? ☐ YES ☒ NO Describe:
Fish or wildlife observed? ☐ YES ☒ NO Describe:
Habitat for:
Fish/spawn areas? ☐ YES ☒ NO

JURISDICTIONAL STATUS:
Is this stream jurisdictional? ☒ YES ☐ NO Describe:

OTHER OBSERVATIONS AND COMMENTS:

Spire STL Pipeline Stream Survey Data Collection Form

DATE: 3/14/17
REVIEWER(S): JJP / CDK
GAI STREAM ID: STL-JJP-054
WEATHER CONDITIONS: 30°F, Light Snow

STREAM TYPE: ☒ PERENNIAL ☐ INTERMITTENT ☐ EPHEMERAL
Stream crossed by centerline: ☐ YES ☒ NO
Stream crossed by access road: ☐ YES ☒ NO

PHOTOGRAPHS TAKEN:
7263 - Upstream S # 7264 - Downstream N # 7265 - Impact Area E
X - Culvert Inflow # X - Culvert Outflow

FULLY FUNCTIONAL: ☐ YES ☒ NO
Considered fully functional if the following criteria are met:
1. Unaltered in any significant manner by human activities
2. Is stable and does not exhibit headcutting, incision, or excessive aggradation
3. Is connected to its overbank flood plain supporting normal hydrological functions
4. Has a riparian buffer of at least 25 ft in width
5. If stream segment is impacted by a minor structural alteration but otherwise fully functional and does not significantly alter stream segments above and below, then the alteration should be considered separate and moderately functional

MODERATELY FUNCTIONAL: ☐ YES ☒ NO
Considered moderately functional if the following are met:
1. Streams have been altered; however, system recovery has a moderate probability of occurring naturally
2. Streams support many, but not all, of the hydraulic and geomorphic functions characteristic of fully functioning streams of similar order in the watershed

FUNCTIONALLY IMPAIRED: ☒ YES ☐ NO
Considered functionally impaired if the stream has more than one of the following:
1. Has been channelized and shows no evidence of self-recovery
2. Is levee protected, impounded, or artificially constricted
3. Entrenched or contains active headcuts
4. Has little or no riparian buffer of deep-rooted vegetation on 1 or both sides of channel
5. Has banks that are extensively eroded or unstable, bank sloughing, erosional scars
6. Has 4 or greater stream impacts within 0.5 mile upstream of proposed stream impact, and stream impacts individually or cumulatively exceed 100 ft in length

GENERAL WATERSHED AND/OR RIPARIAN AREA CHARACTERISTICS WITHIN 100FT BUFFER

RIGHT BANK:
- ☐ FORESTED
- ☒ FARMLAND
- ☐ HAYFIELD
- ☐ INDUSTRIAL
- ☐ RESIDENTIAL
- ☐ WETLAND
- ☐ SCRUB/SHRUB
- ☐ PRAIRIE
- ☐ HIGH BLUFFS

LEFT BANK:
- ☐ FORESTED
- ☒ FARMLAND
- ☐ HAYFIELD
- ☐ INDUSTRIAL
- ☐ RESIDENTIAL
- ☐ WETLAND
- ☐ SCRUB/SHRUB
- ☐ PRAIRIE
- ☐ HIGH BLUFFS

Spire STL Pipeline Stream Survey Data Collection Form (PAGE 2)

DATE: 3/14/17
REVIEWER(S): JJP / CDK
GAI STREAM ID: STL-JJP-054

STREAM CHANNEL PROPERTIES WITH RESPECT TO TOP OF BANK (ESTIMATE):
Average bank-to-bank width (feet): 6ft ; at centerline (feet): N/A
Average bank height (feet): 5ft ; at centerline (feet): N/A
Bottom width (feet): 1ft Water width (feet): 0.5ft Water depth (feet): 3in
Ordinary High Water Mark (OHWM), if observed (feet): 12in

FLOW CHARACTERISTICS:
Water present: ☐ NO WATER, STREAMBED DRY ☐ STREAMBED MOIST ☐ STANDING WATER ☒ FLOWING WATER
If flow present, estimate stage at time of survey: ☐ HIGH ☐ MEDIUM ☒ LOW
Average depth of water (feet): 3in

BANK EROSION: ☐ EXTENSIVE ☐ MODERATE ☒ LITTLE / NONE
Explain (sloughing banks, exposed root wads, undercut banks, etc.): Scour

OBSERVED PRESENCE OF GROUNDWATER SEEPS: ☐ YES ☒ NO

OBSERVED PRESENCE OF SUBSURFACE FLOW: ☐ YES ☒ NO

WATER QUALITY CHARACTERISTICS:
Obvious siltation: ☒ YES ☐ NO
Observable water quality (siltation, water color is clear, discolored, oily film, scum, water odor; etc.):

Identify specific pollutants, if known: None

AQUATIC PLANTS: ☐ PERIPHYTON (brown or yellowish algae on rocks or substrate) None ☐ FILAMENTOUS ALGAE ☐ MACROPHYTES

WETLAND FRINGE: ☐ YES ☐ ABUTTING or ☐ ADJACENT ☒ NO
Describe:

BIOLOGICAL CHARACTERISTICS:
Macroinvertebrates observed? ☐ YES ☒ NO Describe:
Fish or wildlife observed? ☐ YES ☒ NO Describe:
Habitat for:
Fish/spawn areas? ☐ YES ☒ NO

JURISDICTIONAL STATUS:
Is this stream jurisdictional? ☒ YES ☐ NO Describe:

OTHER OBSERVATIONS AND COMMENTS:

IL-JJP-148 A

Spire STL Pipeline Stream Survey Data Collection Form

DATE: 3/14/17
REVIEWER(S): JJP / CDK
GAI STREAM ID: IL-JJP-148

WEATHER CONDITIONS: 30°F, Light Snow

STREAM TYPE: ☐ PERENNIAL ☐ INTERMITTENT ☒ EPHEMERAL
Stream crossed by centerline: ☒ YES ☐ NO moc 80
Stream crossed by access road: ☐ YES ☒ NO

PHOTOGRAPHS TAKEN:
7180 - Upstream NE # 7181 - Downstream SSW # 7182 - Impact Area
X - Culvert Inflow # X - Culvert Outflow

FULLY FUNCTIONAL: ☐ YES ☒ NO
Considered fully functional if the following criteria are met:
1. Unaltered in any significant manner by human activities
2. Is stable and does not exhibit headcutting, incision, or excessive aggradation
3. Is connected to its overbank flood plain supporting normal hydrological functions
4. Has a riparian buffer of at least 25 ft in width
5. If stream segment is impacted by a minor structural alteration but otherwise fully functional and does not significantly alter stream segments above and below, then the alteration should be considered separate and moderately functional

MODERATELY FUNCTIONAL: ☐ YES ☒ NO
Considered moderately functional if the following are met:
1. Streams have been altered; however, system recovery has a moderate probability of occurring naturally
2. Streams support many, but not all, of the hydraulic and geomorphic functions characteristic of fully functioning streams of similar order in the watershed

FUNCTIONALLY IMPAIRED: ☒ YES ☐ NO
Considered functionally impaired if the stream has more than one of the following:
1. Has been channelized and shows no evidence of self-recovery
2. Is levee protected, impounded, or artificially constricted
3. Entrenched or contains active headcuts
4. Has little or no riparian buffer of deep-rooted vegetation on 1 or both sides of channel
5. Has banks that are extensively eroded or unstable, bank sloughing, erosional scars
6. Has 4 or greater stream impacts within 0.5 mile upstream of proposed stream impact, and stream impacts individually or cumulatively exceed 100 ft in length

GENERAL WATERSHED AND/OR RIPARIAN AREA CHARACTERISTICS WITHIN 100FT BUFFER

RIGHT BANK:
- ☒ FORESTED
- ☒ FARMLAND
- ☐ HAYFIELD
- ☐ INDUSTRIAL
- ☐ RESIDENTIAL
- ☐ WETLAND
- ☐ SCRUB/SHRUB
- ☐ PRAIRIE
- ☐ HIGH BLUFFS

LEFT BANK:
- ☒ FORESTED
- ☒ FARMLAND
- ☐ HAYFIELD
- ☐ INDUSTRIAL
- ☐ RESIDENTIAL
- ☐ WETLAND
- ☐ SCRUB/SHRUB
- ☐ PRAIRIE
- ☐ HIGH BLUFFS

SIL-JJP-148A

Spire STL Pipeline Stream Survey Data Collection Form (PAGE 2)

DATE: 3/14/17
REVIEWER(S): JJP / CDK
GAI STREAM ID: SIL-JJP-148

STREAM CHANNEL PROPERTIES WITH RESPECT TO TOP OF BANK (ESTIMATE):
Average bank-to-bank width (feet): 6 ft ; at centerline (feet): 6 ft
Average bank height (feet): 6 ft ; at centerline (feet): 6 ft
Bottom width (feet): 2 ft Water width (feet): bed moist Water depth (feet): bed moist
Ordinary High Water Mark (OHWM), if observed (feet): 8 in

FLOW CHARACTERISTICS:
Water present: ☐ NO WATER, STREAMBED DRY ☒ STREAMBED MOIST ☐ STANDING WATER ☐ FLOWING WATER
If flow present, estimate stage at time of survey: ☐ HIGH ☐ MEDIUM ☒ LOW
Average depth of water (feet): bed moist

BANK EROSION: ☐ EXTENSIVE ☐ MODERATE ☒ LITTLE / NONE
Explain (sloughing banks, exposed root wads, undercut banks, etc.): Scour

OBSERVED PRESENCE OF GROUNDWATER SEEPS: ☐ YES ☒ NO

OBSERVED PRESENCE OF SUBSURFACE FLOW: ☐ YES ☒ NO

WATER QUALITY CHARACTERISTICS:
Obvious siltation: ☐ YES ☒ NO
Observable water quality (siltation, water color is clear, discolored, oily film, scum, water odor; etc.):
Identify specific pollutants, if known: Trash in channel

AQUATIC PLANTS: ☐ PERIPHYTON (brown or yellowish algae on rocks or substrate) None ☐ FILAMENTOUS ALGAE ☐ MACROPHYTES

WETLAND FRINGE: ☐ YES ☐ ABUTTING or ☐ ADJACENT ☒ NO
Describe:

BIOLOGICAL CHARACTERISTICS:
Macroinvertebrates observed? ☐ YES ☒ NO Describe:
Fish or wildlife observed? ☐ YES ☒ NO Describe:
Habitat for:
Fish/spawn areas? ☐ YES ☒ NO

JURISDICTIONAL STATUS:
Is this stream jurisdictional? ☒ YES ☐ NO Describe:

OTHER OBSERVATIONS AND COMMENTS: —

Spire STL Pipeline Stream Survey Data Collection Form

DATE: 6-5-2017
REVIEWER(S): JJP-WJW
GAI STREAM ID: STLJJP200

WEATHER CONDITIONS: Clean / 80°F / rain last 24 hrs

STREAM TYPE: [X] PERENNIAL [ ] INTERMITTENT [ ] EPHEMERAL
Stream crossed by centerline: [X] YES [ ] NO
Stream crossed by access road: [ ] YES [X] NO

PHOTOGRAPHS TAKEN:
#34 - Upstream NW #35 - Downstream SE #36 - Impact Area NE
#40 - Culvert Inflow 18"/metal #39 - Culvert Outflow
37 RB→SW/38 LB→NE

FULLY FUNCTIONAL: [ ] YES [X] NO @ CL
Considered fully functional if the following criteria are met:
1. Unaltered in any significant manner by human activities
2. Is stable and does not exhibit headcutting, incision, or excessive aggradation
3. Is connected to its overbank flood plain supporting normal hydrological functions
4. Has a riparian buffer of at least 25 ft in width
5. If stream segment is impacted by a minor structural alteration but otherwise fully functional and does not significantly alter stream segments above and below, then the alteration should be considered separate and moderately functional

MODERATELY FUNCTIONAL: [ ] YES [X] NO @ CL
Considered moderately functional if the following are met:
1. Streams have been altered; however, system recovery has a moderate probability of occurring naturally
2. Streams support many, but not all, of the hydraulic and geomorphic functions characteristic of fully functioning streams of similar order in the watershed

FUNCTIONALLY IMPAIRED: [X] YES [ ] NO @ CL
Considered functionally impaired if the stream has more than one of the following:
1. Has been channelized and shows no evidence of self-recovery
2. Is levee protected, impounded, or artificially constricted
3. Entrenched or contains active headcuts
4. Has little or no riparian buffer of deep-rooted vegetation on 1 or both sides of channel
5. Has banks that are extensively eroded or unstable, bank sloughing, erosional scars
6. Has 4 or greater stream impacts within 0.5 mile upstream of proposed stream impact, and stream impacts individually or cumulatively exceed 100 ft in length

GENERAL WATERSHED AND/OR RIPARIAN AREA CHARACTERISTICS WITHIN 100FT BUFFER

RIGHT BANK:
[ ] FORESTED [ ] WETLAND
[ ] FARMLAND [ ] SCRUB/SHRUB
[ ] HAYFIELD [ ] PRAIRIE
[ ] INDUSTRIAL [ ] HIGH BLUFFS
[ ] RESIDENTIAL highway roadside @ CL

LEFT BANK:
[X] FORESTED [ ] WETLAND
[ ] FARMLAND [ ] SCRUB/SHRUB
[ ] HAYFIELD [ ] PRAIRIE
[ ] INDUSTRIAL [ ] HIGH BLUFFS
[ ] RESIDENTIAL

Spire STL Pipeline Stream Survey Data Collection Form (PAGE 2)

DATE: 6-5-2017
REVIEWER(S): JWP, WJW
GAI STREAM ID: STLJJP200

STREAM CHANNEL PROPERTIES WITH RESPECT TO TOP OF BANK (ESTIMATE):
Average bank-to-bank width (feet): 4' ; at centerline (feet): 4'
Average bank height (feet): .8 ; at centerline (feet): .4
Bottom width (feet): .5 Water width (feet): 1' Water depth (feet): .2
Ordinary High Water Mark (OHWM), If observed (feet): 1' scour - destroyed veg

FLOW CHARACTERISTICS:
Water present: ☐ NO WATER, STREAMBED DRY ☐ STREAMBED MOIST ☐ STANDING WATER ☒ FLOWING WATER
If flow present, estimate stage at time of survey: ☐ HIGH ☐ MEDIUM ☒ LOW
Average depth of water (feet): .2

BANK EROSION: ☐ EXTENSIVE ☒ MODERATE ☐ LITTLE / NONE
Explain (sloughing banks, exposed root balls, undercut banks, etc.): extensive sediment deposition @ CL crossing / parallels road

OBSERVED PRESENCE OF GROUNDWATER SEEPS: ☐ YES ☒ NO

OBSERVED PRESENCE OF SUBSURFACE FLOW: ☐ YES ☒ NO (possible along existing pipeline ROW)

WATER QUALITY CHARACTERISTICS:
Obvious siltation: ☐ YES ☒ NO
Observable water quality (siltation, water color is clear, discolored, oily film, scum, water odor; etc.): —
Identify specific pollutants, if known: roadside run-off

AQUATIC PLANTS: ☐ PERIPHYTON (brown or yellowish algae on rocks or substrate) ☐ FILAMENTOUS ALGAE ☐ MACROPHYTES

WETLAND FRINGE: ☒ YES ☐ ABUTTING or ☐ ADJACENT ☐ NO
Describe: WTLJJP148 (PFO) abuts stream

BIOLOGICAL CHARACTERISTICS:
Macroinvertebrates observed? ☐ YES ☒ NO Describe: —
Fish or wildlife observed? ☐ YES ☒ NO Describe: —
Habitat for: NONE
Fish/spawn areas? ☐ YES ☒ NO

JURISDICTIONAL STATUS:
Is this stream jurisdictional? ☒ YES ☐ NO Describe: Trib of STLWJW010/ NHD stream

OTHER OBSERVATIONS AND COMMENTS: Stream channel manipulated throughout entire length from flag #5 - end from from existing pipeline construction / Possible stream could be classified as intermittent

Spire STL Pipeline Stream Survey Data Collection Form

DATE: 6-5-2017
REVIEWER(S): JJP-WJW
GAI STREAM ID: STLWP201

WEATHER CONDITIONS: Clear / 80°F / rain last 24 hrs

STREAM TYPE: ☐ PERENNIAL ☒ INTERMITTENT ☐ EPHEMERAL
Stream crossed by centerline: ☒ YES ☐ NO
Stream crossed by access road: ☐ YES ☒ NO

PHOTOGRAPHS TAKEN:
47 - Upstream SE # 48 - Downstream NW # 51 - Impact Area NNE
~ - Culvert Inflow # ~ - Culvert Outflow
49 RB → NE / 50 LB → SW

FULLY FUNCTIONAL: ☐ YES ☒ NO
Considered fully functional if the following criteria are met:
1. Unaltered in any significant manner by human activities
2. Is stable and does not exhibit headcutting, incision, or excessive aggradation
3. Is connected to its overbank flood plain supporting normal hydrological functions
4. Has a riparian buffer of at least 25 ft in width
5. If stream segment is impacted by a minor structural alteration but otherwise fully functional and does not significantly alter stream segments above and below, then the alteration should be considered separate and moderately functional

MODERATELY FUNCTIONAL: ☒ YES ☐ NO
Considered moderately functional if the following are met:
1. Streams have been altered; however, system recovery has a moderate probability of occurring naturally
2. Streams support many, but not all, of the hydraulic and geomorphic functions characteristic of fully functioning streams of similar order in the watershed

FUNCTIONALLY IMPAIRED: ☐ YES ☒ NO
Considered functionally impaired if the stream has more than one of the following:
1. Has been channelized and shows no evidence of self-recovery
2. Is levee protected, impounded, or artificially constricted
3. Entrenched or contains active headcuts
4. Has little or no riparian buffer of deep-rooted vegetation on 1 or both sides of channel
5. Has banks that are extensively eroded or unstable, bank sloughing, erosional scars
6. Has 4 or greater stream impacts within 0.5 mile upstream of proposed stream impact, and stream impacts individually or cumulatively exceed 100 ft in length

GENERAL WATERSHED AND/OR RIPARIAN AREA CHARACTERISTICS WITHIN 100FT BUFFER

RIGHT BANK:
☒ FORESTED ☐ WETLAND
☐ FARMLAND ☐ SCRUB/SHRUB
☐ HAYFIELD ☐ PRAIRIE
☐ INDUSTRIAL ☐ HIGH BLUFFS
☐ RESIDENTIAL
Floodplain

LEFT BANK:
☒ FORESTED ☐ WETLAND
☐ FARMLAND ☐ SCRUB/SHRUB
☐ HAYFIELD ☐ PRAIRIE
☐ INDUSTRIAL ☐ HIGH BLUFFS
☐ RESIDENTIAL
Floodplain

Spire STL Pipeline Stream Survey Data Collection Form (PAGE 2)

DATE: 6-5-2017
REVIEWER(S): JJP-WJW
GAI STREAM ID: STLJJP701

STREAM CHANNEL PROPERTIES WITH RESPECT TO TOP OF BANK (ESTIMATE):
Average bank-to-bank width (feet): 5 ; at centerline (feet): 4
Average bank height (feet): 1 ; at centerline (feet): 1
Bottom width (feet): 1' Water width (feet): 1 Water depth (feet): .2
Ordinary High Water Mark (OHWM), if observed (feet): 1.5 leaf wash - scour

FLOW CHARACTERISTICS:
Water present: ☐ NO WATER, STREAMBED DRY ☐ STREAMBED MOIST ☐ STANDING WATER ☒ FLOWING WATER from Pt #3 downstream
If flow present, estimate stage at time of survey: ☐ HIGH ☐ MEDIUM ☒ LOW
Average depth of water (feet): .2

BANK EROSION: ☐ EXTENSIVE ☐ MODERATE ☒ LITTLE / NONE
Explain (sloughing banks, exposed root wads, undercut banks, etc.): exposed bedrock / some scour

OBSERVED PRESENCE OF GROUNDWATER SEEPS: ☐ YES ☒ NO

OBSERVED PRESENCE OF SUBSURFACE FLOW: ☐ YES ☒ NO

WATER QUALITY CHARACTERISTICS:
Obvious siltation: ☐ YES ☒ NO
Observable water quality (siltation, water color is clear, discolored, oily film, scum, water odor; etc.): None

Identify specific pollutants, if known: None observed

AQUATIC PLANTS: ☐ PERIPHYTON (brown or yellowish algae on rocks or substrate) ☐ FILAMENTOUS ALGAE ☐ MACROPHYTES

WETLAND FRINGE: ☐ YES ☐ ABUTTING or ☐ ADJACENT ☒ NO
Describe: None

BIOLOGICAL CHARACTERISTICS:
Macroinvertebrates observed? ☐ YES ☒ NO Describe: none
Fish or wildlife observed? ☐ YES ☒ NO Describe: —
Habitat for: None
Fish/spawn areas? ☐ YES ☒ NO

JURISDICTIONAL STATUS:
Is this stream jurisdictional? ☒ YES ☐ NO Describe: Trib of STLWJW011

OTHER OBSERVATIONS AND COMMENTS: Boulder - bedrock - cobble - gravel sand substrate / many areas of channel shelving only bedrock

Spire STL Pipeline Stream Survey Data Collection Form

DATE: 6-5-2017
REVIEWER(S): JJP-WJW
GAI STREAM ID: STLJJP202

WEATHER CONDITIONS: clear / 80°F / Rain last 24 hrs

STREAM TYPE: ☐ PERENNIAL ☐ INTERMITTENT ☒ EPHEMERAL
Stream crossed by centerline: ☐ YES ☒ NO
Stream crossed by access road: ☐ YES ☒ NO

PHOTOGRAPHS TAKEN:
#56 - Upstream N #57 - Downstream S #— - Impact Area
#— - Culvert Inflow #— - Culvert Outflow 58 RB→W / 59 LB→E

FULLY FUNCTIONAL: ☐ YES ☒ NO
Considered fully functional if the following criteria are met:
1. Unaltered in any significant manner by human activities
2. Is stable and does not exhibit headcutting, incision, or excessive aggradation
3. Is connected to its overbank flood plain supporting normal hydrological functions
4. Has a riparian buffer of at least 25 ft in width
5. If stream segment is impacted by a minor structural alteration but otherwise fully functional and does not significantly alter stream segments above and below, then the alteration should be considered separate and moderately functional

MODERATELY FUNCTIONAL: ☐ YES ☒ NO
Considered moderately functional if the following are met:
1. Streams have been altered; however, system recovery has a moderate probability of occurring naturally
2. Streams support many, but not all, of the hydraulic and geomorphic functions characteristic of fully functioning streams of similar order in the watershed

FUNCTIONALLY IMPAIRED: ☒ YES ☐ NO
Considered functionally impaired if the stream has more than one of the following:
1. Has been channelized and shows no evidence of self-recovery
2. Is levee protected, impounded, or artificially constricted
3. Entrenched or contains active headcuts
4. Has little or no riparian buffer of deep-rooted vegetation on 1 or both sides of channel
5. Has banks that are extensively eroded or unstable, bank sloughing, erosional scars
6. Has 4 or greater stream impacts within 0.5 mile upstream of proposed stream impact, and stream impacts individually or cumulatively exceed 100 ft in length

GENERAL WATERSHED AND/OR RIPARIAN AREA CHARACTERISTICS WITHIN 100FT BUFFER

RIGHT BANK:
☒ FORESTED ☐ WETLAND
☐ FARMLAND ☐ SCRUB/SHRUB
☐ HAYFIELD ☐ PRAIRIE
☐ INDUSTRIAL ☐ HIGH BLUFFS
☐ RESIDENTIAL

LEFT BANK:
☐ FORESTED ☐ WETLAND
☐ FARMLAND ☐ SCRUB/SHRUB
☐ HAYFIELD ☐ PRAIRIE
☐ INDUSTRIAL ☐ HIGH BLUFFS
☐ RESIDENTIAL Pipe line ROW (Anthropogenic Grassland)

Spire STL Pipeline Stream Survey Data Collection Form (PAGE 2)

DATE: 6-5-2017
REVIEWER(S): JJP - WJW
GAI STREAM ID: STLJJP202

STREAM CHANNEL PROPERTIES WITH RESPECT TO TOP OF BANK (ESTIMATE):
Average bank-to-bank width (feet): 2 ; at centerline (feet): —
Average bank height (feet): .4 ; at centerline (feet): —
Bottom width (feet): .4 Water width (feet): .4 Water depth (feet): <.2
Ordinary High Water Mark (OHWM), If observed (feet): .4 scour

FLOW CHARACTERISTICS:
Water present: ☐ NO WATER, STREAMBED DRY ☐ STREAMBED MOIST ☐ STANDING WATER ☒ FLOWING WATER
If flow present, estimate stage at time of survey: ☐ HIGH ☐ MEDIUM ☒ LOW very low
Average depth of water (feet): <.2

BANK EROSION: ☐ EXTENSIVE ☐ MODERATE ☒ LITTLE / NONE
Explain (sloughing banks, exposed root wads, undercut banks, etc.): slight scour & veg wash

OBSERVED PRESENCE OF GROUNDWATER SEEPS: ☐ YES ☒ NO

OBSERVED PRESENCE OF SUBSURFACE FLOW: ☐ YES ☒ NO

WATER QUALITY CHARACTERISTICS:
Obvious siltation: ☐ YES ☒ NO
Observable water quality (siltation, water color is clear, discolored, oily film, scum, water odor; etc.): none

Identify specific pollutants, if known: None observed

AQUATIC PLANTS: ☐ PERIPHYTON (brown or yellowish algae on rocks or substrate) ☐ FILAMENTOUS ALGAE ☐ MACROPHYTES

WETLAND FRINGE: ☐ YES ☐ ABUTTING or ☐ ADJACENT ☒ NO
Describe: none

BIOLOGICAL CHARACTERISTICS:
Macroinvertebrates observed? ☐ YES ☒ NO Describe: —
Fish or wildlife observed? ☐ YES ☒ NO Describe: —
Habitat for: none
Fish/spawn areas? ☐ YES ☒ NO

JURISDICTIONAL STATUS:
Is this stream jurisdictional? ☒ YES ☐ NO Describe: Trib of NHD stream STLJJP200

OTHER OBSERVATIONS AND COMMENTS: Possible stream channel formed due to the diversion of stream STLJJP200 as channel was interrupted @ pipeline ROW edge. Stream runs along foot of slope parallel to existing pipeline ROW.

Spire STL Pipeline Stream Survey Data Collection Form

DATE: 6-5-2017
REVIEWER(S): JNP-WJW
GAI STREAM ID: STLWJP103

WEATHER CONDITIONS: Clear / 80° F / Rain last 24hrs

STREAM TYPE: ☐ PERENNIAL ☒ INTERMITTENT ☐ EPHEMERAL
Stream crossed by centerline: ☒ YES ☐ NO
Stream crossed by access road: ☐ YES ☒ NO

PHOTOGRAPHS TAKEN:
#60 - Upstream NE #61 - Downstream SW #64 - Impact Area N
#✓ - Culvert Inflow #✓ - Culvert Outflow
62RB→NNW / 63LB→SSW

FULLY FUNCTIONAL: ☐ YES ☒ NO
Considered fully functional if the following criteria are met:
1. Unaltered in any significant manner by human activities
2. Is stable and does not exhibit headcutting, incision, or excessive aggradation
3. Is connected to its overbank flood plain supporting normal hydrological functions
4. Has a riparian buffer of at least 25 ft in width
5. If stream segment is impacted by a minor structural alteration but otherwise fully functional and does not significantly alter stream segments above and below, then the alteration should be considered separate and moderately functional

MODERATELY FUNCTIONAL: ☒ YES ☐ NO
Considered moderately functional if the following are met:
1. Streams have been altered; however, system recovery has a moderate probability of occurring naturally
2. Streams support many, but not all, of the hydraulic and geomorphic functions characteristic of fully functioning streams of similar order in the watershed

FUNCTIONALLY IMPAIRED: ☐ YES ☒ NO
Considered functionally impaired if the stream has more than one of the following:
1. Has been channelized and shows no evidence of self-recovery
2. Is levee protected, impounded, or artificially constricted
3. Entrenched or contains active headcuts
4. Has little or no riparian buffer of deep-rooted vegetation on 1 or both sides of channel
5. Has banks that are extensively eroded or unstable, bank sloughing, erosional scars
6. Has 4 or greater stream impacts within 0.5 mile upstream of proposed stream impact, and stream impacts individually or cumulatively exceed 100 ft in length

GENERAL WATERSHED AND/OR RIPARIAN AREA CHARACTERISTICS WITHIN 100FT BUFFER

RIGHT BANK:		LEFT BANK:	
☒ FORESTED	☐ WETLAND	☒ FORESTED	☐ WETLAND
☐ FARMLAND	☐ SCRUB/SHRUB	☐ FARMLAND	☐ SCRUB/SHRUB
☐ HAYFIELD	☐ PRAIRIE	☐ HAYFIELD	☐ PRAIRIE
☐ INDUSTRIAL	☐ HIGH BLUFFS	☐ INDUSTRIAL	☐ HIGH BLUFFS
☐ RESIDENTIAL		☐ RESIDENTIAL	

* within a ravine (forested)

Spire STL Pipeline Stream Survey Data Collection Form (PAGE 2)

DATE: 6-5-2017
REVIEWER(S): JVP-WJW
GAI STREAM ID: STLJVP203

STREAM CHANNEL PROPERTIES WITH RESPECT TO TOP OF BANK (ESTIMATE):
Average bank-to-bank width (feet): 5 ; at centerline (feet): 5
Average bank height (feet): 1.5 ; at centerline (feet): 1.5
Bottom width (feet): 1.5 Water width (feet): 1.5 Water depth (feet): .5
Ordinary High Water Mark (OHWM), if observed (feet): 5 scour & Leaf wash

FLOW CHARACTERISTICS:
Water present: ☐ NO WATER, STREAMBED DRY ☐ STREAMBED MOIST ☐ STANDING WATER ☒ FLOWING WATER
If flow present, estimate stage at time of survey: ☐ HIGH ☐ MEDIUM ☒ LOW
Average depth of water (feet): .5

BANK EROSION: ☐ EXTENSIVE ☐ MODERATE ☒ LITTLE / NONE some scour
Explain (sloughing banks, exposed root wads, undercut banks, etc.):

OBSERVED PRESENCE OF GROUNDWATER SEEPS: ☐ YES ☒ NO

OBSERVED PRESENCE OF SUBSURFACE FLOW: ☐ YES ☒ NO

WATER QUALITY CHARACTERISTICS:
Obvious siltation: ☐ YES ☒ NO
Observable water quality (siltation, water color is clear, discolored, oily film, scum, water odor; etc.): clear
Identify specific pollutants, if known: none observed

AQUATIC PLANTS: ☐ PERIPHYTON (brown or yellowish algae on rocks or substrate) ☐ FILAMENTOUS ALGAE ☐ MACROPHYTES

WETLAND FRINGE: ☐ YES ☐ ABUTTING or ☐ ADJACENT ☒ NO
Describe: Forested slope

BIOLOGICAL CHARACTERISTICS:
Macroinvertebrates observed? ☐ YES ☒ NO Describe:
Fish or wildlife observed? ☒ YES ☐ NO Describe: frogs
Habitat for: none
Fish/spawn areas? ☐ YES ☒ NO

JURISDICTIONAL STATUS:
Is this stream jurisdictional? ☒ YES ☐ NO Describe: Trib to NHD stream SLWW001

OTHER OBSERVATIONS AND COMMENTS: -bedrock substrate observed throughout stream alignment

Spire STL Pipeline Stream Survey Data Collection Form

DATE: 6-5-2017
REVIEWER(S): WP-WJW
GAI STREAM ID: STL.WP203 ext-2
WEATHER CONDITIONS: Clear / 80°F / Rain last 24 hrs

STREAM TYPE: ☐ PERENNIAL ☐ INTERMITTENT ☒ EPHEMERAL
Stream crossed by centerline: ☐ YES ☐ NO
Stream crossed by access road: ☐ YES ☐ NO

PHOTOGRAPHS TAKEN:
#85 - Upstream NE #86 - Downstream SW #— - Impact Area
#— - Culvert Inflow #— - Culvert Outflow
87 RB→NW/88LB→SE

FULLY FUNCTIONAL: ☐ YES ☒ NO
Considered fully functional if the following criteria are met:
1. Unaltered in any significant manner by human activities
2. Is stable and does not exhibit headcutting, incision, or excessive aggradation
3. Is connected to its overbank flood plain supporting normal hydrological functions
4. Has a riparian buffer of at least 25 ft in width
5. If stream segment is impacted by a minor structural alteration but otherwise fully functional and does not significantly alter stream segments above and below, then the alteration should be considered separate and moderately functional

MODERATELY FUNCTIONAL: ☐ YES ☒ NO
Considered moderately functional if the following are met:
1. Streams have been altered; however, system recovery has a moderate probability of occurring naturally
2. Streams support many, but not all, of the hydraulic and geomorphic functions characteristic of fully functioning streams of similar order in the watershed

FUNCTIONALLY IMPAIRED: ☒ YES ☐ NO
Considered functionally impaired if the stream has more than one of the following:
1. Has been channelized and shows no evidence of self-recovery
2. Is levee protected, impounded, or artificially constricted
3. Entrenched or contains active headcuts
4. Has little or no riparian buffer of deep-rooted vegetation on 1 or both sides of channel
5. Has banks that are extensively eroded or unstable, bank sloughing, erosional scars
6. Has 4 or greater stream impacts within 0.5 mile upstream of proposed stream impact, and stream impacts individually or cumulatively exceed 100 ft in length

GENERAL WATERSHED AND/OR RIPARIAN AREA CHARACTERISTICS WITHIN 100FT BUFFER

RIGHT BANK:		LEFT BANK:	
☒ FORESTED	☐ WETLAND	☒ FORESTED	☐ WETLAND
☐ FARMLAND	☐ SCRUB/SHRUB	☐ FARMLAND	☐ SCRUB/SHRUB
☐ HAYFIELD	☐ PRAIRIE	☐ HAYFIELD	☐ PRAIRIE
☐ INDUSTRIAL	☐ HIGH BLUFFS	☐ INDUSTRIAL	☐ HIGH BLUFFS
☐ RESIDENTIAL		☐ RESIDENTIAL	

within forested ravine

Spire STL Pipeline Stream Survey Data Collection Form (PAGE 2)

DATE: 6-5-2017
REVIEWER(S): JJP - WJW
GAI STREAM ID: STL_JJP203ext2

STREAM CHANNEL PROPERTIES WITH RESPECT TO TOP OF BANK (ESTIMATE):
Average bank-to-bank width (feet): 4 ; at centerline (feet): —
Average bank height (feet): 1.5 ; at centerline (feet): —
Bottom width (feet): .5 Water width (feet): — Water depth (feet): —
Ordinary High Water Mark (OHWM), if observed (feet): 2' scour

FLOW CHARACTERISTICS:
Water present: ☐ NO WATER, STREAMBED DRY ☒ STREAMBED MOIST ☐ STANDING WATER ☐ FLOWING WATER
If flow present, estimate stage at time of survey: ☐ HIGH ☐ MEDIUM ☐ LOW No flow
Average depth of water (feet): None

BANK EROSION: ☐ EXTENSIVE ☐ MODERATE ☒ LITTLE / NONE
Explain (sloughing banks, exposed root wads, undercut banks, etc.): possible scour

OBSERVED PRESENCE OF GROUNDWATER SEEPS: ☐ YES ☒ NO

OBSERVED PRESENCE OF SUBSURFACE FLOW: ☐ YES ☒ NO

WATER QUALITY CHARACTERISTICS:
Obvious siltation: ☐ YES ☒ NO
Observable water quality (siltation, water color is clear, discolored, oily film, scum, water odor; etc.): No flow
Identify specific pollutants, if known: None observed

AQUATIC PLANTS: ☐ PERIPHYTON (brown or yellowish algae on rocks or substrate) ☐ FILAMENTOUS ALGAE ☐ MACROPHYTES

WETLAND FRINGE: ☐ YES ☐ ABUTTING or ☐ ADJACENT ☒ NO
Describe: Forested slopes

BIOLOGICAL CHARACTERISTICS:
Macroinvertebrates observed? ☐ YES ☒ NO Describe: —
Fish or wildlife observed? ☐ YES ☒ NO Describe: —
Habitat for: None
Fish/spawn areas? ☐ YES ☒ NO

JURISDICTIONAL STATUS:
Is this stream jurisdictional? ☒ YES ☐ NO Describe: Trib of NHD stream

OTHER OBSERVATIONS AND COMMENTS: STL_JJP203ext2 section does contain 2-3 drainages / source upslope run-off / No bed rock substrate observed in this sect of stream

Spire STL Pipeline Stream Survey Data Collection Form

DATE: 6-5-2017
REVIEWER(S): JJP - WJW
GAI STREAM ID: STLWJP204

WEATHER CONDITIONS: Clear / 80°F / Rain last 24 hrs

STREAM TYPE: ☐ PERENNIAL ☐ INTERMITTENT ☒ EPHEMERAL
Stream crossed by centerline: ☐ YES ☒ NO
Stream crossed by access road: ☐ YES ☒ NO

PHOTOGRAPHS TAKEN:
#67 - Upstream NE #68 - Downstream SW #✓ - Impact Area
#✓ - Culvert Inflow #✓ - Culvert Outflow
69 RB → N / 70 LB → S

FULLY FUNCTIONAL: ☐ YES ☒ NO
Considered fully functional if the following criteria are met:
1. Unaltered in any significant manner by human activities
2. Is stable and does not exhibit headcutting, incision, or excessive aggradation
3. Is connected to its overbank flood plain supporting normal hydrological functions
4. Has a riparian buffer of at least 25 ft in width
5. If stream segment is impacted by a minor structural alteration but otherwise fully functional and does not significantly alter stream segments above and below, then the alteration should be considered separate and moderately functional

MODERATELY FUNCTIONAL: ☒ YES ☐ NO
Considered moderately functional if the following are met:
1. Streams have been altered; however, system recovery has a moderate probability of occurring naturally
2. Streams support many, but not all, of the hydraulic and geomorphic functions characteristic of fully functioning streams of similar order in the watershed

FUNCTIONALLY IMPAIRED: ☒ YES ☐ NO
Considered functionally impaired if the stream has more than one of the following:.
1. Has been channelized and shows no evidence of self-recovery
2. Is levee protected, impounded, or artificially constricted
3. Entrenched or contains active headcuts
4. Has little or no riparian buffer of deep-rooted vegetation on 1 or both sides of channel
5. Has banks that are extensively eroded or unstable, bank sloughing, erosional scars
6. Has 4 or greater stream impacts within 0.5 mile upstream of proposed stream impact, and stream impacts individually or cumulatively exceed 100 ft in length

GENERAL WATERSHED AND/OR RIPARIAN AREA CHARACTERISTICS WITHIN 100FT BUFFER

RIGHT BANK:
☒ FORESTED ☐ WETLAND
☐ FARMLAND ☐ SCRUB/SHRUB
☐ HAYFIELD ☐ PRAIRIE
☐ INDUSTRIAL ☐ HIGH BLUFFS
☐ RESIDENTIAL

LEFT BANK:
☒ FORESTED ☐ WETLAND
☐ FARMLAND ☐ SCRUB/SHRUB
☐ HAYFIELD ☐ PRAIRIE
☐ INDUSTRIAL ☐ HIGH BLUFFS
☐ RESIDENTIAL

- within forested ravine

Spire STL Pipeline Stream Survey Data Collection Form (PAGE 2)

DATE: 6-5-2017
REVIEWER(S): JJP-WJW
GAI STREAM ID: STLWJP204

STREAM CHANNEL PROPERTIES WITH RESPECT TO TOP OF BANK (ESTIMATE):
Average bank-to-bank width (feet): 4 ; at centerline (feet): ~
Average bank height (feet): 1 ; at centerline (feet): ~
Bottom width (feet): 1.5 Water width (feet): 1 Water depth (feet): .2
Ordinary High Water Mark (OHWM), if observed (feet): 2 scour

FLOW CHARACTERISTICS:
Water present: ☐ NO WATER, STREAMBED DRY ☐ STREAMBED MOIST ☒ STANDING WATER ☒ FLOWING WATER
If flow present, estimate stage at time of survey: ☐ HIGH ☐ MEDIUM ☒ LOW - some areas of channel no standing water
Average depth of water (feet): ~

BANK EROSION: ☐ EXTENSIVE ☐ MODERATE ☒ LITTLE / NONE
Explain (sloughing banks, exposed root wads, undercut banks, etc.): some scour & leaf wash

OBSERVED PRESENCE OF GROUNDWATER SEEPS: ☒ YES ☒ NO

OBSERVED PRESENCE OF SUBSURFACE FLOW: ☐ YES ☒ NO

WATER QUALITY CHARACTERISTICS:
Obvious siltation: ☐ YES ☒ NO
Observable water quality (siltation, water color is clear, discolored, oily film, scum, water odor; etc.): clear
Identify specific pollutants, if known: none observed

AQUATIC PLANTS: ☐ PERIPHYTON (brown or yellowish algae on rocks or substrate) ☐ FILAMENTOUS ALGAE ☐ MACROPHYTES

WETLAND FRINGE: ☐ YES ☐ ABUTTING or ☐ ADJACENT ☒ NO
Describe: forested slopes

BIOLOGICAL CHARACTERISTICS:
Macroinvertebrates observed? ☐ YES ☒ NO Describe: ~
Fish or wildlife observed? ☐ YES ☒ NO Describe: ~
Habitat for: none
Fish/spawn areas? ☐ YES ☒ NO

JURISDICTIONAL STATUS:
Is this stream jurisdictional? ☒ YES ☐ NO Describe: Tributary of STLWJP203 section.

OTHER OBSERVATIONS AND COMMENTS: Substrate of boulder-cobble and gravel & sand / Few areas of exposed bedrock in channel

Spire STL Pipeline Stream Survey Data Collection Form

DATE: 6-5-2017
REVIEWER(S): WP- WJW
GAI STREAM ID: STLWP205

WEATHER CONDITIONS: Clear / 80°F / Rain last 24 hrs

STREAM TYPE: ☐ PERENNIAL ☐ INTERMITTENT ☒ EPHEMERAL
Stream crossed by centerline: ☐ YES ☒ NO
Stream crossed by access road: ☐ YES ☒ NO

PHOTOGRAPHS TAKEN:
71 - Upstream E # 72 - Downstream W # ✓ - Impact Area
✓ - Culvert Inflow # ✓ - Culvert Outflow 73-75 RB → N / 74-76 LB → S

FULLY FUNCTIONAL: ☐ YES ☒ NO
Considered fully functional if the following criteria are met:
1. Unaltered in any significant manner by human activities
2. Is stable and does not exhibit headcutting, incision, or excessive aggradation
3. Is connected to its overbank flood plain supporting normal hydrological functions
4. Has a riparian buffer of at least 25 ft in width
5. If stream segment is impacted by a minor structural alteration but otherwise fully functional and does not significantly alter stream segments above and below, then the alteration should be considered separate and moderately functional

MODERATELY FUNCTIONAL: ☐ YES ☒ NO
Considered moderately functional if the following are met:
1. Streams have been altered; however, system recovery has a moderate probability of occurring naturally
2. Streams support many, but not all, of the hydraulic and geomorphic functions characteristic of fully functioning streams of similar order in the watershed

FUNCTIONALLY IMPAIRED: ☒ YES ☐ NO
Considered functionally impaired if the stream has more than one of the following:
1. Has been channelized and shows no evidence of self-recovery
2. Is levee protected, impounded, or artificially constricted
3. Entrenched or contains active headcuts
4. Has little or no riparian buffer of deep-rooted vegetation on 1 or both sides of channel
5. Has banks that are extensively eroded or unstable, bank sloughing, erosional scars
6. Has 4 or greater stream impacts within 0.5 mile upstream of proposed stream impact, and stream impacts individually or cumulatively exceed 100 ft in length

GENERAL WATERSHED AND/OR RIPARIAN AREA CHARACTERISTICS WITHIN 100FT BUFFER

RIGHT BANK:
- ☒ FORESTED
- ☐ FARMLAND
- ☐ HAYFIELD
- ☐ INDUSTRIAL
- ☐ RESIDENTIAL
- ☐ WETLAND
- ☐ SCRUB/SHRUB
- ☐ PRAIRIE
- ☐ HIGH BLUFFS

LEFT BANK:
- ☒ FORESTED
- ☐ FARMLAND
- ☐ HAYFIELD
- ☐ INDUSTRIAL
- ☐ RESIDENTIAL
- ☐ WETLAND
- ☐ SCRUB/SHRUB
- ☐ PRAIRIE
- ☐ HIGH BLUFFS

Spire STL Pipeline Stream Survey Data Collection Form (PAGE 2)

DATE: 6-5-2017
REVIEWER(S): JWP-WNW
GAI STREAM ID: STLWP205

STREAM CHANNEL PROPERTIES WITH RESPECT TO TOP OF BANK (ESTIMATE):
Average bank-to-bank width (feet): 4 ; at centerline (feet): /
Average bank height (feet): 1 ; at centerline (feet): /
Bottom width (feet): .5 Water width (feet): / Water depth (feet): /
Ordinary High Water Mark (OHWM), if observed (feet): 3'1 possible scour leaf wash

FLOW CHARACTERISTICS:
Water present: ☐ NO WATER, STREAMBED DRY ☒ STREAMBED MOIST ☐ STANDING WATER ☐ FLOWING WATER
If flow present, estimate stage at time of survey: ☐ HIGH ☐ MEDIUM ☐ LOW No flow
Average depth of water (feet): /

BANK EROSION: ☐ EXTENSIVE ☐ MODERATE ☒ LITTLE / NONE
Explain (sloughing banks, exposed root wads, undercut banks, etc.): Little scour

OBSERVED PRESENCE OF GROUNDWATER SEEPS: ☐ YES ☒ NO

OBSERVED PRESENCE OF SUBSURFACE FLOW: ☐ YES ☒ NO

WATER QUALITY CHARACTERISTICS:
Obvious siltation: ☐ YES ☒ NO
Observable water quality (siltation, water color is clear, discolored, oily film, scum, water odor; etc.): None - No flow
Identify specific pollutants, if known: None observed

AQUATIC PLANTS: ☐ PERIPHYTON (brown or yellowish algae on rocks or substrate) ☐ FILAMENTOUS ALGAE ☐ MACROPHYTES

WETLAND FRINGE: ☐ YES ☐ ABUTTING or ☐ ADJACENT ☒ NO
Describe: Forested slope

BIOLOGICAL CHARACTERISTICS:
Macroinvertebrates observed? ☐ YES ☒ NO Describe: /
Fish or wildlife observed? ☐ YES ☒ NO Describe: /
Habitat for: None
Fish/spawn areas? ☐ YES ☒ NO

JURISDICTIONAL STATUS:
Is this stream jurisdictional? ☒ YES ☐ NO Describe: Trib to NHD stream

OTHER OBSERVATIONS AND COMMENTS: Trib to STLWP203 / substrate of boulder - cobble - sand - silt /
* stream outside of current SA boundary

Spire STL Pipeline Stream Survey Data Collection Form

DATE: 6-5-2017
REVIEWER(S): JJP-WJW
GAI STREAM ID: STLJJP706

WEATHER CONDITIONS: Clear / 80°F / Rain last 24 hrs

STREAM TYPE: ☐ PERENNIAL ☐ INTERMITTENT ☒ EPHEMERAL
Stream crossed by centerline: ☒ YES ☐ NO
Stream crossed by access road: ☐ YES ☒ NO

PHOTOGRAPHS TAKEN:
#90 - Upstream WSW #91 - Downstream CW #94 - Impact Area N
#— - Culvert Inflow #— - Culvert Outflow 92 RB→S / 93 LB→N

FULLY FUNCTIONAL: ☐ YES ☒ NO
Considered fully functional if the following criteria are met:
1. Unaltered in any significant manner by human activities
2. Is stable and does not exhibit headcutting, incision, or excessive aggradation
3. Is connected to its overbank flood plain supporting normal hydrological functions
4. Has a riparian buffer of at least 25 ft in width
5. If stream segment is impacted by a minor structural alteration but otherwise fully functional and does not significantly alter stream segments above and below, then the alteration should be considered separate and moderately functional

MODERATELY FUNCTIONAL: ☐ YES ☒ NO
Considered moderately functional if the following are met:
1. Streams have been altered; however, system recovery has a moderate probability of occurring naturally
2. Streams support many, but not all, of the hydraulic and geomorphic functions characteristic of fully functioning streams of similar order in the watershed

FUNCTIONALLY IMPAIRED: ☒ YES ☐ NO
Considered functionally impaired if the stream has more than one of the following:
1. Has been channelized and shows no evidence of self-recovery
2. Is levee protected, impounded, or artificially constricted
3. Entrenched or contains active headcuts
4. Has little or no riparian buffer of deep-rooted vegetation on 1 or both sides of channel
5. Has banks that are extensively eroded or unstable, bank sloughing, erosional scars
6. Has 4 or greater stream impacts within 0.5 mile upstream of proposed stream impact, and stream impacts individually or cumulatively exceed 100 ft in length

GENERAL WATERSHED AND/OR RIPARIAN AREA CHARACTERISTICS WITHIN 100FT BUFFER

RIGHT BANK:
☒ FORESTED ☐ WETLAND
☐ FARMLAND ☐ SCRUB/SHRUB
☐ HAYFIELD ☐ PRAIRIE
☐ INDUSTRIAL ☐ HIGH BLUFFS
☐ RESIDENTIAL

LEFT BANK:
☒ FORESTED ☐ WETLAND
☐ FARMLAND ☐ SCRUB/SHRUB
☐ HAYFIELD ☐ PRAIRIE
☐ INDUSTRIAL ☐ HIGH BLUFFS
☐ RESIDENTIAL

Spire STL Pipeline Stream Survey Data Collection Form (PAGE 2)

DATE: 6-5-2017
REVIEWER(S): JJP - WJW
GAI STREAM ID: STLWP206

STREAM CHANNEL PROPERTIES WITH RESPECT TO TOP OF BANK (ESTIMATE):
Average bank-to-bank width (feet): 5 ; at centerline (feet): 5
Average bank height (feet): 2 ; at centerline (feet): 2
Bottom width (feet): 1 Water width (feet): / Water depth (feet): /
Ordinary High Water Mark (OHWM), if observed (feet): 2 scour

FLOW CHARACTERISTICS:
Water present: ☐ NO WATER, STREAMBED DRY ☒ STREAMBED MOIST ☒ STANDING WATER ☐ FLOWING WATER
If flow present, estimate stage at time of survey: ☐ HIGH ☐ MEDIUM ☐ LOW No flow
Average depth of water (feet): /

BANK EROSION: ☐ EXTENSIVE ☐ MODERATE ☒ LITTLE / NONE
Explain (sloughing banks, exposed root wads, undercut banks, etc.): scour - leaf wash

OBSERVED PRESENCE OF GROUNDWATER SEEPS: ☐ YES ☒ NO

OBSERVED PRESENCE OF SUBSURFACE FLOW: ☐ YES ☒ NO

WATER QUALITY CHARACTERISTICS:
Obvious siltation: ☐ YES ☒ NO No flow
Observable water quality (siltation, water color is clear, discolored, oily film, scum, water odor; etc.): No flow

Identify specific pollutants, if known: None observed

AQUATIC PLANTS: ☐ PERIPHYTON (brown or yellowish algae on rocks or substrate) ☐ FILAMENTOUS ALGAE ☐ MACROPHYTES

WETLAND FRINGE: ☐ YES ☐ ABUTTING or ☐ ADJACENT ☒ NO
Describe: forested slope

BIOLOGICAL CHARACTERISTICS:
Macroinvertebrates observed? ☐ YES ☒ NO Describe: /
Fish or wildlife observed? ☐ YES ☒ NO Describe: /
Habitat for: None
Fish/spawn areas? ☐ YES ☒ NO

JURISDICTIONAL STATUS:
Is this stream jurisdictional? ☒ YES ☐ NO Describe:

OTHER OBSERVATIONS AND COMMENTS: Stream source upslope run-off/ substrate mostly of sand-gravel yet areas of exposed bedrock/-boulders just downstream from CL crossing within channel.

Spire STL Pipeline Stream Survey Data Collection Form

DATE: 6-5-2017
REVIEWER(S): JJP-WJW
GAI STREAM ID: SILJJP707

WEATHER CONDITIONS: Clear / 80°F / Rain last 24 hrs

STREAM TYPE: ☐ PERENNIAL ☐ INTERMITTENT ☒ EPHEMERAL
Stream crossed by centerline: ☒ YES ☐ NO
Stream crossed by access road: ☐ YES ☒ NO

PHOTOGRAPHS TAKEN:
#95-96 - Upstream N #97 - Downstream S #100 - Impact Area S
#/ - Culvert Inflow #/ - Culvert Outflow 98 RB → W / 99 LB → E.

FULLY FUNCTIONAL: ☐ YES ☒ NO
Considered fully functional if the following criteria are met:
1. Unaltered in any significant manner by human activities
2. Is stable and does not exhibit headcutting, incision, or excessive aggradation
3. Is connected to its overbank flood plain supporting normal hydrological functions
4. Has a riparian buffer of at least 25 ft in width
5. If stream segment is impacted by a minor structural alteration but otherwise fully functional and does not significantly alter stream segments above and below, then the alteration should be considered separate and moderately functional

MODERATELY FUNCTIONAL: ☐ YES ☒ NO
Considered moderately functional if the following are met:
1. Streams have been altered; however, system recovery has a moderate probability of occurring naturally
2. Streams support many, but not all, of the hydraulic and geomorphic functions characteristic of fully functioning streams of similar order in the watershed

FUNCTIONALLY IMPAIRED: ☒ YES ☐ NO
Considered functionally impaired if the stream has more than one of the following:
1. Has been channelized and shows no evidence of self-recovery
2. Is levee protected, impounded, or artificially constricted
3. Entrenched or contains active headcuts
4. Has little or no riparian buffer of deep-rooted vegetation on 1 or both sides of channel
5. Has banks that are extensively eroded or unstable, bank sloughing, erosional scars
6. Has 4 or greater stream impacts within 0.5 mile upstream of proposed stream impact, and stream impacts individually or cumulatively exceed 100 ft in length

GENERAL WATERSHED AND/OR RIPARIAN AREA CHARACTERISTICS WITHIN 100FT BUFFER

RIGHT BANK:
☒ FORESTED ☐ WETLAND
☐ FARMLAND ☐ SCRUB/SHRUB
☐ HAYFIELD ☐ PRAIRIE
☐ INDUSTRIAL ☐ HIGH BLUFFS
☐ RESIDENTIAL

LEFT BANK:
☒ FORESTED ☐ WETLAND
☐ FARMLAND ☐ SCRUB/SHRUB
☐ HAYFIELD ☐ PRAIRIE
☐ INDUSTRIAL ☐ HIGH BLUFFS
☐ RESIDENTIAL

Spire STL Pipeline Stream Survey Data Collection Form (PAGE 2)

DATE: 6-5-2017
REVIEWER(S): JJP-WJW
GAI STREAM ID: STLJJP207

STREAM CHANNEL PROPERTIES WITH RESPECT TO TOP OF BANK (ESTIMATE):
Average bank-to-bank width (feet): 4 ; at centerline (feet): 4
Average bank height (feet): 1 ; at centerline (feet): 1
Bottom width (feet): — Water width (feet): — Water depth (feet): —
Ordinary High Water Mark (OHWM), if observed (feet): 2' leaf wash

FLOW CHARACTERISTICS:
Water present: ☐ NO WATER, STREAMBED DRY ☒ STREAMBED MOIST ☐ STANDING WATER ☐ FLOWING WATER
If flow present, estimate stage at time of survey: ☐ HIGH ☐ MEDIUM ☐ LOW No flow
Average depth of water (feet): —

BANK EROSION: ☐ EXTENSIVE ☐ MODERATE ☒ LITTLE / NONE
Explain (sloughing banks, exposed root wads, undercut banks, etc.): no real evasion observed

OBSERVED PRESENCE OF GROUNDWATER SEEPS: ☐ YES ☒ NO

OBSERVED PRESENCE OF SUBSURFACE FLOW: ☐ YES ☒ NO

WATER QUALITY CHARACTERISTICS:
Obvious siltation: ☐ YES ☒ NO
Observable water quality (siltation, water color is clear, discolored, oily film, scum, water odor; etc.): No flow

Identify specific pollutants, if known: None observed

AQUATIC PLANTS: ☐ PERIPHYTON (brown or yellowish algae on rocks or substrate) ☐ FILAMENTOUS ALGAE ☐ MACROPHYTES

WETLAND FRINGE: ☐ YES ☐ ABUTTING or ☐ ADJACENT ☒ NO
Describe: forested slope

BIOLOGICAL CHARACTERISTICS:
Macroinvertebrates observed? ☐ YES ☒ NO Describe: —
Fish or wildlife observed? ☐ YES ☒ NO Describe: —
Habitat for: NMP
Fish/spawn areas? ☐ YES ☒ NO

JURISDICTIONAL STATUS:
Is this stream jurisdictional? ☒ YES ☐ NO Describe:

OTHER OBSERVATIONS AND COMMENTS: Trib of STLJJP206 / substrate composed of few gravel and mostly silt and sand/

Spire STL Pipeline Stream Survey Data Collection Form

DATE: 6-5-2017
REVIEWER(S): JWP-WWW
GAI STREAM ID: STL_JWP208

WEATHER CONDITIONS: Clear/80°F/Rain last 24 hrs

STREAM TYPE: ☐ PERENNIAL ☐ INTERMITTENT ☒ EPHEMERAL
Stream crossed by centerline: ☐ YES ☒ NO
Stream crossed by access road: ☐ YES ☒ NO

PHOTOGRAPHS TAKEN:
#101 - Upstream N #102 - Downstream S #_____ - Impact Area
#_____ - Culvert Inflow #_____ - Culvert Outflow
103 RB→W / 104 LB→E

FULLY FUNCTIONAL: ☐ YES ☒ NO
Considered fully functional if the following criteria are met:
1. Unaltered in any significant manner by human activities
2. Is stable and does not exhibit headcutting, incision, or excessive aggradation
3. Is connected to its overbank flood plain supporting normal hydrological functions
4. Has a riparian buffer of at least 25 ft in width
5. If stream segment is impacted by a minor structural alteration but otherwise fully functional and does not significantly alter stream segments above and below, then the alteration should be considered separate and moderately functional

MODERATELY FUNCTIONAL: ☐ YES ☒ NO
Considered moderately functional if the following are met:
1. Streams have been altered; however, system recovery has a moderate probability of occurring naturally
2. Streams support many, but not all, of the hydraulic and geomorphic functions characteristic of fully functioning streams of similar order in the watershed

FUNCTIONALLY IMPAIRED: ☒ YES ☐ NO
Considered functionally impaired if the stream has more than one of the following:
1. Has been channelized and shows no evidence of self-recovery
2. Is levee protected, impounded, or artificially constricted
3. Entrenched or contains active headcuts
4. Has little or no riparian buffer of deep-rooted vegetation on 1 or both sides of channel
5. Has banks that are extensively eroded or unstable, bank sloughing, erosional scars
6. Has 4 or greater stream impacts within 0.5 mile upstream of proposed stream impact, and stream impacts individually or cumulatively exceed 100 ft in length

GENERAL WATERSHED AND/OR RIPARIAN AREA CHARACTERISTICS WITHIN 100FT BUFFER

RIGHT BANK:
☒ FORESTED ☐ WETLAND
☐ FARMLAND ☐ SCRUB/SHRUB
☐ HAYFIELD ☐ PRAIRIE
☐ INDUSTRIAL ☐ HIGH BLUFFS
☐ RESIDENTIAL

LEFT BANK:
☒ FORESTED ☐ WETLAND
☐ FARMLAND ☐ SCRUB/SHRUB
☐ HAYFIELD ☐ PRAIRIE
☐ INDUSTRIAL ☐ HIGH BLUFFS
☐ RESIDENTIAL

Spire STL Pipeline Stream Survey Data Collection Form (PAGE 2)

DATE: 6-5-2017
REVIEWER(S): WP-WJW
GAI STREAM ID: STL-WP208

STREAM CHANNEL PROPERTIES WITH RESPECT TO TOP OF BANK (ESTIMATE):
Average bank-to-bank width (feet): 4.5 ; at centerline (feet): —
Average bank height (feet): 2 ; at centerline (feet): —
Bottom width (feet): 1' Water width (feet): — Water depth (feet): —
Ordinary High Water Mark (OHWM), if observed (feet): 1' possible scour

FLOW CHARACTERISTICS:
Water present: ☐ NO WATER, STREAMBED DRY ☒ STREAMBED MOIST ☐ STANDING WATER ☐ FLOWING WATER
If flow present, estimate stage at time of survey: ☐ HIGH ☐ MEDIUM ☐ LOW No flow
Average depth of water (feet): —

BANK EROSION: ☐ EXTENSIVE ☐ MODERATE ☒ LITTLE / NONE
Explain (sloughing banks, exposed root wads, undercut banks, etc.): possible scour in some areas

OBSERVED PRESENCE OF GROUNDWATER SEEPS: ☐ YES ☒ NO

OBSERVED PRESENCE OF SUBSURFACE FLOW: ☐ YES ☒ NO

WATER QUALITY CHARACTERISTICS:
Obvious siltation: ☐ YES ☒ NO
Observable water quality (siltation, water color is clear, discolored, oily film, scum, water odor; etc.): No flow
Identify specific pollutants, if known: None observed

AQUATIC PLANTS: ☐ PERIPHYTON (brown or yellowish algae on rocks or substrate) ☐ FILAMENTOUS ALGAE ☐ MACROPHYTES

WETLAND FRINGE: ☐ YES ☐ ABUTTING or ☐ ADJACENT ☒ NO
Describe: forested hillslope

BIOLOGICAL CHARACTERISTICS:
Macroinvertebrates observed? ☐ YES ☒ NO Describe: —
Fish or wildlife observed? ☐ YES ☒ NO Describe: —
Habitat for: None
Fish/spawn areas? ☐ YES ☒ NO

JURISDICTIONAL STATUS:
Is this stream jurisdictional? ☒ YES ☐ NO Describe: trib of STL-WP206

OTHER OBSERVATIONS AND COMMENTS: Dense (8" deep) leaf pack within channel / stream channel was saturated within sand-silt-gravel substrate throughout channel.

Spire STL Pipeline Stream Survey Data Collection Form

DATE: 6-5-2017
REVIEWER(S): JJP-WJW
GAI STREAM ID: STLJJP707

WEATHER CONDITIONS: clear/80°F/Rain last 24 hrs

STREAM TYPE: ☒ PERENNIAL ☐ INTERMITTENT ☐ EPHEMERAL
Stream crossed by centerline: ☒ YES ☐ NO
Stream crossed by access road: ☐ YES ☒ NO

PHOTOGRAPHS TAKEN:
#105 - Upstream W #106 - Downstream E #109 - Impact Area N
#____ - Culvert Inflow #____ - Culvert Outflow 107 RB → S / 108 LB → N

FULLY FUNCTIONAL: ☐ YES ☒ NO
Considered fully functional if the following criteria are met:
1. Unaltered in any significant manner by human activities
2. Is stable and does not exhibit headcutting, incision, or excessive aggradation
3. Is connected to its overbank flood plain supporting normal hydrological functions
4. Has a riparian buffer of at least 25 ft in width
5. If stream segment is impacted by a minor structural alteration but otherwise fully functional and does not significantly alter stream segments above and below, then the alteration should be considered separate and moderately functional

MODERATELY FUNCTIONAL: ☒ YES ☐ NO
Considered moderately functional if the following are met:
1. Streams have been altered; however, system recovery has a moderate probability of occurring naturally
2. Streams support many, but not all, of the hydraulic and geomorphic functions characteristic of fully functioning streams of similar order in the watershed

FUNCTIONALLY IMPAIRED: ☐ YES ☒ NO
Considered functionally impaired if the stream has more than one of the following:
1. Has been channelized and shows no evidence of self-recovery
2. Is levee protected, impounded, or artificially constricted
3. Entrenched or contains active headcuts
4. Has little or no riparian buffer of deep-rooted vegetation on 1 or both sides of channel
5. Has banks that are extensively eroded or unstable, bank sloughing, erosional scars
6. Has 4 or greater stream impacts within 0.5 mile upstream of proposed stream impact, and stream impacts individually or cumulatively exceed 100 ft in length

GENERAL WATERSHED AND/OR RIPARIAN AREA CHARACTERISTICS WITHIN 100FT BUFFER

RIGHT BANK:		LEFT BANK:	
☒ FORESTED	☐ WETLAND	☒ FORESTED	☐ WETLAND
☐ FARMLAND	☐ SCRUB/SHRUB	☐ FARMLAND	☐ SCRUB/SHRUB
☐ HAYFIELD	☐ PRAIRIE	☐ HAYFIELD	☐ PRAIRIE
☐ INDUSTRIAL	☐ HIGH BLUFFS	☐ INDUSTRIAL	☐ HIGH BLUFFS
☐ RESIDENTIAL		☐ RESIDENTIAL	

* stream within forested ravine

Spire STL Pipeline Stream Survey Data Collection Form (PAGE 2)

DATE: 6-5-2017
REVIEWER(S): JJP-WJW
GAI STREAM ID: STL-JJP207

STREAM CHANNEL PROPERTIES WITH RESPECT TO TOP OF BANK (ESTIMATE):
Average bank-to-bank width (feet): 16 ; at centerline (feet): 16
Average bank height (feet): 6 ; at centerline (feet): 6
Bottom width (feet): 10 Water width (feet): 4 Water depth (feet): .5-1.5 in pools
Ordinary High Water Mark (OHWM), if observed (feet): 12 scour

FLOW CHARACTERISTICS:
Water present: ☐ NO WATER, STREAMBED DRY ☐ STREAMBED MOIST ☐ STANDING WATER ☒ FLOWING WATER
If flow present, estimate stage at time of survey: ☐ HIGH ☐ MEDIUM ☒ LOW
Average depth of water (feet): .5 to 1.5

BANK EROSION: ☐ EXTENSIVE ☒ MODERATE ☐ LITTLE / NONE
Explain (sloughing banks, exposed root wads, undercut banks, etc.): undercuts / scour / few wads sediment deposition

OBSERVED PRESENCE OF GROUNDWATER SEEPS: ☐ YES ☒ NO

OBSERVED PRESENCE OF SUBSURFACE FLOW: ☐ YES ☒ NO

WATER QUALITY CHARACTERISTICS:
Obvious siltation: ☒ YES ☐ NO
Observable water quality (siltation, water color is clear, discolored, oily film, scum, water odor; etc.): Clear

Identify specific pollutants, if known: none observed

AQUATIC PLANTS: ☐ PERIPHYTON (brown or yellowish algae on rocks or substrate) ☐ FILAMENTOUS ALGAE ☐ MACROPHYTES

WETLAND FRINGE: ☐ YES ☐ ABUTTING or ☐ ADJACENT ☒ NO
Describe: Yet some areas contain floodplain of small size dominated by pawpaw.

BIOLOGICAL CHARACTERISTICS:
Macroinvertebrates observed? ☐ YES ☒ NO Describe: Limnephilidae
Fish or wildlife observed? ☐ YES ☒ NO Describe: —
Habitat for: pump
Fish/spawn areas? ☐ YES ☒ NO

JURISDICTIONAL STATUS:
Is this stream jurisdictional? ☒ YES ☐ NO Describe: NHD stream

OTHER OBSERVATIONS AND COMMENTS: Multiple tributaries and drainages connect to this stream.

Spire STL Pipeline Stream Survey Data Collection Form

DATE: 6-11-2017
REVIEWER(S): JJP-WJW
GAI STREAM ID: STLJP210

WEATHER CONDITIONS: Clear / 90°F / No rain last 5 days

STREAM TYPE: ☐ PERENNIAL ☐ INTERMITTENT ☒ EPHEMERAL
Stream crossed by centerline: ☐ YES ☒ NO
Stream crossed by access road: ☐ YES ☒ NO

PHOTOGRAPHS TAKEN:
#547 - Upstream S #548 - Downstream N #___ - Impact Area
#___ - Culvert Inflow #___ - Culvert Outflow

549 RB → E / 550 LB → W

FULLY FUNCTIONAL: ☐ YES ☒ NO
Considered fully functional if the following criteria are met:
1. Unaltered in any significant manner by human activities
2. Is stable and does not exhibit headcutting, incision, or excessive aggradation
3. Is connected to its overbank flood plain supporting normal hydrological functions
4. Has a riparian buffer of at least 25 ft in width
5. If stream segment is impacted by a minor structural alteration but otherwise fully functional and does not significantly alter stream segments above and below, then the alteration should be considered separate and moderately functional

MODERATELY FUNCTIONAL: ☒ YES ☐ NO
Considered moderately functional if the following are met:
1. Streams have been altered; however, system recovery has a moderate probability of occurring naturally
2. Streams support many, but not all, of the hydraulic and geomorphic functions characteristic of fully functioning streams of similar order in the watershed

FUNCTIONALLY IMPAIRED: ☒ YES ☐ NO
Considered functionally impaired if the stream has more than one of the following:
1. Has been channelized and shows no evidence of self-recovery
2. Is levee protected, impounded, or artificially constricted
3. Entrenched or contains active headcuts
4. Has little or no riparian buffer of deep-rooted vegetation on 1 or both sides of channel
5. Has banks that are extensively eroded or unstable, bank sloughing, erosional scars
6. Has 4 or greater stream impacts within 0.5 mile upstream of proposed stream impact, and stream impacts individually or cumulatively exceed 100 ft in length

GENERAL WATERSHED AND/OR RIPARIAN AREA CHARACTERISTICS WITHIN 100FT BUFFER

RIGHT BANK:
☒ FORESTED ☐ WETLAND
☐ FARMLAND ☐ SCRUB/SHRUB
☐ HAYFIELD ☐ PRAIRIE
☐ INDUSTRIAL ☐ HIGH BLUFFS
☐ RESIDENTIAL

LEFT BANK:
☒ FORESTED ☐ WETLAND
☐ FARMLAND ☐ SCRUB/SHRUB
☐ HAYFIELD ☐ PRAIRIE
☐ INDUSTRIAL ☐ HIGH BLUFFS
☐ RESIDENTIAL

Spire STL Pipeline Stream Survey Data Collection Form (PAGE 2)

DATE: 6-11-2017
REVIEWER(S): JJP - WJW
GAI STREAM ID: STL_JJP210

STREAM CHANNEL PROPERTIES WITH RESPECT TO TOP OF BANK (ESTIMATE):
Average bank-to-bank width (feet): 4 ; at centerline (feet): /
Average bank height (feet): 2 ; at centerline (feet): /
Bottom width (feet): 1 Water width (feet): / Water depth (feet): /
Ordinary High Water Mark (OHWM), if observed (feet): .8 possible scour

FLOW CHARACTERISTICS:
Water present: ☐ NO WATER, STREAMBED DRY ☒ STREAMBED MOIST ☐ STANDING WATER ☐ FLOWING WATER
If flow present, estimate stage at time of survey: ☐ HIGH ☐ MEDIUM ☐ LOW no flow
Average depth of water (feet): /

BANK EROSION: ☐ EXTENSIVE ☐ MODERATE ☒ LITTLE / NONE
Explain (sloughing banks, exposed root wads, undercut banks, etc.): some scour

OBSERVED PRESENCE OF GROUNDWATER SEEPS: ☐ YES ☒ NO

OBSERVED PRESENCE OF SUBSURFACE FLOW: ☐ YES ☒ NO

WATER QUALITY CHARACTERISTICS:
Obvious siltation: ☐ YES ☒ NO
Observable water quality (siltation, water color is clear, discolored, oily film, scum, water odor; etc.): No flow
Identify specific pollutants, if known: None observed

AQUATIC PLANTS: ☐ PERIPHYTON (brown or yellowish algae on rocks or substrate) ☐ FILAMENTOUS ALGAE ☐ MACROPHYTES

WETLAND FRINGE: ☐ YES ☐ ABUTTING or ☐ ADJACENT ☒ NO
Describe: forested hillslope

BIOLOGICAL CHARACTERISTICS:
Macroinvertebrates observed? ☐ YES ☒ NO Describe: /
Fish or wildlife observed? ☐ YES ☒ NO Describe: /
Habitat for: None
Fish/spawn areas? ☐ YES ☒ NO

JURISDICTIONAL STATUS:
Is this stream jurisdictional? ☒ YES ☐ NO Describe: Trib of NHD stream

OTHER OBSERVATIONS AND COMMENTS:

Spire STL Pipeline Stream Survey Data Collection Form

DATE: 4/4/2017
REVIEWER(S): W. John Wackter Jr., Nick Paouncic WEATHER CONDITIONS: Partly cloudy 60 F
GAI STREAM ID: SIL-WJW-006

STREAM TYPE: ☐ PERENNIAL ☒ INTERMITTENT ☐ EPHEMERAL
Stream crossed by centerline: ☒ YES ☐ NO
Stream crossed by access road: ☐ YES ☒ NO

PHOTOGRAPHS TAKEN:
#P4040015 - Upstream NE #P4040013 - Downstream W-SW #P4040014 - Impact Area
#_____ - Culvert Inflow #_____ - Culvert Outflow

FULLY FUNCTIONAL: ☐ YES ☐ NO
Considered fully functional if the following criteria are met:
1. Unaltered in any significant manner by human activities
2. Is stable and does not exhibit headcutting, incision, or excessive aggradation
3. Is connected to its overbank flood plain supporting normal hydrological functions
4. Has a riparian buffer of at least 25 ft in width
5. If stream segment is impacted by a minor structural alteration but otherwise fully functional and does not significantly alter stream segments above and below, then the alteration should be considered separate and moderately functional

MODERATELY FUNCTIONAL: ☒ YES ☐ NO
Considered moderately functional if the following are met:
1. Streams have been altered; however, system recovery has a moderate probability of occurring naturally
2. Streams support many, but not all, of the hydraulic and geomorphic functions characteristic of fully functioning streams of similar order in the watershed

FUNCTIONALLY IMPAIRED: ☐ YES ☐ NO
Considered functionally impaired if the stream has more than one of the following:
1. Has been channelized and shows no evidence of self-recovery
2. Is levee protected, impounded, or artificially constricted
3. Entrenched or contains active headcuts
4. Has little or no riparian buffer of deep-rooted vegetation on 1 or both sides of channel
5. Has banks that are extensively eroded or unstable, bank sloughing, erosional scars
6. Has 4 or greater stream impacts within 0.5 mile upstream of proposed stream impact, and stream impacts individually or cumulatively exceed 100 ft in length

GENERAL WATERSHED AND/OR RIPARIAN AREA CHARACTERISTICS WITHIN 100FT BUFFER

RIGHT BANK:
☒ FORESTED ☐ WETLAND
☒ FARMLAND ☐ SCRUB/SHRUB
☐ HAYFIELD ☐ PRAIRIE
☐ INDUSTRIAL ☐ HIGH BLUFFS
☐ RESIDENTIAL

LEFT BANK:
☒ FORESTED ☐ WETLAND
☒ FARMLAND ☐ SCRUB/SHRUB
☐ HAYFIELD ☐ PRAIRIE
☐ INDUSTRIAL ☐ HIGH BLUFFS
☐ RESIDENTIAL

Spire STL Pipeline Stream Survey Data Collection Form (PAGE 2)

DATE: 4/4/2017
REVIEWER(S): W. John Wachter, Jr.; Nick Pavonic
GAI STREAM ID: SIL-WJW-006

STREAM CHANNEL PROPERTIES WITH RESPECT TO TOP OF BANK (ESTIMATE):
Average bank-to-bank width (feet): 5 ; at centerline (feet): 5
Average bank height (feet): 4 ; at centerline (feet): 4
Bottom width (feet): 4 Water width (feet): 0.75 Water depth (feet): <0.1
Ordinary High Water Mark (OHWM), if observed (feet): 2

FLOW CHARACTERISTICS:
Water present: ☐ NO WATER, STREAMBED DRY ☐ STREAMBED MOIST ☐ STANDING WATER ☒ FLOWING WATER
If flow present, estimate stage at time of survey: ☒ HIGH ☐ MEDIUM ☐ LOW
Average depth of water (feet): <0.1

BANK EROSION: ☐ EXTENSIVE ☐ MODERATE ☒ LITTLE / NONE
Explain (sloughing banks, exposed root wads, undercut banks, etc.): Some sections deeply incised

OBSERVED PRESENCE OF GROUNDWATER SEEPS: ☐ YES ☒ NO

OBSERVED PRESENCE OF SUBSURFACE FLOW: ☐ YES ☒ NO

WATER QUALITY CHARACTERISTICS:
Obvious siltation: ☒ YES ☐ NO
Observable water quality (siltation, water color is clear, discolored, oily film, scum, water odor; etc.): Substrate is entirely silt
Identify specific pollutants, if known:

AQUATIC PLANTS: ☐ PERIPHYTON (brown or yellowish algae on rocks or substrate) ☐ FILAMENTOUS ALGAE ☐ MACROPHYTES

WETLAND FRINGE: ☐ YES ☐ ABUTTING or ☐ ADJACENT ☒ NO
Describe:

BIOLOGICAL CHARACTERISTICS:
Macroinvertebrates observed? ☐ YES ☒ NO Describe:
Fish or wildlife observed? ☒ YES ☐ NO Describe: Crayfish burrows
Habitat for:
Fish/spawn areas? ☐ YES ☒ NO

JURISDICTIONAL STATUS:
Is this stream jurisdictional? ☒ YES ☐ NO Describe:

OTHER OBSERVATIONS AND COMMENTS:

Spire STL Pipeline Stream Survey Data Collection Form

DATE: 4/4/2017
REVIEWER(S): W. John Wachter, Jr.; Nick Peroncic WEATHER CONDITIONS: Partly cloudy 60F
GAI STREAM ID: SIL-WJW-007

STREAM TYPE: ☐ PERENNIAL ☒ INTERMITTENT ☐ EPHEMERAL
Stream crossed by centerline: ☒ YES ☐ NO
Stream crossed by access road: ☐ YES ☒ NO

PHOTOGRAPHS TAKEN:
#P4040018 - Upstream N-NE #P4040016 - Downstream W-SW #P4040017 - Impact Area
#_____ - Culvert Inflow #_____ - Culvert Outflow

FULLY FUNCTIONAL: ☐ YES ☐ NO
Considered fully functional if the following criteria are met:
1. Unaltered in any significant manner by human activities
2. Is stable and does not exhibit headcutting, incision, or excessive aggradation
3. Is connected to its overbank flood plain supporting normal hydrological functions
4. Has a riparian buffer of at least 25 ft in width
5. If stream segment is impacted by a minor structural alteration but otherwise fully functional and does not significantly alter stream segments above and below, then the alteration should be considered separate and moderately functional

MODERATELY FUNCTIONAL: ☒ YES ☐ NO
Considered moderately functional if the following are met:
1. Streams have been altered; however, system recovery has a moderate probability of occurring naturally
2. Streams support many, but not all, of the hydraulic and geomorphic functions characteristic of fully functioning streams of similar order in the watershed

FUNCTIONALLY IMPAIRED: ☐ YES ☐ NO
Considered functionally impaired if the stream has more than one of the following:
1. Has been channelized and shows no evidence of self-recovery
2. Is levee protected, impounded, or artificially constricted
3. Entrenched or contains active headcuts
4. Has little or no riparian buffer of deep-rooted vegetation on 1 or both sides of channel
5. Has banks that are extensively eroded or unstable, bank sloughing, erosional scars
6. Has 4 or greater stream impacts within 0.5 mile upstream of proposed stream impact, and stream impacts individually or cumulatively exceed 100 ft in length

GENERAL WATERSHED AND/OR RIPARIAN AREA CHARACTERISTICS WITHIN 100FT BUFFER

RIGHT BANK:
☒ FORESTED ☐ WETLAND
☐ FARMLAND ☐ SCRUB/SHRUB
☐ HAYFIELD ☐ PRAIRIE
☐ INDUSTRIAL ☐ HIGH BLUFFS
☐ RESIDENTIAL

LEFT BANK:
☒ FORESTED ☐ WETLAND
☐ FARMLAND ☐ SCRUB/SHRUB
☐ HAYFIELD ☐ PRAIRIE
☐ INDUSTRIAL ☐ HIGH BLUFFS
☐ RESIDENTIAL

Spire STL Pipeline Stream Survey Data Collection Form (PAGE 2)

DATE: 4/4/2017
REVIEWER(S): W. John Wachter, Jr.; Nicole Paonessa
GAI STREAM ID: SIL-WJW-067

STREAM CHANNEL PROPERTIES WITH RESPECT TO TOP OF BANK (ESTIMATE):
Average bank-to-bank width (feet): 5 ; at centerline (feet): 5
Average bank height (feet): 3 ; at centerline (feet): 1.5
Bottom width (feet): 4 Water width (feet): 2 Water depth (feet): 0.1
Ordinary High Water Mark (OHWM), if observed (feet): 0.3-0.5

FLOW CHARACTERISTICS:
Water present: ☐ NO WATER, STREAMBED DRY ☐ STREAMBED MOIST ☐ STANDING WATER ☒ FLOWING WATER
If flow present, estimate stage at time of survey: ☒ HIGH ☐ MEDIUM ☐ LOW
Average depth of water (feet): 0.1

BANK EROSION: ☐ EXTENSIVE ☒ MODERATE ☐ LITTLE / NONE
Explain (sloughing banks, exposed root wads, undercut banks, etc.): Some sections deeply incised

OBSERVED PRESENCE OF GROUNDWATER SEEPS: ☐ YES ☒ NO

OBSERVED PRESENCE OF SUBSURFACE FLOW: ☐ YES ☒ NO

WATER QUALITY CHARACTERISTICS:
Obvious siltation: ☒ YES ☐ NO
Observable water quality (siltation, water color is clear, discolored, olly film, scum, water odor; etc.): Much silt in substrate
Identify specific pollutants, if known:

AQUATIC PLANTS: ☐ PERIPHYTON (brown or yellowish algae on rocks or substrate) ☐ FILAMENTOUS ALGAE ☐ MACROPHYTES

WETLAND FRINGE: ☐ YES ☐ ABUTTING or ☐ ADJACENT ☒ NO
Describe:

BIOLOGICAL CHARACTERISTICS:
Macroinvertebrates observed? ☐ YES ☒ NO Describe:
Fish or wildlife observed? ☒ YES ☐ NO Describe: Crawfish burrows
Habitat for:
Fish/spawn areas? ☐ YES ☒ NO

JURISDICTIONAL STATUS:
Is this stream jurisdictional? ☒ YES ☐ NO Describe:

OTHER OBSERVATIONS AND COMMENTS:

Spire STL Pipeline Stream Survey Data Collection Form

DATE: 4/4/2017
REVIEWER(S): W. John Wachter, Jr.; Nick Paronich WEATHER CONDITIONS: Partly cloudy, 60F
GAI STREAM ID: SIL-WJW-008

STREAM TYPE: ☒ PERENNIAL ☐ INTERMITTENT ☐ EPHEMERAL
Stream crossed by centerline: ☒ YES ☐ NO
Stream crossed by access road: ☐ YES ☒ NO

PHOTOGRAPHS TAKEN:
#P4040033 - Upstream ESE #P4040031 - Downstream √NW #P4040032 - Impact Area
#_____ - Culvert Inflow #_____ - Culvert Outflow

FULLY FUNCTIONAL: ☐ YES ☐ NO
Considered fully functional if the following criteria are met:
1. Unaltered in any significant manner by human activities
2. Is stable and does not exhibit headcutting, incision, or excessive aggradation
3. is connected to its overbank flood plain supporting normal hydrological functions
4. Has a riparian buffer of at least 25 ft In width
5. If stream segment is impacted by a minor structural alteration but otherwise fully functional and does not significantly alter stream segments above and below, then the alteration should be considered separate and moderately functional

MODERATELY FUNCTIONAL: ☒ YES ☐ NO
Considered moderately functional if the following are met:
1. Streams have been altered; however, system recovery has a moderate probability of occurring naturally
2. Streams support many, but not all, of the hydraulic and geomorphic functions characteristic of fully functioning streams of similar order in the watershed

FUNCTIONALLY IMPAIRED: ☐ YES ☐ NO
Considered functionally impaired if the stream has more than one of the following:
1. Has been channelized and shows no evidence of self-recovery
2. is levee protected, impounded, or artificially constricted
3. Entrenched or contains active headcuts
4. Has little or no riparian buffer of deep-rooted vegetation on 1 or both sides of channel
5. Has banks that are extensively eroded or unstable, bank sloughing, erosional scars
6. Has 4 or greater stream impacts within 0.5 mile upstream of proposed stream impact, and stream impacts individually or cumulatively exceed 100 ft in length

GENERAL WATERSHED AND/OR RIPARIAN AREA CHARACTERISTICS WITHIN 100FT BUFFER

RIGHT BANK:
☒ FORESTED ☐ WETLAND
☐ FARMLAND ☐ SCRUB/SHRUB
☐ HAYFIELD ☐ PRAIRIE
☐ INDUSTRIAL ☐ HIGH BLUFFS
☐ RESIDENTIAL

LEFT BANK:
☒ FORESTED ☐ WETLAND
☐ FARMLAND ☐ SCRUB/SHRUB
☐ HAYFIELD ☐ PRAIRIE
☐ INDUSTRIAL ☐ HIGH BLUFFS
☐ RESIDENTIAL

Spire STL Pipeline Stream Survey Data Collection Form (PAGE 2)

DATE: 4/4/2017
REVIEWER(S): W. John Walter, Jr.; Nick Paronich
GAI STREAM ID: STL-WJW-068

STREAM CHANNEL PROPERTIES WITH RESPECT TO TOP OF BANK (ESTIMATE):
Average bank-to-bank width (feet): 8 ; at centerline (feet): 8
Average bank height (feet): 4 ; at centerline (feet): 4
Bottom width (feet): 2 Water width (feet): 4 Water depth (feet): 0.25
Ordinary High Water Mark (OHWM), if observed (feet): _____

FLOW CHARACTERISTICS:
Water present: ☐ NO WATER, STREAMBED DRY ☐ STREAMBED MOIST ☐ STANDING WATER ☒ FLOWING WATER
If flow present, estimate stage at time of survey: ☐ HIGH ☒ MEDIUM ☐ LOW
Average depth of water (feet): 0.25

BANK EROSION: ☐ EXTENSIVE ☒ MODERATE ☐ LITTLE / NONE
Explain (sloughing banks, exposed root wads, undercut banks, etc.): Some sections incised

OBSERVED PRESENCE OF GROUNDWATER SEEPS: ☐ YES ☒ NO

OBSERVED PRESENCE OF SUBSURFACE FLOW: ☐ YES ☒ NO

WATER QUALITY CHARACTERISTICS:
Obvious siltation: ☒ YES ☐ NO
Observable water quality (siltation, water color is clear, discolored, oily film, scum, water odor; etc.): Substrate is entirely silt
Identify specific pollutants, if known: _____

AQUATIC PLANTS: ☐ PERIPHYTON (brown or yellowish algae on rocks or substrate) ☐ FILAMENTOUS ALGAE ☐ MACROPHYTES

WETLAND FRINGE: ☐ YES ☐ ABUTTING or ☐ ADJACENT ☒ NO
Describe: _____

BIOLOGICAL CHARACTERISTICS:
Macroinvertebrates observed? ☐ YES ☒ NO Describe: _____
Fish or wildlife observed? ☒ YES ☐ NO Describe: Crawfish burrows
Habitat for: _____
Fish/spawn areas? ☐ YES ☒ NO

JURISDICTIONAL STATUS:
Is this stream jurisdictional? ☒ YES ☐ NO Describe: _____

OTHER OBSERVATIONS AND COMMENTS: _____

Spire STL Pipeline Stream Survey Data Collection Form

DATE: 4/4/2017
REVIEWER(S): W. John Wachter Jr.; Nick Paremic WEATHER CONDITIONS: Partly cloudy 60F
GAI STREAM ID: SIL-WTW-009

STREAM TYPE: ☐ PERENNIAL ☒ INTERMITTENT ☐ EPHEMERAL
Stream crossed by centerline: ☐ YES ☒ NO
Stream crossed by access road: ☐ YES ☒ NO

PHOTOGRAPHS TAKEN:
#P4040035 - Upstream SSE #P4040034 - Downstream N #1 - Impact Area
#_____ - Culvert Inflow #_____ - Culvert Outflow

FULLY FUNCTIONAL: ☐ YES ☐ NO
Considered fully functional if the following criteria are met:
1. Unaltered in any significant manner by human activities
2. Is stable and does not exhibit headcutting, incision, or excessive aggradation
3. Is connected to its overbank flood plain supporting normal hydrological functions
4. Has a riparian buffer of at least 25 ft in width
5. If stream segment is impacted by a minor structural alteration but otherwise fully functional and does not significantly alter stream segments above and below, then the alteration should be considered separate and moderately functional

MODERATELY FUNCTIONAL: ☒ YES ☐ NO
Considered moderately functional if the following are met:
1. Streams have been altered; however, system recovery has a moderate probability of occurring naturally
2. Streams support many, but not all, of the hydraulic and geomorphic functions characteristic of fully functioning streams of similar order in the watershed

FUNCTIONALLY IMPAIRED: ☐ YES ☐ NO
Considered functionally impaired if the stream has more than one of the following:
1. Has been channelized and shows no evidence of self-recovery
2. Is levee protected, impounded, or artificially constricted
3. Entrenched or contains active headcuts
4. Has little or no riparian buffer of deep-rooted vegetation on 1 or both sides of channel
5. Has banks that are extensively eroded or unstable, bank sloughing, erosional scars
6. Has 4 or greater stream impacts within 0.5 mile upstream of proposed stream impact, and stream impacts individually or cumulatively exceed 100 ft in length

GENERAL WATERSHED AND/OR RIPARIAN AREA CHARACTERISTICS WITHIN 100FT BUFFER

RIGHT BANK:
☐ FORESTED ☐ WETLAND
☐ FARMLAND ☒ SCRUB/SHRUB
☐ HAYFIELD ☐ PRAIRIE
☐ INDUSTRIAL ☐ HIGH BLUFFS
☐ RESIDENTIAL

LEFT BANK:
☐ FORESTED ☐ WETLAND
☐ FARMLAND ☒ SCRUB/SHRUB
☐ HAYFIELD ☐ PRAIRIE
☐ INDUSTRIAL ☐ HIGH BLUFFS
☐ RESIDENTIAL

Spire STL Pipeline Stream Survey Data Collection Form (PAGE 2)

DATE: 4/4/2017
REVIEWER(S): W. John Wachter, Jr.; Nick Panozzo
GAI STREAM ID: SIL-WJW-069

STREAM CHANNEL PROPERTIES WITH RESPECT TO TOP OF BANK (ESTIMATE):
Average bank-to-bank width (feet): 5 ; at centerline (feet): _____
Average bank height (feet): 1.5 ; at centerline (feet): _____
Bottom width (feet): 4 Water width (feet): 0.5 Water depth (feet): 0.1
Ordinary High Water Mark (OHWM), if observed (feet): 1

FLOW CHARACTERISTICS:
Water present: ☐ NO WATER, STREAMBED DRY ☐ STREAMBED MOIST ☐ STANDING WATER ☒ FLOWING WATER
If flow present, estimate stage at time of survey: ☒ HIGH ☐ MEDIUM ☐ LOW
Average depth of water (feet): 0.1

BANK EROSION: ☐ EXTENSIVE ☒ MODERATE ☐ LITTLE / NONE
Explain (sloughing banks, exposed root wads, undercut banks, etc.): Some sections incised

OBSERVED PRESENCE OF GROUNDWATER SEEPS: ☐ YES ☒ NO

OBSERVED PRESENCE OF SUBSURFACE FLOW: ☐ YES ☒ NO

WATER QUALITY CHARACTERISTICS:
Obvious siltation: ☒ YES ☐ NO
Observable water quality (siltation, water color is clear, discolored, oily film, scum, water odor; etc.): Much silt in substrate.
Identify specific pollutants, if known: _____

AQUATIC PLANTS: ☐ PERIPHYTON (brown or yellowish algae on rocks or substrate) ☐ FILAMENTOUS ALGAE ☐ MACROPHYTES

WETLAND FRINGE: ☐ YES ☐ ABUTTING or ☐ ADJACENT ☒ NO
Describe: _____

BIOLOGICAL CHARACTERISTICS:
Macroinvertebrates observed? ☐ YES ☒ NO Describe: _____
Fish or wildlife observed? ☒ YES ☐ NO Describe: Crawfish burrows
Habitat for: _____
Fish/spawn areas? ☐ YES ☒ NO

JURISDICTIONAL STATUS:
Is this stream jurisdictional? ☒ YES ☐ NO Describe: _____

OTHER OBSERVATIONS AND COMMENTS: _____

Spire STL Pipeline Stream Survey Data Collection Form

DATE: 6/5/2017
REVIEWER(S): WTW, JJP
GAI STREAM ID: STL-WJW-010

WEATHER CONDITIONS: Sunny 75

STREAM TYPE: ☒ PERENNIAL ☐ INTERMITTENT ☐ EPHEMERAL
Stream crossed by centerline: ☒ YES ☐ NO
Stream crossed by access road: ☐ YES ☒ NO

PHOTOGRAPHS TAKEN:
#1 - Upstream W #3 - Downstream SSE #_____ - Impact Area
#_____ - Culvert Inflow #_____ - Culvert Outflow

FULLY FUNCTIONAL: ☐ YES ☐ NO
Considered fully functional if the following criteria are met:
1. Unaltered in any significant manner by human activities
2. Is stable and does not exhibit headcutting, incision, or excessive aggradation
3. Is connected to its overbank flood plain supporting normal hydrological functions
4. Has a riparian buffer of at least 25 ft in width
5. If stream segment is impacted by a minor structural alteration but otherwise fully functional and does not significantly alter stream segments above and below, then the alteration should be considered separate and moderately functional

MODERATELY FUNCTIONAL: ☒ YES ☐ NO rip-rapped; state highway along bank
Considered moderately functional if the following are met:
1. Streams have been altered; however, system recovery has a moderate probability of occurring naturally
2. Streams support many, but not all, of the hydraulic and geomorphic functions characteristic of fully functioning streams of similar order in the watershed

FUNCTIONALLY IMPAIRED: ☐ YES ☐ NO
Considered functionally impaired if the stream has more than one of the following:
1. Has been channelized and shows no evidence of self-recovery
2. Is levee protected, impounded, or artificially constricted
3. Entrenched or contains active headcuts
4. Has little or no riparian buffer of deep-rooted vegetation on 1 or both sides of channel
5. Has banks that are extensively eroded or unstable, bank sloughing, erosional scars
6. Has 4 or greater stream impacts within 0.5 mile upstream of proposed stream impact, and stream impacts individually or cumulatively exceed 100 ft in length

GENERAL WATERSHED AND/OR RIPARIAN AREA CHARACTERISTICS WITHIN 100FT BUFFER

RIGHT BANK:
☐ FORESTED ☐ WETLAND
☐ FARMLAND ☐ SCRUB/SHRUB
☐ HAYFIELD ☐ PRAIRIE
☐ INDUSTRIAL ☐ HIGH BLUFFS
☐ RESIDENTIAL

LEFT BANK:
☒ FORESTED ☐ WETLAND
☐ FARMLAND ☐ SCRUB/SHRUB
☐ HAYFIELD ☐ PRAIRIE
☐ INDUSTRIAL ☐ HIGH BLUFFS
☐ RESIDENTIAL Road

Spire STL Pipeline Stream Survey Data Collection Form (PAGE 2)

DATE: 6/5/2017
REVIEWER(S): _____
GAI STREAM ID: _____

STREAM CHANNEL PROPERTIES WITH RESPECT TO TOP OF BANK (ESTIMATE):
Average bank-to-bank width (feet): 1,500? at centerline (feet): 1,500?
Average bank height (feet): 4' ; at centerline (feet): _____
Bottom width (feet): 1,500 Water width (feet): 1,500, Water depth (feet): ?
Ordinary High Water Mark (OHWM), if observed (feet): 4'

FLOW CHARACTERISTICS:
Water present: ☐ NO WATER, STREAMBED DRY ☐ STREAMBED MOIST ☐ STANDING WATER ☒ FLOWING WATER
if flow present, estimate stage at time of survey: ☐ HIGH ☒ MEDIUM ☐ LOW
Average depth of water (feet): _____

BANK EROSION: ☐ EXTENSIVE ☐ MODERATE ☒ LITTLE / NONE
Explain (sloughing banks, exposed root wads, undercut banks, etc.): rip rap

OBSERVED PRESENCE OF GROUNDWATER SEEPS: ☐ YES ☒ NO

OBSERVED PRESENCE OF SUBSURFACE FLOW: ☐ YES ☒ NO

WATER QUALITY CHARACTERISTICS:
Obvious siltation: ☐ YES ☒ NO
Observable water quality (siltation, water color is clear, discolored, oily film, scum, water odor; etc.): Turbid brown water
Identify specific pollutants, if known: _____

AQUATIC PLANTS: ☐ PERIPHYTON (brown or yellowish algae on rocks or substrate) ☐ FILAMENTOUS ALGAE ☐ MACROPHYTES

WETLAND FRINGE: ☐ YES ☐ ABUTTING or ☐ ADJACENT ☒ NO
Describe: _____

BIOLOGICAL CHARACTERISTICS:
Macroinvertebrates observed? ☐ YES ☒ NO Describe: Didn't look
Fish or wildlife observed? ☐ YES ☒ NO Describe: Didn't look
Habitat for: _____
Fish/spawn areas? ☒ YES ☒ NO

JURISDICTIONAL STATUS:
Is this stream jurisdictional? ☒ YES ☐ NO Describe: _____

OTHER OBSERVATIONS AND COMMENTS: _____

Spire STL Pipeline Stream Survey Data Collection Form

DATE: 6/5/2017
REVIEWER(S): WTW, JJP
GAI STREAM ID: SIL-WTW-011
WEATHER CONDITIONS: Sunny 75

STREAM TYPE: ☒ PERENNIAL ☐ INTERMITTENT ☐ EPHEMERAL
Stream crossed by centerline: ☒ YES ☐ NO
Stream crossed by access road: ☐ YES ☒ NO

PHOTOGRAPHS TAKEN:
#7 - Upstream NNE #5 - Downstream SSE #_____ - Impact Area
#_____ - Culvert Inflow #_____ - Culvert Outflow

FULLY FUNCTIONAL: ☒ YES ☐ NO
Considered fully functional if the following criteria are met:
1. Unaltered in any significant manner by human activities
2. Is stable and does not exhibit headcutting, incision, or excessive aggradation
3. Is connected to its overbank flood plain supporting normal hydrological functions
4. Has a riparian buffer of at least 25 ft in width
5. If stream segment is impacted by a minor structural alteration but otherwise fully functional and does not significantly alter stream segments above and below, then the alteration should be considered separate and moderately functional

MODERATELY FUNCTIONAL: ☐ YES ☐ NO
Considered moderately functional if the following are met:
1. Streams have been altered; however, system recovery has a moderate probability of occurring naturally
2. Streams support many, but not all, of the hydraulic and geomorphic functions characteristic of fully functioning streams of similar order in the watershed

FUNCTIONALLY IMPAIRED: ☐ YES ☐ NO
Considered functionally impaired if the stream has more than one of the following:
1. Has been channelized and shows no evidence of self-recovery
2. Is levee protected, impounded, or artificially constricted
3. Entrenched or contains active headcuts
4. Has little or no riparian buffer of deep-rooted vegetation on 1 or both sides of channel
5. Has banks that are extensively eroded or unstable, bank sloughing, erosional scars
6. Has 4 or greater stream impacts within 0.5 mile upstream of proposed stream impact, and stream impacts individually or cumulatively exceed 100 ft in length

GENERAL WATERSHED AND/OR RIPARIAN AREA CHARACTERISTICS WITHIN 100FT BUFFER

RIGHT BANK:
☒ FORESTED ☐ WETLAND
☐ FARMLAND ☐ SCRUB/SHRUB
☐ HAYFIELD ☐ PRAIRIE
☐ INDUSTRIAL ☐ HIGH BLUFFS
☐ RESIDENTIAL

LEFT BANK:
☒ FORESTED ☐ WETLAND
☐ FARMLAND ☐ SCRUB/SHRUB
☐ HAYFIELD ☐ PRAIRIE
☐ INDUSTRIAL ☐ HIGH BLUFFS
☐ RESIDENTIAL

Spire STL Pipeline Stream Survey Data Collection Form (PAGE 2)

DATE: 6/5/2017
REVIEWER(S): WJW, JJP
GAI STREAM ID: SIL-WJW-011

STREAM CHANNEL PROPERTIES WITH RESPECT TO TOP OF BANK (ESTIMATE):
Average bank-to-bank width (feet): 8 ; at centerline (feet): 8
Average bank height (feet): 3 ; at centerline (feet): 3
Bottom width (feet): 6 Water width (feet): 3 Water depth (feet): 0.1-0.8
Ordinary High Water Mark (OHWM), if observed (feet): 2

FLOW CHARACTERISTICS:
Water present: ☐ NO WATER, STREAMBED DRY ☐ STREAMBED MOIST ☐ STANDING WATER ☒ FLOWING WATER
If flow present, estimate stage at time of survey: ☐ HIGH ☒ MEDIUM ☐ LOW
Average depth of water (feet): 0.1-0.8

BANK EROSION: ☐ EXTENSIVE ☒ MODERATE ☐ LITTLE / NONE
Explain (sloughing banks, exposed root wads, undercut banks, etc.): Undercut banks

OBSERVED PRESENCE OF GROUNDWATER SEEPS: ☐ YES ☒ NO

OBSERVED PRESENCE OF SUBSURFACE FLOW: ☐ YES ☒ NO

WATER QUALITY CHARACTERISTICS:
Obvious siltation: ☒ YES ☐ NO
Observable water quality (siltation, water color is clear, discolored, oily film, scum, water odor; etc.): Clear, silt deposits in channel
Identify specific pollutants, if known:

AQUATIC PLANTS: ☐ PERIPHYTON (brown or yellowish algae on rocks or substrate) ☐ FILAMENTOUS ALGAE ☐ MACROPHYTES

WETLAND FRINGE: ☐ YES ☐ ABUTTING or ☐ ADJACENT ☒ NO
Describe:

BIOLOGICAL CHARACTERISTICS:
Macroinvertebrates observed? ☒ YES ☐ NO Describe: Flatworms, Isopods, Amphipods
Fish or wildlife observed? ☐ YES ☒ NO Describe:
Habitat for:
Fish/spawn areas? ☒ YES ☐ NO

JURISDICTIONAL STATUS:
Is this stream jurisdictional? ☒ YES ☐ NO Describe:

OTHER OBSERVATIONS AND COMMENTS:

Spire STL Pipeline Stream Survey Data Collection Form

DATE: 6/5/2017
REVIEWER(S): WJW, JJP
WEATHER CONDITIONS: Sunny 75
GAI STREAM ID: STL-WJW-012

STREAM TYPE: ☐ PERENNIAL ☐ INTERMITTENT ☒ EPHEMERAL
Stream crossed by centerline: ☐ YES ☐ NO
Stream crossed by access road: ☐ YES ☒ NO

PHOTOGRAPHS TAKEN:
#10 - Upstream ENE #9 - Downstream SW #_____ - Impact Area
#_____ - Culvert Inflow #_____ - Culvert Outflow

FULLY FUNCTIONAL: ☒ YES ☐ NO
Considered fully functional if the following criteria are met:
1. Unaltered in any significant manner by human activities
2. Is stable and does not exhibit headcutting, incision, or excessive aggradation
3. Is connected to its overbank flood plain supporting normal hydrological functions
4. Has a riparian buffer of at least 25 ft in width
5. If stream segment is impacted by a minor structural alteration but otherwise fully functional and does not significantly alter stream segments above and below, then the alteration should be considered separate and moderately functional

MODERATELY FUNCTIONAL: ☐ YES ☐ NO
Considered moderately functional if the following are met:
1. Streams have been altered; however, system recovery has a moderate probability of occurring naturally
2. Streams support many, but not all, of the hydraulic and geomorphic functions characteristic of fully functioning streams of similar order in the watershed

FUNCTIONALLY IMPAIRED: ☐ YES ☐ NO
Considered functionally impaired if the stream has more than one of the following:
1. Has been channelized and shows no evidence of self-recovery
2. Is levee protected, impounded, or artificially constricted
3. Entrenched or contains active headcuts
4. Has little or no riparian buffer of deep-rooted vegetation on 1 or both sides of channel
5. Has banks that are extensively eroded or unstable, bank sloughing, erosional scars
6. Has 4 or greater stream impacts within 0.5 mile upstream of proposed stream impact, and stream impacts individually or cumulatively exceed 100 ft in length

GENERAL WATERSHED AND/OR RIPARIAN AREA CHARACTERISTICS WITHIN 100FT BUFFER

RIGHT BANK:
☒ FORESTED ☐ WETLAND
☐ FARMLAND ☐ SCRUB/SHRUB
☐ HAYFIELD ☐ PRAIRIE
☐ INDUSTRIAL ☐ HIGH BLUFFS
☐ RESIDENTIAL

LEFT BANK:
☒ FORESTED ☐ WETLAND
☐ FARMLAND ☐ SCRUB/SHRUB
☐ HAYFIELD ☐ PRAIRIE
☐ INDUSTRIAL ☐ HIGH BLUFFS
☐ RESIDENTIAL

Spire STL Pipeline Stream Survey Data Collection Form (PAGE 2)

DATE: 6/5/2017
REVIEWER(S): WJW, JJP
GAI STREAM ID: SIL-WJW-012

STREAM CHANNEL PROPERTIES WITH RESPECT TO TOP OF BANK (ESTIMATE):
Average bank-to-bank width (feet): 5 ; at centerline (feet): _____
Average bank height (feet): 2 ; at centerline (feet): _____
Bottom width (feet): 3 Water width (feet): 0 Water depth (feet): 0
Ordinary High Water Mark (OHWM), if observed (feet): None

FLOW CHARACTERISTICS:
Water present: ☒ NO WATER, STREAMBED DRY ☐ STREAMBED MOIST ☐ STANDING WATER ☐ FLOWING WATER
If flow present, estimate stage at time of survey: ☐ HIGH ☐ MEDIUM ☒ LOW
Average depth of water (feet): 0

BANK EROSION: ☐ EXTENSIVE ☒ MODERATE ☐ LITTLE / NONE
Explain (sloughing banks, exposed root wads, undercut banks, etc.): Sloughing and undercut banks

OBSERVED PRESENCE OF GROUNDWATER SEEPS: ☐ YES ☒ NO

OBSERVED PRESENCE OF SUBSURFACE FLOW: ☐ YES ☒ NO

WATER QUALITY CHARACTERISTICS:
Obvious siltation: ☐ YES ☒ NO
Observable water quality (siltation, water color is clear, discolored, oily film, scum, water odor; etc.): No water
Identify specific pollutants, if known: _____

AQUATIC PLANTS: ☐ PERIPHYTON (brown or yellowish algae on rocks or substrate) ☐ FILAMENTOUS ALGAE ☐ MACROPHYTES

WETLAND FRINGE: ☐ YES ☐ ABUTTING or ☐ ADJACENT ☒ NO
Describe: _____

BIOLOGICAL CHARACTERISTICS:
Macroinvertebrates observed? ☐ YES ☒ NO Describe: _____
Fish or wildlife observed? ☐ YES ☒ NO Describe: _____
Habitat for: _____
Fish/spawn areas? ☐ YES ☒ NO

JURISDICTIONAL STATUS:
Is this stream jurisdictional? ☐ YES ☐ NO Describe: Maybe, non-RPW

OTHER OBSERVATIONS AND COMMENTS: _____

Spire STL Pipeline Stream Survey Data Collection Form

DATE: 6/5/2017
REVIEWER(S): WJW, JJP
GAI STREAM ID: SIL-WJW-013
WEATHER CONDITIONS: Sunny 75

STREAM TYPE: ☐ PERENNIAL ☐ INTERMITTENT ☒ EPHEMERAL
Stream crossed by centerline: ☐ YES ☐ NO
Stream crossed by access road: ☐ YES ☐ NO

PHOTOGRAPHS TAKEN:
#19 - Upstream VSV #16 - Downstream N #_____ - Impact Area
#_____ - Culvert Inflow #_____ - Culvert Outflow

FULLY FUNCTIONAL: ☒ YES ☐ NO
Considered fully functional if the following criteria are met:
1. Unaltered in any significant manner by human activities
2. Is stable and does not exhibit headcutting, incision, or excessive aggradation
3. Is connected to its overbank flood plain supporting normal hydrological functions
4. Has a riparian buffer of at least 25 ft in width
5. If stream segment is impacted by a minor structural alteration but otherwise fully functional and does not significantly alter stream segments above and below, then the alteration should be considered separate and moderately functional

MODERATELY FUNCTIONAL: ☐ YES ☐ NO
Considered moderately functional if the following are met:
1. Streams have been altered; however, system recovery has a moderate probability of occurring naturally
2. Streams support many, but not all, of the hydraulic and geomorphic functions characteristic of fully functioning streams of similar order in the watershed

FUNCTIONALLY IMPAIRED: ☐ YES ☐ NO
Considered functionally impaired if the stream has more than one of the following:
1. Has been channelized and shows no evidence of self-recovery
2. Is levee protected, impounded, or artificially constricted
3. Entrenched or contains active headcuts
4. Has little or no riparian buffer of deep-rooted vegetation on 1 or both sides of channel
5. Has banks that are extensively eroded or unstable, bank sloughing, erosional scars
6. Has 4 or greater stream impacts within 0.5 mile upstream of proposed stream impact, and stream impacts individually or cumulatively exceed 100 ft in length

GENERAL WATERSHED AND/OR RIPARIAN AREA CHARACTERISTICS WITHIN 100FT BUFFER

RIGHT BANK:		**LEFT BANK:**	
☒ FORESTED	☐ WETLAND	☒ FORESTED	☐ WETLAND
☐ FARMLAND	☐ SCRUB/SHRUB	☐ FARMLAND	☐ SCRUB/SHRUB
☐ HAYFIELD	☐ PRAIRIE	☐ HAYFIELD	☐ PRAIRIE
☐ INDUSTRIAL	☐ HIGH BLUFFS	☐ INDUSTRIAL	☐ HIGH BLUFFS
☐ RESIDENTIAL		☐ RESIDENTIAL	

Spire STL Pipeline Stream Survey Data Collection Form (PAGE 2)

DATE: 6/5/2017
REVIEWER(S): WTW, JTP
GAI STREAM ID: SIL-WTW-013

STREAM CHANNEL PROPERTIES WITH RESPECT TO TOP OF BANK (ESTIMATE):
Average bank-to-bank width (feet): 5 ; at centerline (feet): _____
Average bank height (feet): 2 ; at centerline (feet): _____
Bottom width (feet): 2 Water width (feet): 0 Water depth (feet): 0
Ordinary High Water Mark (OHWM), if observed (feet): 0.3

FLOW CHARACTERISTICS:
Water present: ☒ NO WATER, STREAMBED DRY ☐ STREAMBED MOIST ☐ STANDING WATER ☐ FLOWING WATER
If flow present, estimate stage at time of survey: ☐ HIGH ☐ MEDIUM ☒ LOW
Average depth of water (feet): 0

BANK EROSION: ☐ EXTENSIVE ☒ MODERATE ☐ LITTLE / NONE
Explain (sloughing banks, exposed root wads, undercut banks, etc.): Sloughing and undercut banks

OBSERVED PRESENCE OF GROUNDWATER SEEPS: ☐ YES ☒ NO

OBSERVED PRESENCE OF SUBSURFACE FLOW: ☐ YES ☒ NO

WATER QUALITY CHARACTERISTICS:
Obvious siltation: ☐ YES ☒ NO
Observable water quality (siltation, water color is clear, discolored, oily film, scum, water odor; etc.): No water
Identify specific pollutants, if known: _____

AQUATIC PLANTS: ☐ PERIPHYTON (brown or yellowish algae on rocks or substrate) ☐ FILAMENTOUS ALGAE ☐ MACROPHYTES

WETLAND FRINGE: ☐ YES ☐ ABUTTING or ☐ ADJACENT ☒ NO
Describe: _____

BIOLOGICAL CHARACTERISTICS:
Macroinvertebrates observed? ☐ YES ☒ NO Describe: _____
Fish or wildlife observed? ☐ YES ☒ NO Describe: _____
Habitat for: _____
Fish/spawn areas? ☐ YES ☒ NO

JURISDICTIONAL STATUS:
Is this stream jurisdictional? ☐ YES ☐ NO Describe: Maybe, Non-RPW

OTHER OBSERVATIONS AND COMMENTS: _____

Spire STL Pipeline Stream Survey Data Collection Form

DATE: 6/6/2017
REVIEWER(S): WJW, JJP
WEATHER CONDITIONS: Sunny 80F
GAI STREAM ID: SIL-WJW-014

STREAM TYPE: ☐ PERENNIAL ☐ INTERMITTENT ☒ EPHEMERAL
Stream crossed by centerline: ☐ YES ☐ NO
Stream crossed by access road: ☐ YES ☐ NO

PHOTOGRAPHS TAKEN:
#14 - Upstream NNW #13 - Downstream SSW #_____ - Impact Area
#_____ - Culvert Inflow #_____ - Culvert Outflow

FULLY FUNCTIONAL: ☒ YES ☐ NO
Considered fully functional if the following criteria are met:
1. Unaltered in any significant manner by human activities
2. Is stable and does not exhibit headcutting, incision, or excessive aggradation
3. Is connected to its overbank flood plain supporting normal hydrological functions
4. Has a riparian buffer of at least 25 ft in width
5. If stream segment is impacted by a minor structural alteration but otherwise fully functional and does not significantly alter stream segments above and below, then the alteration should be considered separate and moderately functional

MODERATELY FUNCTIONAL: ☐ YES ☐ NO
Considered moderately functional if the following are met:
1. Streams have been altered; however, system recovery has a moderate probability of occurring naturally
2. Streams support many, but not all, of the hydraulic and geomorphic functions characteristic of fully functioning streams of similar order in the watershed

FUNCTIONALLY IMPAIRED: ☐ YES ☐ NO
Considered functionally impaired if the stream has more than one of the following:
1. Has been channelized and shows no evidence of self-recovery
2. Is levee protected, impounded, or artificially constricted
3. Entrenched or contains active headcuts
4. Has little or no riparian buffer of deep-rooted vegetation on 1 or both sides of channel
5. Has banks that are extensively eroded or unstable, bank sloughing, erosional scars
6. Has 4 or greater stream impacts within 0.5 mile upstream of proposed stream impact, and stream impacts individually or cumulatively exceed 100 ft in length

GENERAL WATERSHED AND/OR RIPARIAN AREA CHARACTERISTICS WITHIN 100FT BUFFER

RIGHT BANK:
☒ FORESTED ☐ WETLAND
☐ FARMLAND ☐ SCRUB/SHRUB
☐ HAYFIELD ☐ PRAIRIE
☐ INDUSTRIAL ☐ HIGH BLUFFS
☐ RESIDENTIAL

LEFT BANK:
☒ FORESTED ☐ WETLAND
☐ FARMLAND ☐ SCRUB/SHRUB
☐ HAYFIELD ☐ PRAIRIE
☐ INDUSTRIAL ☐ HIGH BLUFFS
☐ RESIDENTIAL

Spire STL Pipeline Stream Survey Data Collection Form (PAGE 2)

DATE: 6/6/2017
REVIEWER(S): WJW, JJP
GAI STREAM ID: SIL-WJW-014

STREAM CHANNEL PROPERTIES WITH RESPECT TO TOP OF BANK (ESTIMATE):
Average bank-to-bank width (feet): 5 ; at centerline (feet): _____
Average bank height (feet): 1 ; at centerline (feet): _____
Bottom width (feet): 3 Water width (feet): 0 Water depth (feet): 0
Ordinary High Water Mark (OHWM), if observed (feet): 0.3

FLOW CHARACTERISTICS:
Water present: ☒ NO WATER, STREAMBED DRY ☐ STREAMBED MOIST ☐ STANDING WATER ☐ FLOWING WATER
If flow present, estimate stage at time of survey: ☐ HIGH ☐ MEDIUM ☒ LOW
Average depth of water (feet): 0

BANK EROSION: ☐ EXTENSIVE ☒ MODERATE ☐ LITTLE / NONE
Explain (sloughing banks, exposed root wads, undercut banks, etc.): Sloughing banks, undercut banks

OBSERVED PRESENCE OF GROUNDWATER SEEPS: ☐ YES ☒ NO

OBSERVED PRESENCE OF SUBSURFACE FLOW: ☐ YES ☒ NO

WATER QUALITY CHARACTERISTICS:
Obvious siltation: ☐ YES ☒ NO
Observable water quality (siltation, water color is clear, discolored, oily film, scum, water odor; etc.): No water
Identify specific pollutants, if known: _____

AQUATIC PLANTS: ☐ PERIPHYTON (brown or yellowish algae on rocks or substrate) ☐ FILAMENTOUS ALGAE ☐ MACROPHYTES

WETLAND FRINGE: ☐ YES ☐ ABUTTING or ☐ ADJACENT ☒ NO
Describe: _____

BIOLOGICAL CHARACTERISTICS:
Macroinvertebrates observed? ☐ YES ☒ NO Describe: _____
Fish or wildlife observed? ☐ YES ☒ NO Describe: _____
Habitat for: _____
Fish/spawn areas? ☐ YES ☒ NO

JURISDICTIONAL STATUS:
Is this stream jurisdictional? ☐ YES ☐ NO Describe: Maybe, Non-RPW

OTHER OBSERVATIONS AND COMMENTS: _____

Spire STL Pipeline Stream Survey Data Collection Form

DATE: 6/7/2015
REVIEWER(S): WJW, JTP
GAI STREAM ID: SIL-WJW-015
WEATHER CONDITIONS: Sunny 80F

STREAM TYPE: ☐ PERENNIAL ☐ INTERMITTENT ☒ EPHEMERAL
Stream crossed by centerline: ☐ YES ☒ NO
Stream crossed by access road: ☐ YES ☒ NO

PHOTOGRAPHS TAKEN:
#2 - Upstream WNW #1 - Downstream S #_____ - Impact Area
#_____ - Culvert Inflow #_____ - Culvert Outflow

FULLY FUNCTIONAL: ☒ YES ☐ NO
Considered fully functional if the following criteria are met:
1. Unaltered in any significant manner by human activities
2. Is stable and does not exhibit headcutting, incision, or excessive aggradation
3. Is connected to its overbank flood plain supporting normal hydrological functions
4. Has a riparian buffer of at least 25 ft in width
5. If stream segment is impacted by a minor structural alteration but otherwise fully functional and does not significantly alter stream segments above and below, then the alteration should be considered separate and moderately functional

MODERATELY FUNCTIONAL: ☐ YES ☐ NO
Considered moderately functional if the following are met:
1. Streams have been altered; however, system recovery has a moderate probability of occurring naturally
2. Streams support many, but not all, of the hydraulic and geomorphic functions characteristic of fully functioning streams of similar order in the watershed

FUNCTIONALLY IMPAIRED: ☐ YES ☐ NO
Considered functionally impaired if the stream has more than one of the following:
1. Has been channelized and shows no evidence of self-recovery
2. Is levee protected, impounded, or artificially constricted
3. Entrenched or contains active headcuts
4. Has little or no riparian buffer of deep-rooted vegetation on 1 or both sides of channel
5. Has banks that are extensively eroded or unstable, bank sloughing, erosional scars
6. Has 4 or greater stream impacts within 0.5 mile upstream of proposed stream impact, and stream impacts individually or cumulatively exceed 100 ft in length

GENERAL WATERSHED AND/OR RIPARIAN AREA CHARACTERISTICS WITHIN 100FT BUFFER

RIGHT BANK:
☒ FORESTED ☐ WETLAND
☐ FARMLAND ☐ SCRUB/SHRUB
☐ HAYFIELD ☐ PRAIRIE
☐ INDUSTRIAL ☐ HIGH BLUFFS
☐ RESIDENTIAL

LEFT BANK:
☒ FORESTED ☐ WETLAND
☐ FARMLAND ☐ SCRUB/SHRUB
☐ HAYFIELD ☐ PRAIRIE
☐ INDUSTRIAL ☐ HIGH BLUFFS
☐ RESIDENTIAL

Spire STL Pipeline Stream Survey Data Collection Form (PAGE 2)

DATE: 6/7/2017
REVIEWER(S): WJW, JJP
GAI STREAM ID: SIL-WJW-015

STREAM CHANNEL PROPERTIES WITH RESPECT TO TOP OF BANK (ESTIMATE):
Average bank-to-bank width (feet): 3 ; at centerline (feet): _____
Average bank height (feet): 1 ; at centerline (feet): _____
Bottom width (feet): 1.5 Water width (feet): 0 Water depth (feet): 0
Ordinary High Water Mark (OHWM), if observed (feet): 0.6

FLOW CHARACTERISTICS:
Water present: ☒ NO WATER, STREAMBED DRY ☐ STREAMBED MOIST ☐ STANDING WATER ☐ FLOWING WATER
If flow present, estimate stage at time of survey: ☐ HIGH ☐ MEDIUM ☒ LOW
Average depth of water (feet): 0

BANK EROSION: ☐ EXTENSIVE ☒ MODERATE ☐ LITTLE / NONE
Explain (sloughing banks, exposed root wads, undercut banks, etc.): Sloughing banks and undercut banks

OBSERVED PRESENCE OF GROUNDWATER SEEPS: ☐ YES ☒ NO

OBSERVED PRESENCE OF SUBSURFACE FLOW: ☐ YES ☒ NO

WATER QUALITY CHARACTERISTICS:
Obvious siltation: ☐ YES ☒ NO
Observable water quality (siltation, water color is clear, discolored, oily film, scum, water odor; etc.): No water
Identify specific pollutants, if known: _____

AQUATIC PLANTS: ☐ PERIPHYTON (brown or yellowish algae on rocks or substrate) ☐ FILAMENTOUS ALGAE ☐ MACROPHYTES

WETLAND FRINGE: ☐ YES ☐ ABUTTING or ☐ ADJACENT ☒ NO
Describe: _____

BIOLOGICAL CHARACTERISTICS:
Macroinvertebrates observed? ☐ YES ☒ NO Describe: _____
Fish or wildlife observed? ☐ YES ☒ NO Describe: _____
Habitat for: _____
Fish/spawn areas? ☐ YES ☒ NO

JURISDICTIONAL STATUS:
Is this stream jurisdictional? ☐ YES ☐ NO Describe: Maybe, Non-RPW

OTHER OBSERVATIONS AND COMMENTS: _____

Spire STL Pipeline Stream Survey Data Collection Form

DATE: 6/7/2017
REVIEWER(S): WTW, JJP
GAI STREAM ID: SIL-WTW-016
WEATHER CONDITIONS: Sunny 85F

STREAM TYPE: ☐ PERENNIAL ☒ INTERMITTENT ☐ EPHEMERAL
Stream crossed by centerline: ☐ YES ☒ NO
Stream crossed by access road: ☐ YES ☒ NO

PHOTOGRAPHS TAKEN:
#10 - Upstream NW #9 - Downstream E #_____ - Impact Area
#_____ - Culvert Inflow #_____ - Culvert Outflow

FULLY FUNCTIONAL: ☒ YES ☐ NO
Considered fully functional if the following criteria are met:
1. Unaltered in any significant manner by human activities
2. Is stable and does not exhibit headcutting, incision, or excessive aggradation
3. Is connected to its overbank flood plain supporting normal hydrological functions
4. Has a riparian buffer of at least 25 ft in width
5. If stream segment is impacted by a minor structural alteration but otherwise fully functional and does not significantly alter stream segments above and below, then the alteration should be considered separate and moderately functional

MODERATELY FUNCTIONAL: ☐ YES ☐ NO
Considered moderately functional if the following are met:
1. Streams have been altered; however, system recovery has a moderate probability of occurring naturally
2. Streams support many, but not all, of the hydraulic and geomorphic functions characteristic of fully functioning streams of similar order in the watershed

FUNCTIONALLY IMPAIRED: ☐ YES ☐ NO
Considered functionally impaired if the stream has more than one of the following:
1. Has been channelized and shows no evidence of self-recovery
2. Is levee protected, impounded, or artificially constricted
3. Entrenched or contains active headcuts
4. Has little or no riparian buffer of deep-rooted vegetation on 1 or both sides of channel
5. Has banks that are extensively eroded or unstable, bank sloughing, erosional scars
6. Has 4 or greater stream impacts within 0.5 mile upstream of proposed stream impact, and stream impacts individually or cumulatively exceed 100 ft in length

GENERAL WATERSHED AND/OR RIPARIAN AREA CHARACTERISTICS WITHIN 100FT BUFFER

RIGHT BANK:
☒ FORESTED ☐ WETLAND
☐ FARMLAND ☐ SCRUB/SHRUB
☐ HAYFIELD ☐ PRAIRIE
☐ INDUSTRIAL ☐ HIGH BLUFFS
☐ RESIDENTIAL

LEFT BANK:
☒ FORESTED ☐ WETLAND
☐ FARMLAND ☐ SCRUB/SHRUB
☐ HAYFIELD ☐ PRAIRIE
☐ INDUSTRIAL ☐ HIGH BLUFFS
☐ RESIDENTIAL

Spire STL Pipeline Stream Survey Data Collection Form (PAGE 2)

DATE: 6/7/2017
REVIEWER(S): WTW, JTP
GAI STREAM ID: SIL-WTW-016

STREAM CHANNEL PROPERTIES WITH RESPECT TO TOP OF BANK (ESTIMATE):
Average bank-to-bank width (feet): 8 ; at centerline (feet): _____
Average bank height (feet): 1.5 ; at centerline (feet): _____
Bottom width (feet): 5 Water width (feet): 0.5 Water depth (feet): 0.1
Ordinary High Water Mark (OHWM), if observed (feet): 0.3

FLOW CHARACTERISTICS:
Water present: ☐ NO WATER, STREAMBED DRY ☐ STREAMBED MOIST ☐ STANDING WATER ☒ FLOWING WATER
If flow present, estimate stage at time of survey: ☐ HIGH ☒ MEDIUM ☐ LOW
Average depth of water (feet): 0.1

BANK EROSION: ☐ EXTENSIVE ☒ MODERATE ☐ LITTLE / NONE
Explain (sloughing banks, exposed root wads, undercut banks, etc.): Sloughing and undercut banks

OBSERVED PRESENCE OF GROUNDWATER SEEPS: ☐ YES ☒ NO

OBSERVED PRESENCE OF SUBSURFACE FLOW: ☐ YES ☒ NO

WATER QUALITY CHARACTERISTICS:
Obvious siltation: ☐ YES ☒ NO
Observable water quality (siltation, water color is clear, discolored, oily film, scum, water odor; etc.): Water is clear
Identify specific pollutants, if known: _____

AQUATIC PLANTS: ☐ PERIPHYTON (brown or yellowish algae on rocks or substrate) ☐ FILAMENTOUS ALGAE ☐ MACROPHYTES

WETLAND FRINGE: ☐ YES ☐ ABUTTING or ☐ ADJACENT ☒ NO
Describe: _____

BIOLOGICAL CHARACTERISTICS:
Macroinvertebrates observed? ☐ YES ☒ NO Describe: _____
Fish or wildlife observed? ☐ YES ☒ NO Describe: _____
Habitat for: _____
Fish/spawn areas? ☐ YES ☒ NO

JURISDICTIONAL STATUS:
Is this stream jurisdictional? ☒ YES ☐ NO Describe: _____

OTHER OBSERVATIONS AND COMMENTS: _____

Spire STL Pipeline Stream Survey Data Collection Form

DATE: 6/7/2017
REVIEWER(S): WJW, JJP
GAI STREAM ID: SIL-WJW-017
WEATHER CONDITIONS: Sunny. 85F

STREAM TYPE: ☐ PERENNIAL ☐ INTERMITTENT ☒ EPHEMERAL
Stream crossed by centerline: ☐ YES ☒ NO
Stream crossed by access road: ☐ YES ☒ NO

PHOTOGRAPHS TAKEN:
#17 - Upstream NW #18 - Downstream SSE #_____ - Impact Area
#_____ - Culvert Inflow #_____ - Culvert Outflow

FULLY FUNCTIONAL: ☒ YES ☐ NO
Considered fully functional if the following criteria are met:
1. Unaltered in any significant manner by human activities
2. is stable and does not exhibit headcutting, incision, or excessive aggradation
3. is connected to its overbank flood plain supporting normal hydrological functions
4. Has a riparian buffer of at least 25 ft in width
5. if stream segment is impacted by a minor structural alteration but otherwise fully functional and does not significantly alter stream segments above and below, then the alteration should be considered separate and moderately functional

MODERATELY FUNCTIONAL: ☐ YES ☐ NO
Considered moderately functional if the following are met:
1. Streams have been altered; however, system recovery has a moderate probability of occurring naturally
2. Streams support many, but not all, of the hydraulic and geomorphic functions characteristic of fully functioning streams of similar order in the watershed

FUNCTIONALLY IMPAIRED: ☐ YES ☐ NO
Considered functionally impaired if the stream has more than one of the following:
1. Has been channelized and shows no evidence of self-recovery
2. Is levee protected, impounded, or artificially constricted
3. Entrenched or contains active headcuts
4. Has little or no riparian buffer of deep-rooted vegetation on 1 or both sides of channel
5. Has banks that are extensively eroded or unstable, bank sloughing, erosional scars
6. Has 4 or greater stream impacts within 0.5 mile upstream of proposed stream impact, and stream impacts individually or cumulatively exceed 100 ft in length

GENERAL WATERSHED AND/OR RIPARIAN AREA CHARACTERISTICS WITHIN 100FT BUFFER

RIGHT BANK:
☒ FORESTED ☐ WETLAND
☐ FARMLAND ☐ SCRUB/SHRUB
☐ HAYFIELD ☐ PRAIRIE
☐ INDUSTRIAL ☐ HIGH BLUFFS
☐ RESIDENTIAL

LEFT BANK:
☒ FORESTED ☐ WETLAND
☐ FARMLAND ☐ SCRUB/SHRUB
☐ HAYFIELD ☐ PRAIRIE
☐ INDUSTRIAL ☐ HIGH BLUFFS
☐ RESIDENTIAL

Spire STL Pipeline Stream Survey Data Collection Form (PAGE 2)

DATE: 6/7/2017
REVIEWER(S): WJW, JJP
GAI STREAM ID: SIL-WJW-017

STREAM CHANNEL PROPERTIES WITH RESPECT TO TOP OF BANK (ESTIMATE):
Average bank-to-bank width (feet): 8 ; at centerline (feet): _____
Average bank height (feet): 2 ; at centerline (feet): _____
Bottom width (feet): 5 Water width (feet): 6 Water depth (feet): 6
Ordinary High Water Mark (OHWM), if observed (feet): 1.3

FLOW CHARACTERISTICS:
Water present: ☒ NO WATER, STREAMBED DRY ☐ STREAMBED MOIST ☐ STANDING WATER ☐ FLOWING WATER
If flow present, estimate stage at time of survey: ☐ HIGH ☐ MEDIUM ☒ LOW
Average depth of water (feet): _____

BANK EROSION: ☐ EXTENSIVE ☒ MODERATE ☐ LITTLE / NONE
Explain (sloughing banks, exposed root wads, undercut banks, etc.): Sloughing and undercut banks

OBSERVED PRESENCE OF GROUNDWATER SEEPS: ☐ YES ☒ NO

OBSERVED PRESENCE OF SUBSURFACE FLOW: ☐ YES ☒ NO

WATER QUALITY CHARACTERISTICS:
Obvious siltation: ☐ YES ☒ NO
Observable water quality (siltation, water color is clear, discolored, oily film, scum, water odor; etc.): No water
Identify specific pollutants, if known: _____

AQUATIC PLANTS: ☐ PERIPHYTON (brown or yellowish algae on rocks or substrate) ☐ FILAMENTOUS ALGAE ☐ MACROPHYTES

WETLAND FRINGE: ☐ YES ☐ ABUTTING or ☐ ADJACENT ☒ NO
Describe: _____

BIOLOGICAL CHARACTERISTICS:
Macroinvertebrates observed? ☐ YES ☒ NO Describe: _____
Fish or wildlife observed? ☐ YES ☒ NO Describe: _____
Habitat for: _____
Fish/spawn areas? ☐ YES ☒ NO

JURISDICTIONAL STATUS:
Is this stream jurisdictional? ☐ YES ☐ NO Describe: Maybe, Non-RPW

OTHER OBSERVATIONS AND COMMENTS: _____

Spire STL Pipeline Stream Survey Data Collection Form

DATE: 6/7/2017
REVIEWER(S): WJW, JJP
GAI STREAM ID: SIL-WJW-018

WEATHER CONDITIONS: Sunny 85F

STREAM TYPE: ☐ PERENNIAL ☐ INTERMITTENT ☒ EPHEMERAL
Stream crossed by centerline: ☐ YES ☒ NO
Stream crossed by access road: ☐ YES ☒ NO

PHOTOGRAPHS TAKEN:
#32 - Upstream W #29 - Downstream E-SE #_____ - Impact Area
#_____ - Culvert Inflow #_____ - Culvert Outflow

FULLY FUNCTIONAL: ☒ YES ☐ NO
Considered fully functional if the following criteria are met:
1. Unaltered in any significant manner by human activities
2. Is stable and does not exhibit headcutting, incision, or excessive aggradation
3. Is connected to its overbank flood plain supporting normal hydrological functions
4. Has a riparian buffer of at least 25 ft in width
5. If stream segment is impacted by a minor structural alteration but otherwise fully functional and does not significantly alter stream segments above and below, then the alteration should be considered separate and moderately functional

MODERATELY FUNCTIONAL: ☐ YES ☐ NO
Considered moderately functional if the following are met:
1. Streams have been altered; however, system recovery has a moderate probability of occurring naturally
2. Streams support many, but not all, of the hydraulic and geomorphic functions characteristic of fully functioning streams of similar order in the watershed

FUNCTIONALLY IMPAIRED: ☐ YES ☐ NO
Considered functionally impaired if the stream has more than one of the following:
1. Has been channelized and shows no evidence of self-recovery
2. Is levee protected, impounded, or artificially constricted
3. Entrenched or contains active headcuts
4. Has little or no riparian buffer of deep-rooted vegetation on 1 or both sides of channel
5. Has banks that are extensively eroded or unstable, bank sloughing, erosional scars
6. Has 4 or greater stream impacts within 0.5 mile upstream of proposed stream impact, and stream impacts individually or cumulatively exceed 100 ft in length

GENERAL WATERSHED AND/OR RIPARIAN AREA CHARACTERISTICS WITHIN 100FT BUFFER

RIGHT BANK:
☒ FORESTED ☐ WETLAND
☐ FARMLAND ☐ SCRUB/SHRUB
☐ HAYFIELD ☐ PRAIRIE
☐ INDUSTRIAL ☐ HIGH BLUFFS
☐ RESIDENTIAL

LEFT BANK:
☒ FORESTED ☐ WETLAND
☐ FARMLAND ☐ SCRUB/SHRUB
☐ HAYFIELD ☐ PRAIRIE
☐ INDUSTRIAL ☐ HIGH BLUFFS
☐ RESIDENTIAL

Spire STL Pipeline Stream Survey Data Collection Form (PAGE 2)

DATE: 6/7/2017
REVIEWER(S): WJW, JJP
GAI STREAM ID: SIL-WJW-018

STREAM CHANNEL PROPERTIES WITH RESPECT TO TOP OF BANK (ESTIMATE):
Average bank-to-bank width (feet): 5 ; at centerline (feet): _____
Average bank height (feet): 1.5 ; at centerline (feet): _____
Bottom width (feet): 3 Water width (feet): 0 Water depth (feet): 0
Ordinary High Water Mark (OHWM), if observed (feet): 1

FLOW CHARACTERISTICS:
Water present: ☒ NO WATER, STREAMBED DRY ☐ STREAMBED MOIST ☐ STANDING WATER ☐ FLOWING WATER
If flow present, estimate stage at time of survey: ☐ HIGH ☐ MEDIUM ☒ LOW
Average depth of water (feet): 0

BANK EROSION: ☐ EXTENSIVE ☒ MODERATE ☐ LITTLE / NONE
Explain (sloughing banks, exposed root wads, undercut banks, etc.): Sloughing, undercut banks

OBSERVED PRESENCE OF GROUNDWATER SEEPS: ☐ YES ☒ NO

OBSERVED PRESENCE OF SUBSURFACE FLOW: ☐ YES ☒ NO

WATER QUALITY CHARACTERISTICS:
Obvious siltation: ☐ YES ☒ NO
Observable water quality (siltation, water color is clear, discolored, oily film, scum, water odor; etc.): No water
Identify specific pollutants, if known: _____

AQUATIC PLANTS: ☐ PERIPHYTON (brown or yellowish algae on rocks or substrate) ☐ FILAMENTOUS ALGAE ☐ MACROPHYTES

WETLAND FRINGE: ☐ YES ☐ ABUTTING or ☐ ADJACENT ☒ NO
Describe: _____

BIOLOGICAL CHARACTERISTICS:
Macroinvertebrates observed? ☐ YES ☒ NO Describe: _____
Fish or wildlife observed? ☐ YES ☒ NO Describe: _____
Habitat for: _____
Fish/spawn areas? ☐ YES ☒ NO

JURISDICTIONAL STATUS:
Is this stream jurisdictional? ☐ YES ☐ NO Describe: Maybe, Non-RPW

OTHER OBSERVATIONS AND COMMENTS: _____

Spire STL Pipeline Stream Survey Data Collection Form

DATE: 6/8/2017
REVIEWER(S): WJW, JJP
GAI STREAM ID: STL-WJW-019
WEATHER CONDITIONS: Sunny 80F

STREAM TYPE: ☒ PERENNIAL ☐ INTERMITTENT ☐ EPHEMERAL
Stream crossed by centerline: ☐ YES ☒ NO
Stream crossed by access road: ☐ YES ☒ NO

PHOTOGRAPHS TAKEN:
#16 - Upstream WSW #15 - Downstream ENE #_____ - Impact Area
#_____ - Culvert Inflow #_____ - Culvert Outflow

FULLY FUNCTIONAL: ☒ YES ☐ NO
Considered fully functional if the following criteria are met:
1. Unaltered in any significant manner by human activities
2. Is stable and does not exhibit headcutting, incision, or excessive aggradation
3. Is connected to its overbank flood plain supporting normal hydrological functions
4. Has a riparian buffer of at least 25 ft in width
5. If stream segment is impacted by a minor structural alteration but otherwise fully functional and does not significantly alter stream segments above and below, then the alteration should be considered separate and moderately functional

MODERATELY FUNCTIONAL: ☐ YES ☐ NO
Considered moderately functional if the following are met:
1. Streams have been altered; however, system recovery has a moderate probability of occurring naturally
2. Streams support many, but not all, of the hydraulic and geomorphic functions characteristic of fully functioning streams of similar order in the watershed

FUNCTIONALLY IMPAIRED: ☐ YES ☐ NO
Considered functionally impaired if the stream has more than one of the following:
1. Has been channelized and shows no evidence of self-recovery
2. Is levee protected, impounded, or artificially constricted
3. Entrenched or contains active headcuts
4. Has little or no riparian buffer of deep-rooted vegetation on 1 or both sides of channel
5. Has banks that are extensively eroded or unstable, bank sloughing, erosional scars
6. Has 4 or greater stream impacts within 0.5 mile upstream of proposed stream impact, and stream impacts individually or cumulatively exceed 100 ft in length

GENERAL WATERSHED AND/OR RIPARIAN AREA CHARACTERISTICS WITHIN 100FT BUFFER

RIGHT BANK:
☒ FORESTED ☐ WETLAND
☐ FARMLAND ☐ SCRUB/SHRUB
☐ HAYFIELD ☐ PRAIRIE
☐ INDUSTRIAL ☐ HIGH BLUFFS
☐ RESIDENTIAL

LEFT BANK:
☒ FORESTED ☐ WETLAND
☐ FARMLAND ☐ SCRUB/SHRUB
☐ HAYFIELD ☐ PRAIRIE
☐ INDUSTRIAL ☐ HIGH BLUFFS
☐ RESIDENTIAL

Spire STL Pipeline Stream Survey Data Collection Form (PAGE 2)

DATE: 6/8/2017
REVIEWER(S): WJW, JJP
GAI STREAM ID: SIL-WJW-019

STREAM CHANNEL PROPERTIES WITH RESPECT TO TOP OF BANK (ESTIMATE):
Average bank-to-bank width (feet): 10 ; at centerline (feet): _____
Average bank height (feet): 3 ; at centerline (feet): _____
Bottom width (feet): 7 Water width (feet): 1 Water depth (feet): 0.1-0.2
Ordinary High Water Mark (OHWM), if observed (feet): 3

FLOW CHARACTERISTICS:
Water present: ☐ NO WATER, STREAMBED DRY ☐ STREAMBED MOIST ☐ STANDING WATER ☒ FLOWING WATER
If flow present, estimate stage at time of survey: ☐ HIGH ☒ MEDIUM ☐ LOW
Average depth of water (feet): 0.1-0.2

BANK EROSION: ☐ EXTENSIVE ☒ MODERATE ☐ LITTLE / NONE
Explain (sloughing banks, exposed root wads, undercut banks, etc.): Sloughing, undercut banks

OBSERVED PRESENCE OF GROUNDWATER SEEPS: ☐ YES ☒ NO

OBSERVED PRESENCE OF SUBSURFACE FLOW: ☐ YES ☒ NO

WATER QUALITY CHARACTERISTICS:
Obvious siltation: ☒ YES ☐ NO
Observable water quality (siltation, water color is clear, discolored, oily film, scum, water odor; etc.): Water very slightly turbid brown; silty sediment deposits
Identify specific pollutants, if known: _____

AQUATIC PLANTS: ☐ PERIPHYTON (brown or yellowish algae on rocks or substrate) ☐ FILAMENTOUS ALGAE ☐ MACROPHYTES

WETLAND FRINGE: ☐ YES ☐ ABUTTING or ☐ ADJACENT ☒ NO
Describe: _____

BIOLOGICAL CHARACTERISTICS:
Macroinvertebrates observed? ☐ YES ☒ NO Describe: _____
Fish or wildlife observed? ☐ YES ☒ NO Describe: _____
Habitat for: _____
Fish/spawn areas? ☐ YES ☒ NO

JURISDICTIONAL STATUS:
Is this stream jurisdictional? ☒ YES ☐ NO Describe: _____

OTHER OBSERVATIONS AND COMMENTS: _____

Spire STL Pipeline Stream Survey Data Collection Form

DATE: 6/10/2017
REVIEWER(S): W. John Wechter, Jr.
GAI STREAM ID: SIL-WJW-020

WEATHER CONDITIONS: Sunny, 80F

STREAM TYPE: ☐ PERENNIAL ☒ INTERMITTENT ☐ EPHEMERAL
Stream crossed by centerline: ☒ YES ☐ NO
Stream crossed by access road: ☐ YES ☒ NO

PHOTOGRAPHS TAKEN:
#P6100009 - Upstream ESE #P6100011 - Downstream WNW #P6100010 - Impact Area
_____ - Culvert Inflow # _____ - Culvert Outflow

OOA According to Notes

FULLY FUNCTIONAL: ☐ YES ☐ NO
Considered fully functional if the following criteria are met:
1. Unaltered in any significant manner by human activities
2. Is stable and does not exhibit headcutting, incision, or excessive aggradation
3. Is connected to its overbank flood plain supporting normal hydrological functions
4. Has a riparian buffer of at least 25 ft in width
5. If stream segment is impacted by a minor structural alteration but otherwise fully functional and does not significantly alter stream segments above and below, then the alteration should be considered separate and moderately functional

MODERATELY FUNCTIONAL: ☒ YES ☐ NO
Considered moderately functional if the following are met:
1. Streams have been altered; however, system recovery has a moderate probability of occurring naturally
2. Streams support many, but not all, of the hydraulic and geomorphic functions characteristic of fully functioning streams of similar order in the watershed

FUNCTIONALLY IMPAIRED: ☐ YES ☐ NO
Considered functionally impaired if the stream has more than one of the following:
1. Has been channelized and shows no evidence of self-recovery
2. Is levee protected, impounded, or artificially constricted
3. Entrenched or contains active headcuts
4. Has little or no riparian buffer of deep-rooted vegetation on 1 or both sides of channel
5. Has banks that are extensively eroded or unstable, bank sloughing, erosional scars
6. Has 4 or greater stream impacts within 0.5 mile upstream of proposed stream impact, and stream impacts individually or cumulatively exceed 100 ft in length

GENERAL WATERSHED AND/OR RIPARIAN AREA CHARACTERISTICS WITHIN 100FT BUFFER

RIGHT BANK:
☒ FORESTED ☐ WETLAND
☒ FARMLAND ☐ SCRUB/SHRUB
☐ HAYFIELD ☐ PRAIRIE
☐ INDUSTRIAL ☐ HIGH BLUFFS
☐ RESIDENTIAL

LEFT BANK:
☒ FORESTED ☐ WETLAND
☒ FARMLAND ☐ SCRUB/SHRUB
☐ HAYFIELD ☐ PRAIRIE
☐ INDUSTRIAL ☐ HIGH BLUFFS
☐ RESIDENTIAL

Spire STL Pipeline Stream Survey Data Collection Form (PAGE 2)

DATE: 6/10/2017
REVIEWER(S): W. John Wachter, Jr.
GAI STREAM ID: SIL-WJW-020

STREAM CHANNEL PROPERTIES WITH RESPECT TO TOP OF BANK (ESTIMATE):
Average bank-to-bank width (feet): 8 ; at centerline (feet): 8
Average bank height (feet): 2 ; at centerline (feet): 2
Bottom width (feet): 6 Water width (feet): 1 Water depth (feet): <0.1
Ordinary High Water Mark (OHWM), if observed (feet): 1.5

FLOW CHARACTERISTICS:
Water present: ☐ NO WATER, STREAMBED DRY ☐ STREAMBED MOIST ☐ STANDING WATER ☒ FLOWING WATER
If flow present, estimate stage at time of survey: ☐ HIGH ☐ MEDIUM ☒ LOW
Average depth of water (feet): <0.1

BANK EROSION: ☐ EXTENSIVE ☒ MODERATE ☐ LITTLE / NONE
Explain (sloughing banks, exposed root wads, undercut banks, etc.): Bank cutting

OBSERVED PRESENCE OF GROUNDWATER SEEPS: ☐ YES ☒ NO

OBSERVED PRESENCE OF SUBSURFACE FLOW: ☐ YES ☒ NO

WATER QUALITY CHARACTERISTICS:
Obvious siltation: ☒ YES ☐ NO
Observable water quality (siltation, water color is clear, discolored, oily film, scum, water odor; etc.): Substrate mostly silt
Identify specific pollutants, if known:

AQUATIC PLANTS: ☐ PERIPHYTON (brown or yellowish algae on rocks or substrate) ☐ FILAMENTOUS ALGAE ☐ MACROPHYTES

WETLAND FRINGE: ☐ YES ☐ ABUTTING or ☐ ADJACENT ☒ NO
Describe:

BIOLOGICAL CHARACTERISTICS:
Macroinvertebrates observed? ☐ YES ☒ NO Describe:
Fish or wildlife observed? ☐ YES ☒ NO Describe:
Habitat for:
Fish/spawn areas? ☐ YES ☒ NO

JURISDICTIONAL STATUS:
Is this stream jurisdictional? ☐ YES ☐ NO Describe: Maybe, probably an RPW

OTHER OBSERVATIONS AND COMMENTS:

SMO- CDK-006

Spire STL Pipeline Stream Survey Data Collection Form

DATE: 3/15/17
REVIEWER(S): JJP / CDK
GAI STREAM ID: SMO-CDK-006

WEATHER CONDITIONS: 39°F, Partly Cloudy

STREAM TYPE: ☐ PERENNIAL ☐ INTERMITTENT ☒ EPHEMERAL
Stream crossed by centerline: ☐ YES ☒ NO
Stream crossed by access road: ☐ YES ☒ NO

PHOTOGRAPHS TAKEN: JJP camera
#7270 - Upstream E #7271 - Downstream W #7272 - Impact Area SE
#7269 - Culvert Inflow W #7268 - Culvert Outflow E

FULLY FUNCTIONAL: ☐ YES ☒ NO
Considered fully functional if the following criteria are met:
1. Unaltered in any significant manner by human activities
2. Is stable and does not exhibit headcutting, incision, or excessive aggradation
3. Is connected to its overbank flood plain supporting normal hydrological functions
4. Has a riparian buffer of at least 25 ft in width
5. If stream segment is impacted by a minor structural alteration but otherwise fully functional and does not significantly alter stream segments above and below, then the alteration should be considered separate and moderately functional

MODERATELY FUNCTIONAL: ☐ YES ☒ NO
Considered moderately functional if the following are met:
1. Streams have been altered; however, system recovery has a moderate probability of occurring naturally
2. Streams support many, but not all, of the hydraulic and geomorphic functions characteristic of fully functioning streams of similar order in the watershed

FUNCTIONALLY IMPAIRED: ☒ YES ☐ NO
Considered functionally impaired if the stream has more than one of the following:
1. Has been channelized and shows no evidence of self-recovery
2. Is levee protected, impounded, or artificially constricted
3. Entrenched or contains active headcuts
4. Has little or no riparian buffer of deep-rooted vegetation on 1 or both sides of channel
5. Has banks that are extensively eroded or unstable, bank sloughing, erosional scars
6. Has 4 or greater stream impacts within 0.5 mile upstream of proposed stream impact, and stream impacts individually or cumulatively exceed 100 ft in length

GENERAL WATERSHED AND/OR RIPARIAN AREA CHARACTERISTICS WITHIN 100FT BUFFER

RIGHT BANK:
- ☐ FORESTED
- ☒ FARMLAND
- ☐ HAYFIELD
- ☒ INDUSTRIAL
- ☐ RESIDENTIAL
- ☒ WETLAND
- ☐ SCRUB/SHRUB
- ☐ PRAIRIE
- ☐ HIGH BLUFFS

LEFT BANK:
- ☐ FORESTED
- ☒ FARMLAND
- ☐ HAYFIELD
- ☒ INDUSTRIAL
- ☐ RESIDENTIAL
- ☒ WETLAND
- ☐ SCRUB/SHRUB
- ☐ PRAIRIE
- ☐ HIGH BLUFFS

SMU-CDK-006

Spire STL Pipeline Stream Survey Data Collection Form (PAGE 2)

DATE: 3/15/17
REVIEWER(S): JSP/ CDK
GAI STREAM ID: SMU-CDK-006

STREAM CHANNEL PROPERTIES WITH RESPECT TO TOP OF BANK (ESTIMATE):
Average bank-to-bank width (feet): 3 ft ; at centerline (feet): N/A
Average bank height (feet): 0.75ft at centerline (feet): N/A
Bottom width (feet): 2.5 ft Water width (feet): 1 ft Water depth (feet): <1 in
Ordinary High Water Mark (OHWM), if observed (feet): ↕ 3 in
↔ 2.5 ft

FLOW CHARACTERISTICS:
Water present: ☐ NO WATER, STREAMBED DRY ☐ STREAMBED MOIST ☒ STANDING WATER ☐ FLOWING WATER
If flow present, estimate stage at time of survey: ☐ HIGH ☐ MEDIUM ☒ LOW
Average depth of water (feet): <1 in

BANK EROSION: ☐ EXTENSIVE ☐ MODERATE ☒ LITTLE / NONE
Explain (sloughing banks, exposed root wads, undercut banks, etc.): Scour

OBSERVED PRESENCE OF GROUNDWATER SEEPS: ☐ YES ☒ NO

OBSERVED PRESENCE OF SUBSURFACE FLOW: ☐ YES ☒ NO

WATER QUALITY CHARACTERISTICS:
Obvious siltation: ☐ YES ☒ NO
Observable water quality (siltation, water color is clear, discolored, oily film, scum, water odor; etc.):

Identify specific pollutants, if known: None

AQUATIC PLANTS: ☐ PERIPHYTON (brown or yellowish algae on rocks or substrate) ☐ FILAMENTOUS ALGAE ☐ MACROPHYTES None

WETLAND FRINGE: ☒ YES ☐ ABUTTING or ☒ ADJACENT ☐ NO
Describe: PEM

BIOLOGICAL CHARACTERISTICS:
Macroinvertebrates observed? ☐ YES ☒ NO Describe:
Fish or wildlife observed? ☐ YES ☒ NO Describe:
Habitat for:
Fish/spawn areas? ☐ YES ☒ NO

JURISDICTIONAL STATUS:
Is this stream jurisdictional? ☒ YES ☐ NO Describe:

OTHER OBSERVATIONS AND COMMENTS: Receives some wetland drainage but mostly ephemeral from toe of railroad embankment slope.

Spire STL Pipeline Stream Survey Data Collection Form

DATE: 2-25-2017
REVIEWER(S): JJP-WJW
GAI STREAM ID: SMOJJP033A

WEATHER CONDITIONS: partly Cloudy / 40°F

STREAM TYPE: ☐ PERENNIAL ☐ INTERMITTENT ☒ EPHEMERAL
Stream crossed by centerline: ☐ YES ☒ NO
Stream crossed by access road: ☐ YES ☒ NO

PHOTOGRAPHS TAKEN:
#6986 - Upstream NW #6981 - Downstream SE #____ - Impact Area
#____ - Culvert Inflow #____ - Culvert Outflow 6987RB→W / 6988LB→E

FULLY FUNCTIONAL: ☐ YES ☒ NO
Considered fully functional if the following criteria are met:
1. Unaltered in any significant manner by human activities
2. Is stable and does not exhibit headcutting, incision, or excessive aggradation
3. Is connected to its overbank flood plain supporting normal hydrological functions
4. Has a riparian buffer of at least 25 ft in width
5. If stream segment is impacted by a minor structural alteration but otherwise fully functional and does not significantly alter stream segments above and below, then the alteration should be considered separate and moderately functional

MODERATELY FUNCTIONAL: ☒ YES ☐ NO
Considered moderately functional if the following are met:
1. Streams have been altered; however, system recovery has a moderate probability of occurring naturally
2. Streams support many, but not all, of the hydraulic and geomorphic functions characteristic of fully functioning streams of similar order in the watershed

FUNCTIONALLY IMPAIRED: ☒ YES ☐ NO
Considered functionally impaired if the stream has more than one of the following:
1. Has been channelized and shows no evidence of self-recovery
2. Is levee protected, impounded, or artificially constricted
3. Entrenched or contains active headcuts
4. Has little or no riparian buffer of deep-rooted vegetation on 1 or both sides of channel
5. Has banks that are extensively eroded or unstable, bank sloughing, erosional scars
6. Has 4 or greater stream impacts within 0.5 mile upstream of proposed stream impact, and stream impacts individually or cumulatively exceed 100 ft in length

GENERAL WATERSHED AND/OR RIPARIAN AREA CHARACTERISTICS WITHIN 100FT BUFFER

RIGHT BANK:
☒ FORESTED ☐ WETLAND
☐ FARMLAND ☐ SCRUB/SHRUB
☐ HAYFIELD ☐ PRAIRIE
☐ INDUSTRIAL ☐ HIGH BLUFFS
☐ RESIDENTIAL

LEFT BANK:
☒ FORESTED ☐ WETLAND
☐ FARMLAND ☐ SCRUB/SHRUB
☐ HAYFIELD ☐ PRAIRIE
☐ INDUSTRIAL ☐ HIGH BLUFFS
☐ RESIDENTIAL

Spire STL Pipeline Stream Survey Data Collection Form (PAGE 2)

DATE: 2-25-2017
REVIEWER(S): JJP-WJW
GAI STREAM ID: SMOJJP033A

STREAM CHANNEL PROPERTIES WITH RESPECT TO TOP OF BANK (ESTIMATE):
Average bank-to-bank width (feet): 8 ; at centerline (feet): —
Average bank height (feet): 5 ; at centerline (feet): —
Bottom width (feet): 1 Water width (feet): — Water depth (feet): —
Ordinary High Water Mark (OHWM), if observed (feet): .5

FLOW CHARACTERISTICS:
Water present: ☒ NO WATER, STREAMBED DRY ☐ STREAMBED MOIST ☐ STANDING WATER ☐ FLOWING WATER
If flow present, estimate stage at time of survey: ☐ HIGH ☐ MEDIUM ☐ LOW no flow
Average depth of water (feet): —

BANK EROSION: ☐ EXTENSIVE ☒ MODERATE ☐ LITTLE / NONE
Explain (sloughing banks, exposed root wads, undercut banks, etc.): scour

OBSERVED PRESENCE OF GROUNDWATER SEEPS: ☐ YES ☒ NO

OBSERVED PRESENCE OF SUBSURFACE FLOW: ☐ YES ☒ NO

WATER QUALITY CHARACTERISTICS:
Obvious siltation: ☐ YES ☒ NO
Observable water quality (siltation, water color is clear, discolored, oily film, scum, water odor; etc.): no flow
Identify specific pollutants, if known: None observed

AQUATIC PLANTS: ☐ PERIPHYTON (brown or yellowish algae on rocks or substrate) ☐ FILAMENTOUS ALGAE ☐ MACROPHYTES

WETLAND FRINGE: ☐ YES ☐ ABUTTING or ☐ ADJACENT ☒ NO
Describe: Forested slope

BIOLOGICAL CHARACTERISTICS:
Macroinvertebrates observed? ☐ YES ☒ NO Describe: —
Fish or wildlife observed? ☐ YES ☒ NO Describe: —
Habitat for: none
Fish/spawn areas? ☐ YES ☒ NO

JURISDICTIONAL STATUS:
Is this stream jurisdictional? ☒ YES ☐ NO Describe: Tributary of NHD stream

OTHER OBSERVATIONS AND COMMENTS: Tributary of SMOWP012 ext 1